

Management accounting system effectiveness and goal achievement: evidence from automotive businesses in Thailand

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Keywords

Management Accounting System, Effectiveness, Goal Achievement, Environmental Pressure

Abstract

This study investigated the relationships between the MAS effectiveness and goal achievement of 163 automotive businesses in Thailand. Both Resourced-based view and contingency theory are used to develop a conceptual framework. The results provide support for (1) dimensions of MAS effectiveness consist cost determination and financial control, information for planning and control, reduction of resource waste in a business process and creation of value through effective resource use, influence on cost information accuracy, corporate practice efficiency and performance evaluation effectiveness. (2) Both performance evaluation effectiveness and corporate practice efficiency significantly positive impact on goal achievement. (3) Antecedents include best accounting system, and accountant competency has significantly positively affected cost determination and financial control. Top management support and best accounting system influence on information for planning and control. Moreover, all antecedent variables impact on the creation of value through effective resource use significantly. (4) Top management support has a significant positive effect on cost determination and financial control. The best accounting system relates to both cost determination and financial control, and information for planning and control when such relationships were moderated by environmental pressure.

1. Introduction

Over 50 years, the automotive business in Thailand has been developed and supported by the public and the private sectors continually. It had started from importing the automotive components from European and Japan in order to build the domestic automotive since 1961. The leaders of the multinational automotive businesses such as Toyota motors, Isuzu motors, Honda automobiles and Nissan motors, that these firms have become the most important business for economic growth in Thailand. The important factors of the growth in the automotive industry are the production joint venture with the global automotive manufacturers to provide Thailand as the major production base for exporting. Moreover, geography, production efficiency, skills of the worker and infrastructure combine with the several measurements which was supported by the government is an incentive leading to the relocation of the production base in Thailand of the global automotive enterprises.

Management accounting system (MAS) is the infrastructures of the automotive business that provide both the processes and the technology management, which focus on firm value (Phadoongsitthi, 2003). MAS is mostly the formal systems that provide information both internal and external such as reporting the performance measurement systems and the computerized information systems, planning for budgeting, and predicting (Bouwens and Abernethy, 2000). Moreover, MAS has also impacted significantly on the quality of management decisions in organizations (Sprinkle, 2003) owing to the managers often use MAS for both short and long term decisions (Mia and Patiar, 2001). Thus, MAS of organizations can provide information about the specific performance and be also used as a tool to monitor the achievement of the goals of the organization. MAS involve a variety of tasks, and systems within the organization such as budgeting, costing, evaluation and reward systems. All systems assist managers set objectives for future performance and planning of resource allocation, setting specific targets for the departments and the organization (Macdonald, 1999). For all reasons above, management accounting system has the important role and beneficial for the automotive and the other industries.

The key research questions whether management accounting system effectiveness relates to goal achievement. Besides, the specific questions include: 1) how does each dimension of MAS effectiveness related to cost information accuracy, corporate practice efficiency, and performance evaluation effectiveness? 2) How do cost information accuracy, corporate practice efficiency, and performance evaluation effectiveness associated with goal achievement? 3) How do each dimension of management accounting system effectiveness related top management support, best accounting system, and accountant competency? 4) How does environmental pressure moderate the relationships between each dimension of MAS effectiveness and all antecedents? Hence, the key purpose is to investigate the relationships between each dimension of MAS effectiveness (including cost determination and financial control, information for planning and control, reduction of resource waste in business process and creation of value through effective resource use) and goal achievement. Also, the specific research purposes are as follows: 1) to investigate the influence of MAS effectiveness' dimension on cost information accuracy, corporate practice efficiency, and performance evaluation effectiveness. 2) To explore the impact of cost information accuracy, corporate practice efficiency, and performance evaluation effectiveness on goal achievement. 3) To examine the effect of antecedences including top management support, best accounting system, accountant competency on each dimension of MAS effectiveness. 4) To examine the moderating variable role of environmental pressure on the relationship between all antecedence variables and each dimension of MAS effectiveness.

2. Theoretical framework

Two concepts relate to this study consisting resource-based view and contingency theory that both theories are used to describe the situation and understand the relationship between variables in the conceptual model.

Resource base view has been described by Barney (1991) that the results of the implementation of the value-creating strategy for sustainable competitive advantages. To accomplish the competitive advantage, that cannot use the same strategy only in the same period. Therefore, the sustainable competitive advantage will be born from the resources when competitors are not able to replicate or to receive the benefits arising from the strategic value use for the organization. Moreover, Barney (1991) had also suggested that organizations where are able to create a unique feature of the organization potential to achieve competitive advantage. The resources of the organization consist of four main features including valuable, rare, imperfectly imitable and non-substitutable. In four elements, if its lack any element, the organizations will not create the sustainable competitive advantage. Hence, the main reasons why motivate firms in the automotive industry using the management accounting system for maximum benefit.

Besides, contingency theory is the idea that neither theory nor method of administration to be applied in all circumstances or the best management style. The very different environment results in each administration and method. Therefore, choosing the right kind base on the situation due to each method has its own advantages, and limitations are inherent in the effective management that is critical to the selection of appropriate management for each situation with each issue. There was the expertise to analyze classification and resolve the situation (Fiedler, 1964) which is the fact that each has a different problem. The various relevant factors of the relationship between the organization and external factors, including technology and cultural organization that is mainly caused by the environment factor (Isiam and Hu.2012). Gordon and Miller (1976) posited that MAS related to various factors such as environmental, organizational and decision-making style (Moore and Yuen, 2001). Thus, the contingency theory is used to design of management accounting system under changing of environmental pressure and all circumstances of organizations, such as top management support, best accounting system and accountant competency to support the goal achievement of the organization.

3. Literature review and hypotheses development

In this study, MAS effectiveness is the primary variable that has an effect on firms' goal achievement through the mediating function of cost information accuracy, corporate practice efficiency and performance evaluation effectiveness. Top management support, best accounting system, and accountant competency are determined as the antecedent variable of MAS effectiveness,

through a moderating effect of environmental pressure. Figure 1 shows the conceptual model in this study.

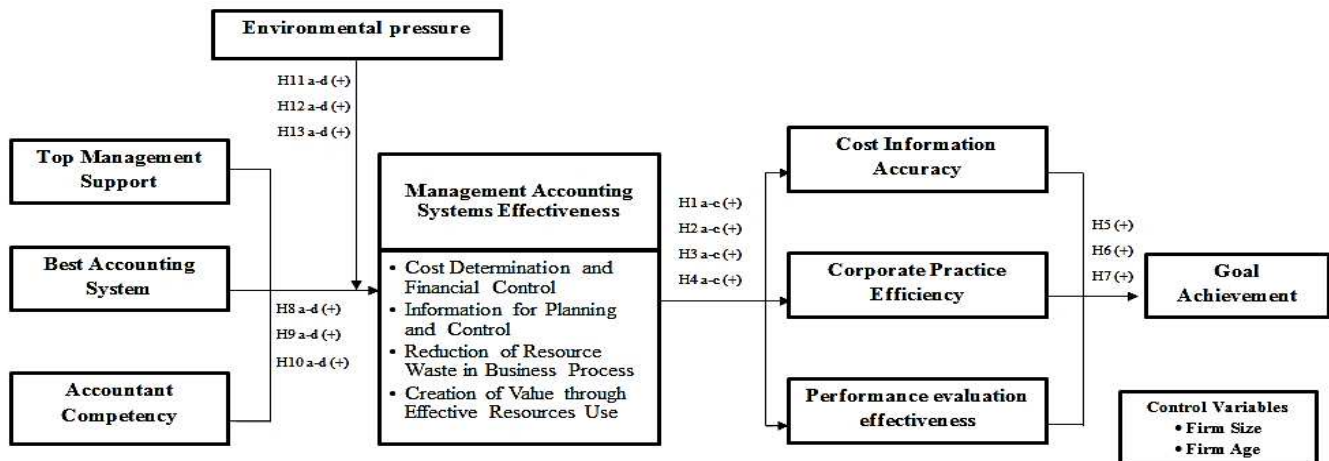


Figure 1 MAS Effectiveness on Goal Achievement
Management accounting system effectiveness

Management Accounting System (MAS) refers to creating information within the organization to facilitate managers' decision and control processes (Bruns and Kaplan, 1987). Chi (1995) defined MAS as an organizational control mechanism that facilitates control by reporting and creating visibility into the action and performance of its members. The purpose of management accounting system, Macdonald (1999) stated that the management accounting system generates information that assists managers with planning, coordination, motivation and evaluation of the activities of the organization and its members. The management accounting objective is identified by IFAC (1998), including the cost determination and financial control, the information for management planning and the control, the reduction of waste of resources in business processes, and creation of value through effective resource use. Therefore, the definition "management accounting system effectiveness" of this study as activities for creating information both the internal and external organization to help decision makers assessing the objective achievement of the organization. Dimensions of the MAS effectiveness are evaluated by IFAC (1998), including first dimension as "cost determination and financial control" (CDF) is defined as the attention that the primary data source was financial statements how to use of ratio analysis, financial statement analysis and other cost accounting. Second, "information for planning and control" (IPC) is defined as the use of information which gain from accounting techniques to support decision, analysis and accountability, accounting was introduced such as standard costing, cost-volume-profit, and break-even analysis. Third, "reduction of resource waste in business process" (RRW) is defined as the reduction of resource waste in a business process that focused on this was made possible through the elimination of "non-value-added activities" and the use of mathematical formulas such as the economic order quantity, inventory evaluation models such as FIFO, LIFO, and multiple regressions. Finally dimension, "creation of value through efficient resource use" (CVE) is defined as the effective use of resources and technologies to examine drivers of customer and shareholder value, and organizational innovation. The introduction of an advanced management accounting method consists just-in-time (JIT), balanced scorecard and strategic management accounting.

Consequences of Management accounting system effectiveness

Cost Information Accuracy (CIA) is defined as the degree of cost information accuracy that has a significant role in the decision, such as pricing, producing, buying, cost-reducing, and developing new products. **Corporate Practice Efficiency (CPE)** is defined as the enhancement of utilizing that arranges the performance management of the firm, according to the specification standard initial for the operational planning, developing, monitoring, and evaluating (Thaweechan, 2011). **Performance Evaluation Effectiveness (PEE)** is defined as the evaluation of performance that reflects the potential of the operation completely. As a result, businesses can allocate resources

appropriately. Moreover, the company can determine its strengths and weaknesses to be applied in the workplace.

Recent literature, Soobaroyen and Poorundersing (2008) found that there are the significant positive relationships between MAS and managerial performance. Likewise, Sharma, Jones and Ratnatunga (2006) concluded that the relationship between broad scope MAS and performance is positive significant. Also, Lea and Min (2003) found that MAS that depicts the manufacturing process how to provide accurate product, cost information and result in a better system performance than the other systems. Moreover, Sim and Killough (1998) had investigated the impact of interaction between manufacturing practices and management accounting system on performance finding MAS which have incentive pay and high extensive performance goals is combined with high levels of Total Quality Management (TQM) or Just-in-Time (JIT) effects on the highest level performance. Thus, the relationships are hypothesized as follows:

Hypothesis 1a-c: The higher the cost determination and financial control, is the more likely that firm will gain greater (a) the cost information accuracy, (b) the corporate practice efficiency, and (c) the performance evaluation effectiveness.

Hypothesis 2a-c: The more the information for planning and control is, the more likely that firm will gain greater (a) the cost information accuracy, (b) the corporate practice efficiency, and (c) the performance evaluation effectiveness.

Hypothesis 3a-c: The higher the reduction of resource waste in a business process which is the dimension of MAS effectiveness is, the more likely that firm will gain greater (a) the cost information accuracy, (b) the corporate practice efficiency, and (c) the performance evaluation effectiveness.

Hypothesis 4a-c: The higher the creation of value through effective resource use, which is the dimension of MAS effectiveness is, the more likely that firm will gain greater (a) the cost information accuracy, (b) the corporate practice efficiency, and (c) the performance evaluation effectiveness.

Mediating variables and goal achievement

Goal Achievement (GAC) refers to the representation of the final process in the operation or as obtained results, which enable firms to achieve the objectives set by linking them to the missions, visions, and strategies (Nilaphay and Ussahawanitchakit, 2012). The past research of Mia (2000) supported the interaction between the adoption of Just-in-Time (JIT) and the MAS information can assist an organization in improving the profitability. Thus, the relationships are hypothesized as follows:

Hypothesis 5: The higher the cost information accuracy is, the more likely that firm will gain greater firm goal achievement.

Hypothesis 6: The higher the corporate practice efficiency is, the more likely that firm will achieve greater firm goal achievement.

Hypothesis 7: The better the performance evaluation effectiveness is, the more likely that firm will gain greater firm goal achievement.

Antecedents of Management accounting system effectiveness

Top Management Support (TMS) refers to a chief executive emphasized on the amount of support given to develop and implement new techniques and procedure in organizations such as strong active support, tying to the competitive strategies of the new technique and procedure (Foster and Swenson, 1997). **Best Accounting System (BAS)** is defined by Zhang and Zhou, 2007 as "a suitable accounting system process, technology and an organized set of manual and computerized accounting method. Moreover; procedures, control established to gather, record, classify, analyze, summarize, interpret, present accurate and timely accounting information for management decisions". **Accountant Competency (ACO)** refers to the existing capacities of accountant that help predict competent performance in a certain job that it encompasses the knowledge, skills, abilities, experience and personality of an accountant such as elective training, cognitive abilities, and technical skills (Conroy, 1976; Ley and Albert, 2003; Kennedy and Dresser, 2005; Baird et al, 2007).

Top Management Support related to vision and operations and direction to stimulate demand in the system which believes that the organization had supported data quality by top

management, especially accounting information creates efficient process, manage and achieve goals (Vlahos and Ferrant, 1995; Vlahos et al., 2004). Davila and Foster (2005) suggest that CEO experience, CEO beliefs about MAS, and number of employees are associated with the hiring decision, and also found that the employees who faster use of operating budgets related to faster -growing companies. Shields (1995) discover several behavioral variables and organizational variables, including top management support, competitive strategies, performance evaluation and compensation, training, ownership by non-accountants, and adequate resources be important to explain cross-sectional variation in ABC success which is a proxy of MAS. Naranjo-Gil and Hartmann (2006) found the negative relationship between top management term professionalism and the use of financial information. Also, a positive influence of nonfinancial information on relationships between MAS characteristics and strategy implementation. Hence

Hypothesis 8a-d: The higher the top management support is, the more likely that firm will gain greater (a) cost determination and financial control, (b) information for planning and control, (c) reduction of resource waste in business process, and (d) creation of value through effective resources use

Hypothesis 9a-d: The higher the best accounting system is, the more likely that firm will gain greater (a) cost determination and financial control, (b) information for planning and control, (c) reduction of resource waste in business process, and (d) creation of value through effective resources use

Hypothesis 10a-d: The higher the accountant competency is, the more likely that firm will gain greater (a) cost determination and financial control, (b) information for planning and control, (c) reduction of resource waste in business process, and (d) creation of value through effective resources use

Moderating role of environmental pressure

Environmental Pressure (EPR) is defined by Sharfman (1985) as "the product of the dynamism in the environment and the firm's resource relationships and dependencies".

The past research found that environmental pressure has the important role in determining the success, and the performance of the organization such as Agbejule (2005) found the effects of MAS on performance depend on perceived environmental uncertainty. Sun et al., (2012) found that the environmental pressure can promote the use of environmental marketing strategies and directly impact corporate performance. The firms can use the environmental marketing strategies to moderate the degree of influence of environmental pressure on corporate performance. Chong and Chong (1997) found that strategic choice and environmental uncertainty effect on MAS design. The broad scope MAS information is an important antecedent of the performance of the strategic business unit. Therefore, environmental pressure has the important role of being a moderating variable the relationship between three antecedents, which consists top management support, best accounting system, and accountant competency; and each dimension of MAS effectiveness. Therefore, the relationships are hypothesized as follows:

Hypothesis 11a-d: The relationships between the top management support and (a) cost determination and financial control, (b) information for planning and control, (c) reduction of resource waste in business process, (d) creation of value through effective resource use will be positively moderated by environmental pressure.

Hypothesis 12a-d: The relationships between the best accounting system and (a) cost determination and financial control, (b) information for planning and control, (c) reduction of resource waste in business process, (d) creation of value through effective resource use will be positively moderated by environmental pressure.

Hypothesis 13a-d: The relationships between the accountant competency and (a) cost determination and financial control, (b) the information for planning and controls, (c) reduction of resource waste in business process, (d) creation of value through effective resource use will be positively moderated by environmental pressure.

4. Research methods

4.1 Sample and Data Collection

163 completed and returned surveys were usable for the automotive businesses in Thailand. The questionnaires were mailed surveys of the procedure, and the key informants were accounting executives of each firm. The effective response rate was approximately 18.50%. The non-response bias is calculated by comparing the results of early and late respondents (Armstrong and Overton, 1977). Firm's characteristics consist firm size, firm age, and firm capital were used in this analysis. Non-response bias use t-test (early respondents (n=82) vs. last respondents (n=81)) which the results were not significantly different, which indicate that non-response bias did not appear to be a problem for this study.

4.2 Measurement

Measurement of each construct in the conceptual model, all variables in Table 1 are anchored by five-points Likert scale (1: strongly disagree, 5: strongly agree) without control variables. Moreover, all constructs are developed for measuring from the definition of each construct and examined the relationship between theoretical frameworks and prior literature reviews. Thus, the variables measurement of dependent variable, independent variables, mediating variables, antecedent variables, moderating variables and control variables of this study can describe as follows:

Dependent Variable

Goal Achievement is measured by four items which involve the financial measured by increasing success about revenue, profitability, market share and non-financial measure such as customer and stakeholder acceptance (Durmusoglu et al., 2012). The cronbach alpha was 0.884.

Independent Variables

Cost Determination and Financial Control measure four items that involve the key data from financial statements such as the use of ratio analysis and the analysis of other cost accounting. The cronbach alpha was 0.857.

Information for Planning and Control is measured by four items that involve the use of traditional management accounting techniques for supporting decision and responsibility accounting was introduced, such as standard costing, break-even analysis and other. The cronbach alpha was 0.859.

Reduction of Resource Waste in Business Processes is measured by four items which involve possible through the elimination of "non-value-added activities" and the use of mathematical formulas, such as the economic order quantity, inventory evaluation models such as FIFO, LIFO. The cronbach alpha was 0.715.

Creation of Value through The Effective Resource Use is measured by four items that involve customer value, shareholder value, and organizational innovation. The introduction of advanced management accounting methods includes just-in-time (JIT), balanced scorecard, and strategic management accounting. The cronbach alpha was 0.831.

Mediating Variables

Cost Information Accuracy is measured by four items that involve the degree of cost information accuracy have a significant role in the decision on pricing, product-mixing, making-or-buying, cost-reducing, and developing new products. The cronbach alpha was 0.881.

Corporate Practice Efficiency is measured by five items that involve the enhancement of utilizing that prepare firm performance management for the specification standard initial for planning, developing, monitoring, and evaluating in the operation. The cronbach alpha was 0.898.

Performance Evaluation Effectiveness is measured by four items that involve the evaluation of performance that reflects the potential of the operation completely. As a result, businesses can allocate resources appropriately. Moreover, the company can determine its strengths and weaknesses to be applied in the workplace. The cronbach alpha was 0.895.

Antecedent Variables

Top Management Support is measured by four items which involve the amount of support given to developing and implementing new techniques and procedure in organizations, such as strong active support, tying to the competitive strategies of the new technique and procedure. The cronbach alpha was 0.805.

Best Accounting System is measured by four items that involve a suitable accounting system process, technology and an organized set of manual and computerized accounting method,

processes and controls to collect records, classify, analyze, summarize, interpret to cause present accurate and timely accounting information for management decisions. The cronbach alpha was 0.877.

Accountant Competency is measured by four items which involve an accountant who has the capabilities to help predict performance in a job that is comprehensive both knowledge, skills, abilities, experience and personality of an accountant such as elective training, cognitive abilities, and technical skills. The cronbach alpha was 0.875.

Moderating Variables

Environmental Pressure is measured by four items that involve technology, the supported government, the customer relationship, laws, and regulations. The cronbach alpha was 0.867

Control Variables

The control variables may affect the relationship between independent variable and dependent variable so firm age (FA), and firm size (FS) are the control variables of this study. Firm size is measured by total assets of the firm, that is a dummy variable (0 = total assets of the firm that below and equal 200,000,000 baht, 1 = total assets of the firm that higher than 200,000,000 baht). And firm age is measured by the period of time in business (0 = below and equal 15 years, 1 = higher than 15 years).

4.3 Reliability and Validity

Reliability was tested by Cronbach Alpha to measure the internal consistency of respondents' answer for all items in the questionnaires. Table 1 presents an alpha coefficient that is higher than 0.70, and the coefficients should have a value greater than 0.70 (Nunnally and Bernstein, 1994). Alpha coefficients of constructs have values ranging from 0.715 to 0.898, the lowest coefficient for reduction of resource waste in the business process and the highest coefficient for corporate practice efficiency.

Factor analysis was utilized to examine whether the relationships of a large number of items and to determine that they can be reduced to a smaller set of factors. Thus, a higher rule-of-thumb cut off the value of 0.40 (Nunnally and Bernstein, 1994). All factor loadings are more than 0.40, and are statistically significant.

Table 1
Results of measure validation

Items	Factor Loadings	Cronbach Alpha
Cost Determination and Financial Control (CDF)	0.795 - 0.867	.857
Information for Planning and Control (IPC)	0.748 - 0.881	.859
Reduction of Resource Waste in Business Process (RRW)	0.625 - 0.795	.715
Creation of Value through Effective Resources Use (CVE)	0.725 - 0.875	.831
Cost Information Accuracy (CIA)	0.805 - 0.882	.881
Corporate Practice Efficiency (CPE)	0.753 - 0.904	.898
Performance Evaluation Effectiveness (PEE)	0.654 - 0.732	.895
Goal Achievement (GAC)	0.815 - 0.891	.884
Top Management Support (TMS)	0.752 - 0.860	.805
Best Accounting System (BAS)	0.787 - 0.892	.877
Accountant Competency (ACO)	0.776 - 0.903	.875
Environmental pressure (EPR)	0.811 - 0.865	.867

4.4 Statistic Test

The ordinary least squares regression (OLS) used to test hypotheses which all variables are categorical and interval data by Hair et al. (2010). Thus, all proposed hypotheses transform 12 statistical equations as follows.

$$\begin{aligned}
 \text{Equation 1: CIA} &= \beta_{01} + \beta_1\text{CDF} + \beta_2\text{IPC} + \beta_3\text{RRW} + \beta_4\text{CVE} + \beta_5\text{FS} + \beta_6\text{FA} + \varepsilon \\
 \text{Equation 2: CPE} &= \beta_{02} + \beta_7\text{CDF} + \beta_8\text{IPC} + \beta_9\text{RRW} + \beta_{10}\text{CVE} + \beta_{11}\text{FS} + \beta_{12}\text{FA} + \varepsilon \\
 \text{Equation 3: PEE} &= \beta_{03} + \beta_{13}\text{CDF} + \beta_{14}\text{IPC} + \beta_{15}\text{RRW} + \beta_{16}\text{CVE} + \beta_{17}\text{FS} + \beta_{18}\text{FA} + \varepsilon \\
 \text{Equation 4: GAC} &= \beta_{04} + \beta_{19}\text{CIA} + \beta_{20}\text{CPE} + \beta_{21}\text{PEE} + \beta_{22}\text{FS} + \beta_{23}\text{FA} + \varepsilon \\
 \text{Equation 5: CDF} &= \beta_{05} + \beta_{24}\text{TMS} + \beta_{25}\text{BAS} + \beta_{26}\text{ACO} + \beta_{27}\text{FS} + \beta_{28}\text{FA} + \varepsilon \\
 \text{Equation 6: IPC} &= \beta_{06} + \beta_{29}\text{TMS} + \beta_{30}\text{BAS} + \beta_{31}\text{ACO} + \beta_{32}\text{FS} + \beta_{33}\text{FA} + \varepsilon \\
 \text{Equation 7: RRW} &= \beta_{07} + \beta_{34}\text{TMS} + \beta_{35}\text{BAS} + \beta_{36}\text{ACO} + \beta_{37}\text{FS} + \beta_{38}\text{FA} + \varepsilon \\
 \text{Equation 8: CVE} &= \beta_{08} + \beta_{39}\text{TMS} + \beta_{40}\text{BAS} + \beta_{41}\text{ACO} + \beta_{42}\text{FS} + \beta_{43}\text{FA} + \varepsilon \\
 \text{Equation 9: CDF} &= \beta_{09} + \beta_{44}\text{TMS} + \beta_{45}\text{BAS} + \beta_{46}\text{ACO} + \beta_{47}\text{EPR} + \beta_{48}(\text{TMS} * \text{EPR}) + \beta_{49}(\text{BAS} * \text{EPR}) + \\
 &\quad \beta_{50}(\text{ACO} * \text{EPR}) + \beta_{51}\text{FS} + \beta_{52}\text{FA} + \varepsilon \\
 \text{Equation 10: IPC} &= \beta_{10} + \beta_{53}\text{TMS} + \beta_{54}\text{BAS} + \beta_{55}\text{ACO} + \beta_{56}\text{EPR} + \beta_{57}(\text{TMS} * \text{EPR}) + \beta_{58}(\text{BAS} * \text{EPR}) + \\
 &\quad \beta_{59}(\text{ACO} * \text{EPR}) + \beta_{60}\text{FS} + \beta_{61}\text{FA} + \varepsilon \\
 \text{Equation 11: RRW} &= \beta_{11} + \beta_{62}\text{TMS} + \beta_{63}\text{BAS} + \beta_{64}\text{ACO} + \beta_{65}\text{EPR} + \beta_{66}(\text{TMS} * \text{EPR}) + \beta_{67}(\text{BAS} * \text{EPR}) + \\
 &\quad \beta_{68}(\text{ACO} * \text{EPR}) + \beta_{69}\text{FS} + \beta_{70}\text{FA} + \varepsilon \\
 \text{Equation 12: CVE} &= \beta_{71} + \beta_{72}\text{TMS} + \beta_{73}\text{BAS} + \beta_{74}\text{ACO} + \beta_{75}\text{EPR} + \beta_{76}(\text{TMS} * \text{EPR}) + \beta_{77}(\text{BAS} * \text{EPR}) + \\
 &\quad \beta_{78}(\text{ACO} * \text{EPR}) + \beta_{79}\text{FS} + \beta_{80}\text{FA} + \varepsilon
 \end{aligned}$$

Where;

- CDF = Cost Determination and Financial Control
- IPC = Information for Planning and Control
- RRW = Reduction of Resource Waste in Business Process
- CVE = Creation of Value through Effective Resources Use
- CIA = Cost Information Accuracy
- CPE = Corporate Practice Efficiency
- PEE = Performance Evaluation Effectiveness
- GAC = Goal Achievement
- TMS = Top Management Support
- BAS = Best Accounting System
- ACO = Accountant Competency
- EPR = Environmental Pressure
- FS = Firm Size
- FA = Firm Age
- β = Beta coefficient
- ε = Error

5. Research findings

Table 2 shows descriptive statistics and correlation matrix for all variables. While potential problems relate to multicollinearity, so variance inflation factors (VIF) are used to provide information on the relationship between the independent variables. This study has VIFs range from 2.135 to 2.907, well below the cutoff value of 10 as recommended by Neter, Wasserman and Kutner (1989), meaning the independent variables are not correlated with each other. Therefore, there are no multicollinearity problems encountered in this study.

Table 2

Descriptive statistics and correlation matrix

Variables	CDF	IPC	RRW	CVE	CIA	CPE	PEE	GAC	TMS	BAS	ACO	EPR	FS	FA
Mean	4.252	4.209	4.08	4.043	4.172	3.834	3.736	3.902	4.012	4.129	3.994	3.908	N/A	N/A
s.d.	0.632	0.633	0.577	0.651	0.681	0.678	0.683	0.65	0.638	0.686	0.689	0.646	N/A	N/A
CDF														
IPC	.711***													
RRW	.465***	.513***												
CVE	.462***	.652***	.674***											
CIA	.516***	.557***	.524***	.484***										
CPE	.376***	.493***	.668***	.542***	.603***									
PEE	.235***	.323***	.561***	.519***	.448***	.748***								
GAC	.445***	.477***	.575***	.502***	.499***	.747***	.745***							
TMS	.353***	.466***	.747***	.528***	.480***	.631***	.585***	.690***						
BAS	.491***	.657***	.569***	.555***	.593***	.522***	.450***	.545***	.611***					
ACO	.410***	.481***	.485***	.501***	.592***	.579***	.503***	.598***	.508***	.644***				
EPR	.422***	.491***	.621***	.588***	.470***	.656***	.653***	.676***	.660***	.617***	.665***			
FS	.048	.129	.172**	.080	.144	.146	.061	.015	.055	.151	.143	.145		
FA	.213***	.204***	.245***	.147	.030	.046	.135	.093	.176**	.170**	.063	.153	.178**	

*** p<.01, ** p<.05

Table 3 shows the results of the OLS regression analysis for 1-4 equations that used due to test H1-H8. The results indicated four dimensions of management accounting system effectiveness (including cost determination and financial control, information for planning and control, reduction of resource waste in business process and creation of value through effective resource use) affect mediating variables, including cost information accuracy, corporate practice efficiency, and performance evaluation effectiveness. The result of each mediating variables effects goal achievement.

The first set tests H1a-c to H3a-c of each dimension of management accounting system effectiveness on cost information accuracy, corporate practice efficiency, and performance evaluation effectiveness. In model 1, the results show that the cost determination and financial control significantly positively influence on cost information accuracy (H1a; $\beta_1 = 0.199$, $p < 0.05$), the information for planning and control (H2a; $\beta_2 = 0.246$, $p < 0.05$), has a significant positive influence on cost information accuracy. The reduction of resource waste in business process has a significant positive influence on cost information accuracy (H3a; $\beta_3 = 0.302$, $p < 0.01$), but creation of value through effective resources does not have significant positive influence on cost information accuracy (H4a). Therefore, **hypotheses 1a, 2a and 3a are supported; hypothesis 4a is not supported.**

In model 2, the results show that the cost determination and financial control do not have a significant positive influence on the corporate practice efficiency (H1b). The information for planning and control (H2b; $\beta_8 = 0.219$, $p < 0.05$) has a significant positive influence on corporate practice efficiency. The reduction of resource waste in business process has a significant positive influence on the corporate practice efficiency (H3b; $\beta_9 = 0.594$, $p < 0.01$), but creation of value through effective resources does not have significant positive influence on the corporate practice efficiency (H4b). Therefore, **hypotheses 2b and 3b are supported; hypotheses 1b and 4b are not supported.**

Table 3
Results of OLS regression analysis

Independent Variables	Dependent Variables			
	CIA Model 1	CPE Model 2	PEE Model 3	GAC Model 4
CDF	.199** (.083)	-.037 (.080)	-.077 (.095)	
IPC	.246** (.100)	.219** (.096)	-.027 (.114)	
RRW	.302*** (.089)	.594*** (.085)	.457*** (.102)	
CVE	.042 (.094)	.056 (.090)	.313*** (.108)	
CIA				.091 (.063)
CPE				.416*** (.084)
PEE				.401*** (.071)
Firm Size (FS)	.137 (.114)	.082 (.109)	-.059 (.130)	.401**
Firm Age (FA)	-.288** (.116)	-.268** (.111)	.035 (.132)	-.168 (.094)
Adjusted R ²	.407	.480	.333	.637
Maximum VIF	2.818	2.818	2.818	2.907

*** $p < .01$, ** $p < .05$, * $p < .10$

In model 3, the results show that both the cost determination and financial control (H1c) and the information for planning and control (H2c) do not have a significant positive influence on performance evaluation effectiveness. Both the reduction of resource waste in business process and creation of value through effective resources have significant positive influence on the performance evaluation effectiveness, which there are coefficients (H3c; $\beta_{15} = 0.457$, $p < 0.01$) and (H4c; $\beta_{16} = 0.313$, $p < 0.01$) respectively. Therefore, **hypotheses 3c and 4c are supported; hypotheses 1c and 2c are not supported.**

In model 4 tests H5 to H7, the results show that both performance evaluation effectiveness and corporate practice efficiency have significant positive influence on goal achievement, which

there are coefficients (H6; $\beta_{20}=0.416$, $p<0.01$) and (H7; $\beta_{21}=0.401$, $p<0.01$) respectively. Thus, **hypotheses 6 and 7 supported. Hypothesis 5 is not supported.**

Table 4 shows the results of the OLS regression analysis for 5-12 equations which used to test H8-H13. The results indicate the relationship between each dimension of MAS effectiveness and four antecedents were moderated by environmental pressure.

In model 5 to 8 use to test H8a-d to 10a-d, The results show that both best accounting system and accountant competency have significant positive influence on cost determination and financial control, which there are coefficients (H9a; $\beta_{25}= 0.333$, $p<0.01$) and (H10a; $\beta_{26}= 0.401$, $p<0.10$) respectively. The best accounting system has a significant positive influence on information for planning and control (H9b; $\beta_{30}= 0.493$, $p<0.01$). The top management support has a significant positive influence on information for planning and control (H8c; $\beta_{34}= 0.536$, $p<0.01$). The all antecedent variables have a significant positive influence on the creation of value through effective resource use, which there are coefficients (H8d; $\beta_{39}= 0.234$, $p<0.01$) (H9d; $\beta_{40}= 0.239$, $p<0.01$) and (H10d; $\beta_{41}= 0.180$, $p<0.05$) respectively. Thus, **hypotheses 8c and 8d are supported; hypotheses 9a, 9b and 9c are supported; hypotheses 10a and 10d are supported.**

Table 4
Results of OLS regression analysis

Independent Variables	Dependent Variables							
	CDF	IPC	RRW	CVE	CDF	IPC	RRW	CVE
	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
TMS	.031 (.083)	.070 (.070)	.536*** (.057)	.234*** (.073)	.021 (.086)	.069 (.074)	.491*** (.063)	.138* (.079)
BAS	.333*** (.095)	.493*** (.080)	.097 (.065)	.239*** (.083)	.237*** (.090)	.441*** (.078)	.070 (.066)	.205** (.084)
ACO	.161* (.086)	.082 (.072)	.071 (.059)	.180** (.076)	.115 (.088)	.047 (.076)	.016 (.065)	.079 (.082)
EPR					.168* (.096)	.107 (.083)	.147** (.070)	.265*** (.088)
TMS* EPR					.292*** (.081)	.058 (.070)	.010 (.059)	-.038 (.075)
BAS* EPR					.292*** (.103)	-.336*** (.089)	-.082 (.075)	-.026 (.095)
ACO* EPR					.011 (.072)	.150** (.063)	.035 (.053)	.079 (.067)
Firm Size (FS)	-.109 (.134)	.027 (.113)	.165* (.092)	-.019 (.118)	-.137 (.125)	.028 (.108)	.155* (.092)	-.035 (.116)
Firm Age (FA)	.286** (.135)	.168 (.113)	.171* (.092)	.085 (.119)	.319** (.127)	.222** (.110)	.176* (.093)	.084 (.118)
Adjusted R ²	.257	.434	.589	.369	.362	.480	.593	.394
Maximum VIF	2.135	2.135	2.135	2.135	2.867	2.867	2.867	2.867

***p < .01, ** p < .05, * p < .10

In model 9 to 12 tests H11a-d, H12a-d and 13H a-d examining the moderating role of the environmental pressure on the relation between the top management support, the best accounting system, the accountant competency and each dimension of the management accounting system effectiveness. The results show that the interactions between top management support and environmental pressure have a significant positive effect on cost determination and financial control (H11a; $\beta_{48}= 0.292$, $p<0.01$). The interactions between the best accounting system and environmental pressure have a significant positive effect on cost determination and financial control (H12a; $\beta_{49}= 0.292$, $p<0.01$). The interactions between the best accounting system and environmental pressure have a significant positive effect on information for planning and control (H13b; $\beta_{59}= 0.150$, $p<0.05$). Thus, **hypotheses 11a, 12a and 13b are supported.**

6. Contributions

6.1 Theoretical Contributions and Directions for Future Research

This study provided a clear understanding of the relationships between the dimensions of MAS effectiveness, which include cost determination and financial control, information for planning and control, reduction of resource waste in business process, and creation of value through effective

resource use and goal achievement. Moreover, this study attempts to investigate the impact of moderators on management accounting system effectiveness in the new model found that environmental pressure is a moderator of the positive relationship between top management support and cost determination and financial control, best accounting system and cost determination and financial control, best accounting system and information for planning and control.

Also, the further research can investigate the other moderator role, such as environmental uncertainty, Managerial relevant information (MRI), Organizational structure, and cultural organization. Limitations of this study, industries where are the sample beings have higher efficiency in management accounting system so future research could compare the success of the firm in other industries.

6.2 Managerial Contribution

For automotive businesses, this study helps them understand and know that management accounting system effectiveness is an important factor that enhances their firm goal achievement. Automotive businesses must have best accounting system and accountant competency to help increase the cost determination and financial control of businesses. Best accounting system and top management support can increase information for planning and control. Moreover, top management support, best accounting system, and accountant competency have increased the creation of value through effective resource use of automotive businesses.

7. Conclusions

This study had examined the relationships between the MAS effectiveness, which include four dimensions and goal achievement. There were 163 automotive firms in Thailand used as the unit of analysis and the key informants were accounting executive of each firm. The results support that cost determination and financial control, the information for planning and control and the reduction of resource waste in the business process have a significant positive influence on cost information accuracy. Moreover, both the information for planning and control, and reduction of resource waste in a business process has a significant positive influence on corporate practice efficiency. In addition, both the reduction of resource waste in the business process and the creation of value through effective resources have a significant positive influence on performance evaluation effectiveness. Both performance evaluation effectiveness and corporate practice efficiency have a significant positive influence on goal achievement.

Both best accounting system and accountant competency have a significant positive influence on cost determination and financial control. Top management support and best accounting system have a significant positive influence on information for planning and control. All antecedent variables have a significant positive influence on the creation of value through effective resource use. The interactions between top management support and environmental pressure have a significant positive effect on cost determination and financial control. The interactions between the best accounting system and environmental pressure have a significant positive effect on the cost determination and financial control, and information for planning and control.

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