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LEVERS OF CONTROL ON FIRM PERFORMANCE IN AN EMERGING COUNTRY: DO MANAGEMENT ACCOUNTING PRACTICES MATTER?

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Abstract

This study aims to examine the influence of the four levers of control systems (LOC) on firm performance. Further, the study analyzes how the choice of management accounting practice (MAP) interacts with the relationships between LOC and firm performance. Using a survey research design, data were collected from 158 firms operating in various economic sectors in Yemen. A structural equation model (SEM) is used for data analysis utilizing AMOS software. The results indicate that LOC is significantly and positively related to firms' financial and non-financial performance (FNFP). Additionally, MAP moderates the relationship between LOC and firm performance. The impact of LOC on FNFP is more pronounced and greater in firms that use advanced MAP. This study enhances the understanding of how MAP interacts with other organizational activities, such as the control system in improving firm performance.

Keywords: management accounting practices, levers of control systems, firm performance.

1. INTRODUCTION

This study responds to recent attempts to unveil how the interaction between MAP and LOC influences overall organizational performance, particularly in a Middle Eastern country such as Yemen. The wide range of management accounting techniques (MAT) has resulted in a high level of variation in MAPs, which has been the focus of a significant body of research which attempts to explain the underlying reasons for the different MAPs. Researchers have argued that the introduction of new MATs has transformed how management accountants work. Rather than solely providing information for planning and control, they now actively contribute to strategic decision making and enhance business performance (Davis & Albright,

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2004; Duh et al., 2009; Kaplan & Atkinson, 1998; Maiga & Jacobs, 2008). However, there is a scarcity of studies that elucidate how the interaction of the various MAPs and the LOC influence organizational performance.

The LOC classification that was introduced by Simons (1995) for management control systems (MCSs), is used by company managers to maximize resource utilization and align the goals of individuals to achieve organizational objectives. The effectiveness of LOC depends on the quality of the information provided by a variety of management accounting practices. Govindarajan (1988) provided evidence that high organizational performance is caused by the equivalent combination of an organization's environment, strategy (combination of all intended management practices), and internal structures and systems. MCS encompasses internal structures and systems. Hence, MAPs must be tailored explicitly to support LOC to enhance the competitive advantage which leads to superior organizational performance.

A few studies about MAP have assumed a positive link between the implementation of certain MATs and business performance (Tuanmat et al., 2010) and have emphasized that an advanced MAP could improve business management and increase the profitability of companies (Al-Dhubaibi et al., 2023; Jun Lin & Yu, 2002). Furthermore, studies that have investigated the influence of a single MAP tool on firms' performance have reported a positive association between MAP and firm performance, e.g. Total Quality Management (TQM) (Hilman et al., 2019), Balanced Scorecard (BSC) (Osunsanwo & Dada, 2019), and Performance Measurement Systems (PMS) (Gomes et al., 2017).

Importantly, most of the previous empirical studies are lacking in terms of the relationships which explain how an advanced MAP impacts firms' FNFP (Hoque, 2011). It is unclear whether the adoption and implementation of an advanced MAP has a direct effect on corporate performance or whether the influence occurs through one or more organizational functions that MAP serves, e.g., decision-making, control systems (e.g., levers of control), cost management, performance evaluation, or other functions. This study aims to augment this type of research and examine the impact of LOC on firms' FNFP, evaluating the role of MAPs in enhancing this expected influence. This study contributes in many ways. First, this study uses a new construct for the level of MAP advancement that is based on the four stages of the International Federation of Accountants (IFAC) Framework for management accounting (MA) evolution. The significance of the IFAC framework is based on the authority that IFAC represents as an international body of accounting, representing a large number of professionals around the world (Abdel-Kader & Luther, 2006).

The IFAC Framework represents a move from basic, rudimentary systems to more sophisticated and integrated approaches. The first stage, as described by Abdel-Kader and Luther (2006), focuses on fundamental financial accounting, including the recording and reporting of financial transactions. As organizations progress to the second stage, they incorporate internal reporting systems that provide information for managerial decision-making. In the third stage, organizations utilize advanced management accounting techniques to support strategic decision-making, performance management, and value creation. The fourth stage, the most advanced, represents the highest level of MA sophistication, where management accounting is fully integrated into the organization's strategic planning, decision-making, and performance management processes. This integration is achieved through a comprehensive system that incorporates diverse MA techniques and methodologies.

This study utilizes the IFAC Framework to assess the level of MAP advancement in the studied firms. By incorporating this framework, the study contributes to the existing literature by providing a structured and nuanced understanding of the relationship between the level of MAP advancement and the effectiveness of levers of control in improving firm performance. The study's focus on this framework allows for a more comprehensive and robust assessment

of the role of management accounting practices in influencing firm performance within an emerging market context.

Secondly, in contrast to a considerable amount of prior research that has focused on one or two LOCs, this study extends the focus to consider the four LOCs (beliefs, boundary, diagnostic, and interactive) and elucidates the interactions between them. To achieve balance, Simons (1995) argued that business performance is managed through a combination of the four systems, as they are interdependent and complementary.

The limited research on management accounting practices and their impact on firm performance in Yemen, combined with the unique context of an emerging market with specific cultural and economic characteristics, presents a compelling opportunity to contribute to knowledge and understanding. This study seeks to shed light on how management accounting practices influence firm performance in Yemen, a context that has been understudied, and provide valuable insights into the potential role of management accounting in promoting sustainable growth and development in emerging economies.

The remainder of this paper is structured as follows: The following section reviews the literature and outlines the formulation of the hypotheses. Next, the methodology and the results are presented. The final two sections discuss the results and conclude the study.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Simons (1994) elaborated that top management utilizes the four LOC systems to ensure awareness of, gain allegiance to, and focus, organizational attention on the implementation of a new strategy. Simons (1995) demonstrates that the four LOCs enhance organizational learning and management expertise, which, in turn, improve overall business performance. Organizational learning supported by proper application of a control system has been found to improve the organizational competitive position and FNFP (Chenhall, 2005; Hult, 1998; Slater & Narver, 1995; Tippins & Sohi, 2003). MA as a source of information for diagnostic and interactive systems has been argued to improve organizational performance through a positive effect on the intellectual capital represented by human and structural capital (Novas et al., 2017). The most profound organizational outcomes of the performance measurement system (PMS) are associated with the interactive and diagnostic use of PMS (Guenther & Heinicke, 2019). Levers of control have been argued to be interrelated in their impact on project performance (Rezania et al., 2016).

Henri (2006) provided empirical evidence about the support of interactive systems as part of an interactive LOC for organizational capabilities. On the other hand, Bisbe and Otley (2004) concluded that an interactive control system enhances the impact of innovation on performance. Managers use interactive systems to reduce information asymmetries with lenders and reduce debt pressure, resulting in a lower future cost of debt, and, ultimately, improving performance (Osma et al., 2018). Widener (2007) argued that the four LOCs interact in interdependent and complementary ways that eventually influence and improve performance through organizational learning and management attention. He further explained that the belief and diagnostic levers of control systems enhance the efficiency of management attention and the process of knowledge acquisition within an organization, which, in turn, is related to organizational performance. For interdependency, Widener (2007) found that the belief system supports the boundary, diagnostic, and interactive LOCs, while the interactive system supports the boundary and diagnostic systems. Baird et al. (2019) emphasized that the positive impact of the belief and interactive LOCs on organizational performance is achieved through management innovations that are embedded into management practices, processes, and organizational structures. Meanwhile, the positive impact of the boundary and diagnostic systems on organizational performance is observed through the use of managerial techniques,

such as benchmarking, activity-based management, and balanced scorecards. In the same context, Marginson (2002) explained that the belief system is used as a means for strategic change while the boundary, diagnostic, and interactive systems, are utilized to secure the execution of a strategy. The support of LOC for strategy change and implementation implies that LOCs might eventually influence the non-financial aspects of business performance and financial performance. LOCs are interdependent (Widener, 2007) and have an interdependent effect on performance (Bedford, 2015). Task certainty achieved by a diagnostic control system reinforces the efficiency of time (nonfinancial performance) and cost (financial performance) (Bedford, 2015). Lill and Wald (2021) confirmed the positive influence of the belief and interactive systems on nonfinancial performance through innovative project performance. The diagnostic control system increases the level of transparency of operations and results for various stakeholders (Widener, 2007) guaranteeing the alignment of stakeholders' interests and improving financial performance (Silaen & Williams, 2009). The interactive control system enables organizations to grab new opportunities and manage strategic uncertainties (Simons, 1995). Hence, non-financial performance is positively affected through innovation within the realm of services (Abernethy & Brownell, 1997), products (Bisbe & Otley, 2004), and visualization (Mackey & Deng, 2016). Simons (2000) asserted that the levers of control should not be used selectively, rather, the four levers should be integrated to form an effective control system. Based on Simons' conceptualization and empirical evidence of the interdependency of the four LOCs (e.g. Heinicke et al., 2016 and Speklé et al., 2017) in aggregating the effect of the four LOC systems, the following hypotheses are introduced:

H1 (a): The levers of control systems have a significant and positive effect on financial performance.

H1 (b): The levers of control systems have a significant and positive effect on non-financial performance.

Moderation or interaction models are used when the strength of the impact of the management system, budget, or any independent variable on an outcome (e.g., performance) depends on the influence of particular factor(s) or contexts (Brownell, 1982; Brownell & Dunk, 1991; Brownell & Hirst, 1986; Davila, 2000; Gul & Chia, 1994). Davila (2000) argued that the positive impact of control systems on performance is moderated positively by the intense use of cost information and customer information that is provided by the management accounting systems. Interaction models are widely used in contingency-based research where the relationships between the control systems and dependent variables, such as organizational performance, will depend on the performance of another context variable (Chenhall, 2003; Hartmann & Moers, 1999; Tsamenyi et al., 2011). Contingency theory posits that no specific applicable management accounting system (MAS) can be equally effective for all organizations in every situation (Daowadueng, 2022). Instead, it is suggested that an effective MAS should be aligned with both the internal and external factors (for example; environment, technology, and business strategy) to witness higher business performance.

Bisbe and Otley (2004) examined the impact of the interactive MCS and innovation on performance. They found that the effect of innovation on performance is greater when the MAS is used interactively. However, when they operationalized the interactive use of the MAS, they employed the use of three MATs, namely, balanced scorecard, budgeting, and project management systems, in an interactive style of MAS. Consequently, the balanced scorecard and other MATs supported interactive control effectively, which, in turn, enhanced the effect of innovation on performance. The use of the balanced scorecard in the interactive LOC was represented by several metrics that are provided by the balanced scorecard as feedback for interactive control usage to reformulate the strategy and implement the needed corrective

action for performance improvement. MASs as part of organization control systems have been found to impact business performance (Ghasemi et al., 2016).

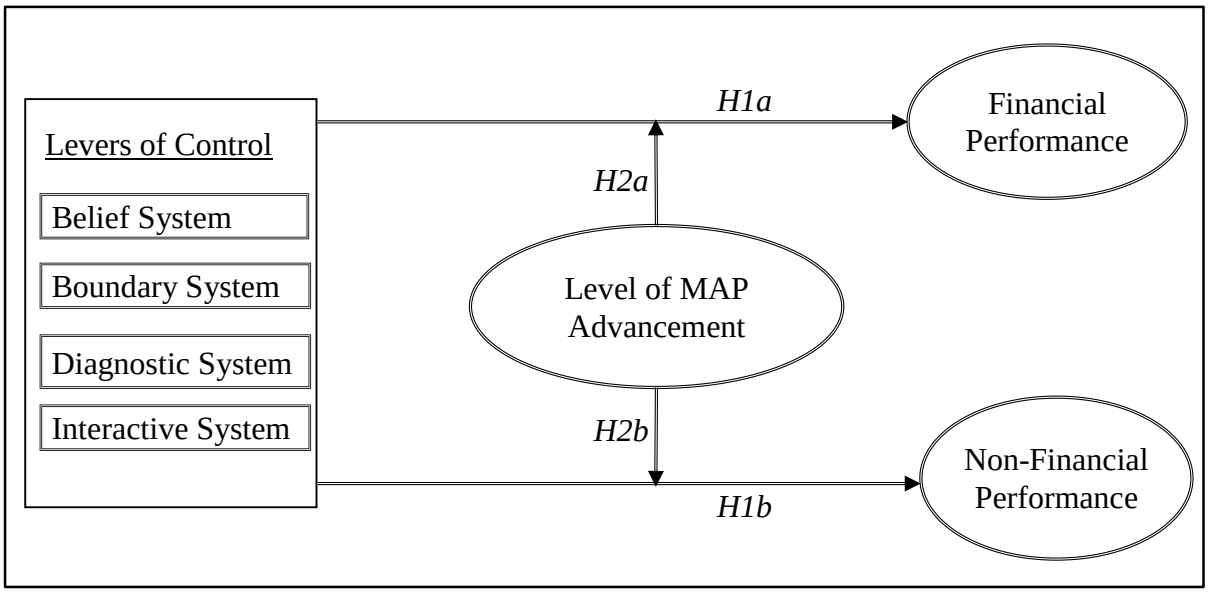
Empirical studies have provided explicit and implicit evidence on the role of various MATs in making the effect of interactive and diagnostic LOCs on performance more pronounced. For instance, Tsamenyi et al. (2011) investigated the use of various MATs to support the interactive and diagnostic use of MA. In their study, MATs, such as measures of customer satisfaction, benchmarking, measures based on employees, and strategic planning, were found to support interactive levers of control. Additionally, they found that MATs, such as variance analysis, absorption costing, activity-based costing, standard costing, and participative budgeting provide significant support for the diagnostic LOC. Finally, their results revealed improved performance when interactive and diagnostic levers of control supported the organizational strategy through the use of MA information. Drawing upon the findings of the previous empirical studies and contingency theory assumptions, the following hypotheses are developed:

H2 (a): The MAP level of advancement moderates positively the relationship between the levers of control and financial performance.

H2 (b): The MAP level of advancement moderates positively the relationship between the levers of control and non-financial performance.

Figure 1 depicts the conceptual framework of the study, which proposes that the levers of control systems have a significant and positive effect on both financial performance and non-financial performance. Furthermore, the model suggests that the level of advancement of the management accounting practices (MAP) moderates these relationships. Specifically, the study examines whether a higher level of MAP advancement will positively influence the relationship between the levers of control and financial performance, as well as the relationship between the levers of control and non-financial performance. In other words, the conceptual model posits that the levers of control directly influence both financial and non-financial outcomes, and that the effectiveness of these relationships is enhanced by the organization's level of management accounting practice sophistication.

Figure 1 Theoretical Proposed Model of the Study



3. METHODOLOGY

The data for this study were obtained through the distribution of questionnaires to chief accountants and chief financial officers across different companies in Yemen between August 1, and December 31, 2021. Based on the company lists of two business associations in the country, the questionnaires were sent using a mail survey as well as personal visits. This approach was used to avoid a low response rate. The two associations assisted with the information about the companies' locations and provided letters of support in addition to the distribution of questionnaires to their members. Out of the 430 questionnaires that were distributed, the researcher received 174 responses, thereby representing a 40% response rate. Of the received responses, 16 were removed due to missing data. Accordingly, the number of valid responses was 158 with a response rate of 37%. The instrument's constructs were adopted from the existing literature to enhance the validity and reliability of the measures with some modifications to the constructs to suit the current study settings of this specific Middle Eastern country. This study also performed a non-response bias analysis using the chi-square test to compare the early and late results. Based on the chi-square statistic, the results of the two groups, the 'early' and 'late', were not significantly different in terms of the demographic variables. This indicates that the non-response bias was not a serious problem in this study.

The measurements of the FNFP constructs capture the assessments of the respondents of their companies' performance compared to the average of the industry on a seven-point Likert scale ranging from (1) "Significantly Lower" to (7) "Significantly Higher" with (4) being "Almost the Same". The measurements of both financial performance (FP) and non-financial performance (NFP) constructs have been adopted from prior studies that have adopted the self-reported performance measurement against the industry average, i.e.,(Cadez & Guilding, 2008; Henri, 2006; Hoque, 2011; Jermias & Gani, 2004; Kallunki et al., 2011). The financial performance construct includes operating income, return on investment, return on assets, and sales growth rate, whereas the non-financial construct includes employee satisfaction, market share, customer response time, customer retention, and other items. The measurement of the LOC known in the literature as "Simons Levers of Control" covers the four elements, each with four items for the respondents to select on a 7-point Likert scale adopted from Widener (2007) and Henri (2006). Management accounting practice (MAP) is measured by using the four different stages identified by IFAC, encompassing the traditional and advanced MAP.

The validity of the measures was achieved through the procedures of content validity and construct validity. The results of reliability tests of this study's constructs' Cronbach alphas are above 0.70, and thus the constructs are considered reliable (Sousa et al., 2006). SEM analysis was utilized to test for the interaction of MAP and LOC in influencing overall organizational performance.

SEM is a powerful tool for analyzing complex relationships, thus, its use is particularly well-suited for this study due to the intricate interplay of multiple constructs. Specifically, this study examines the complex relationships between the four levers of control, the level of MAP advancement, and both financial and non-financial performance. SEM, allows simultaneous examination of direct effects, as well as examination of the moderating influence of MAP advancement on the relationship between LOC and firm performance. Furthermore, SEM provides a rigorous approach to model fit, allowing the assessment of the overall goodness-of-fit of the proposed theoretical model and determination of whether it aligns with the collected data.

4. RESULTS

In this study, data were analyzed using SEM through AMOS 21 software. The model of the study was analyzed and verified in two stages: (1) Assessing the validity and reliability of the measurement model, which examines the association between the latent variables (the constructs) and their measures (indicators). (2) Analyzing the structural model, which examines the relationships (paths) between the variables (constructs) and tests the research hypotheses (Gallagher et al., 2008).

4.1 Assessing the Validity and the Reliability of the Measurement Model

The measurement model specifies how well the indicators represent their latent variables. This study assesses the unidimensionality of the measurement model in addition to discriminant validity, convergent validity, internal consistency, and composite reliability. To assess the validity and reliability of the measurement model, the model was established to obtain the discriminant validity index, and Confirmatory Factor Analysis (CFA) was used to test how well these indicators represent their latent constructs.

Discriminant validity was obtained through the deletion of the redundant items or constraining them as a "free parameter" for the constructs which comprise four items only to avoid an identification problem for the construct. The correlations between latent constructs were below 0.80 (see Table 1) except for the correlation between the diagnostic LOC construct and the interactive lever of control system construct, which has a correlation value of 0.87. According to Bagozzi et al. (1991) and Ou et al. (2010), a high correlation of $r > 0.90$ causes a common method bias. However, the two highly correlated constructs (Diagnostic and Interactive) were combined with the other levers of control constructs (Belief and Boundary) as first-order constructs under LOC which is a second-order construct.

Table 1 The Discriminant Validity Index Summary

	Belief System	Interactive System	Diagnostic System	Boundary System	Non-Financial Performance	Financial Performance
1- Belief System	0.862					
2- Interactive System	0.640	0.880				
3- Diagnostic System	0.681	0.876	0.864			
4- Boundary System	0.743	0.762	0.693	0.831		
5- Non-Financial Performance	0.452	0.442	0.454	0.437	0.830	
6- Financial Performance	0.458	0.454	0.446	0.389	0.607	0.797

The unidimensionality of the measurement model was achieved, as the factor loading for all items that comprise the latent variables of the model achieved the required levels. As shown in Table 2, all items indicated a factor loading of > 0.6. Table 2 also displays the Average Variance Extracted (AVE) for each construct in the model. All items in the measurement model have an AVE > 0.5 for each construct. The AVE values obtained range from 0.64 to 0.77. Therefore, convergent validity has been achieved.

The construct reliability was examined by assessing Cronbach's Alpha scores. As presented in Table 2, Cronbach's Alpha values ranged from 0.86 to 0.93, indicating an

acceptable internal consistency level for each construct (Hair et al., 1995, as cited by Ou et al., 2010). According to Awang (2012), a CR ≥ 0.6 is required to achieve the composite reliability of a construct. The CR values for the model range from 0.87 to 0.93, indicating good composite reliability.

Table 2 Confirmatory Factor Analysis (CFA) Summary for All Constructs

Construct	Item	Factor Loading	Cronbach Alpha(Above 0.7)	CR (Above 0.6)	AVE (Above 0.5)
Belief System	BeliefSy_1	0.85	0.913	0.920	0.743
	BeliefSy_2	0.87			
	BeliefSy_3	0.86			
	BeliefSy_4	0.88			
Boundary System	BoundarySy_1	0.88	0.900	0.899	0.691
	BoundarySy_2	0.82			
	BoundarySy_3	0.77			
	BoundarySy_4	0.85			
Diagnostic System	DiagnosticSy_1	0.89	0.925	0.922	0.746
	DiagnosticSy_2	0.88			
	DiagnosticSy_3	0.86			
	DiagnosticSy_4	0.83			
Interactive System	InteractiveSy_1	0.92	0.932	0.932	0.774
	InteractiveSy_2	0.87			
	InteractiveSy_3	0.89			
	InteractiveSy_4	0.83			
Financial Performance	FinPer_1	0.77	0.857	0.872	0.636
	FinPer_2	0.92			
	FinPer_3	0.85			
	FinPer_4	0.61			
Non-Financial Performance	NonFinPer_1	0.79	0.893	0.898	0.689
	NonFinPer_2	0.93			
	NonFinPer_3	0.88			
	NonFinPer_4	0.71			

4.2 Analysis of the Structural Model (Hypotheses Testing)

The structural model was designed to test the effect of LOC on FNFP. It is hypothesized that the effect will be greater when the advanced MAP is used. In other words, it is hypothesized that the level of MAP advancement moderates the effect of the levers of control systems on firms' FNFP.

The LOC is a second-order construct that comprises four constructs, namely, BeliefSy, BoundarySy, DiagnosticSy, and InteractiveSy. Each of the first-order constructs comprises four items. AMOS first tests the direct effect of the LOC System on FP and NFP through the direct model. It then tests the moderating effects of different levels of MAP advancement on the association between the LOC System and performance.

4.2.1 Levers of Control System Direct Model

Table 3 demonstrates the actual beta value (Estimate) of the regression weight related to the effect of the LOC System on the dependent variables (DVs). The actual beta estimate of

the effect of the LOC System on FP (0.317) and NFP (0.352) shows how the dependent variables (FNFP) change when the independent variable (LOC System) changes in actual value.

The P-value shows that the effect of the LOC System on financial performance is significant at $p < 0.001$. The results show that the effect of LOCs on financial performance is positive and significant, hence, supporting Hypothesis 1(a). Similar to the studies by Henri (2006), Nilniyom & Ussahawanitchakit (2009), and Tsamenyi et al., (2011), the findings in this study indicate that the use of belief, boundary, diagnostic, and interactive LOCs enhance management expertise in optimizing organizational resources through effective employee engagement, resulting in improved organizational financial performance.

Further, the P-value shows that the effect of the LOC Systems on NFP is significant at $p < 0.001$. Consequently, the results support Hypothesis 1(b), which indicates that the LOC has a significant and positive effect on NFP. This result conforms with the findings of Henri (2006) regarding the positive effect of the interactive use of MCS on NFP, such as market orientation, entrepreneurship, organizational learning, and innovativeness.

Table 3 The Regression Weights for the LOC System Direct Model

Construct	Path	Construct	Estimate	S.E.	C.R.	P-value	Result
Financial Performance	←	LOC System	.317	.054	5.865	***	Significant
Non-Financial Performance	←	LOC System	.352	.058	6.078	***	Significant

4.2.2 Levers of Control System Moderated Model

4.2.2.1 MAP Moderation of the Effect of LOC System on Financial Performance

Testing for the moderating effect using AMOS requires a multi-group analysis that involves many steps. First, the sample is divided into two or more groups based on the moderator variable. Then, a multi-group analysis is conducted to assess whether the structural paths differ significantly between the groups. The specific steps involved in testing the moderating effect are as follows:

1. Unconstrained model: First, an unconstrained model is estimated, where all the structural paths are freely estimated across the groups.
2. Constrained model: Next, the parameter of the path hypothesized to be moderated is constrained to be equal across the groups. This is done by placing a (1) constraint on the path coefficient, indicating that the path coefficient should be the same for all groups.
3. Model comparison: The fit of the unconstrained model is then compared to the fit of the constrained model using a chi-square difference test. If the chi-square difference test is significant, it suggests that the path coefficient is significantly different across the groups, indicating that a moderating effect is present.
4. Interpreting the moderating effect: If the chi-square difference test is significant, further examination can determine the nature of the moderating effect by comparing the path coefficients between the groups. This allows for an interpretation of how the moderator variable influences the relationship between the predictor and the outcome variable.

Therefore, in testing the moderating effect of the MAP's level of advancement on the relationship between the LOC System and Financial Performance, the following procedures were performed; 1- The data were split according to the MAP Stage factor into two groups. The first group (dataset 1) is the group of responding firms that use traditional MAP while the second group (dataset 2) is the group of responding firms that use advanced MAP. 2- Two

separate AMOS models were developed for each group (two models for the traditional group and two models for the advanced group). 3- The parameter of one of the traditional group models constrained by (1) on the path that represents the association between the LOC System and FP and was named "the constrained model". The second model of the traditional group was not constrained, and, hence, was named the unconstrained model. 4- The two models of the traditional group were estimated, and the Chi-square values of each model were obtained. 5- The difference in the Chi-square values between the constrained and the unconstrained models was estimated. If the value differs by more than 3.84, then moderation is confirmed to occur in the path (Awang, 2012). 6- The same procedures were performed with the two models in the advanced group: the constrained model, and the unconstrained model. 7- Finally, once the moderation effect was established within the two groups, the unconstrained models from the two groups were compared concerning the actual beta estimate and its significance for both groups to determine in which group (traditional MAP or advanced MAP) the effect of the LOC System on FP is more pronounced.

Table 4 summarizes the moderating effect of the MAP's level of advancement on the relationship between LOC and FP. Having moderation established within the two MAP groups, the level of significance related to the effect of the LOC System on Financial Performance in the two groups indicates the type of moderation. Since the effect of the LOC on FP is insignificant in the traditional MAP group ($P > 0.05$) and significant in the advanced MAP group ($P < 0.001$), it is concluded that the type of moderation is full moderation. This is because when firms use advanced MAP, the effect of the LOC on FP is significant and when firms use traditional MAP, the effect is not significant. In other words, the level of MAP implemented by firms alters the effect level of the LOC on FP. Accordingly, the results support Hypothesis 2(a), which indicates that the level of MAP advancement moderates the relationship between the levers of control and financial performance. That is, the more advanced MAP used by the firm, the greater the impact of LOC on FP. This result is similar to the findings of Bisbe and Otley (2004), which revealed that the interactive use of MCS moderates, in a positive way, the impact of innovation on business performance.

Table 4 Summary of MAP Moderation effect on the relationship between the Levers of Control System and Financial Performance

	Construct	Path	Construct	Estimate	P-value	Result
MAP Traditional Group:						
Chi-Square Difference	22.897					
DF	1					
Result on Moderation	Significant					
Path Regression Weights	Financial Performance	←	LOC Systems	.103	.428	Insignificant
MAP Advanced Group:						
Chi-Square Difference	23.717					
DF	1					
Result on Moderation	Significant					
Path Regression Weights	Financial Performance	←	LOC Systems	.308	***	Significant
Conclusion			Full Moderation			

4.2.2.2 MAP's Moderation of the Effect of LOC System on Non-Financial Performance

The same procedures that were performed to test the moderating effect of the level of MAP advancement on the relationship between the LOC system and FP were also used to test the moderating effect of the level of MAP advancement on the relationship between LOC and NFP. In brief, dataset (1) (traditional MAP group) and dataset (2) (advanced MAP group) were used again and two separate AMOS models were developed for each group (two models for the traditional group and two models for the advanced group). The parameters of one of the traditional group models and one of the advanced group models were constrained by (1) on the path that represents the relationship between the LOC System and Non-Financial Performance and were named as the constrained model (in each group). The second model in each group was not constrained, and, hence, was named the unconstrained model. The difference in the Chi-square values between the constrained and unconstrained models was estimated. When the moderation effect was established within the two groups, the unconstrained models from the two groups were compared concerning the actual beta estimate and its significance for both groups to determine in which group (traditional MAP or advanced MAP) the effect of the LOC on NFP was more pronounced.

Table 5 summarizes the moderating effect of the level of MAP advancement on the relationship between LOC and NFP. Having the moderation established in the two MAP groups, the level of significance related to the effect of the LOC System on Non-Financial Performance in the two groups indicates the type of moderation. Since the effect of the LOC System on NFP is not significant in the traditional MAP group ($P > 0.05$) and significant in the advanced MAP group ($P < 0.01$), it is concluded that the type of moderation is full moderation. This is because when firms use advanced MAP, the effect of the LOC on NFP is significant and when firms use traditional MAP, the effect is not significant. In other words, the level of MAP implemented by firms alters the effect level of the LOC on NFP, hence supporting Hypothesis 2(b).

Table 5 Summary of MAP Moderation Effect on the Relationship between the Levers of Control System and Non-Financial Performance

	Construct	Path	Construct	Estimate	P-value	Result
MAP Traditional Group:						
Chi-Square Difference	22.047					
DF	1					
Result on Moderation	Significant					
Path Regression Weights	Non-Financial Performance	←	LOC Systems	.178	.123	Insignificant
MAP Advanced Group:						
Chi-Square Difference	26.906					
DF	1					
Result on Moderation	Significant					
Path Regression Weights	Non-Financial Performance	←	LOC Systems	.246	.002	Significant
Conclusion	Full Moderation					

5. DISCUSSION

Following Widener (2007), this study conceptualizes the MCSs using the Simons LOC framework to examine the impact of the four levers on performance. The aim of this study is twofold, to examine how the four LOCs influence FNFP, and to analyze the role of MAP in altering or enhancing such impact. In other words, this study examines the interaction between LOC and MAP in terms of its impact on performance. The four LOCs are considered as four dimensions (second-order factors) that represent the levers of control construct (first-order variable) to examine the overall effect on performance in congruence with prior research (e.g. Speklé et al., 2017). This study builds on the complementariness of the four LOCs in their effect on organizational performance which has been confirmed by a considerable number of previous studies. For instance, Sheehan (2006) provided a view of how the four LOCs can be used complementarily to implement strategy and direct performance. The interdependent and complementary use of the four levers of control systems has been emphasized by Widener (2007) and Hoque and Chia (2012). Other studies emphasized the complementariness between two LOCs such as the diagnostic and interactive systems in achieving organizational objectives (e.g. Rathnasekara & Gooneratne, 2020).

The SEM results presented in this paper showed a significant and positive impact for greater usage of the four LOCs on FNFP. These results are consistent with the findings of prior research that emphasized the positive effect of the levers of control (collectively) or particular levers on organizational performance (i.e. Bedford, 2015; Bisbe & Otley, 2004; Su et al., 2015; and Widener, 2007). Moreover, the impact of LOC on both types of performance is more pronounced and greater in firms that use advanced MAP. Hence, consistent with the contingency theory, the level of MAP advancement is proven to moderate the effect of LOC on corporate performance. These results are similar to the findings of Baird et al. (2019) which indicated that the boundary and diagnostic control systems were associated with organizational performance indirectly through the adoption of new management techniques.

Successful implementation of LOC requires sophisticated MAS that can supply the management with the information needed for planning, controlling, and performance evaluation. The diagnostic LOC is the formal control system that managers use to monitor organizational activities, operations, and overall performance. Managers use the diagnostic control system to ensure proper implementation of the organizational strategy. For this purpose, the diagnostic system is used by managers in the planning, and observation of the implementation of plans, and in the comparison of actual performance with planned performance. In doing so, use of the diagnostic system of management control requires information about FNFP measures to detect and manage variations from planned performance. This information is provided by advanced MATs, such as the balanced scorecard, just-in-time, activity-based management, target costing, customer profitability analysis, and benchmarking. For instance, the use of the balanced scorecard, which is an advanced MA tool, helps in directing the diagnostic LOC to the four perspectives of organizations instead of focusing only on financial results. When the balanced scorecard is used, the control system will take into account the financial and non-financial activities of the business, e.g., customer satisfaction; internal process and quality; and learning, growth, and innovation. Hence, the information provided by MAS enhances the positive effect of the control system on firms' FNFP. Consistent with these results, Tuomela (2005) explained how the balanced scorecard as a new MAT was used to support the execution of the four LOCs and how the information and reports provided by the BSC foster the effectiveness of the diagnostic, interactive, boundary, and belief systems.

Similarly, advanced MAS are used in the interactive use of a control system as they provide information that facilitates the continuous dialog of targets and strategy. When

managers use a control system interactively, information is exchanged between various levels of management and organizational functions. A considerable amount of information that is conveyed from top management to lower-level management and the feedback that goes bottom up is timely and more relevant if processed and provided by an advanced MAS that uses sophisticated MATs. For instance, when the target costing technique is used in an organization, the information regarding the objectives and targets that are to be sent from the top management to operational managers will be processed through the target costing management accounting tool. Further, feedback on the actual cost that is to be sent back from operational levels to top management, would be more accurate and relevant if processed through activity-based costing which allocates cost more accurately to activities and then to products and services. The information exchanged in this way helps managers in detecting the variations, identifying and eliminating non-value added activities, allocating resources more efficiently, and improving overall organizational performance. Hence, the effect of a LOC system on firm performance is more pronounced when advanced MATs are used.

The belief control system stipulates the shared values that drive organizational goals and directs the actions that are aimed at achieving those goals. Vision, mission, and organizational values, which are the building blocks of the belief control system, encourage innovation and motivate employees to work towards achieving organizational objectives. The existence of an effective performance measurement system, which uses management accounting information, with a proper reward and compensation scheme helps embed organizational values into practice and makes the effect of the belief control system on the firm's performance more explicit. Employees understand that top management supports any action that is in line with the values and purposes that are explicitly defined by the belief system (Lill & Wald, 2021). The belief system, therefore, encourages those actions and promotes commitment to the attainment of organizational objectives (Adler & Chen, 2011) which in turn has a positive effect on performance (Ylinen & Gullkvist, 2014).

6. CONCLUSION

The findings of this study showed that advanced MAP use increases the effectiveness of MCS and reinforces the positive impact of LOC on organizational performance. Therefore, organizations should focus on the best practices of MAP and observe the changes in other organizational activities (such as management control systems) to develop a management accounting practice that copes with the given change. The alignment of MAP with other organizational activities keeps the MAP relevant to the organization and supports various organizational activities and overall organizational objectives.

These findings provide several theoretical and practical implications. In line with contingency theory, the influence and interaction of MAP with other organizational activities that lead to improvement in organizational performance implies that MAP is an integrated activity that works with other organizational activities to achieve organizational objectives. Therefore, MAP should be studied in the context of other organizational activities, such as the LOC system to explore what affects MAP and how MAP affects other activities or complements other activities to recommend the proper form of MAP based on the specific context and special activities of a focal organization.

This study has its limitations that should be taken into account when interpreting the results. First, the common limitation in accounting research, which is a low response rate, applies to this study. The busyness of CFOs, chief accountants, and accountants in general, in addition to the reluctance of the management of many firms to provide information on their financial and accounting aspects, make the limitation of a low response rate unavoidable. Second, although questionnaires were distributed to firms in various industries, the response

rate for each industry does not represent all industries. The limit number of responses collected from some industries, such as health care and tourism, means that the generalization of the study findings to all types of industries needs to be made with caution.

Future research may examine new factors that are not included in this study. For instance, future research could examine the impact of leadership styles on the type of MCS and the level of MAP. Organizational culture could also be an influential factor that determines the type of MCS and the level of MAP in an organization. Therefore, it is recommended that future research investigate how organizational culture influences the choice and application of MCS and MAP. Furthermore, the interaction between leadership style and organizational culture could be investigated concerning MCS and MAP.

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