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How Do Management Accounting Capabilities Affect Organizational Performance?

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Abstract

This study explores the relationship between contemporary performance measurement systems (CPMS) use and organizational performance organizational in term of organizational (i.e., management accounting) capabilities. Data collected from our mail-based questionnaires reveal that absorptive capacity and experiential learning capabilities in CPMS use, one of the organizational capabilities of management accounting, play important roles in organizational performance improvement. Our results also show that absorptive capacity and experiential learning capabilities have opposite effects that are conditioned by the specific situation.

Keywords

Management Accounting Capabilities, Absorptive Capacity, Experiential Learning Capabilities, Contemporary Performance Measurement System, Organizational Performance, Exploratory Study

1 Introduction

How does the use of contemporary performance measurement systems (CPMS) impact organizational performance? The CPMS is often used interchangeably with other systems, such as the balanced scorecard (Kaplan and Norton 1996), strategic performance measurement systems (Chenhall, 2005; Ittner et al., 2003), and comprehensive performance measurement systems (Hall, 2008). Many studies have investigated the relationship between CPMS use and organizational performance (Banker et al., 2000; Davis and Albright, 2004; Ittner and Larker, 1998; Ittner et al., 2003; Said et al., 2003); however, none has been able to identify a specific relationship between these two variables (Ittner and Larcker, 2009). Several studies have tried to explain this relationship by hypothesizing that CPMS use affects organizational processes such as organizational behavior or organizational capabilities and performance (Grafton et al., 2010; Henri, 2006; Widener, 2007). If such a relationship exists, however, clearly determining the exact nature of the relationship between CPMS use and organizational performance will be difficult (Franco-Santos et al., 2012). Furthermore, it remains to be explained why the use of similar kinds of CPMS and organizational processes can affect organizational performance differently.

Incorporating a perspective on the organizational capabilities to use management accounting systems may help resolve these problems. For example, it has been revealed that organizational capabilities related to target costing may improve results and prevent negative effects (Yook, 2003; Yoshida, 2003). Other studies have discussed the moderating impact of strategic orientation (Chanhall and Langfield-Smith, 1998; Ittner et al., 2003; Perera et al., 1997; Van der Stede et al., 2006), organizational structure and competition (Lee and Yang, 2010), and environmental uncertainty (Hoque, 2004), while Franco-Santos et al. (2013) have suggested that other factors should be investigated. It is expected that the extent of these organizational capabilities influences the effectiveness of management accounting system use and organizational performance. Therefore, by hypothesizing that organizational capabilities related to management accounting (management accounting capabilities) moderate the effect of CPMS on organizational performance, we may reveal how CPMS use could improve organizational performance. Then, this study may be able to contribute to extant body literatures that has sought to explore what the effects of CPMS on organizational performance by introducing moderating effects.

This study examines the relationship between CPMS use, management accounting capabilities to use such systems effectively, and organizational performance

by employing empirical evidence based on data obtained from responses to mail-based questionnaires. We focus on the CPMS, which is strongly associated with organizational performance, as well as absorptive capacity and experiential learning capabilities, among the organizational capabilities required to utilize management accounting systems effectively.

The remainder of this paper is structured as follows. Section 2 reviews the literature and presents the study's research questions. The study's research methodologies, research setting, and variable measurement are explained in Section 3. Finally, Section 4 provides the results of the analysis and discusses them.

2 Literature

2.1 Management accounting capabilities

Few studies attempt to closely investigate the organizational capabilities to use management accounting systems effectively or reveal how these capabilities affects management accounting use (Yook, 2003; Yoshida, 2003). However, some studies do suggest the existence of such organizational capabilities (Kaplan and Norton, 1996; Tani et al., 1994). For example, Kaplan and Norton (1996) reveal that, while newly introduced balanced scorecards do not necessarily begin to function immediately, organizations could successfully adopt this system gradually, through trial and error. Tani et al. (1994) examine data collected by a mail-based survey on the use of target costing and show that the long-term use of target costing could enable organizations to use this system for multiple purposes rather than for only what was originally planned. These studies suggest that, while using management accounting systems, organizations could store knowledge on how to use them effectively. Yoshida (2001a, 2001b, 2003) explicitly reveals the existence of the organizational capabilities to use management accounting systems effectively, naming the organizational capacity related to target costing "target costing capabilities" and examining its effects on the outcomes and adverse results of target costing. The studies reveal that accumulating knowledge related to target costing enhanced target costing capabilities and prevented burnout, an adverse effect of target costing. Yook (2003) shows that higher target costing capabilities improves target costing outcomes. All these studies suggest that the organizational capacity to utilize management accounting systems effectively has a positive effect on organizational performance.

What are the organizational capabilities that enable organizations to use management accounting systems more effectively? Management information systems

that include management accounting systems must produce sustainable competitive advantage and fit the organization's management objectives (Mata et al., 1995). To make the best use of its knowledge, an organization must continuously acquire knowledge from both external and internal sources (Kogut and Zander, 1992; Teece et al., 1997).

2.2 Absorptive capacity

Absorptive capacity may be conceptually key to the acquisition and effective use of knowledge gleaned from outside the organization (Zahra and George, 2002). The absorptive capacity of an organization is its capabilities to recognize and incorporate the value of new knowledge and information taken from outside the organization and to adapt them to existing knowledge and organizational routines (Cohen and Levinthal, 1990; Zahra and George, 2002). The extent of the organization's absorptive capacity affects its performance (Lane et al., 2006; Szulanski, 1996). It has also been found that the extent of absorptive capacity plays an important role in the introduction and use of management accounting systems (Fayrad et al., 2012; Libby and Waterhouse, 1996; Williams and Seaman, 2001). For example, Libby and Waterhouse (1996) and Williams and Seaman (2001) suggest that absorptive capabilities facilitate the introduction of new management accounting systems.

In addition, Fayard et al. (2012) suggest that using inter-organizational cost management and information sharing with external organizations such as suppliers encourage organizations to use inter-organizational cost management by increasing the depth, frequency, ease of communication, and absorptive capacity in their exploration and evaluation of knowledge.

Thus, absorptive capacity encourages organizations to introduce and employ sophisticated management accounting systems. Some studies examine the moderating effect of absorptive capacity (Fernhaber and Patel, 2012; Kauppi et al., 2013). Kauppi et al. (2013) reveal that a purchasing function's absorptive capacity moderates the effect of electronic purchasing tolls on category-level purchasing performance, while Fernhaber and Patel (2012) reveal that having high absorptive capacity and building a complex portfolio of products can be beneficial and that having low absorptive capacity can be harmful. Therefore, absorptive capacity is one of the organizational capabilities that enable better management accounting systems performance. We thus pose the following research question:

RQ1: What effect does absorptive capacity in CPMS use have on the relationship between CPMS use and organizational performance?

2.3 Experiential learning capabilities

Experiential learning may be conceptually key to acquiring and using knowledge gleaned from inside the organization (Kolb, 1984; Yeung et al., 1999). Experiential learning is the process of learning through experience in order to acquire new ideas (Kolb 1984). Experiential learning occurs not only among individuals but also among organizations, which must reflect upon their organizational experience in order to acquire new ideas (Argote et al., 2001; Edmondson, 2002; Kayes et al., 2005). Some studies indicate that experiential learning exerts a positive influence on the implementation of management accounting systems (Kaplan and Norton, 1996; Tani et al., 1994). For example, Kaplan and Norton (1996) argue that establishing targets and tolerances for a balanced scorecard requires a trial-and-error process. Tani et al. (1994) found that, when first implemented, target costing was meant to reduce costs but was ultimately used to achieve other objectives, including the timely introduction of new products and the satisfaction of consumer needs. These studies suggest that experimental learning about the use of management accounting helps firms realize the desired results of management accounting. We thus pose the following research question:

RQ2: What effect does experiential learning capabilities in CPMS use have on the relationship between CPMS use and organizational performance?

3 Methodology

3.1 Research methods and data

We conducted a mail-based survey of 1,524 Japanese manufacturing firms listed in stock exchanges around Japan, targeting individuals responsible for business performance. We posted the questionnaires in July 2016 with a submission deadline of August 2016. To increase the response rate, we sent a follow-up chaser in September 2016. A total of 236 questionnaires were collected, for a response rate of 15.5%. We used data from 220 individuals, and 16 questionnaires with missing were excluded (Table 1).

Two tests were conducted to assess whether the data suffered from any response bias. First, a comparative analysis (t-test) between the responding and non-responding

firms indicated no significant differences in size (in terms of sales and number of employees). Second, a chi-square goodness-of-fit test between the sample and responding firms indicated no significant difference in industry distributions. These results suggest that the empirical data display no response bias.

Table 1. Demographic data

Panel A: Industry					**Panel B: Size**	
Industry classification		Sent	Received		Number of employees	
3050	Foods	134	17	12.7%	0 – 250	34
3100	Textiles and apparels	55	6	10.9%	250 – 500	36
3150	Pulp and paper	26	4	15.4%	500 – 1,000	36
3200	Chemicals	215	30	14.0%	1,000 – 2,500	41
3250	Pharmaceutical	65	4	6.2%	2,500 – 5,000	27
3300	Oil and coal products	13	1	7.7%	5,000 –	46
3350	Rubber products	19	4	21.1%		
3400	Glass and ceramics	61	8	13.1%		
3450	Iron and steel	48	8	16.7%		
3500	Nonferrous metals	35	5	14.3%		
3550	Metal products	91	14	15.4%		
3600	Machinery	234	46	19.7%		
3650	Electric appliances	266	36	13.5%		
3700	Transportation	99	15	15.2%		
3750	Precision instruments	51	5	9.8%		
3800	Other products	112	17	15.2%		

Table 2. Questionnaire items and descriptive statics

	Items in questionnaire	Range		Mean	S. D.
		Theoretical	Actual		
PMS_C1	Setting financial performance target	1 – 5	3 – 5	4.66	0.50
PMS_C2	Setting measureable non-financial performance target	1 – 5	1 – 5	3.48	0.96
PMS_C3	Setting non-financial performance target, which is difficult to measure	1 – 5	1 – 5	3.33	0.95
PMS_C4	Evaluating financial performance	1 – 5	3 – 5	4.58	0.57
PMS_C5	Evaluating measureable non-financial performance	1 – 5	1 – 5	3.43	0.95
PMS_C6	Evaluating non-financial performance, which is difficult to measure	1 – 5	1 – 5	3.31	0.93
PMS_C7	Performance goals for realizing a strategy	1 – 5	1 – 5	4.17	0.84
PMS_C8	Relationship between the performance measures	1 – 5	1 – 5	3.80	0.91
PMS_C9	Action plan for achieving performance target	1 – 5	2 – 5	4.12	0.79
PMS_U1	Presentation of the cause of the problem	1 – 5	1 – 5	3.81	0.86
PMS_U2	Provision of the materials required for decision-making	1 – 5	1 – 5	3.83	0.78
PMS_U3	Support for decision-making	1 – 5	1 – 5	3.74	0.80
PMS_U4	Provision of the materials required for verifying the results of decision- making	1 – 5	1 – 5	3.69	0.76
PMS_U5	Understanding the results of business activities	1 – 5	2 – 5	4.43	0.65
PMS_U6	Understanding the progress of achieving the goals	1 – 5	2 – 5	4.48	0.63
PMS_U7	Relationship between the performance measures	1 – 5	2 – 5	4.47	0.68
PMS_U8	Action plan for achieving performance target	1 – 5	1 – 5	3.86	0.87
PMS_U9	Link between the performance and monetary rewards of general manager	1 – 5	1 – 5	3.79	0.84
PMS_U10	Link between the performance and monetary rewards of manager	1 – 5	1 – 5	3.51	0.80

PMS_U11	Link between the performance and monetary rewards of subsection chief	1 – 5	1 – 5	3.09	0.90
PMS_U12	Link between the performance and promotion of general manager	1 – 5	1 – 5	3.66	0.79
PMS_U13	Link between the performance and promotion of manager	1 – 5	1 – 5	3.45	0.76
PMS_U14	Link between the performance and promotion of subsection chief	1 – 5	1 – 5	3.16	0.86
AC_1	Acquiring knowledge about PMS from the president or director	1 – 5	1 – 5	3.61	0.98
AC_2	Acquiring knowledge about PMS from consultant	1 – 5	1 – 5	2.67	1.06
AC_3	Acquiring knowledge about PMS from off-site exchanges	1 – 5	1 – 5	2.40	0.98
AC_4	Recording and accumulation of knowledge about PMS	1 – 5	1 – 5	3.33	0.90
AC_5	Determining the usefulness of knowledge about PMS quickly	1 – 5	1 – 5	3.06	0.80
AC_6	Discussing about improvement plan of PMS based on acquired knowledge	1 – 5	1 – 5	3.47	0.87
AC_7	Reflection of improvement plan of PMS discussed	1 – 5	1 – 5	3.50	0.84
ELC_1	Review types of performance indicators	1 – 5	1 – 5	3.62	0.88
ELC_2	Review performance target tightness	1 – 5	2 – 5	3.77	0.82
ELC_3	Review relationship between performance goals and business strategy	1 – 5	2 – 5	3.88	0.80
ELC_4	Review relationship between the performance measures	1 – 5	1 – 5	3.36	0.84
ELC_5	Review utilization of PMS	1 – 5	1 – 5	3.36	0.78
ELC_6	Refine types of performance indicators	1 – 5	1 – 5	3.81	0.82
ELC_7	Refine performance target tightness	1 – 5	2 – 5	3.96	0.79
ELC_8	Refine relationship between performance goals and business strategy	1 – 5	2 – 5	3.82	0.75
ELC_9	Refine relationship between the performance measures	1 – 5	1 – 5	3.43	0.78
ELC_10	Refine utilization of PMS	1 – 5	1 – 5	3.42	0.77

Table 3. Factor analysis of variables

Panel A	**CPMS components**	FPM	NFPM	SPM
PMS_C6	Evaluating non-financial performance, which is difficult to measure	**0.853**	-0.073	-0.031
PMS_C3	Setting non-financial performance target, which is difficult to measure	**0.819**	-0.005	-0.047
PMS_C5	Evaluating measureable non-financial performance	**0.767**	0.041	0.056
PMS_C2	Setting measureable non-financial performance target	**0.708**	0.089	0.066
PMS_C1	Setting financial performance target	-0.003	**1.024**	-0.052
PMS_C4	Evaluating financial performance target	0.021	**0.804**	0.125
PMS_C8	Relationship between the performance measures	0.003	-0.080	**0.809**
PMS_C9	Action plan for achieving performance target	0.006	0.066	**0.719**
PMS_C7	Performance goals for realizing a strategy	0.059	0.185	**0.532**
	Variance explained	28.3%	20.7%	16.8%

Panel B	**CPMS purpose**	PfP	PE	DM
PMS_U13	Link between the performance and promotion of manager	**0.805**	-0.114	0.087
PMS_U10	Link between the performance and monetary rewards of manager	**0.803**	0.269	-0.150
PMS_U14	Link between the performance and promotion of subsection chief	**0.733**	-0.248	0.144
PMS_U11	Link between the performance and monetary rewards of subsection chief	**0.731**	-0.005	-0.001
PMS_U12	Link between the performance and promotion of general manager	**0.599**	-0.001	0.133
PMS_U9	Link between the performance and monetary rewards of general manager	**0.522**	0.361	-0.044
PMS_U5	Evaluating measureable non-financial performance	0.002	**0.872**	0.027
PMS_U7	Relationship between the performance measures	-0.034	**0.824**	0.132
PMS_U6	Understanding the progress of achieving the goals	0.027	**0.818**	0.050
PMS_U8	Action plan for achieving performance target	0.039	**0.487**	0.198

PMS_U4	Provision of the materials required for verifying the results of decision- making	-0.061	0.041	**0.789**
PMS_U2	Provision of the materials required for decision-making	0.053	0.047	**0.781**
PMS_U3	Support for decision-making	0.036	0.066	**0.750**
PMS_U1	Presentation of the cause of the problem	0.074	0.138	**0.537**
	Variance explained	22.0%	19.7%	17.6%

Panel C	**Absorptive capacity**	Utilizing	Acquiring
AC_6	Discussing about improvement plan of PMS based on acquired knowledge	**0.917**	-0.051
AC_7	Reflection of improvement plan of PMS discussed	**0.896**	-0.034
AC_5	Determining the usefulness of knowledge about PMS quickly	**0.696**	0.134
AC_4	Recording and accumulation of knowledge about PMS	**0.594**	0.131
AC_2	Acquiring knowledge about PMS from consultant	0.028	**0.693**
AC_3	Acquiring knowledge about PMS from off-site exchanges	-0.025	**0.644**
AC_1	Acquiring knowledge about PMS from the president or director	0.070	**0.394**
	Variance explained	36.4%	16.7%

Panel D	**Experiential learning capabilities**	**ELCAPA**
ELC_3	Review relationship between performance goals and business strategy	**0.804**
ELC_8	Refine relationship between performance goals and business strategy	**0.799**
ELC_4	Review relationship between the performance measures	**0.786**
ELC_6	Refine types of performance indicators	**0.786**
ELC_7	Refine performance target tightness	**0.785**
ELC_10	Refine utilization of PMS	**0.775**
ELC_2	Review performance target tightness	**0.771**
ELC_5	Review utilization of PMS	**0.761**
ELC_1	Review types of performance indicators	**0.754**
ELC_6	Refine types of performance indicators	**0.754**
	Variance explained	60.1%

3.2 Variables measurement and setting

3.2.1 CPMS

Among the new concepts concerning performance management systems that have been introduced in recent years is CPMS, which is also known as "strategic performance management systems" (or "strategic performance measurement systems"). Although these modern performance management systems are defined in various ways, they are similar to CPMS in their components—as they use both financial and non-financial indicators of performance and performance measures linked to strategy and show explicit and implicit cause-and-effect relationships among measures—and in their purpose, which is to evaluate organizational performance in order to inform decision making (Franco-Santos et al., 2012).

We measured the CPMS components using nine questions (see Table 2, PMS_C1–PMS_C9) and measured CPMS purpose using 14 questions (see Table 2,

PMS_U1–PMS_U14) suggested by Franco-Santos et al. (2013). An exploratory factor analysis on CPMS components resulted in three factors within constructs above 0.4 (see Table 3, Panel A). The first factor relates to the setting and evaluation of non-financial measures presented in a non-financial performance measurement system ($\alpha = 0.88$). The second factor relates to the setting and evaluation of financial measures presented in a financial performance measurement system ($\alpha = 0.88$). The third factor relates to performance measures linked to strategy and the showing of explicit and implicit cause-and-effect relationships among the measures presented in strategic performance measurement systems ($\alpha = 0.70$).

Another exploratory factor analysis using polychoric correlation matrix on CPMS purpose resulted in three factors within constructs above 0.4 (see Table 3, Panel B). The first factor relates to performance-influenced monetary rewards and promotion in pay-for-performance use ($\alpha = 0.88$). The second factor relates to the evaluation of organizational performance in performance evaluation use ($\alpha = 0.84$). The third factor relates to the checking or analysis of decision making in order to inform managerial decision making ($\alpha = 0.85$). As in the other scales, the high reliability estimate allowed for the calculation of a mean that could serve as the composite score for these scales.

3.2.2 Absorptive capacity

We investigated the organizational features of effective CPMS use in key business sectors. As we could not use the measurement items employed in existing management accounting studies on the effective use of CPMS, we developed seven questions (see Table 2, AC_1–AC_7) based on Jansen et al. (2005) and Lichtenthaler (2009). The results of exploratory factor analysis extracted two factors showing the characteristics of the absorptive capacity (see Table 3, Panel C). The first factor concerns the transforming acquired knowledge and exploitation it to effective use of CPMS ($\alpha = 0.88$). The second factor concerns the acquiring knowledge existing outside the organization ($\alpha = 0.62$). Like the other scales, the high reliability estimate allowed for the calculation of a mean that could serve as the composite score for these scales. Because, the absorptive capacity of an organization is its capabilities to not only recognize and incorporate the value of new knowledge taken from outside the organization and but also adapt it to existing knowledge and organizational routines (Cohen and Levinthal, 1990; Zahra and George, 2002), we calculate the product of the two factors.

3.2.3 Experiential learning capabilities

We measured experiential learning capabilities using 10 questions (see Table 2, ELC_1–ELC_10) that asked respondents to assess the extent to which their organizations not only reviewed performance measurement activities and business strategies but also refined them. These questions were developed on the basis of past research on experiential learning (Huber, 1991; Kolb, 1984). The results of the factor analysis revealed one major factor that shows the characteristic of experiential learning (see Table 3, Panel D), which was named "experiential learning capabilities" ($\alpha = 0.91$). For the operation of the variables, we scored the average value of the 10 questions.

3.2.4 Organizational performance

How best to measure organizational performance has been the subject of debate. Groot and Selto (2013) argue that a discussion based on subjective measures of performance has merit because it is difficult to describe the relationship between the use of performance management systems and objective performance. However, other studies suggest that examining the impact of management accounting and control systems such as CPMS on organizational performance requires objective performance measures (Smith 2011). In this study, organizational performance is measured through objective instruments using return on sales (ROS) and return on equity (ROE).

4 Findings

4.1 Method of analysis

We explore the research questions on how the absorptive capacity and experiential learning capabilities related to CPMS affect the relationship between CPMS and organizational performance. We test the relations using OLS (ordinary least squares) regression through the following models:

$$PERF_i = \beta_0 + \beta_1 FPM_i + \beta_2 NFPM_i + \beta_3 SPM_i + \beta_4 PE_i + \beta_5 DM_i + \beta_6 PfP_i + \beta_7 ACAP_i + \beta_8 FPM_i * ACAP_i + \beta_9 NFPM_i * ACAP_i + \beta_{10} SPM_i * ACAP_i + \beta_{11} PE_i * ACAP_i + \beta_{12} DM_i * ACAP_i + \beta_{13} PfP_i * ACAP_i + \beta_{14\text{-}16} (CONTROLS_i) + \varepsilon_i \quad (1)$$

$$PERF_i = \beta_0 + \beta_1 FPM_i + \beta_2 NFPM_i + \beta_3 SPM_i + \beta_4 PE_i + \beta_5 DM_i + \beta_6 PfP_i + \beta_7 ELCAPA_i + \beta_8 FPM_i * ELCAPA_i + \beta_9 NFPM_i * ELCAPA_i + \beta_{10} SPM_i * ELCAPA_i + \beta_{11} PE_i * ELCAPA_i + \beta_{12} DM_i * ELCAPA_i + \beta_{13} PfP_i * ELCAPA_i + \beta_{14\text{-}16} (CONTROLS_i) + \varepsilon_i \quad (2)$$

$$PERF_i = \beta_0 + \beta_1 FPM_i + \beta_2 NFPM_i + \beta_3 SPM_i + \beta_4 PE_i + \beta_5 DM_i + \beta_6 PfP_i + \beta_7 ACAP_i + \beta_8 ELCAPA_i + \beta_9 FPM_i * ACAP_i + \beta_{10} NFPM_i * ACAP_i + \beta_{11} SPM_i * ACAP_i + \beta_{12} PE_i * ACAP_i + \beta_{13} DM_i * ACAP_i + \beta_{14} PfP_i * ACAP_i + \beta_{15} FPM_i * ELCAPA_i + \beta_{16} NFPM_i * ELCAPA_i + \beta_{17} SPM_i * ELCAPA_i + \beta_{18} PE_i * ELCAPA_i + \beta_{19} DM_i * ELCAPA_i + \beta_{20} PfP_i * ELCAPA_i + \beta_{21\text{-}23} (CONTROLS_i) + \varepsilon_i \quad (3)$$

where PERF represents firm performance; FPM, NFPM, SPM, PE, DM, and PfP represent the emphasis placed on financial performance measurement systems, non-financial performance measurement systems, strategic performance measurement systems, performance evaluation use, decision making use, and pay-for-performance use respectively; ACAP represents absorptive capacity; ELCAPA represents experiential learning capabilities; and * ACAP and * ELCAPA represent the interaction effects of CPMS components/purposes and absorptive capacity and experiential learning capabilities.

4.2 Result

A correlation matrix is presented in Figure 3, and Figure 4 presents the regression results. Model 1 represents the baseline regression that includes the individual CPMS components and purposes and the firm control variables. Models 2 and 3 introduce the interaction terms of absorptive capacity (Model 2), as shown in equation (1), and experiential learning capabilities (Model 3), as shown in equation (2). Model 4 presents the full model, as shown in equation (3). Prior to the construction of the interaction and interaction terms, the independent variables are mean-centered to reduce the potential effects of multicollinearity (Cohen et al. 2003). The maximum VIF across the models is 5.43, which is well below the general threshold of 10 (Hair et al., 2006).

First, Model 3a shows that the interaction of NFPM * ELCAPA is positive and significant for ROS (β = 0.134, $p < 0.10$); on the other hand, Model 3b shows that the interaction of PE * ELCAPA is negative and significant for ROE (β = -0.236, $p < 0.05$). These models show that the interaction effects of experiential learning capabilities and CPMS components and purposes are uncertain. When the interaction terms of absorptive capacity are introduced, models 4a and 4b show similar interaction effects: the interaction effect of DM * ELCAPA is positive and significant for ROS (β = 0.319, $p < 0.01$) and for ROE (β = 0.242, $p < 0.05$), while the interaction effect of PE * ELCAPA is negative and significant for ROS (β = -0.127, $p < 0.05$) and for ROE (β = -0.415, $p < 0.01$).

Second, Model 2a shows that introducing the interaction terms of absorptive capacity and CPMS components and purposes has no significant interaction effects. Models 4a and 4b, introducing the interaction terms of experiential learning capabilities, show that the interaction effect of PE * ACAP is positive and significant for ROS (β = 0.319, p < 0.05) and for ROE (β = 0.254, p < 0.10), while the interaction effect of DM * ACAP is negative and significant for ROS (β = -0.262, p < 0.05) and for ROE (β = -0.248, p < 0.10).

Table 4. Correlation matrix of the variables in the study

	Mean	S.D.	Actual Range	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) FPM	4.63	0.510	3.00 – 5.00	1											
(2) NFPM	3.39	0.819	1.00 – 5.00	0.235**	1										
(3) SPM	4.04	0.670	2.00 – 5.00	0.388**	0.349**	1									
(4) PE	4.33	0.565	2.00 – 5.00	0.547**	0.239**	0.592**	1								
(5) DM	3.79	0.649	2.00 – 5.00	0.299**	0.263**	0.579**	0.529**	1							
(6) PfP	3.49	0.618	1.00 – 5.00	0.170*	0.220**	0.299**	0.230**	0.294**	1						
(7) ACAP	10.16	4.000	1.80 – 25.00	0.209**	0.296**	0.444**	0.384**	0.503**	0.344**	1					
(8) ELCAPA	3.64	0.640	1.80 – 5.00	0.407**	0.371**	0.584**	0.605**	0.621**	0.332**	0.556**	1				
(9) ENVHOST	2.90	0.841	2.00 – 5.00	0.049	0.072	0.148*	0.154*	0.162*	0.133*	0.241**	0.151*	1			
(10) ENVDYN	3.60	0.639	1.00 – 5.00	0.221**	0.164*	0.338**	0.298**	0.302**	0.170*	0.310**	0.345**	0.279**	1		
(11) IND_ROS	0.07	0.016	-0.02 – 0.11	0.057	-0.005	-0.056	-0.059	0.003	0.095	-0.058	-0.017	0.003	0.026	1	
(12) IND_ROE	0.05	0.013	-0.03 – 0.10	0.049	-0.038	-0.065	-0.043	-0.005	0.078	-0.054	-0.050	0.058	0.020	0.896**	1

Table 5. Results of OLS regression

	ROS (Return on Sales)				ROE (Return on Equity)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
FPM	0.066	0.088	0.051	0.070	0.095	0.086	0.098	0.094
	(0.824)	(1.041)	(0.608)	(0.815)	(1.178)	(1.011)	(1.154)	(1.083)
NFPM	0.031	0.045	-0.029	-0.029	-0.049	-0.011	-0.081	-0.072
	(0.429)	(0.595)	(-0.389)	(-0.362)	(-0.679)	(-0.143)	(-1.081)	(-0.893)
SPM	-0.106	-0.108	-0.112	-0.079	-0.117	-0.124	-0.135	-0.090
	(-1.139)	(-1.105)	(-1.195)	(-0.823)	(-1.246)	(-1.266)	(-1.430)	(-0.922)
PE	0.165	0.168	0.056	0.026	0.131	0.124	-0.003	-0.027
	(1.756*)	(1.719*)	(0.551)	(0.259)	(1.379)	(1.266)	(-0.027)	(-0.262)
DM	-0.092	-0.097	-0.143	-0.117	0.019	0.029	-0.035	-0.004
	(-1.081)	(-1.068)	(-1.551)	(-1.264)	(0.218)	(0.319)	(-0.380)	(-0.041)
PfP	0.135	0.135	0.094	0.089	0.098	0.102	0.052	0.067
	(1.920*)	(1.841*)	(1.312)	(1.220)	(1.377)	(1.391)	(0.733)	(0.914)
ACAP		-0.008		-0.088		-0.060		-0.159
		(-0.089)		(-0.940)		(-0.673)		(-1.676*)
FPM * ACAP		0.041		0.054		-0.008		-0.082
		(0.436)		(0.446)		(-0.085)		(-0.674)
NFPM * ACAP		0.042		-0.030		0.069		-0.009
		(0.455)		(-0.303)		(0.742)		(-0.090)
SPM * ACAP		-0.136		-0.167		-0.065		-0.046
		(-1.236)		(-1.364)		(-0.595)		(-0.374)
PE * ACAP		0.082		0.319		-0.044		0.254
		(0.705)		(2.215**)		(-0.376)		(1.743*)
DM * ACAP		-0.046		-0.262		-0.097		-0.248
		(-0.452)		(-2.105**)		(-0.946)		(-1.965*)
PfP * ACAP		0.080		0.226		0.091		0.143
		(0.861)		(1.784*)		(0.985)		(1.116)
ELCAPA			0.197	0.225			0.190	0.236
			(1.999**)	(2.172**)			(1.922*)	(2.246**)
FPM * ELCAPA			-0.050	-0.079			0.040	0.084
			(-0.536)	(-0.630)			(0.430)	(0.657)
NFPM * ELCAPA			0.134	0.117			0.110	0.101
			(1.733*)	(1.393)			(1.421)	(1.198)
SPM * ELCAPA			-0.035	0.054			-0.115	-0.063
			(-0.341)	(0.469)			(-1.135)	(-0.533)
PE * ELCAPA			-0.127	-0.326			-0.236	-0.415
			(-1.071)	(-2.183**)			(-1.988**)	(-2.745***)
DM * ELCAPA			0.156	0.319			0.097	0.242
			(1.712*)	(2.776***)			(1.058)	(2.069**)
PfP * ELCAPA			-0.054	-0.196			0.032	-0.048
			(-0.652)	(-1.658*)			(0.387)	(-0.398)
ENVHOST	-0.134	-0.157	-0.142	-0.167	-0.043	-0.045	-0.066	-0.059
	(-1.931*)	(-2.169**)	(-2.042**)	(-2.372**)	(-0.615)	(-0.620)	(-0.946)	(-0.829)
ENVDYN	-0.074	-0.086	-0.062	-0.042	-0.066	-0.079	-0.067	-0.043
	(-1.012)	(-1.113)	(-0.826)	(-0.558)	(-0.899)	(-1.028)	(-0.893)	(-0.557)
IND_PERF	0.139	0.134	0.164	0.172	0.171	0.165	0.197	0.195
	(2.092*)	(1.972*)	(2.427**)	(2.563**)	(2.548**)	(2.438**)	(2.898***)	(2.863***)
R^2	0.093	0.108	0.139	0.195	0.074	0.100	0.137	0.176

Adj. R^2	0.054	0.038	0.071	0.100	0.035	0.029	0.069	0.079
F	2.389**	1.539*	2.050**	2.063***	1.877*	1.411	2.018**	1.818**

4.3 Discussion

The results of this study contribute to the growing number of contradictory findings on CPMS' effects on organizational performance. This study finds that the effects of individual CPMS components and purposes have no significant impact on organizational performance. When the effects of absorptive capacity and experiential learning capabilities in CPMS use are introduced, the results show positive and negative influences on organizational performance. The effects of absorptive capacity are opposite to those of experiential learning capabilities, indicating that the effects of absorptive capacity and experiential learning capabilities will depend on which components and purposes are being emphasized in the effort to improve organizational performance.

6 Conclusion

In this study, we investigated the relationship between CPMS use, the organizational capabilities to use such systems effectively, and organizational performance employing empirical evidence based on data obtained through mail-based questionnaires. This study offers important implications, as it highlights the importance of absorptive capacity and experiential learning capabilities related to CPMS components and purposes. The results of our analysis suggest that an organization with high absorptive capacity and experiential learning capabilities related to CPMS may attain higher performance. It is important that organizations continuously accumulate the knowledge required to use information systems, to ensure that these systems, including management accounting systems, perform as expected (Kogut and Zander, 1992; Mata et al., 1995). Therefore, improving absorptive capacity and experiential learning capabilities related to CPMS is important for organizations, since businesses that strive to acquire and use internal and external knowledge could enhance their organizational performance.

This study has several limitations. First, regarding the interaction of absorptive capacity and experiential learning capabilities, this study shows that these capabilities have contradictory effects. The relationship between these capabilities should be further investigated. Second, this study captured organizational performance in terms of objective organizational performance. Other performance issues should be studied, such as the effects of performance management systems in terms of organizational

performance objectives and subjective measures of performance objective achievement (Groot and Selto, 2013).

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