

Antecedents of Environmental Management Accounting Capability: Empirical Evidence from ISO 14000 Firms in Thailand

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Abstract

For the green society era of today, there is an increasing number of firms adopting and implementing environmental management accounting as a new managerial technology to give the information involving corporate environmental management. However, an extensive body of previous literature has examined the benefits received from environmental management accounting, relatively little is known about the antecedents of environmental management accounting capability. The purpose of this research is to examine the effect of antecedents on environmental management accounting capability. Also, this research studies the moderating role of business ethics on the associations among antecedents and environmental management accounting capability as well. Data was collected from 107 certified ISO 14000 firms in Thailand by questionnaire mail survey. The statistic used to analyze is the ordinary least square regression. The results reveal that social responsibility vision, market culture, and stakeholder force dynamism have significant positive influence on environmental management accounting capability. Interestingly, business ethics has a positive moderate effect on only the relationships between market culture and environmental management accounting capability but it does not moderate other antecedents and environmental management accounting capability. The suggestion of this research with the conclusions is highlighted as well.

Keywords : Environmental Management Accounting Capability, Social Responsibility Vision, Strategic Management Accounting System, Market Culture, Stakeholder Force Dynamism, Business Ethics

Introduction

Nowadays, environmental issues have become a global concern from stakeholders. It has become serious issues for firms, especially in manufacturing industries, to consider environmental effects from their business activities. This is because the large amounts of natural resources consumed by these industries constitute a major source of pollution such as carbon dioxide and effluents emissions. Thus, firms must contribute to resolve the environmental problem with integration of sustainability and environmental management issues as a part of their management strategies such as project evaluation, providing external environmental reports, efficient energy consumption and waste reduction (Seetharaman, Ismail, and Saravanan, 2007). Whereas, managers do not have sufficient information on environmental performance for decision-making due to the fact that traditional management accounting system ignored the

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information about environmental impacts of firms (Milne, 1996). As aforementioned, there is an increasing number of firms adopting environmental management accounting (EMA) as a new managerial technology in a sector of their management strategies to give essential environmental information involving corporate environmental management (Setthasakko, 2010).

For a decade, the issue of EMA receives worldwide attention of researchers and academicians because EMA is relatively new as a field of management accounting research and practice. From the literature reviews, EMA focuses on the survey about the benefits received from EMA (Ferreira, Moulang and Hendro, 2010). Numerous studies investigated the barriers of EMA adoption (Setthasakko, 2010). Moreover, some studies investigated EMA practices (Bhondekar et al., 2011). However, there are relatively little is known about the antecedents of environmental management accounting capability. Therefore, understanding what determines environmental management accounting capability is of interest to firms in order to increase firm performance. Therefore, the purpose of this study is to contribute to this gap in the literature.

Research Objectives

1. To explore the effect of four antecedents, including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism pressure on environmental management accounting capability.
2. To examine the moderating role of business ethics on the relationships among four antecedents and environmental management accounting capability.

Literature Review

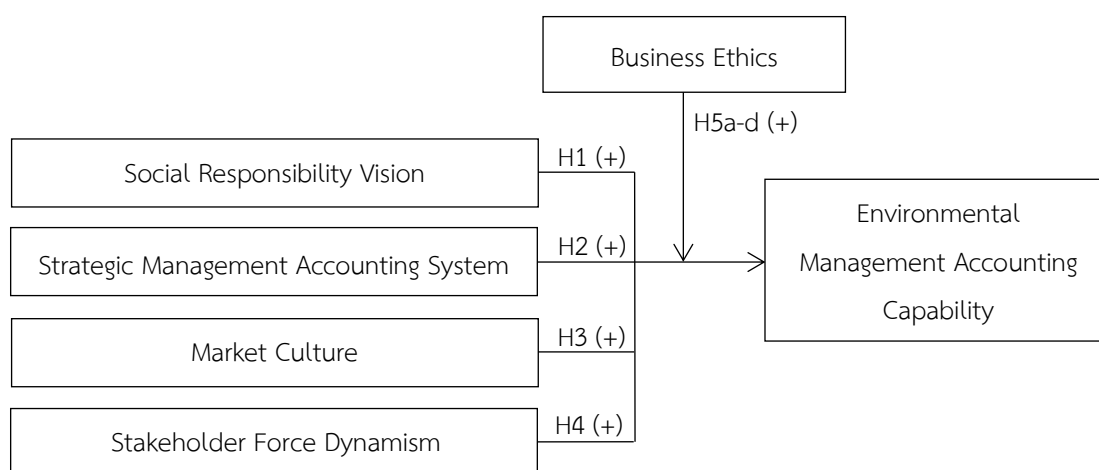
EMA has emerged as a response to the challenges faced by conventional management accounting practice in relation to environmental activities. IFAC (2005) defined EMA as the management of environmental and economic performance through the development of an accounting structure which is related to environmental responsibility and practices, include reporting and auditing in some firms. In addition, EMA is a tool that assists firms to manage environmental performance for internal decision-making, and disclosing the quantitatively measured results of environmental activities to external stakeholders (Chang, 2007). From the discussion of EMA definitions, EMA data is not only used by firms internally, but is also made public through environmental reporting (Ministry of Environment, 2002). Therefore, firms should focus on development and improvement of the firm capability about EMA for success in the green society. In this research, environmental management accounting capability refers to the firm capability to manage environmental performance through identifying environmental issues and implementing appropriate accounting practices in order to collect, calculate, and analyze the environmental data, including the reporting and auditing of environmental performance.

Environmental management accounting capability also plays a very important role in significant internal decision-making improvement about environmental management (IFAC, 2005). Unfortunately, very little is known about the antecedents to environmental management accounting capability. This research was presented antecedents that will help to enhance environmental management accounting capability of firms. From the literature review, the



antecedents of environmental management accounting capability include social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism. Also, business ethics is moderator on the associations among antecedents and social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism. The conceptual model presents the relations between antecedents of environmental management accounting capability as shown in Figure 1.

Figure 1: Conceptual Model of Antecedents of Environmental Management Accounting Capability



Social Responsibility Vision

Vision is the view of the executive involving his viewpoint of the firm operation in the future. It is the category of intentions that is broad, all-inclusive, and forward- thinking. Clearly, vision supports strategy planning and design appropriate for course actions (Srikarsem and Ussahawanitchakit, 2009). Interestingly, in recent years, social responsibility vision is an interesting concept to the firm. It is a concept about the integration of ethical, social and environmental into business practices. This vision focuses on the benefits to the individual, community and society with voluntary disclosure of useful information beyond mandatory disclosure (Jones, Comfort and Hillier, 2005). Persic and Markic (2013) mentioned that social responsibility vision can serve as the foundation of the long-term development and growth of firm. Accordingly, social responsibility vision of firm may not have a positive performance in the short term; but on the other hand, social responsibility vision is positive to a business in the long-term (Lin, Yang and Liou, 2009).

In this research, social responsibility vision refers to the concept of the goals for future-oriented management that reflects awareness and features society's needs which rise to balance the economy, society and the environment, and surviving in the society for the long term (Waenkaeo and Ussahawanitchakit, 2011). Healy and Palepu (2001) argued that executives who use social legitimacy vision will have more incentive to disclose environmental information and provide increasing information to the public about the real change of their business operation that impacts society and environment. Importantly, firms which incorporate the vision and



strategy of social responsibility principles into their business plans have more improving of environmental impacts (Persic and Markic, 2013). Furthermore, the role of the leader as a supporter generates corporate social responsibility policies in the firm such as policies for health benefits, work-life balance, fair wages, and environmental performance considerations (London, 2008). Ultimately, the executive vision for sustainability development impacts social responsibility accounting (Waenkaeo and Ussahawanitchakit, 2011). Based on the literature, social responsibility vision can promote environmental management accounting capability to **move** from the current state to a future desirable state in response to rapid environmental change. Therefore, the associations are hypothesized as follows:

Hypothesis 1: Social responsibility vision will positively relate to environmental management accounting capability.

Strategic Management Accounting System

Management accounting system is the system of accounting function. The primary role of management accounting system is to provide economic information such as managerial, accounting, and statistical information to facilitate the decision-making of a manager or related persons. Baines and Langfield-Smith (2003) noted that different firms generally operate with different management accounting systems. It depends on the policy and accounting structure of each firm. In addition, Cadez and Guilding (2008) revealed that the contingency framework is mostly used to study management accounting which investigates a fit of strategic management accounting system with a contingency factor that results in firm effectiveness. As to this discussion point, Chenhall and Langfield-Smith, (1998) explored the relationship between strategic management accounting system and the uncertainty of the environment concept in the contingency theory. The results indicated that when business environment changes more, firms try to improve the management accounting system by adjusting the strategy for the preparation of accounting information to match with the business environment. For instance, currently, there is an increasing awareness about the importance of environmental reporting to the stakeholders. A firm should be adjusted strategic management accounting system that focuses on the preparation and reporting of information related to the environment.

In this research, strategic management accounting system refers to the accounting procedure that collects, classifies, analyzes, summarizes, interprets, and presents accurate economic information such as managerial, accounting, and statistical information to facilitate a manager in decision-making, consistent with the current business environment (Hammad, Jusoh and Oon, 2010). In the review of the literature, empirical research suggested that traditional management accounting system ignored the information about environmental impacts on the firms; while in today's business environment, modern strategic management accounting system focuses more on the preparation and presentation of information related to environmental reporting effectiveness (Dixon, Mousa and Woodhead, 2005). It can provide value-added information for managerial decision-making, control activity to achieve a firm's goals and provide different types of information for different stakeholders (Williams and Seaman, 2002). For example, a manager needs information about costs, revenues and profits. Meanwhile, society and community are concerned about environmental information. Based on the literature, strategic



management accounting system can help firms attain more environmental management accounting capability. Respectively, the related hypothesis is postulated as the following :

Hypothesis 2: Strategic management accounting system will positively relate to environmental management accounting capability.

Market Culture

Organizational culture focuses attention on the nebulous, informal, and hidden forces within a firm. These things have a tremendous influence on the behavior and productivity of its employees, perhaps more so than formal, written policies or rules (Webster, 1995). Organizational culture concepts have been included in a model of selling effectiveness and a few researchers have begun an analysis of the linkage between culture and the marketing of services (Weitz, Sujan and Sujan, 1986). Webster (1995) has given the definition of market culture as a multifaceted construct that encompasses the importance placed on product or service quality, interpersonal relationships, the selling task, organizations, internal communications, and innovativeness. Thus, market culture is the operation of a firm to force employees to continuously study the requirements of customers for building the marketing plan, and to bring the marketing method into practice as being objective (Sashittal and Wilemon, 1996). Moreover, market culture has an effect on new business idea generation, continuous working improvement, change mindset adaptation, stakeholder response focus, and social survival awareness (Syers and Ussahawanitchakit, 2011).

In this research, market culture refers to the pattern of shared values and beliefs which create the behavior of employees conferring exceptional value to the customer of a firm's goods and enables effectively and profitably achieving excellent business results (Sashittal and Wilemon, 1996). In the review of the literature, prior research indicated that main customers have greater influence on the adoption of an environmental management system in the firm because customers increasingly require environmentally friendly products, ecological products and cleaner production of business operations (Kamruzzaman, 2012). Furthermore, customer and media severe expect that firms not only have environmental management policies, but they also request the firm to have transparent disclosure of the environmental information for themselves (Che-Ahmad, 2015). These requirements force firms and employees to continuously study the requirements of customers for building sustainable performance. Therefore, the associations are hypothesized as follows:

Hypothesis 3: Market culture will positively relate to environmental management accounting capability.

Stakeholder Force Dynamism

The stakeholder is any group or individual who can affect or be affected by the activity of an organization engaging in accomplishing its mission and goals (Freeman, 1984). Stakeholders put something at risk in relationship to the firm. They are essential to the inception, development, and survival of firms (Bhide and Stevenson, 1999). Accordingly, stakeholder forces are powered to influence the firm operation. Interestingly, stakeholders' forces will change according to the current business situation. Thus firms should focus on stakeholder forces management in order to survive in the long term (Roberts, 1992).



In this research, stakeholder force dynamism refers to the requirements and expectations of individuals or groups who are influential in shaping the decision-making of a firm regarding social consciousness, consumer-orientation and environmental considerations (Jurgens et al., 2010). From the literature review, stakeholders pay more attention to corporate sustainability development (economic, societal and environmental aspects) such as in sustainable reporting and environmental auditing quality (Jonge, 2006). In addition, the regulatory and corporate watchdog groups are putting great pressure on firms to become more environmentally responsible through policies, procedures, and systems (Jose and Lee, 2007). Moreover, Johnsson et al. (2010) suggested that stakeholders expects firm to identify the utilization rate of natural resources in order to reduce energy consumption, increase energy efficiency, and increase the use of renewable energy. Interestingly, investors and shareholders are requiring more environmental information because they are concerned about the magnitude of costs and liabilities associated with environmental issues (Mastrandonas and Strife, 1992). Based on the literature, stakeholder force dynamism can promote environmental management accounting capability to move from the current state to a future desirable state in response to rapid environmental change. Therefore, the associations are hypothesized as follows:

Hypothesis 4: Stakeholder force dynamism will positively relate to environmental management accounting capability.

Business Ethics

Business ethics concept receives more attention from the public. The business ethics concept, as a branch of applied ethics, attempts to apply theoretical ethics to business. Business ethics is the study of what constitutes right or wrong, or what is good or bad in human conduct in a business environment. Especially, business ethics also is an application of general ethical principles to actual practical problems in the area of business to determine what conduct is ethical or what is considered appropriate or right conduct in conformity with the general ethical standards (Christie, 2003).

In this research, business ethics refers to the operational guidance of firm to apply the principles of code of conduct, regulations of morality, core value, and legality in all aspects of business conduct and actual practical problems in the area of business (Christie, 2003). From the literature review, one empirical research indicated that a business ethics concept is an important factor to provide quality accounting services to society (Farrell and Cobbin, 2000). Likewise, Mele (2005) noted that rules, values and virtues of the firm should lead to rethink ethics in social accounting. Moreover, the strategy of firms which are capable of implementing ethical codes and moral values, as well as socially responsible behavior of employees while carrying on their business activity, lead to the adoption of social responsibility accounting of a firm (Wilson, 2000; Kakabase). Specifically, in the intensely competitive market, social and environmental impacts are being increasingly considered. For instance, in Australia, Denmark, Netherlands, Norway, Sweden and the US all stakeholders have mandatory requirements for which firms prepare ethical reporting (including social and environmental) for the public (Carol, 2004). Based on the literature reviewed above, therefore, this research expects that when business ethics exists in a



firm, it increases the relationships between antecedents and environmental management accounting capability. The hypotheses are proposed as follows:

Hypothesis 6: Business ethics will positively moderate the relationships between a) social responsibility vision, b) strategic management accounting system, c) market culture, and d) stakeholder force dynamism and environmental management accounting capability.

Methodology

Sample Selection and Data Collection Procedure

The population is certified ISO 14000 firms in Thailand. The sample is selected from the online data base of the Federation of the Thai Industrial Standards Institute, Ministry of Industry, Thailand ([www.http://app.tisi.go.th](http://app.tisi.go.th)). The firms are active in the database totaling 458 certified ISO 14000 firms (information drawn on April 15, 2016). Accordingly, an appropriate sample size is 210 certified ISO 14000 firms under the 95% confidentiality rule (Krejcie and Morgan, 1970). Based on prior business research, a 20% response rate for a mail survey, without an appropriate follow-up procedure, is deemed sufficient (Aaker, Kumar and Day, 2001). As a result, this research finally uses 458 firms as a sample population and for a distributed mail survey. With regard to the questionnaire mailing, 7 surveys were undeliverable because some firms had moved to unknown location. Deducting the undeliverable from the original 458 mailed, the valid mailing was 451 surveys, from which 111 responses were received. Due to 4 found incomplete and with response errors. As a result, completed questionnaires are 107.

The effective response rate was approximately 23.73%. The response rate for a mail survey, without an appropriate follow-up procedure, if greater than 20 percent, is considered acceptable (Aaker, Kumar and Day, 2001). Hence, 107 firms are an enough sample size for employing multiple regression analysis.

Variable Measurement

To measure each construct in the conceptual model, all variables are anchored by five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) excluding control variables. In addition, all constructs are developed for measuring from the definition of each construct and examined the relationship from theoretical framework and prior literature reviews. Hence, the variable measurements of this study are described as follows:

Dependent Variable

Environmental management accounting capability is the ending dependent variable in this research. This construct is measured via environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. This construct is measured using a five-item scale, developed as a new scale, based on its definition.

Independent Variables

Social responsibility vision is measured via the firm perception focusing on the executive vision for social responsibility in the concept of management to balance the economy, society



and the environment. So, this construct is developed as an adopted scale, including a four-item scale.

Strategic management accounting system is measured through the firm perspective which regards development and application of new techniques and methods in management accounting system, and linking of management accounting system and other management systems together for improving the business operations. This construct is developed as a new scale from the definition and literature review, including a four-item scale.

Market culture is measured by the firms' overall culture, measured by firm perception focusing on the ability of a firm to analyze the changing needs of customers, creating consciousness in good services, and learning customer requirements in order to success in business operations. This construct is developed as a new scale from the definition and literature review, including a five-item scale.

Stakeholder force dynamism is measured by the managerial perception toward the continuous change of stakeholder's needs and expectations that influence shaping the decision-making of a firm. This construct is developed as an adopted scale, inclusive of five items.

Moderating Variable

Business ethics is measured via the firm perception focusing on the ability of a firm to learn, understand, and apply ethics or professional ethics in all aspects of a business operation. This construct is developed as a new scale from the definition and literature review, including a four-item scale.

Control Variables

Control variables in this research include firm size and duration certified. For the analysis, firm size is represented by a dummy variable including 0 (total capital of the firm that is less than or equal 250,000,000 baht), and 1 (total capital of the firm with more than 250,000,000 baht). Duration certified is represented by a dummy variable including 0 (less than or equal 10 years), and 1 (more than 10 years).

Reliability and Validity

In this study, the Cronbach's alpha was used to test the reliability of the measurement. Coefficient alpha indicates the degree of internal consistency among items in questionnaires that should be greater than 0.70 (Hair et al., 2010). In this study, convergent validity was tested by the factor loading, each of construct should be greater than the 0.40 cut-off and all factors are statistically significant (Hair et al., 2010). The results of measure validation show in table 1.

Table 1: Result of Measure Validation

Variables	Factor Loadings	Cronbach's Alpha
Social Responsibility Vision (SRV)	.875-.967	.953
Strategic Management Accounting System (SMAS)	.685-.889	.928
Market Culture (MKC)	.761-.906	.909
Stakeholder Force Dynamism (SFD)	.813-.864	.898
Business Ethics (BET)	.877-.964	.949
Environmental Management Accounting Capability (EMAC)	.878-.906	.933



Table 1 presents all variables have factor score between 0.685 - 0.967 indicating that there is the construct validity. Moreover, the reliability of all variable is accepted because Cronbach's alpha for all variables are shown between 0.898 – 0.953.

Statistical Techniques

All dependent and independent variables in this study are the metric scale. Therefore, OLS regression is appropriate technique to test all hypotheses. From the conceptual model and hypotheses, the following four equation models are formulated:

$$\text{Equation 1: } \text{EMAC} = \alpha_1 + \beta_1\text{FS} + \beta_2\text{DC} + \epsilon_1$$

$$\text{Equation 2: } \text{EMAC} = \alpha_2 + \beta_3\text{SRV} + \beta_4\text{SMAS} + \beta_5\text{MKC} + \beta_6\text{SFD} + \beta_7\text{FS} + \beta_8\text{DC} + \epsilon_2$$

$$\text{Equation 3: } \text{EMAC} = \alpha_3 + \beta_9\text{SRV} + \beta_{10}\text{SMAS} + \beta_{11}\text{MKC} + \beta_{12}\text{SFD} + \beta_{13}\text{BET} + \beta_{14}\text{FS} + \beta_{15}\text{DC} + \epsilon_3$$

$$\text{Equation 4: } \text{EMAC} = \alpha_4 + \beta_{16}\text{SRV} + \beta_{17}\text{SMAS} + \beta_{18}\text{MKC} + \beta_{19}\text{SFD} + \beta_{20}\text{BET} + \beta_{21}(\text{SRV}*\text{BET}) + \beta_{22}(\text{SMAS}*\text{BET}) + \beta_{23}(\text{MKC}*\text{BET}) + \beta_{24}(\text{SFD}*\text{BET}) + \beta_{25}\text{FS} + \beta_{26}\text{DC} + \epsilon_4$$

Results and Discussion

Table 2 shows descriptive statistics and correlation matrix for all variables. Correlation coefficients of variables are ranging from 0.579 - 0.799. With respect to potential problems relating to multicollinearity, variance inflation factors (VIF) were used to test the intercorrelations among independent variable. In this study, the VIFs range from 1.041 to 7.177, well below the cut-off value of 10 (Hair et al., 2010), meaning that the independent variables are not correlated with each other. Therefore, there are no substantial multicollinearity problems encountered in this study.

Table 2: Descriptive Statistics and Correlation Matrix

Variables	EMAC	SRV	SMAS	MKC	SFD	BET	FS	DC
Mean	4.076	4.030	4.012	4.150	4.192	4.262	n/a	n/a
S.D	.505	.621	.602	.575	.564	.643	n/a	n/a
EMAC	1							
SRV	.705***	1						
SMAS	.661***	.797***	1					
MKC	.663***	.670***	.706***	1				
SFD	.653***	.699***	.650***	.711***	1			
BET	.579***	.646***	.631***	.799***	.655***	1		
FS	.052	.179	.147	.118	.095	.123	1	
DC	-.055	.090	.057	-.032	-.032	-.060	.198**	1

*** p<0.01, ** p<0.05

Table 3 shows the results of the OLS regression analysis of the relationships between social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism, and environmental management accounting capability. Moreover, this table 3 shows moderating effects of business ethics on the relationships between antecedents and environmental management accounting capability.



For the antecedents of environmental management accounting capability, the results show that social responsibility vision has a significant positive impact on environmental management accounting capability ($\beta_3 = 0.358$, $p < 0.01$). Consistent with prior research found that executives who use social legitimacy vision will have more incentive to disclose environmental information and provide increasing information to the public about the real change of their business operation that impacts society and environment (Healy and Palepu, 2001). Thus, firms with greater social responsibility vision help firms to have environmental management accounting capability. **Therefore, Hypothesis 1 is supported.**

Secondly, strategic management accounting system has no significant influence on environmental management accounting capability ($\beta_4 = 0.123$, $p > 0.10$). It may be implied that firms cannot adapt and integrate strategic management accounting system to match with environmental management accounting practice. It makes firm will not achieve preparation of environmental information to a group of interested parties. Thus, strategic management accounting system cannot help firms to have environmental management accounting capability. **Therefore, Hypothesis 2 is not supported.**

Thirdly, market culture has a significant positive impact on environmental management accounting capability ($\beta_5 = 0.221$, $p < 0.05$). Consistent with prior research found that main customers have greater influence on the adoption of an environmental management system in the firm because customers increasingly require environmentally friendly products and request firm to have transparent disclosure of the environmental information for them (Kamruzzaman, 2012; Che-Ahmad, 2015).

Table 3: Results of OLS Regression Analysis for Effects of Antecedents of Environmental Management Accounting Capability and Results of Moderating Effect of Business Ethics

Independent Variables	Dependent Variables ^a			
	EMAC Model 1	EMAC Model 2	EMAC Model 3	EMAC Model 4
Social Responsibility Vision (SRV : H1)		.358*** (.117)	.364*** (.119)	.400*** (.118)
Strategic Management Accounting System (SMAS : H2)		.123 (.115)	.123 (.115)	.093 (.117)
Market Culture (MKC : H3)		.221** (.103)	.246** (.124)	.241** (.121)
Stakeholder Force Dynamism (SFD : H4)		.169* (.101)	.173* (.102)	.142 (.102)
Business Ethics (BET)			-.040 (.112)	-.028 (.113)
SRV * BET (H5a)				.101 (.139)
SMAS * BET (H5b)				-.199* (.117)



Independent Variables	Dependent Variables ^a			
	EMAC Model 1	EMAC Model 2	EMAC Model 3	EMAC Model 4
MKC * BET (H5c)				.185** (.092)
SFD * BET (H5d)				-.203* (.109)
Firm size (FS)	.138 (.211)	-.124 (.141)	-.123 (.141)	-.092 (.141)
Duration Certified (DC)	-.161 (.238)	-.167 (.158)	-.172 (.159)	-.148 (.157)
Adjusted R ²	-.012	.566	.562	.587
Maximum VIF	1.041	3.353	3.713	7.177

*** p<0.01, ** p<0.05, * p<0.10, ^a Beta coefficients with standard errors in parenthesis

These requirements force firms and employees to continuously study the requirements of customers for building sustainable performance. Thus, firms with greater market culture help firms to have environmental management accounting capability. **Therefore, Hypothesis 3 is supported.**

Fourthly, stakeholder force dynamism has a significant positive impact on environmental management accounting capability ($\beta_6 = 0.169$, $p < 0.10$). Consistent with prior research found that stakeholders give more attention to corporate sustainability development (economic, societal and environmental aspects) such as in sustainable reporting and environmental auditing quality (Jonge, 2006). Thus, firms with greater stakeholder force dynamism help firms to have environmental management accounting capability. **Therefore, Hypothesis 4 is supported.**

In the next part, the effects of business ethics on the relationships between antecedents and environmental management accounting capability. The results found that business ethics has a significant positive impact on the relationships between market culture and environmental management accounting capability ($\beta_{23} = 0.185$, $p < 0.05$). Consistent with prior research found that the strategy of firms which are capable of implementing ethical codes and moral values, as well as socially responsible behavior of employees while carrying on their business activity, lead to the adoption of social responsibility accounting of a firm (Wilson, 2000; Kakabase, Rozuel and Lee-Davies, 2005). Thus, business ethics stimulates firms which have market culture can help firms to have environmental management accounting capability. **Therefore, Hypothesis 5c is supported.**

At the same time, business ethics has a significant negative effect on the relationships of strategic management accounting system and environmental management accounting capability ($\beta_{22} = -0.199$, $p < 0.10$) and stakeholder force dynamism and environmental management accounting capability ($\beta_{24} = -0.203$, $p < 0.10$). **Thus, Hypotheses 5b and 5d are not supported.** Likewise, business ethics has no significant impact on the relationships among social responsibility vision and environmental management accounting capability ($\beta_{21} = 0.101$, $p > 0.10$). **Therefore,**



Hypothesis 5a is not supported. Thus, summary that business ethics does not help promote social responsibility vision, strategic management accounting system, and stakeholder force dynamism contributes to an environmental management accounting capability. This may imply that business ethics in the practice of Thailand has many problems such as firms focus on business ethics in order to represent firm responsibility to customers, employees, society and the environment. Thus, in the context of Thailand, business ethics is a tool for generate a good image of firm. It has not been actually used for indicate what's right or wrong in their operations (Sawasdee, 2013). Thus, business ethics factor cannot help explains the results of this research in context of Thailand.

Contributions

Theoretical Contribution

This study is an attempt to provide a clearer understanding of antecedents of environmental management accounting capability. It provides unique theoretical contribution expanding on previous knowledge and literature of environmental management accounting capability. Likewise, this study explicitly considers environmental management accounting capability antecedents, including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism. Also, this research advances the literature by examine moderators of environmental management accounting capability (include business ethics). For advancing the field theoretically, this study has attempted to focus on the aforementioned relationships of certified ISO 14000 firms in Thailand.

Professional Contribution

This research has potential implications for certified ISO 14000 firms. The first, this research helps certified ISO 14000 firms to identify and justify antecedents of environmental management accounting capability that may be more critical in firm survival. Secondly, certified ISO 14000 firms that have social responsibility vision, market culture, and stakeholder force dynamism can develop and enhance environmental management accounting capability. Finally, for gaining superior performance of certified ISO 14000 firms, firms should generate and utilize environmental management accounting capability which leads to sustainable performance development and firm survival.

Conclusion

The purpose of this study is to examine the effect of four antecedents, including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism on environmental management accounting capability. Moreover, this research examines the moderating role of business ethics on the relationships among four antecedents and environmental management accounting capability as well. The results indicated that social responsibility vision, market culture, and stakeholder force dynamism have significant positive influence on environmental management accounting capability. Interestingly, business ethics has a positive moderate effect on only the relationships between market culture and environmental management accounting capability but it does not moderate other antecedents and environmental management accounting capability.



This study has some limitations that should be mentioned. Firstly, this research uses only questionnaires for collection data. Therefore, future research could develop other research methodologies to test this conceptual framework of antecedents of environmental management accounting capability. For example, qualitative in-depth interviews may help to explore the up-to-date point of views of reality from the chief accounting executive, the accounting director or the accounting manager of each certified ISO 14000 firm. This qualitative methodology stimulates the whole picture and the comprehensive understanding of antecedents of environmental management accounting capability. Secondly, in this research, business ethics has positive, moderating effects on only the relationships between market culture and environmental management accounting capability. As a result, a requirement for future research is to require other moderating variables to enhance the relationships between environmental management accounting capability and its antecedents. Therefore, future research may shed light on board characteristics (i.e., board size, board independence, board gender) as alternate moderating variables of the environmental management accounting capability framework.

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