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Strategic Management Accounting Usage, Environmental Uncertainty and Organizational Performance

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Abstract

This paper is concerned with an empirical investigation into the relations among Strategic Management Accounting (SMA), perceived environmental uncertainty (PEU) and organizational performance. It was motivated by the scarcity of the empirical attention given to the subject despite the claimed importance placed by SMA promoters. The study follows a standard contingency type interaction fit to propose that PEU moderate the direct relationship between management accounting and control systems and organizational performance. The results indicated that (1) the level of SMA usage positively affect organizational performance, and (2) Perceived Environmental uncertainty moderate the relationship. These results contribute to the strategic management accounting literature by providing empirical evidence that the relationship between SMA usage and organizational performance is moderated by a perceived environmental uncertainty.

Keywords: Strategic Management Accounting, Perceived Environmental Uncertainty, Organizational Performance, Contingency Theory.

1. Introduction

In recent years, scholars have recommended that today's organizations need new management accounting and control systems (MACS) to adapt the rapidly changing organizational and environment (Abernethy & Bouwens, 2005; Abernethy & Lillis, 1995, 2001; Abernethy & Stoelwinder, 1991; Baines & Langfield-Smith, 2003). Strategic Management Accounting generates relevant information that provides the organizations with continuous signals to update their organizational strategy and to get competitive advantages (Chenhall, 2003; Drake & Haka, 2008; Hoque & James, 2000).

While prior management accounting studies have investigated the relationships among environments, control systems, and performance (e.g. Abernethy & Bouwens, 2005; Baines & Langfield-Smith, 2003; Brownell & McInnes, 1986;Cavalluzzo & Ittner, 2004; Chenhall & Brownell, 1988; Kren, 1992), there has been little systematic empirical examination of whether organizational performance is influenced by the level of SMA techniques usage, as well as, whether perceived environmental uncertainty moderate such relationship. This study fills this knowledge gap in existing management accounting literatures; it makes several contributions to our understanding of the role of SMA usage in enhance the organizational performance under specific environmental conditions. Firstly, it extends prior SMA usage studies of Cadez and Guilding (2008) by providing additional evidence on linking between SMA with organizational performance. Secondly, this study provides additional insights into our understanding of the moderation effect of perceived environmental uncertainty on the relationship between SMA usage and performance, which has not been investigated by previous studies. This issue is not well developed in the contemporary management accounting research literature. Finally, the study's use of a moderation contingency fit in theorizing the research problems facilitates the creation of valuable insights into the subject trend.

The next section presents a literature review and develops the hypotheses. Section 3 describes the research method. Next, Section 4 presents the research results. The final section offers conclusions in addition to the future studies and limitations of the study.

2. Literature and Hypotheses

This study uses the moderating or interaction fit of contingency theory (Chenhall & Chapman, 2006; Drazin & Van de Ven, 1985;Gerdin & Greeve, 2004) to examine whether perceived environmental uncertainty moderate the relationship between SMA and organizational performance. Perceived environmental uncertainty has considered as moderating variable, SMA usage as the independent variable and organizational performance is the dependent variable. The expected relationships among the variables are drowning sequentially.

2.1 SMA Usage and Organizational Performance

The relationship between the usage of SMA and organizational performance can be seen under the broad view of the association between MACS, and organizational performance. In the literature, MACS

defined broadly as a system providing useful information to assist managers in their decision making to achieve desired organizational outcomes or goals efficiently (Anthony & Govindarajan, 2001; R. H. Chenhall, 2003; J. Fisher, 1995; Langfield-Smith, 1997; Otley, 1999). Based on this critical role of management accounting and control system of providing very necessary information to support a company's strategy, the increased use of SMA information for decision-making and control result in better organizational performance (Ajibolade, et al., 2010; Cadez & Guilding, 2008; Gul, 1991; Gul & Chia, 1994; Hoque, 2005; Hoque & James, 2000; Scott & Tiessen, 1999; Seaman & Williams, 2011).

In 2008, Cadez and Guilding investigated the relationship among, SMA, strategic choices, marketing orientation, firm size and organizational performance. In their study, they suggested SMA that includes sixteen techniques. Their findings showed that there was a positive relationship between SMA and organizational performance. In addition, they also found a positive link between marketing orientations, strategies choices, firm size, and performance. Recently, Al-Mawali, Zainuddin and Noor Nasir (2012) have investigated the relationship between customers accounting (as a part of SMA) and organizational performance, the results show that the level of usage of customer accounting information positively affect the organizational performance in context of Jordanian services sectors.

H1: there is positive relationship between SAM usage and organizational performance.

2.2 Perceived Environmental Uncertainty

Previous studies have given some support for moderating effect of PEU on the relationship between management accounting systems and organizational performance. For example, Gul et al. (1992) introduced PEU as the moderator for the relationship between MAS information and organizational performance. The result of their study confirmed that MAS has a positive effect on organizational performance under high level of PEU, and the relationship between MAS and organizational performance becomes negative under low level of PEU. This result provides that PEU is a pure moderator for the relationship between MAS information and organizational performance.

Moreover, Chong, Eggleton, and Leong (2005) have examined the moderating effect of market competition on the relationship between budgetary participation and performance in financial institutions. Their study finding showed that the higher the intensity of market competition, the more positive is the association between budgetary participation and performance. Agbejule (2005) reported that under low level of PEU sophistication, MAS has a negative effect on performance. Seaman and Williams (2011) have investigated the moderating effect of PEU on the association between MAS and subunit performance. Their results gave support for the moderating effect of PEU. Duh et al. (2006) examined the moderating effect of PEU on the relationship between features of the budgeting system and firm performance. Their results showed that PEU moderate this relationship. Recently, Aljibolade et al. (2010) have also examined the moderating effect of PEU on the relationship between MAS and organizational performance. Results obtained suggested a strong moderating effect of PEU on the relationship between MAS design and performance. Companies under high PEU appeared to perform better when they adopted more sophisticated MAS designs. In addition, other related studies are still suggesting that future research should take into consideration the effect of PEU in the relationship between SMA and organizational performance (e.g., Cadez & Guilding, 2008; McManus & Guilding, 2008; Guilding & McManus; 2002). Therefore,

H2: The higher SAM usage the higher organizational performance, if PEU is higher.

3. Research Methodology

3.1 Sampling Procedure

In the current study, the population is all companies listed in Amman Stock Exchange 2009. The companies listed in Amman Stock Exchange (Companies' Guide 2009) were used as the sampling frame for the current study. The companies' Guide by Amman Stock Exchange is the only listing that specifically covers all sectors and industries in Jordan. This directory lists the names, titles, and the general information about the listed companies (e.g., the address and established year), from which a list of 296 companies in Jordan were identified. However, given the small sampling frame of the study, and to achieve the minimum target sample, questionnaires were distributed to the entire population. The primary objective of the current study is to investigate the level of SMA usage, and its effect on the organizational performance, under different levels of

environmental uncertainty. As these three factors are in the strategic level background. Therefore, Chief Accountant, Chief Controller, or Chief Financial Officer, are the appropriate respondents to answer the questions. The first mailing resulted in 64 usable responses. A reminder letter was posted three weeks following the initial mail-out. This yielded an additional 42 responses. Thus the overall usable questionnaires were 106 with response rate 35.8%. The response rate was also considered acceptable compared with other similar studies. For instance, Al-Jedaiah (2008) who studied the relationship between Information communications technology and Jordanian organizations performance achieved 75% response rate. In addition, Altememi and Alkshali (2007), Al-Soboa (2009), and Harrim (2010) achieved 54%, 60%, and 61% of response rate respectively.

3.2 Variable Measurement

SMA technique - The degree of SMA technique usage was measured using the same method as Cravens and Guilding (2001), Guilding and McManus (2002) and Cadez and Guilding (2008). Following the question "To what extent does your organization use the following techniques?", the 16 SMA techniques were listed together with a Likert-type scale ranging from "1" (not at all), to "7" (to a great extent). However, in case of any technique not applicable the respondents requested to choose N/A.

Performance- A modified instrument based on previous related studies, used to assess company performance. Each manager was asked to evaluate her/his company's performance level by comparing it with the major competitor on eight financial and non- financial performance indicators. Managers respond to each of the items of performance on a seven-point Likert scale anchored at both ends such that, 1 = Poor and 7 = Excellent (Grafton, Lillis, & Widener, 2010).

Perceived Environmental Uncertainty- The current study has measured PEU using the same instrument applied by Kren and Kerr (1993). This instrument was developed based on Miles and Snow's (1987) measurement. However, many subsequent accounting studies (e.g., Gul, 1991; Chenhall & Morris, 1993; Gul & Chia, 1994) have measured PEU by adaption of Govindarajan's PEU factors. The respondents requested to indicate their perception about the predictability regarding their organization's factors (including; customers, suppliers, government, competitors, and technologies) on a seven-point numerical scale anchored at (1) Highly predictable and (7) Highly unpredictable.

Control Variables- To avoid the effect of omitted variable bias two control variables were introduced in this study. This is following several studies done previously in management accounting and related studies (Cadez, 2006; G.G. Dess, Ireland, & Hitt, 1990; Guilding, et al., 2000). The control variables were introduced to control for the potential effect of firm's size and industry type.In this study, the firm size variable is measured by the number of total employees in the organization and industry type was measured on a categorical scale (1= manufacturing, 0= non manufacturing).

4. Findings

4.1 Goodness of Measures

According to Sekaran (2003), the procedures for testing the goodness of measures must be utilized prior to any analysis. The techniques for testing the goodness of measures suggested by Sekaran (2003) were subsequently followed. These included factor analysis and reliability analysis. In this study, the Cronbach's alpha measure of internal consistency was used to assess the overall reliability of the measurement scale. The recommended minimum acceptable level of reliability for Cronbach's alpha is .60 using Hair et al. (1998) criterion, and greater than .50 using Nunnally's (1978) criterion. The Cronbach's alpha values show that all the variables passed the test and the achieved values exceeding the recommended value of this test.

In conducting factor analysis, this study followed the six assumptions recommended by Hair et al. (2010). First, Kaiser-Meyer-Olkin of Sampling adequacy (KMO) measure must be greater than 0.5. Second, Barlett's test of sphericity must at least be significant at .05 level. Third, antimage correlation of items is greater than .50. Fourth, communalities of items must be greater than .50. Fifth, considering the sample size (n = 106) the minimum requirement of factor loading (cutoff point) was .55 based on a .05 significance level. Sixth, the minimum Eigenvalue for factor analysis extraction had to be 1. However, more than one run have been done till all the above six assumptions have met in this study.

4.2 Hypotheses Testing

To test Hypothesis 1 (H1) that was postulated that there is a positive relationship between SMA usage and organizational performance, a hierarchical regression analysis was carried out (see Table 1). In step one, the analysis tested the effect of the control variables (firm size and type of industry) on the dependent variable. Then, in step two, the independent (predictor) variable was introduced to test its marginal effect on the dependent variable.

In the first step, only firm size had significant effect on organizational performance. The control variables together explained about 6.4% of the total variation in organizational performance. The addition of the SMA in step two explained an additional 33.7% of the variance in organizational performance. This means that the control variables and the SMA cumulatively explained 40.1% of the variance in organizational performance. The result, in step two, shows that SMA usage had a significant impact on organizational performance at $p < .10$, $\beta = 0.29$. This means that the higher SMA usage the higher is the organizational performance. Thus, H1is supported.

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TABLE 1: Moderating Effect of Perceived Environmental Uncertainty on The Relationships Between SMA and Organizational Performance

Variables	**DV: Organizational Performance**			
	Step 1 Std. Beta	**Step 2 Std. Beta**	**Step 3 Std. Beta**	**Step 4 Std. Beta**
Control variables:				
Type of Industry (manufacturing = 1, non-manufacturing = 0)	-.054	-.075	-.064	-.085
Firm Size (≥ 300 = 1, < 300 = 0)	.296**	.231**	.229**	.189**
Independent variables:				
SMA		.290*	.267*	.702*
Moderating variable				
Perceived Environmental Uncertainty (PEU)			.165**	.840*
Interaction terms				
SMA*PEU				.857**
F value	3.513**	9.291**	8.977**	6.858***
R^2	.064	.401	.428	.495
Adjusted R^2	.046	.358	.380	.423
R^2 change	.064	.337	.027	.067
F change	3.513**	10.919**	4.461**	2.411**

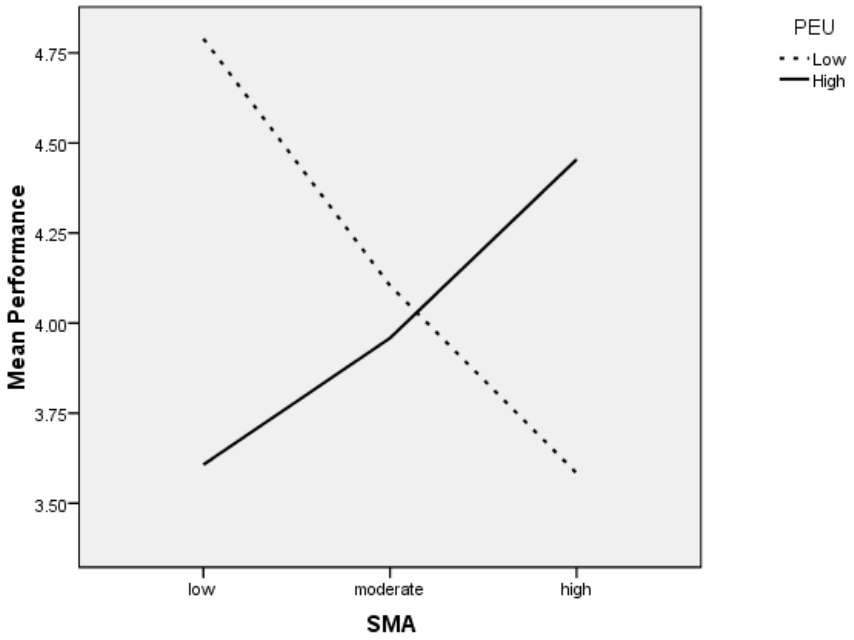
Note: Significance levels: *$p < .10$, **$p <. 05$, ***$p < .01$

The hierarchical regressions analysis was performed to test the moderating effects of perceived environmental uncertainly on the relationship between SMA usage and organizational performance. The moderated regression technique, established by Baron and Kenny (1986), and Sharma, Durand, and Gur-Arie (1981), was used to test hypothesis 2 (H2). A four-step hierarchical regression was performed for each of the moderators. In the first step, the control variables were entered; the independent variables were entered in the second step; the moderating variable was entered in the third step, and lastly, interaction terms were introduced into the equation to test the joint effect of predictor and the moderator on the dependent variable. The interaction terms were calculated by multiplying predictor with moderating variables.

To determine whether the moderator effect on the anticipated relationship existed or otherwise, three maximum conditions were used. First, the final model must be significant. Second, the F change must be significant. Third, the beta coefficient of interaction term must also be statistically significant. An assessment on the beta coefficients for interaction terms (at Step4) shows that perceived environmental uncertainty moderated the relationship between SMA usage and organizational performance, at $p < .10$, ß =.857. The introduction of the interaction terms significantly increased the model value (as indicated by significant F change) and raised R squared around 7%, and generally the model as a whole was significant ($F = 6.858$, $p < .01$). Based on this result, the moderating effect on the proposed relationship would be demonstrated graphically if the beta

coefficient of interaction term is significant. The graph portrayed in Figure 1 illustrates the effect of perceived environmental uncertainty on the relationship between SMA and organizational performance.

Figure 1: Moderating Effect of PEU on The Relationship Between SMA and Organizational Performance.



The graph shows that the higher the SMA usage, the higher will be the organizational performance, under the situation of higher perceived environmental uncertainty. Therefore, hypothesis H2 was supported.

5. Discussion

The results of the study showed the level of SMA usage had significant positive relationships with organizational performance. This result illustrated that Jordanian services companies' usage of these SMA techniques had contributed to the performance measured by financial and non-fanatical indicators relative to their major competitors. It was evident from the findings that customer profitability analysis and customer equity analysis are important elements of management accounting information for services companies to be more capable, relative to their major competitors. It is explicably sensible where such management accounting techniques provide with information allows companies to continuously update and modify their business strategy compared with their competitors. Accordingly, when company successfully modified and updated its strategy to fit with surrounded environment, they would be able to achieve their organizational performance goals. The findings of the current study are in line with the long-held view in management accounting systems literature that proper use of management accounting information can improve organizational performance (Chenhall & Morris, 1986; Gupta & Zeithaml, 2006; Ittner & Larcker, 1997; W. Reinartz, Thomas, & Kumar, 2005).

Moreover, the results from the current research suggested that the relationship between SMA and organizational performance was moderated by the level of environmental uncertainty faced by companies. The significant interaction (based on the figure 1) showed that in companies facing high level of perceived environmental uncertainty, the SMA usage continues to have positive impact on organizational performance in all range of SMA usage. The opposite is true for companies facing low level of perceived environmental uncertainty. For these companies SMA continuously affect organizational performance negatively. To illustrate of the significance of the result, consider companies that face increasing and high levels of environmental uncertainty, Management frequently review the companies' goals and strategies to cope with external as well as internal changes. To achieve this process, management then also need more sophisticated management accounting systems such as SMA. The objective of providing the management with SMA's information is to help the companies accomplish their goals and enhanced their companies' performance, this arguments supported by Kaplan and Narayanan (2001). However, extensive usage of SMA in a low environment uncertainty, costs the companies much more that the value this SMA's information can provide to the companies. These findings in general were consistent with that of previous related studies on the general notion of environmental uncertainty moderating the relationship between management accounting systems, strategy, or market orientation and

organizational performance (Ajibolade, et al., 2010; Hoque, 2005; Li & Simerly, 1998; Prescott, 1986).

6. Limitations and Future Studies

Even though this study contributes to the understanding of the applicability of contingency theory across the levels of SMA usage and its relationship with organizational performance, as well as the moderating effect of perceived environmental uncertainty on the abovementioned relationship, these results must be interpreted with caution because of certain limitations. First, the companies in the sample of the study are services companies listed on the Amman Stock Exchange. The findings of the current study should be treated with caution when applied to other industries, such as manufacturing or agriculture industry. The second limitation is regarding the nature of data collection in a cross-sectional study where data are collected at one point in time. Bearing in mind that SMA are long-term techniques strategies that need time to be built and nurtured to yield results in terms of organizational performance, a study conducted in a longitudinal framework might be able to illuminate the causal relationships between the variables of concern, which were not captured by the cross-sectional data, and provide more accurate results.

One of the main objectives of the current study was to investigate the role of perceived environmental uncertainty as a moderator for the relationship between SMA information and organizational performance. Further research in other contingency factors such as management style, business strategy, and culture could be able to advance the understanding of the impact of SMA on organizational performance.

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