Determinants of Performance Measurement Practices: Toward a Contingency Framework

Kaveh Asiaei[1], Ruzita Jusoh[2]

Department of Accounting, Faculty of Business and Accountancy, University of Malaya,

Kuala Lumpur, Malaysia

[1]kave.asia@gmail.com

[2]geee@um.edu.my

Abstract-_The issue of understanding the antecedent conditions that are necessary for the effective implementation of performance measurement system (PMS) is at the heart of the debate in the management accounting control systems (MACS) literature. This study intends to examine empirically the associations between one element of MACS i.e. PMS and some contextual factors, namely organizational culture, industry type, and firm size from contingency lens. The paper is based on the results of a study carried out in Iran through a questionnaire survey of Chief Financial Officers (CFOs) belong to 128 companies in Tehran Stock Exchange (TSE). SMARTPLS V2.0 M3, which using partial least squares (PLS), was utilized to analyze the data collected in this study. The results of the survey reveal that organizational culture and size are the contributing factors in the usage of certain PMS, i.e. the extent use of multidimensional performance measures, within Iranian public listed companies. This study extends the current management accounting literature in general and previous research on PMS in particular through offering an exhaustive conceptualization of PMS. Moreover, this study sheds light on the way in which practitioners and organizations may realize those antecedents that are pivotal to their effective usage of PMS with the ultimate purpose of taking full advantage of their PMS implementation. Such insight offers guidance as to the focus required in understanding necessary organizational traits as a basic phase of the procedure of PMS usage._

Keywords- _Performance measurement system (PMS); Multidimensional performance measures; Contingency theory; Iran_

1. INTRODUCTION

Over the past years, there has been a growing concern about traditional performance measures in which the emphasis primarily is laid upon financial criteria such as return on investment or net earnings (Kaplan & Norton, 1992, 1993 and 1996; Hoque & James, 2000; Jusoh & Parnell, 2008). A plausible rationale behind such concern is that conventional performance measures are narrow in focus, historical in nature and often incomplete (Hoque, Mia, & Alam, 2001). Ample empirical evidence lends support to this concern (e.g. Abernethy & Lillis, 1995; Bisbe & Malagueño, 2012; Chenhall, 1997; Ittner & Larcker, 1998). Meanwhile, the significance of performance measures has increased considerably as acknowledged by the numerous literature on 'benchmarking', 'total quality' measures and 'balanced-scorecards' (Hoque, 2004). Such approaches encompass either non-financial or financial measures as well as, nowadays, measures in relation to a firm's intellectual capital. The huge interest in performance measurement by executives, consultants and scholars manifests the intense pressure which entities are to augment performance. Notwithstanding the huge importance of PMS, managers still suffer from inefficiency in the implementation of PMS which may stems from inconsistencies in the design and nature of PMS usage. According to Usoff, Thibodeau, and

Burnaby (2002), there is a considerable variability in the nature and the extent to which firms apply PMS. Lee (1987) observed that more than half of the CFOs surveyed asserted that one of the major impediments to their companies' success is attributed to their incapability of developing a systematic and robust PMS. In this respect, this paper aims to conceptualize a comprehensive and complex conceptualization of PMS. In today's hyper-competitive environment, companies require a multidimensional PMS that must furnish managers with constant signals as to what is most significant in their daily functions as well as where endeavors ought to be directed (Otley, 1999). Such a multiple perspective towards performance measurement is notably manifested itself in the seminal work of Kaplan & Norton (1992, 1993 and 1996) with a buzzword, the Balanced Scorecard (BSC). In this study, a multidimensional PMS which is conceptualized as the extent use of a broad set of financial and non-financial performance measures was addressed. It specifically covers four common perspectives of Kaplan and Norton's BSC, namely financial, customer, internal business processes, learning and innovation perspective (Kaplan &Norton, 1992, 1996). More importantly, the performance measures under the four aforesaid dimensions of BSC were supplemented by some additional performance measures items which are classified under the heading of social and environmental perspective (Hoque &

Adams, 2008). Accordingly, this study proposes a conceptual model to synthesize literature on PMS across a variety of performance measures which in turn bring about a more robust conceptualization of PMS. A complex and comprehensive conceptualization of multidimensional PMS through supplementing four general and very common dimensions of BSC by one new dimension, i.e. social and environmental perspective, may offer a more systematic approach to synthesize a broad set of financial and non-finical measures more effectively. Furthermore, a large and growing body of literature has explored the association between the use and effectiveness of PMS in firms and contextual factors, including, among others, technology, strategy, environment, organizational structure, and so forth (Govindarajan & Gupta, 1985; Simons, 1990). Although this stream of research has worldwide appeal, the majority of the existing studies on PMS have mainly concentrated on the developed nations. There are only a few studies in the literature that explore the PMS in Iran (Aryankhesal, Sheldon, & Mannion, 2013; Najmi, Rigas, & Fan, 2005; Valmohammadi & Servati, 2011). Besides, there is a lack of empirical evidence for how a multidimensional PMS is related to industry type, firm size, and more importantly, the dominant cultural type (based on the Competing Values Model developed by Quinn and Rohrbaugh, 1983) in a developing context. This study, accordingly, endeavors to empirically articulate and test the associations among a company's size, culture, as well as industry type and multidimensional performance measurement functions. The paper is based on a sample of 128 public listed companies across different industries. This paper is organized as follows. First, the literature on PMS and its antecedent variables are discussed, followed by the hypotheses development. After the research method is presented, the results are reported. Finally, the study findings are discussed along with the study limitations, implications and the conclusions.

2. LITERATURE AND HYPOTHESES DEVELOPMENT

Drawing on 'contingency' view, the scope of the current study is narrowed to organizational culture, organization size, and industry type as contextual variables of interest since they are capable of exerting a significant effect on organizational systems (Cooper, 1995; Johnson & Kaplan, 1987; Woodward, Dawson, & Wedderburn, 1965). The foregoing three contextual factors as well as their relationships with the criterion variable, i.e. multidimensional PMS usage, are elaborated in this section.

2.1 Performance Measurement System

Performance measurement system refers to a mechanism to allocate responsibilities and decision rights, set performance targets, and reward the achievement of targets (Lee & Yang, 2011; Merchant & Van der Stede, 2007). In order to fulfill these functions in an effective manner, it is imperative to innovate in relation to the way of measuring

performance inside companies (Kaplan & Norton, 2001). According to Tayles, Pike, and Sofian (2007), strategy is a pattern of resource allocation through which an organization would be able to sustain or augment performance which consequently leads to "fitness" among a firm's practices and functions. Simons (1990) pointed out that PMS is tracking the execution of business strategy through comparing and contrasting the outcomes and predetermined strategic targets. Since performance is a consequence of an action (Porter & Millar, 1985) performance ought to be measured with the purpose of evaluating strategies. PM is referred as the most significant, yet most misunderstood and most difficult, task in management accounting (Atkinson, Banker, Kaplan, & Young, 1995). In the same vein, Neely (1998) argued that PM "is the process of quantifying past action". Financial indicators such as sales, cost, and Return on investment (ROI) are at the heart of traditional accounting performance measurement. Such conventional PM has been widely criticized as being backward looking, incapable of measuring knowledge-based assets and not appropriate for evaluating performance of investments in new technologies and markets that are necessary for organizations' survival in today's hyper-competitive world (Bourne, Mills, Wilcox, Neely, & Platts, 2000). According to Ittner, Larcker, and Meyer (2003), the utilization of balanced financial and non-financial measures could be perceived as the simplest way to develop an innovative PMS. Leading proponents of this view hold that it may bring about superior organizational effectiveness (e.g. Banker, Potter, & Srinivasan, 2000; Hoque & James, 2000; Lingle & Schiemann, 1996).

2.2 Organizational Culture and its Implications for PMS

This paper borrows Competing Values Model (CVM) to address organizational culture within Iranian organizations. Quinn and Rohrbaugh (1983) originally developed The CVM with the initial intention of investigating various organizational phenomena, including culture (Quinn & McGrath, 1985; Zammuto & Krakower, 1991). The CVM involves two sets of competing values along two axes as follows: the first one is the control/flexibility dilemma that reflects preferences concerning structure, stability, and change, and the second is concerned with the people/organization dilemma that reflects differences in organizational focus. Following Henri (2006), this research aims to identify the particular position of each company according to the control/flexibility continuum, that is to say dominant type. Cultural types related to control values foster tight control of operations, highly structured channels of communication, and restricted flows of information (Burns & Stalker, 1961). On the contrary, flexibility values are representative of spontaneity, change, openness, adaptability and responsiveness. Overall, cultural types that are linked to flexibility values promote loose and informal controls, open and lateral channels of

communication, and free flow of information throughout an organization (Burns & Stalker, 1961).Control values are generally manifested in tight control, vertical interaction and manager's desire for conformity and stability (Henri, 2006). Conventional performance measures relying upon financial indicators are related to a planning-and-control cycle (Nanni, Dixon, & Vollmann, 1992) and vertical functions (Ittner & Larcker, 1998). Hence, companies characterized by control value are likely oriented towards financial measures. Moreover, as Otley (2001) pointed out, financial data fosters conservatism and a ''playing safe'' approach. In this respect, Dent (1990) and Langfield-Smith (1997) advocate that accounting measures such as ROE, ROA, and so on, which are rooted in formal control systems could preclude flexibility, innovation, and novelty seeking. The stress on financial information is probably associated with the emphasis laid upon conformity and stability in control value organizations. On the other hand, the lateral channels of communication along with loose and informal controls lie at the heart of flexibility values through which adaptation and change are highlighted by managers. Nonfinancial indicators are manifested as actionable, traceable to strategic priorities and timely signals. According to Ittner and Larcker (1998), such measures direct administrative function, rather than controlling it, and represent cross-functional procedures. In effect, organizations with flexibility value are most likely implement a variety of non-financial measures as supplement to financial measures to facilitate focus organizational attention as well as promote interior communication. Besides, non-financial measures are able to pique curiosity, encourage trial and error, and inspire organizational reforms which all in turn contribute to the advent of novel strategies and learning (Dent, 1990). This is in harmony with the importance attaching to the adaptation and change within flexibility value companies. Given the foregoing argument, therefore, the following hypothesis is put forward:

H1. There is an association between the firm's dominant cultural type and the extent use of multidimensional performance measures.

2.3 Organization Size and Multidimensional PMS

According to Taylor and Taylor (2013), the rationales for investigating the nexus between firm size and performance measurement system stem from four sources as follows: (1) Scholars in the field who have suggested that size differences must be taken into account; (2) Contingency view in which size is regarded as a relevant factor from theoretical vantage point; (3) Empirical work in which size has been demonstrated as a potential determinant of the other management practices development such as supply chain co-ordination, business process re-engineering (BPR), TQM, Lean and CSR; (4) The lack of consistent empirical support for the influence of firm size on PMS development.While organization size is treated as a typical element within early contingency-based research on firm structure, somewhat few empirical works address directly

the impact of organization size on the design of PMS (Speckbacher & Wentges, 2012). Furthermore, recently, empirical research demonstrates mixed findings regarding the influence of organization size on PMS. Although several scholars, among others, (Hendricks, Menor, & Wiedman, 2004; Hoque & James, 2000; Pedersen & Sudzina, 2012) detect the presence of size effect on PMS, some fail to show such effect. For instance Ezzamel (1990) fails to observe a meaningful association between size and some budget features. Along the same line, Libby and Waterhouse (1996) indicated that there is no relationship between size and some management accounting changes. Meanwhile, Gosselin (1997) reported that organization size and the decision to adopt ABM and AMC are not significantly related. Hoque et al. (2001) also found an insignificant relationship concerning diversity of performance measures and firm size. Broadly speaking, prior contingency studies propose that organizations employ more formalized and advanced MCS in parallel with the increase in firm size, inasmuch as larger entities face higher complexity and, hence, have greater coordination and communication requirements (Chenhall, 2003). In addition, larger organizations could rest upon economies of scale and possess the necessary capacities for developing such systems. For example, Bruns and Waterhouse (1975), demonstrated that larger companies tend towards formalized and standardized "Administrative Control Strategy" while smaller companies have a propensity for a more flexible "Interpersonal Control Strategy" relying on personal connections. Likewise, Merchant (1981) observed that size could potentially determine the control strategies. Hoque and James (2000) indicated that there is a positive association between the size and BSC-type measures (measured as a 20-item scale). Plausibly, larger firms tend to use a multidimensional PMS, like BSC, for the purpose of facilitating their strategic decision making. Joshi (2001) also corroborates this result through showing that bigger companies have a tendency to employ more innovative and strategic management accounting practices compared with medium sized companies. In the same vein, Ambler, Kokkinaki, and Puntoni (2004) found that larger organizations are oriented towards the use of more diversity of performance measures in comparison with smaller organizations. Besides, Widener (2006) observed that the extent use of multiple performance measures could be determined by organization size. With the foregoing discussion in mind, it is expected that larger organizations use multidimensional PMS to a greater extent due plausibly to the fact that large companies enjoy a greater access to resources, economies of scale, and value chain alliances (Kettinger, Grover, Guha, & Segars, 1994), hence the demand for information in general and performance measures in particular would increase. Accordingly, it could conceivably be hypothesized that:

H2: The propensity to use multidimensional PMS is positively associated with firm size.

2.4 Industry Type and Multidimensional PMS

The industry in which a company belongs is referred as a contributing factor to determine the type and the extent use of performance measures (Abdel-Maksoud, Dugdale, & Luther, 2005; Bhimani, 1993, 1994). Organizations within various industries encounter various demands, difficulties, and opportunities. In this case, they tend to vary in their input processes, throughputs, and outputs (Porter 1980; Duh, Xiao, & Chow, 2009). Spender (1989) argued companies within different sectors are inclined towards the development of different business models and configurations of internal operations. Foster and Foster and Gupta (1994) observed that the use of accounting information in marketing decision-making has also placed emphasis on the role played by industry factors. Previous empirical research shows that industry is a determining factor on organizations' MACS design (Chapman, 1997; Fisher, 1998). Williams and Seaman (2001) demonstrated that MACS design differs significantly across industries in Singaporean organizations in terms of manufacturing, industrial, or service. However, Duh et al. (2009) found that significant linkage was not completely absent in the relationship of industry and a set of selected MAPs in China. Chenhall and Morris (1986) advised on further investigation to determine the impact of contextual factors, including industry type, on the effective design of MACS. Moreover, Lee (1987) refers to industry type as one of the various important factors which could account for differences in PMS design and implementation. The CIMA (1993) survey of UK manufacturers concludes that no single set of performance indicators is found in use in all manufacturing firms surveyed or not with a similar degree of importance attached. Given the foregoing argument, the potential for industry to be a significant factor affecting multidimensional PMS inspires the hypothesis three.

H3. There is an association between the type of industry to which a company belongs and the extent use of multidimensional PMS.

Given the foregoing argument on literature and hypotheses development, a theoretical framework is developed as illustrated in Figure 1 in Appendix. As elaborated earlier, contingency theory principally underpins the current study in which organizational culture, organization size, and industry type treat as the contextual variables of interest given that they could potentially explain the differences in organizational systems (Johnson & Kaplan, 1987; Cooper, 1995; Khandwalla, 1972; Woodward, 1965; Bhimani, 2003; Henri, 2006). Specifically, the theoretical framework illustrates the effect of organizational size and industry type on the usage of multidimensional PMS. More importantly, this study intends to determine to what extent organizational culture would account for the differences in the design of one element of management accounting and control systems i.e. PMS (Bhimani, 2003; Henri, 2006). This association is investigated since culture could influence almost all facets of corporate relations along with the actions at the top management level.

3. RESEARCH METHOD

3.1 Variables and Measurement

3.1.1 Organizational Culture

Organizational culture was captured according to the competing-values approach. This instrument was validated by previous studies (Zammuto & Krakower, 1991). Beside, some recent accounting researchers have applied the instrument in their studies (Bhimani, 2003; Henri, 2006). The instrument asked key informants (CFOs) to distribute 100 scores among the four ideal cultural types along each of the following four dimensions of culture: institutional character; institutional leader; institutional cohesion; and, institutional emphases. For each dimension, respondents should distribute 100 points among four sentences where organization A represents "group culture", organization B refers to "developmental culture", organization C refers to "hierarchical culture", and organization D refers to "rational culture". Following Henri (2006), this research aims to identify the particular position of each company according to the control/flexibility continuum, that is to say dominant type. Cultural-type score and a value score determine the dominant- type score. In this regard, firstly, the cultural-type score is computed for each culture through averaging the ratings obtained on the four dimensions. For each organization, the sum of the four cultural types equals 100. Secondly, the value score is calculated for the control/flexibility continuum in the following manner:

Flexibility-value score = (Group-culture score + Developmental-culture score)

Control-value score = (Hierarchical-culture score + Rational-culture score)

Finally, the dominant-type score is achieved through deducting the control-values score from the flexibility values score. Concerning that the flexibility and control value scores are the extremes of a competing-values continuum, a difference score specifies the particular position of each company on this continuum. That is, a positive score represents a flexibility dominant type and, on the contrary, a negative score represents a control dominant type.

3.1.2 Organization size

Although previous studies have adopted many different approaches, among others, gross sales or gross value of assets (Kettinger et al., 1994), sales turnover (Hoque et al., 2001), natural log of total revenue (Elijido-Ten, 2009; Habib, 2010; Hoque & James, 2000) to define and measure organization size, the number of employees is the most frequently used proxy (Aiken, Bacharach, & French, 1980; Chenhall, 2003; Dewar & Dutton, 1986; Ezzamel, 1990; Govindarajan, 1984; Kopp & Litschert, 1980; Merchant, 1981) and is practically interchangeable with other measures (Agarwal, 1979). For the purpose of current research, organization size is measured based on the number of employees extracted from Tehran Stock Exchange (TSE) directory. Given the non-normality of

Size, it was transformed logarithmically to adjust for expected nonlinearity or non-normality (Carpenter & Fredrickson, 2001).

3.1.3 Industry type

As explained earlier, the literature demonstrates that the use and implementation of various management accounting initiatives may significantly vary according to the industry type like manufacturing and service companies (Cooper, 1988). In this study, therefore, dummy variable differentiates between manufacturing and non-manufacturing companies in consistent with the management accounting literature (e.g. Cagwin & Bouwman, 2002; Widener, 2006). Dummy variable 1 was designated for manufacturing company while 0 was assigned to non manufacturing organizations.

3.1.4 Multidimensional Performance measures

For measuring the multidimensional performance measures construct, this study basically adopts the instrument used by Henri (2006) which was originally an adapted version of Hoque and James (2000). It includes twenty performance measures items largely based on four dimensions of the balanced scorecard (BSC), namely financial, customer, internal business process, and innovation and learning which developed initially by Kaplan and Norton (1992). In addition, the aforesaid four perspectives were supplemented by seven items came under the heading of social and environmental performance measures (Hoque & Adams, 2008) as the fifth perspective. Accordingly, the instrument asked about the frequency of use of total 27 performance measures which categorized under five broad dimensions. That is, the informants were asked to rate the degree of their organization's use of each measure on the five perspectives employing a 7-point Likert-type scale ranging from 1 (not at all), 4 (to a moderate extent), to 7 (to a very great extent). It is imperative to mention that, an aggregate score was computed for the 27 diverse performance measures.

3.2 Sample

This study selected all the public listed companies within the Tehran Stock Exchange (TSE) in Iran as the unit of analysis, inasmuch as these organizations are perceived as the most prominent and dominant group among the organizations in Iran. The economy of Iran is diversified economy with over 40 industries directly involved in the Tehran Stock Exchange. As recommended by Bontis (1998), a multi-industry sample would allow an investigation of inter-industry effects and potentially broaden the study's generalization. The data collection procedure for the current study was carried out using a structured questionnaire. The questionnaire supplemented by a cover letter posted to the Chief Financial Officers of the sampled 339 companies within TSE as the largest stock exchange in Iran. Nowadays TSE has become a thrilling and flourishing market in which either individual or institutional investor deal in securities of more than 330

organizations with a market capitalization of US$104.21 billion. A total of 136 questionnaires were received, from which 128 usable questionnaires with a response rate of 37.7 % were eventually coded and used for the purpose of data analysis.

4. DATA ANALYSIS AND RESULTS

Partial Least Squares (PLS) is classified as one of the structural equation modeling techniques generally adopted for managing rather small data samples. This statistical method has been employed as a research tool in various contexts, among others, management accounting (e.g. Chenhall, 2004; Naranjo-Gil & Hartmann, 2006, 2007); business disciplines (Hulland & Kleinmuntz, 1994); cooperative ventures (Fornell, Lorange, & Roos, 1990); global strategy (Johansson & Yip, 1994); risk-return outcomes (Cool, Dierickx, & Jemison, 1989); and in intellectual capital research (e.g. Asiaei & Jusoh, 2014; Bontis, 1998; Bontis, Keow, & Richardson, 2000; Cabrita & Bontis, 2008; Cleary, Kennedy, O'Donnell, & O'Regan, 2007). The superiority of PLS stems from capability to model linear associations regardless of the limitations of other SEM techniques, such as normality and large sample size that coordinates with estimated indicators (Chin, Marcolin, & Newsted, 2003). The degree to which any particular PLS model accomplishes this objective can be determined by examining the R-squared values for the dependent (endogenous) constants. Similar to the other structural equation modeling techniques, a two-step process is typically utilized in PLS (Chin et al., 2003; Chwelos, Benbasat, & Dexter, 2001; Karimi, Somers, & Gupta, 2004; Ko, Kirsch, & King, 2005; Teo, Wei, & Benbasat, 2003; Wixom & Watson, 2001). The measurement model is assessed at the outset, along the same lines as factor analysis and tests of unidimensionality. The second phase is assessing the structural model with the aim of providing path coefficients which demonstrate the associations of each variable. The estimation of the measurement model provides factor loadings and reliability measures from items to latent constructs whereas the assessment of the structural model illustrates the path coefficients for significant effects on the relationships between constructs.

4.1 Measurement Model Assessment

Unidimensionality is presented by composite reliabilities of the constructs that are shown in Table 1 in Appendix. The reliability level is desirable at 0.8 for the basic study while it is acceptable at 0.7 for the exploratory study (Hair, Anderson, Tatham, & Black, 1998). An internal consistency measure (Cronbach α) developed by Fornell and Larcker (1981), and composite reliability calculated by Bacon, Sauer, and Young (1995), are typically reported. In this study Cronbach's α varies between 0.876 (PMS) and 1 (organizational culture, size, and industry type). Furthermore, the composite reliabilities are shown in Table 1 in Appendix range from 0.908 (PMS) to 1 (organizational culture, size, and industry type) which are

acceptable by the guideline suggested by Hair et al., (1998).Construct validity can be captured through the estimation of each measure's convergent, discriminant validity or factor loadings of each item in each construct. Construct, convergent and discriminant validity were demonstrated in several articles (Chin et al., 2003; Chwelos et al., 2001; Karimi et al., 2004; Ko et al., 2005; Teo et al., 2003). A publicly acknowledged rule of thumb is to accept items with loadings of 0.70 and higher, that implies that there is more shared variance between the construct and its measures than error variance (Barclay, Higgins, & Thompson, 1995; Hair et al., 1998). According to Bollen (1998), the larger the factor loadings, the stronger the evidence of unidimensionality is. Convergent validity is defined as the extent to which constructs which must be associated theoretically are actually interrelated (Campbell & Fiske, 1959) whereas discriminant validity is defined as the extent to which constructs which must not be associated theoretically are not interrelated in effect (Campbell & Fiske, 1959). Convergent validity is obtained when the average variance extracted (AVE) between the constructs exceeds 0.5 (Chin et al., 1998). AVE provides a measure of the variance shared between a construct and its indicators. In Table 1 in Appendix, the AVEs range from 0.665 (contribute to PMS) and 1 (organizational culture, size, and industry type), exceeding the cutoff point of .50 suggested by (Fornell & Larcker, 1981). This research drew upon the suggestion of Fornell and Larker (1981) in order to assess discriminant validity: the square root of AVE must be larger than the correlations of the constructs to achieve acceptable discriminant validity. Hence, the value of diagonal elements must be higher than those of off-diagonal elements (Fornell & Larcker, 1981). As presented in Table 2 in Appendix, the values show acceptable discriminant validity. Overall, all the statistics reveal that the measurement model is adequate and sufficient for testing the structural model.

4.2 Structural Model Assessment

In PLS path modeling, the structural model is assessed through estimating the path coefficients along with the R^2 value. While path coefficients show the strength of the associations among the predictor and criterion constructs, the R^2 value is a scale of the predictive intensity of a model for the criterion (dependent) constructs (Ko et al., 2005; Chin et al., 1998, 2003). The significance of path coefficients in the model lends support for hypothesized associations (Bentler & Wu, 1995). SMARTPLS V2.0 M3 (Ringle, Wende, & Will, 2005), was chosen to use a bootstrap resampling method (5000 resamples) to determine the significance of the paths within the structural model. Table 3 presents results of the SEM assessment which consists of standardized path coefficients β in addition to their corresponding t-statistics extracted from PLS estimation. The bootstrap resampling technique with 5000 resamples was conducted for estimating the standard errors.

The standardized coefficient of the effect of organizational culture on multidimensional PMS provides support for hypothesis H1. That is, culture (flexibility dominant cultural type) has a significant positive impact on PMS with a path coefficient of 0.308, t-value 3.909 and significant at $p < 0.01$. Similarly, there is a significant relationship between size and the extent use of multidimensional performance measures with a path coefficient of 0.194, t-value 2.176 and significant at $p < 0.01$ (H2). Conversely, the results do not support the hypothesis H3 since no statistical significance was found between industry type and the extent use of multidimensional performance measures (β=0.0473, t-value=0.513). R^2 in the PMS for the structural model was 12%, which was explained by the following factors: culture, size, and industry. In other words, overall, 12% of the IC was explained by the aforesaid independent variables

5. DISCUSSION & CONCLUSION

From contingency lens, the present study was set out to determine the effect of some potential precursors of the usage of a certain performance measurement system in Iran as a developing country. Specifically, the paper investigated the influence of organizational culture, organization size, and industry type on the use of multidimensional performance measures. For the purpose of examining the postulated associations, the research surveyed 128 Iranian public listed companies across different sectors including manufacturing and non-manufacturing organizations. We used the relevant literature in order to develop hypotheses concerning three contextual factors which potentially could account for differences in the extent use of multidimensional performance measures. First and foremost, the findings confirmed that culture is evidently a necessary precursor to the extent use of multidimensional PMS. This implies that while the organizational initiatives such as contemporary PMS is advocating for changing the way organizations operate, success essentially hinges upon successful cultural change. An interpretation of the results is that flexibility-oriented companies which are characterized by more innovative and novelty-seeking traits have a propensity for using multidimensional PMS to a greater extent. This finding is in agreement with prior contingency studies regarding the impact of corporate culture on management accounting and control practices (Baird, Harrison, & Reeve, 2004; Chia & Koh, 2007; Jordão, Souza, & Avelar, 2013; O'Connor, 1995; Pfister & HARTMANN, 2011). Taking into consideration the importance of other contingent factors studied earlier (e.g., strategy, information system, organization structure, environment, etc.), culture is appeared to be an omnipresent feature that able to impact virtually all facets of corporate interactions and functions (Henri, 2006). The comprehension of this key determinant is essential to address and understand performance measurement from a holistic approach. The

analysis also revealed that organization size is significantly associated with the extent use of multidimensional performance measures (β=0.194). As hypothesized, there is a significant positive association between organization size and PMS characterized by a variety of performance measures, including financial, customer, internal business process, innovation and learning, and social and environmental measures. This implies that as size increases, companies find it more helpful to attach more importance to integrated and balanced performance measurement approaches such as balanced scorecard. Such PMS facilitates the strategic decision making due to the fact that it embraces much broader measures of the performance of companies. This result corroborates the previous research on the impact of size on management accounting in general and PMS in particular from contingency lens (e.g. Chenhall, 2003; Hendricks et al., 2004; Hoque & James, 2000; Joshi, 2001; Pedersen & Sudzina, 2012; Taylor & Taylor, 2013; Widener, 2006).

Although the industry type is referred as a contributing factor for MACS in general (Fisher, 1995, 1998; Chapman, 1997; Duh et al., 2009; Williams & Seaman, 2001) as well as PMS in particular (Lee, 1987; CIMA, 1993; Bhimani, 1993, 1994; Abdel-Maksoud et al., 2005), manufacturing and non-manufacturing entities cannot be differentiated in this study. It is admitted that different industry types may entail different design and practices of management accounting. This is not the case in the current research in which the industry type failed to explain differences in the design of PMS overall (aggregate form). However, this may open an avenue for further research whereby researchers could delve deeply into PMS within several different industries in more detail, perhaps addressing the individual dimensions of the balanced PMS, namely financial, customer, innovation and learning and so forth.

5.1 Implications

The results yield some contributions and implications either in terms of theory or practice. From a theoretical perspective, generally speaking, this study extends prior body of research on management accounting using a contingency view. Notwithstanding insights from prior studies, current research tends to overlook the associations between organizational culture and performance measurement system from a holistic vantage point. Besides, this work is among the early empirical studies within the management accounting context which investigate organizational culture by means of a cross-sectional and quite large-sample perspective. In particular, this study extents the earlier PMS literature by investigating the effects of organizational culture, size, and industry type on the design of one basic element of management control systems, i.e. PMS which manifest itself in a broad set of financial and non-financial measures under the five different perspectives. Such a research with a comprehensive and complex conceptualization of PMS was not existent in the current literature, although there is a

well-established stream of research on the topic of PMS in general. That is, this study is among the first, to the authors' knowledge, to incorporate social and environmental perspective into the four common BSC perspectives in one research model across a wide range of manufacturing and non-manufacturing companies in Iran. The factor analysis results outlined five factors with acceptable levels of reliability and validity. Future research may employ this scale to provide further insight into the way we conceptualize PMS in a more systematic manner. This in turn sheds light on how to achieve an effective and robust PMS implementation. As stated above, this study presents a new conceptualization of PMS through supplementing four main dimensions of BSC by an additional dimension which is labeled as social and environmental measures. Hence, the paper highlights the topic of sustainability in performance evaluations in line with the efforts of some other scholars in the field (e.g. Atkinson, 2000; Dias-Sardinha & Reijnders, 2005; Hsu, Hu, Chiou, & Chen, 2011) who suggested various frameworks on sustainable performance measurement. This comprehensive conceptualization may provide some research-guided insight into the topic of sustainability and into the importance of such novel argument within management accounting context. In parallel with the foregoing theoretical implications, this research caries some contributions from practical angle as well. The results provide insight into the way practitioners could realize those antecedents which are pivotal to their effective use of PMS. Such insight offers guidance as to the focus required in developing necessary organizational traits as a basic phase of the procedure of PMS usage. Chief among these traits is the organizational culture. Although there may exist some intuitive notion in the relation between the culture and PMS usage, our results present somehow strong evidence to support this standpoint. Since organization's inability to produce systematic PMS is a primary obstacle to their success, an effective combination and integration of multiple perspectives of PMS, which can bring about more systematic PMS, would be beneficial in practice. Iranian companies and top management teams would be able to gain an understanding of how alleviates disruptive performance stems from an organization's failure to produce systematic and robust PMS. Such experiences in Iran can be useful for other developing countries with similar cultural, economic and political environments, such as the Middle East and North Africa region.

5.2 Limitations and Future Research

In spite of its contributions, this research is subject to some potential limitations. First, the instrument of the study was the questionnaire survey which this consequently made the study as a whole relies seriously on the perception and opinions of key informants. Even now the research's instrument was tested either in terms of the reliability or the validity, there should exist some type of bias when the key informants specify their organizational features.

Secondly, the data presented in this research is regarded cross-sectional or one-shot. Those critical factors were captured and measured just once and at a static point instead of as they were developing, thereby missing the value of time explanation. It is imperative to attach importance to long-term effects, particularly on the creation and development of the PMS and organizational culture. Besides, survey data derived from cross-sectional analyses is incapable of producing conclusive evidence of causality. Instead, the evidence should be regarded in line with theoretical arguments and expected associations. Future research could embark longitudinal survey in order to investigate the causality and interrelationships among factors which are pivotal to intellectual capital development. Thirdly, the data were collected in a single country (Iran). Potential culture limitations should be noted, especially the cultural differences among developing countries and developed nations that influence the perceptions of management accounting practices. The framework of the study must be examined further through including samples from other countries to generalize or modify the concepts. Moreover, concerning the concept of organizational culture, despite an acceptable reliability and validity of the instruments, richness could not be completely acquired via a survey instrument as organizational culture is perceived as a broad construct. It is also worthwhile investigating other potential explanatory factors that could account differences in the design and usage of PMS such as technology, business strategy, competition, environment, etc. considering a larger set of industry sectors, instead of designating only two broad categories of industry types as manufacturing and non-manufacturing. This study treated multidimensional PMS in an aggregate form instead of addressing them individually. Future studies may delve into the individual component of multidimensional PMS in isolation for providing better understanding of each element in particular. The scope of the current study is narrowed to only a single-feature of performance measurement system i.e. multidimensional PMS which mainly address the argument of integrated financial and non-financial measures. It is also worthwhile focusing on other important attributes of PMS including the nature of PMS use such as those were initially introduced by Simon (1990) as the levers of control.

6. REFERENCES

[1]   Abdel-Maksoud, Ahmed, Dugdale, David, & Luther, Robert. (2005). Non-financial performance measurement in manufacturing companies. The British Accounting Review, 37(3), 261-297.

[2]   Abernethy, Margaret A, & Lillis, Anne M. (1995). The impact of manufacturing flexibility on management control system design. Accounting, Organizations and Society, 20(4), 241-258.

[3]   Agarwal, Naresh C. (1979). Research Notes: On the Interchangeability of Size Measures. Academy of Management Journal, 22(2), 404-409.

[4]   Aiken, Michael, Bacharach, Samuel B, & French, J Lawrence. (1980). Organizational structure, work process, and proposal making in administrative bureaucracies. Academy of management journal, 23(4), 631-652.

[5]   Ambler, Tim, Kokkinaki, Flora, & Puntoni, Stefano. (2004). Assessing marketing performance: reasons for metrics selection. Journal of Marketing Management, 20(3-4), 475-498.

[6]   Aryankhesal, Aidin, Sheldon, Trevor A, & Mannion, Russell. (2013). Role of pay-for-performance in a hospital performance measurement system: a multiple case study in Iran. Health policy and planning, 28(2), 206-214.

[7]   Asiaei, Kaveh, & Jusoh, Ruzita. (2014). Antecedent conditions for leveraging intellectual capital: a contingency perspective. International Journal of Research in Business and technology, (4)1, 354-366.

[8]   Atkinson, Anthony, Banker, Rajiv D, Kaplan, Robert S, & Young, SM. (1995). Management Accounting Prentice Hall. Englewood, Cliffs, NJ.

[9]   Atkinson, Giles. (2000). Measuring corporate sustainability. Journal of Environmental Planning and management, 43(2), 235-252.

[10]   Bacon, Donald R, Sauer, Paul L, & Young, Murray. (1995). Composite reliability in structural equations modeling. Educational and Psychological Measurement, 55(3), 394-406.

[11]   Baird, Kevin M, Harrison, Graeme L, & Reeve, Robert C. (2004). Adoption of activity management practices: a note on the extent of adoption and the influence of organizational and cultural factors. Management Accounting Research, 15(4), 383-399.

[12]   Banker, Rajiv D, Potter, Gordon, & Srinivasan, Dhinu. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. The Accounting Review, 75(1), 65-92.

[13]   Barclay, Donald, Higgins, Christopher, & Thompson, Ronald. (1995). The partial least squares (PLS) approach to causal modeling: personal computer adoption and use as an illustration. Technology studies, 2(2), 285-309.

[14]   Bentler, PM, & Wu, EJC. (1995). EQS for Macintosh user" s guide. Encino. CA: Multivariate Software: Inc.

[15]   Bhimani, A. (1993). Performance measures in UK manufacturing companies: the state of play. MANAGEMENT ACCOUNTING-LONDON-, 71, 20-20.

[16]   Bhimani, A. (1994). Monitoring performance measures in UK manufacturing companies. MANAGEMENT ACCOUNTING-LONDON-, 72, 34-34.

[17]   Bhimani, Alnoor. (2003). A study of the emergence of management accounting system ethos and its influence on perceived system success. Accounting, Organizations and Society, 28(6), 523-548.

[18]   Bisbe, Josep, & Malagueño, Ricardo. (2012). Using strategic performance measurement systems for strategy formulation: Does it work in dynamic environments? Management Accounting Research, 23(4), 296-311.

[19]   Bollen, Kenneth A. (1998). Structural equation models: Wiley Online Library.

[20]   Bontis, Nick. (1998). Intellectual capital: an exploratory study that develops measures and models. Management decision, 36(2), 63-76.

[21]   Bontis, Nick, Keow, William Chua Chong, & Richardson, Stanley. (2000). Intellectual capital and business performance in Malaysian industries. Journal of intellectual capital, 1(1), 85-100.

[22]   Bourne, Mike, Mills, John, Wilcox, Mark, Neely, Andy, & Platts, Ken. (2000). Designing, implementing and updating performance measurement systems. International Journal of Operations & Production Management, 20(7), 754-771.

[23]   Bruns Jr, William J, & Waterhouse, John H. (1975). Budgetary control and organization structure. Journal of accounting research, 177-203.

[24]   Burns, Tom, & Stalker, George Macpherson. (1961). The management of innovation. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.

[25]   Cabrita, Maria Do Rosario, & Bontis, Nick. (2008). Intellectual capital and business performance in the Portuguese banking industry. International Journal of Technology Management, 43(1), 212-237.

[26]   Cagwin, Douglass, & Bouwman, Marinus J. (2002). The association between activity-based costing and improvement in financial performance. Management Accounting Research, 13(1), 1-39.

[27]   Campbell, Donald T, & Fiske, Donald W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological bulletin, 56(2), 81.

[28]   Carpenter, Mason A, & Fredrickson, James W. (2001). Top management teams, global strategic posture, and the moderating role of uncertainty. Academy of Management Journal, 44(3), 533-545.

[29]   Chapman, Christopher S. (1997). Reflections on a contingent view of accounting. Accounting, Organizations and Society, 22(2), 189-205.

[30]   Chatterjee, Sayan, Lubatkin, Michael H, Schweiger, David M, & Weber, Yaakov. (1992). Cultural differences and shareholder value in related mergers: Linking equity and human capital. Strategic Management Journal, 13(5), 319-334.

[31]   Chenhall, Robert H. (1997). Reliance on manufacturing performance measures, total quality management and organizational performance. Management Accounting Research, 8(2), 187-206.

[32]   Chenhall, Robert H. (2003). Management control systems design within its organizational context: findings from contingency-based research and directions for the future. Accounting, organizations and society, 28(2), 127-168.

[33]   Chenhall, Robert H. (2004). The role of cognitive and affective conflict in early implementation of activity-based cost management. Behavioral Research in Accounting, 16(1), 19-44.

[34]   Chenhall, Robert H, & Morris, Deigan. (1986). The impact of structure, environment, and interdependence on the perceived usefulness of management accounting systems. Accounting Review, 16-35.

[35]   Chia, Yew Ming, & Koh, Hian Chye. (2007). Organizational culture and the adoption of management accounting practices in the public sector: A Singapore study. Financial Accountability & Management, 23(2), 189-213.

[36]   Chin, Wynne W, Marcolin, Barbara L, & Newsted, Peter 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.

[37]   Chwelos, Paul, Benbasat, Izak, & Dexter, Albert S. (2001). Research report: empirical test of an EDI adoption model. Information systems research, 12(3), 304-321.

[38]   Cleary, Peter, Kennedy, Tom, O'Donnell, David, & O'Regan, Philip. (2007). Positioning management accounting on the intellectual capital agenda. International Journal of Accounting, Auditing and Performance Evaluation, 4(4), 336-359.

[39]   Cool, Karel, Dierickx, Ingemar, & Jemison, David. (1989). Business strategy, market structure and risk-return relationships: A structural approach. Strategic Management Journal, 10(6), 507-522.

[40]   Cooper, Robert Gravlin. (1988). Winning at new products: Kogan Page London.

[41]   Cooper, Robin. (1995). When lean enterprises collide: competing through confrontation (Vol. 5): Harvard Business School Press Boston, MA.

[42]   Dent, Jeremy F. (1990). Strategy, organization and control: some possibilities for accounting research. Accounting, Organizations and Society, 15(1), 3-25.

[43]   Dewar, Robert D, & Dutton, Jane E. (1986). The adoption of radical and incremental innovations: an empirical analysis. Management science, 32(11), 1422-1433.

[44]   Dias-Sardinha, Idalina, & Reijnders, Lucas. (2005). Evaluating environmental and social performance of large Portuguese companies: a balanced scorecard approach. Business Strategy and the Environment, 14(2), 73-91.

[45]   Duh, Rong-Ruey, Xiao, Jason Zezhong, & Chow, Chee W. (2009). Chinese firms' use of management accounting and controls: facilitators, impediments, and performance effects. Journal of International Accounting Research, 8(1), 1-30.

[46]   Elijido-Ten, Evangeline. (2009). Can stakeholder theory add to our understanding of Malaysian

environmental reporting attitudes? Malaysian Accounting Review, 8(2), 85-110.

[47]   Ezzamel, Mahmoud. (1990). The impact of environmental uncertainty, managerial autonomy and size on budget characteristics. Management Accounting Research, 1(3), 181-197.

[48]   Fisher, Joseph G. (1998). Contingency theory, management control systems and firm outcomes: past results and future directions. Behavioral Research in Accounting, 10, 47-64.

[49]   Fornell, Claes, & Larcker, David F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, 39-50.

[50]   Fornell, Claes, Lorange, Peter, & Roos, Johan. (1990). The cooperative venture formation process: A latent variable structural modeling approach. Management Science, 36(10), 1246-1255.

[51]   Foster, George, & Gupta, Mahendra. (1994). Marketing, cost management and management accounting: Jackson Library, Graduate School of Business, Stanford University.

[52]   Gosselin, Maurice. (1997). The effect of strategy and organizational structure on the adoption and implementation of activity-based costing. Accounting, Organizations and Society, 22(2), 105-122.

[53]   Govindarajan, Vijay. (1984). Appropriateness of accounting data in performance evaluation: an empirical examination of environmental uncertainty as an intervening variable. Accounting, Organizations and Society, 9(2), 125-135.

[54]   Govindarajan, Vijay, & Gupta, Anil K. (1985). Linking control systems to business unit strategy: impact on performance. Accounting, Organizations and Society, 10(1), 51-66.

[55]   Habib, Ahsan. (2010). Value relevance of alternative accounting performance measures: Australian evidence. Accounting Research Journal, 23(2), 190-212.

[56]   Hair, Joseph F, Anderson, Rolph E, Tatham, Ronald L, & Black, William C. (1998). Multivariate analysis. Englewood: Prentice Hall International.

[57]   Hendricks, Kevin, Menor, Larry, & Wiedman, Christine. (2004). The balanced scorecard: to adopt or not to adopt? Ivey Business Journal, 69(2), 1-7.

[58]   Henri, Jean-François. (2006). Organizational culture and performance measurement systems. Accounting, organizations and society, 31(1), 77-103.

[59]   Hoque, Zahirul. (2004). A contingency model of the association between strategy, environmental uncertainty and performance measurement: impact on organizational performance. International Business Review, 13(4), 485-502.

[60]   Hoque, Zahirul, & Adams, Carol Alison. (2008). Measuring Public Sector Performance: A study of government departments in Australia.

[61]   Hoque, Zahirul, & James, Wendy. (2000). Linking balanced scorecard measures to size and market

factors: impact on organizational performance. Journal of management accounting research, 12(1), 1-17.

[62]   Hoque, Zahirul, Mia, Lokman, & Alam, Manzurul. (2001). Market competition, computer-aided manufacturing and use of multiple performance measures: an empirical study. The British Accounting Review, 33(1), 23-45.

[63]   Hsu, Chia-Wei, Hu, Allen H, Chiou, Cherng-Ying, & Chen, Ta-Che. (2011). Using the FDM and ANP to construct a sustainability balanced scorecard for the semiconductor industry. Expert Systems with Applications, 38(10), 12891-12899.

[64]   Hulland, John S, & Kleinmuntz, Don N. (1994). Factors influencing the use of internal summary evaluations versus external information in choice. Journal of Behavioral Decision Making, 7(2), 79-102.

[65]   Ittner, Christopher D, & Larcker, David. (1998). Innovations in performance measurement: trends and research implications. Journal of management accounting research.

[66]   Ittner, Christopher D, Larcker, David F, & Meyer, Marshall W. (2003). Subjectivity and the weighting of performance measures: Evidence from a balanced scorecard. The Accounting Review, 78(3), 725-758.

[67]   Johansson, Johny K, & Yip, George S. (1994). Exploiting globalization potential: US and Japanese strategies. Strategic Management Journal, 15(8), 579-601.

[68]   Johnson, H Thomas, & Kaplan, Robert S. (1987). The rise and fall of management accounting. Engineering Management Review, IEEE, 15(3), 36-44.

[69]   Jordão, Ricardo Vinícius Dias, Souza, Antônio Artur, & Avelar, Ewerton Alex. (2013). Organizational culture and post-acquisition changes in management control systems: An analysis of a successful Brazilian case. Journal of Business Research.

[70]   Joshi, Prem Lal. (2001). The international diffusion of new management accounting practices: the case of India. Journal of International Accounting, Auditing and Taxation, 10(1), 85-109.

[71]   Jusoh, Ruzita, & Parnell, John A. (2008). Competitive strategy and performance measurement in the Malaysian context: An exploratory study. Management Decision, 46(1), 5-31.

[72]   Kaplan, Robert S, & Norton, David P. (1993). Putting the balanced scorecard to work. The performance measurement, management and appraisal sourcebook, 66-79.

[73]   Kaplan, Robert S, & Norton, David P. (2001). Transforming the balanced scorecard from performance measurement to strategic management: Part I. Accounting horizons, 15(1), 87-104.

[74]   Karimi, Jahangir, Somers, Toni M, & Gupta, Yash P. (2004). Impact of environmental uncertainty and task characteristics on user satisfaction with data. Information Systems Research, 15(2), 175-193.

[75]   Kettinger, William J, Grover, Varun, Guha, Subashish, & Segars, Albert H. (1994). Strategic

information systems revisited: a study in sustainability and performance. MIS quarterly, 31-58.

[76] Ko, Dong-Gil, Kirsch, Laurie J, & King, William R. (2005). Antecedents of knowledge transfer from consultants to clients in enterprise system implementations. MIS quarterly, 59-85.

[77] Kopp, Daniel G, & Litschert, Robert J. (1980). A buffering response in light of variation in core technology, perceived environmental uncertainty, and size. Academy of Management Journal, 23(2), 252-266.

[78] Langfield-Smith, Kim. (1997). Management control systems and strategy: a critical review. Accounting, organizations and society, 22(2), 207-232.

[79] Lee, Chia-Ling, & Yang, Huan-Jung. (2011). Organization structure, competition and performance measurement systems and their joint effects on performance. Management Accounting Research, 22(2), 84-104.

[80] Lee, John Y. (1987). Managerial accounting changes for the 1990s: McKay Business Systems Artesia, CA.

[81] Libby, Theresa, & Waterhouse, John H. (1996). Predicting change in management accounting systems. Journal of Management Accounting Research, 8, 137-150.

[82] Lingle, John H, & Schiemann, William A. (1996). From balanced scorecard to strategic gauges: is measurement worth it? Management Review, 85(3), 56-61.

[83] Merchant, Kenneth A. (1981). The design of the corporate budgeting system: influences on managerial behavior and performance. Accounting Review, 813-829.

[84] Merchant, Kenneth A, & Van der Stede, Wim A. (2007). Management control systems: Performance measurement, evaluation and incentives: Pearson Education.

[85] Najmi, Manoochehr, Rigas, John, & Fan, Ip-Shing. (2005). A framework to review performance measurement systems. Business Process Management Journal, 11(2), 109-122.

[86] Nanni, Alfred J, Dixon, J Robb, & Vollmann, Thomas E. (1992). Integrated performance measurement: management accounting to support the new manufacturing realities. Journal of Management Accounting Research, 4(1), 1-19.

[87] Naranjo-Gil, David, & Hartmann, Frank. (2006). How top management teams use management accounting systems to implement strategy. Journal of Management Accounting Research, 18(1), 21-53.

[88] Naranjo-Gil, David, & Hartmann, Frank. (2007). Management accounting systems, top management team heterogeneity and strategic change. Accounting, Organizations and Society, 32(7), 735-756.

[89] Neely, Andy. (1998). Three modes of measurement: theory and practice. International Journal of Business Performance Management, 1(1), 47-64.

[90] O'Connor, Neale G. (1995). The influence of organizational culture on the usefulness of budget participation by Singaporean-Chinese managers. Accounting, Organizations and Society, 20(5), 383-403.

[91] Otley, David. (1999). Performance management: a framework for management control systems research. Management accounting research, 10(4), 363-382.

[92] Otley, David. (2001). Extending the boundaries of management accounting research: developing systems for performance management. The British Accounting Review, 33(3), 243-261.

[93] Pedersen, Esben Rahbek Gjerdrum, & Sudzina, Frantisek. (2012). Which firms use measures?: Internal and external factors shaping the adoption of performance measurement systems in Danish firms. International Journal of Operations & Production Management, 32(1), 4-27.

[94] Pfister, Jan, & HARTMANN, FRANK. (2011). Managing organizational culture for effective internal control: From practice to theory. The Accounting Review, 86(2), 738-741.

[95] Porter, Michael. (1980). E.(1980). Competitive strategy. New York.

[96] Porter, Michael E, & Millar, Victor E. (1985). How information gives you competitive advantage: Harvard Business Review, Reprint Service.

[97] Quinn, Robert E, & McGrath, Michael R. (1985). The transformation of organizational cultures: A competing values perspective. Organizational culture, 315-334.

[98] Quinn, Robert E, & Rohrbaugh, John. (1983). A spatial model of effectiveness criteria: towards a competing values approach to organizational analysis. Management science, 29(3), 363-377.

[99] Ringle, Christian M, Wende, Sven, & Will, Alexander. (2005). SmartPLS 2.0 (beta): Hamburg, Germany.

[100] Simons, Robert. (1990). The role of management control systems in creating competitive advantage: new perspectives. Accounting, Organizations and Society, 15(1), 127-143.

[101] Speckbacher, Gerhard, & Wentges, Paul. (2012). The impact of family control on the use of performance measures in strategic target setting and incentive compensation: A research note. Management Accounting Research, 23(1), 34-46.

[102] Spender, JC. (1989). Industry recipes: Basil Blackwell Oxford.

[103] Tayles, Mike, Pike, Richard H, & Sofian, Saudah. (2007). Intellectual capital, management accounting practices and corporate performance: perceptions of managers. Accounting, Auditing & Accountability Journal, 20(4), 522-548.

[104] Taylor, Andrew, & Taylor, Margaret. (2013). Factors influencing effective implementation of performance measurement systems in small and medium-sized enterprises and large firms: a perspective from Contingency Theory. International Journal of Production Research(ahead-of-print), 1-20.

[105] Teo, Hock-Hai, Wei, Kwok Kee, & Benbasat, Izak. (2003). Predicting intention to adopt

interorganizational linkages: an institutional perspective. Mis Quarterly, 19-49.

[106] Usoff, Catherine A, Thibodeau, Jay C, & Burnaby, Priscilla. (2002). The importance of intellectual capital and its effect on performance measurement systems. Managerial Auditing Journal, 17(1/2), 9-15.

[107] Valmohammadi, Changiz, & Servati, Azadeh. (2011). Performance measurement system implementation using Balanced Scorecard and statistical methods. International Journal of Productivity and Performance Management, 60(5), 493-511.

[108] Widener, Sally K. (2006). Associations between strategic resource importance and performance measure use: The impact on firm performance. Management Accounting Research, 17(4), 433-457.

[109] Williams, John J, & Seaman, Alfred E. (2001). Predicting change in management accounting systems: national culture and industry effects. Accounting, Organizations and Society, 26(4), 443-460.

[110] Wixom, Barbara H, & Watson, Hugh J. (2001). An empirical investigation of the factors affecting data warehousing success. MIS quarterly, 25(1), 17-32.

[111] Woodward, Joan, Dawson, Sandra, & Wedderburn, Dorothy. (1965). Industrial organization: Theory and practice (Vol. 3): Oxford University Press London.

[112] Zammuto, Raymond F, & Krakower, Jack Y. (1991). Quantitative and qualitative studies of organizational culture: JAI Press Inc.

Author's Biography

Kaveh Asiaei is a PhD scholar at the Department of Accounting, Faculty of Business and Accountancy, University of Malaya (UM). His research interests are in intellectual capital, management accounting and control system, performance measurement system, and auditing. He is the corresponding author and can be contacted at: kave.asia@gmail.com

Ruzita Jusoh is an Associate Professor at the Department of Accounting, Faculty of Business and Accountancy, University of Malaya. Her areas of research interest include management accounting control system, performance measurement system, and environmental management accounting. She has published several articles in both local and international journals. She has been supervising several doctoral students.
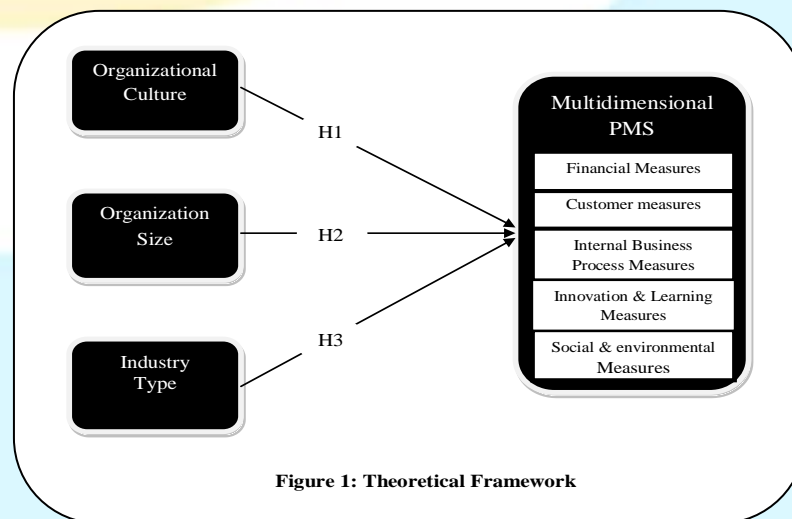
APPENDIX

Figure 1: Theoretical Framework

Table 1: Results of the Confirmatory Factor Analysis

Variables	AVE	Composite Reliability	Cronbach's Alpha
Multidimensional PMS	0.665	0.908	0.876
Organizational Culture	1	1	1
Industry Type	1	1	1

Firm Size	1	1	1

Table 2: Discriminant Validity

Variables	PMS	Culture	Industry	Size
PMS	**0.6654**			
Culture	0.08673	1		
Industry	0.002411	0.002809	1	
Size	0.025953	0.008892	0.005791	1

Table 3: Results of the SEM

No.	Hypothesis	Path	Parameter Estimate (β)	Sample Mean	Standard Error	T Statistics	Results
1	H1	Culture --> PMS	0.308***	0.316	0.079	3.909	Supported
2	H2	Size --> PMS	0.194***	0.195	0.089	2.176	Supported
3	H3	Industry --> PMS	0.047	0.050	0.092	0.513	Not Supported

Variance explained (R^2) in PMS (dependent variable) = 12%,

*** $p<0.01$;   ** $p<0.05$;   * $p<0.1$;   [ns] *not significant*