Environmental Management Accounting Capability on Sustainable Performance Development and Firm Survival: Empirical Evidence from ISO 14000 Firms in Thailand

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Abstract

The purpose of this study was to examine the effect of environmental management accounting capability on sustainable performance development and firm survival. Data was collected in 2016 from 107 certified ISO 14000 firms in Thailand by questionnaire mail survey. The statistic used to analyze was the ordinary least square regression. The results revealed that two dimensions of environmental management accounting capability including environmental reporting transparency emphasis and environmental improvement disclosure implementation, had a significant positive influence on sustainable performance development and firm survival meanwhile only environmental identification efficiency orientation and environmental auditing effectiveness focus had significantly positive influence on sustainable performance development. Furthermore, sustainable performance development had a positive influence on firm survival. The suggestion of this research with the conclusions is highlighted as well.

Keywords: Environmental Management Accounting Capability, Firm Survival, Sustainable Performance Development

1. Introduction

For a decade, the world has had high growth in the aspects of economic and technology. This growth brings industry sectors to require continuous consumption of natural resources for produce more superior quality of goods than other competitors in order to achieve better long-term financial performance (Namakonzi & Inanga, 2014). These manufacturing activities can cause air, water and soil pollution such as by producing waste from industry and sending greenhouse gases to in the atmosphere. In addition, the emission of toxic gases, waste and effluents produced from the manufacturing is uncontrolled and becomes a major environmental impact including climate change, global warming, and ozone depletion (Ratnatunga & Balachandran, 2009).

As aforementioned, firms have faced mounting pressure to change, including increased environmental legislations and growing environmental awareness of their stakeholders about the impact of firm operations on the environment and society (Medley, 1997). These concerns are forcing many firms to

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seek for new, creative, and cost effective ways to minimize environmental problems (Muza & Magadi, 2014). Managers do not have accurate environmental information for environmental activity management to achieve sustainable development due to the fact that financial accounting could not completely support the decision-making (Tsui, 2014). Thus, global organizations for the accountancy profession are now confronting the demand for awareness accounting-related to environmental issues.

Based on the problem above, the International Federation of Accountants (IFAC) provides specific instructions for environmental management accounting (EMA) to solve the problem of conventional accounting practices by representing a broader term of environmental information. EMA focuses on providing environmental information for internal decision-making purposes both in economic and non-economic aspects (Muza & Magadi, 2014). Additionally, EMA can help external stakeholders to gain clarity on detailed information about environmental performance of a firm (Pagalung, 2016). Thus, in the green society era today, there are an increasing number of firms adopting and implementing EMA because it has been accepted to deliver many benefits to the users. Firms should focus on development and improvement of the capability of a firm about EMA for success in the green society.

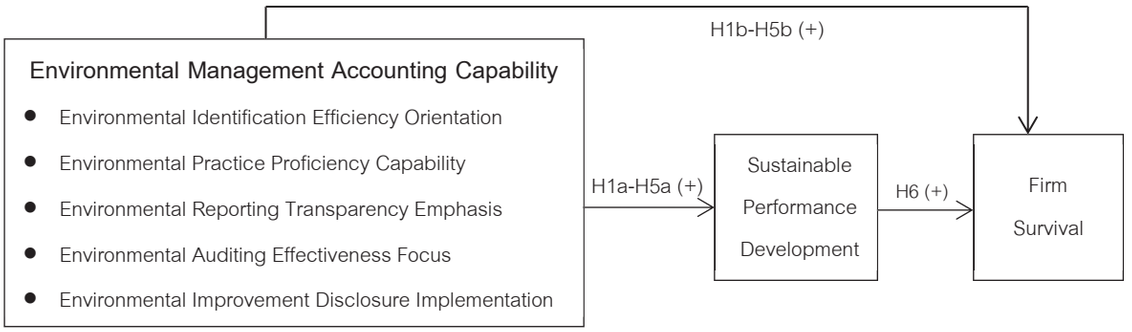
Thus, this research attempts to integrate the key components of environmental management accounting capability in a new model. The main purpose of this research is to investigate the effects of environmental management accounting capability on sustainable performance development and firm survival. The remains of this study are structured as follows. Firstly, the researcher provides the relevant literatures and hypotheses development of all constructs. Secondly, the researcher explains the methodology. Thirdly, the researcher discusses the results of this study. Fourthly, the researcher explains the contributions and directions for future research. Finally, the researcher concludes of this research.

2. Literature review and hypothesis development

From literature review, EMA is divided into two functions that include internal and external functions (Ministry of Environment, 2005). On the part of internal function, EMA focuses on the preparation of appropriate financial and non-financial information related to physical and monetary environmental aspects. Physical EMA data refers to the impact of a firm on the natural resource. It presents in terms of physical units such as joules of energy used per unit product, or kilograms of material per customer served. Meanwhile, monetary EMA data refers to the costs of the firm's consumption of natural resources and costs for preventing environmental damage (Tsui, 2014). It presents in terms of monetary units such as costs of fines for breaking environmental laws and investment in capital projects that improve the environment (Burritt et al., 2002). In the part of external function, EMA can be placed within the concept of social accounting. It can help a firm to prepare and disclose the quantitative measurable results of environmental activities in environmental or sustainability reporting to stakeholders (UNDSD, 2002). Thus, firms should focus on improvement of the capability of a firm about EMA for success in the green society because environmental management accounting capability is a beneficial tool that helps firms to identify

and collect of the environmental data, including the auditing and reporting of environmental performance to both internal and external stakeholders (IFAC, 2005; Tsui, 2014). Therefore, the conceptual model presents the relations between environmental management accounting capability and firm survival as shown in Figure 1.

Figure 1: Conceptual Model of Environmental Management Accounting Capability and Firm Survival



2.1 Environmental management accounting capability

Environmental management accounting capability refers to the capability of firm to manage environmental performance through identifying environmental issues and implementing appropriate accounting practices in order to collect, calculate, and analyze of the environmental data, including the reporting and auditing of environmental performance.

From the prior research and literature, the issue of EMA receives worldwide attention of researchers and academicians because it is a new managerial technology in a sector of their management strategies to give essential information involving corporate environmental management (Setthasakko, 2010). Environmental management accounting capability is one of the fundamental tools to success in the environmental management of the firm. It also plays a very important role in significant internal decision-making improvement about environmental management (IFAC, 2005). Moreover, the capability of a firm about EMA can assure transparency for the firm to clearly disclose environmental reporting. It is utilized to gain more public trust and enhance the image of the firm (Berthelot et al., 2003).

2.1.1 Environmental identification efficiency orientation refers to the ability of firm to accurately specify of environmental costs related to environmental operation during the normal course of business, as well as accurately specify of environmental benefits that are received from good environmental management (Vasile & Man, 2012). From the literature review, the identification of environmental costs and benefits from the firm's operations during the regular operation of business is the first step in the process of environmental management for sustainable development because it is the beginning of clearly measuring a firm's results from an environmental perspective (Ministry of Environment, 2005). Prior research found that if firm has a good process to identify environmental cost for cost saving, it can help firm to improve the performance over the long-term (Johnson, 2004). Moreover, Jasch (2003)

indicated that EMA procedure allows managers to identify the opportunities for cost savings from good environmental management. Therefore, the associations are hypothesized as follows:

Hypothesis 1: Environmental identification efficiency orientation will positively relate to a) sustainable performance development and b) firm survival.

2.1.2 Environmental practice proficiency capability refers to the ability of firm to develop and implement an appropriate accounting system related to the environment in order to have a collect, calculate, and analyze the environmental costs and benefits from the normal course of business activities (Munteanu, 2013). From the literature review it was found that environmental practice in part of accounting is becoming extremely important, not only for environmental management decisions, but it also provides accounting information related to all activities of the administration; for example, in product design, cost allocation, capital budgeting, and product pricing (Jing & Songqing, 2011). For accounting research, prior research found that EMA practice is a beneficial procedure for management with an interest in the environment (Burritt et al., 2002). The principles of EMA practice not only give the environmental cost information for business decision-making, but also give the physical flow information such as the use of raw materials and rate of waste. It can help managers in their strategic planning and can help them to identify and reduce business activities that negatively impact society and the environment (Howes, 2004). Therefore, the associations are hypothesized as follows:

Hypothesis 2: Environmental practice proficiency capability will positively relate to a) sustainable performance development and b) firm survival.

2.1.3 Environmental reporting transparency emphasis is defined as the ability of firm to prepare and present the information related to the environment of the firm to a group of interested parties which can be used in management and economic decisions-making with reliability, neutrality, completeness, and verifiability (Khuntia, 2014). The purpose of the environmental reporting is to provide current information relevant to the decisions of a group of interested parties. Environmental reporting includes two functions. The first function is an external function. It serves about disclose the valuable environmental information to stakeholders for decision-making. Next is an internal function. It serves to review the environmental policy, environmental objectives, environmental action plans, and encourages executives and employees featured in environmental activities (Ministry of Environment, 2005). Prior research found that the firm that can provides useful environmental information to its stakeholders, it may be beneficial to financial and non-financial performance. Particularly, firm image and share price may increase (Khuntia, 2014). Moreover, environmental reporting may influence the interpretation of stakeholders on the firms' financial performance and increase investor confidence, leading to a lower cost of capital (Cormier & Magnan, 2003). Therefore, the associations are hypothesized as follows:

Hypothesis 3: Environmental reporting transparency emphasis will positively relate to a) sustainable performance development and b) firm survival.

2.1.4 Environmental auditing effectiveness focus refers to the ability of firm to evaluate the environmental performance which an evaluates the business information that is collected and focuses on activity monitoring, processes, and management that are related to environmental issues (Gui-zhen et al., 2007). Environmental auditing is an important component of environmental management systems. It is the system which has documents including schedule, time and objectives for the environmental assessment of firm. It focuses on the physical or monetary environmental information that checks and verifies the data, information, and processes (Gui-zhen et al., 2007). Moreover, environmental auditing can add value to the management approaches being taken by firms, and is a way of identifying, evaluating and managing environmental risks (Department of Environmental Affairs and Tourism, 2004). Previous literature found that environmental auditing serves as an important environmental management tool for the development performance of firms and industries in the long- term. Similarly, Thompson and Wilson (1994) found that environmental auditing is the monitoring process of the environmental management system, compliance with laws, regulations, policies, and the development of an action plan to deal with defects leading to enhancing firm performance. Therefore, the associations are hypothesized as follows:

Hypothesis 4: Environmental auditing effectiveness focus will positively relate to a) sustainable performance development and b) firm survival.

2.1.5 Environmental improvement disclosure implementation refers to the ability of firm to inform the public about the firm's operations about environmental protection, controlling and preventing environmental problems through determining the business policy, seeking a way to new accounting techniques, creating conscience as to environmental concern, and promoting activities related to environmental development (Mathur & Mathur, 2000). In accounting literature, environmental disclosure is a voluntary disclosure about the environmental information to the public that surpass mandatory disclosure (Bowen, 2009). However, most of the firms have concern and are encouraged to conserve the environment. The firms focus on the disclosure of the improvement in their business operations that impact the environment so as to attract investors and fulfill the demands of stakeholder groups (Norhasimah et al., 2016). Prior research indicated that voluntary environmental disclosure such as environmental conservation activities and an environmental solutions policy on the firm's website is positively related to litigation outcomes in the form of a reduced punitive damage award (Lee and Sweeney, 2015). Likewise, Rondinelli and Berry (1997) mentioned that Toyota motors has disclosed its environmental policy and promotes environmental activities in order to strengthen the reputation of firm in the long term. Therefore, the associations are hypothesized as follows:

Hypothesis 5: Environmental improvement disclosure implementation will positively relate to a) sustainable performance development and b) firm survival.

2.2 The relationship between environmental management accounting capability and firm survival

The consequence of environmental management accounting capability in this research is sustainable performance development and firm survival. This part emphasizes the effects of sustainable performance development on firm survival.

2.2.1 Sustainable performance development refers to the supreme potential of firm in continuously increasing and maintaining its overall business operation both in financial and non-financial aspects in the long run (Holliday, 2001). In accounting literature, sustainable performance of the firm divides into two groups, which are financial and non-financial performance. Financial performance is the degree of the actual attainment of organizational financial goals such as sales, profits, cost, and return on assets (Choe, 2004). Besides, non-financial performance in the context of accounting for social responsibility refers to nonmonetary and qualitative measures, such as customer satisfaction and number of new customers (Prachsriphum & Ussahawanitchakit, 2009). Prior literature suggested that firms can survive over the long run if they response to the needs of all their stakeholders and efforts to improve their business performance over the competitors (Sachs et al., 2002). Moreover, the best way to help a firm survive in the long term is to not only focus on improving financial performance, but also to focus on social and environmental performance (Elkington, 1997). In this research, firm survival is defined as the durability of the firm to continue in existence in the long run, while the firm's operation remains unshakable and stable under the intense competition and uncertain business environment (Szekely & Knirsch, 2005). Therefore, the associations are hypothesized as follows:

Hypothesis 6: Sustainable performance development will positively relate to firm survival.

3. Methodology

3.1 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 Thai Industrial Standards Institute, Ministry of Industry, Thailand (www.app.tisi.go.th). The certified ISO 14000 firms are active in the database totaling 458 firms (information drawn on April 15, 2016). Accordingly, an appropriate sample size is 210 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). Thus, 1,050 firms for a sampling frame; notwithstanding, this number exceeds the total population. 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. 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, completed questionnaires are 107.

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

3.2 Test of non-response bias

To test non-response bias and to detect and consider possible problems with non-response errors was investigated by t-test that followed to Armstrong and Overton (1977). The researcher was compared early and late responses about business entity, the operating capital, the average annual income, and the reward for environmental management. The results were not significant between early and late responses. Therefore, it was implied that these received questionnaires show insignificant non-response bias for the analysis in this research.

3.3 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 definition of each constructs and examine the relationship from theoretical framework and prior literature reviews. Hence, the variable measurements of this study are described as follows:

3.3.1 Dependent variable

Firm survival is the ending dependent variable in this research. This construct is measured via the perception of business overall outcome and goal achievement in both the short and long term an under uncertain business environment. This construct is an adopted scale, including four items.

3.3.2 Independent variables

Environmental management accounting capability includes five dimensions: environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. The variable measurements of each dimension are described as follows:

Environmental identification efficiency orientation is measured via the firm perception to determine concrete criteria, classification and specification the environmental costs and benefits during the normal course of business with accuracy and clarity. This construct is measured using a five-item scale, developed as a new scale, based on its definition.

Environmental practice proficiency capability is measured via the firm perception toward its ability in good environmental practice, application of accounting practices-related environment and new technologies in order to help the environmental management system to be more successful. This construct is measured using a four-item scale, developed as a new scale, based on its definition.

Environmental reporting transparency emphasis is measured via the firm perception focusing on the preparation and reporting of actual environmental information in all aspects with frankness,

accuracy and completeness to a group of interested parties. This construct is measured using a four-item scale, developed as a new scale, based on its definition.

Environmental auditing effectiveness focus is measured via the managerial perception on how activity monitoring, processes, and management relate to environmental issues. This construct is an adopted scale, including four items.

Environmental improvement disclosure implementation is measured via the managerial perception toward the firm ability and proficiency to provide information about ongoing environmental improvements, environmental budget, and environmental activities to the public. This construct is measured using a four-item scale, developed as a new scale, based on its definition.

3.3.3 Mediating variables

Sustainable performance development is measured via the perception of a firm to seek out for continuously reducing cost and enhancing customer acceptance, achieving its goals, retaining old customers, and adding new customers. This construct is measured using a four-item scale, developed as a new scale, based on its definition.

3.3.4 Control variables

Control variables in this study comprise 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).

3.4 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 that should be greater than 0.70 (Hair et al., 2010). Also, 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).

Table 1: Result of Measure Validation

Variables	Factor Loadings	Cronbach's Alpha
Environmental Identification Efficiency Orientation (EIEO)	.881-.963	.960
Environmental Practice Proficiency Capability (EPPC)	.729-.885	.830
Environmental Reporting Transparency Emphasis (ERTE)	.817-.921	.913
Environmental Auditing Effectiveness Focus (EAEF)	.887-.929	.932
Environmental Improvement Disclosure Implementation (EIDI)	.878-.964	.930
Sustainable Performance Development (SPD)	.855-.904	.909
Firm Survival (FSU)	.713-.930	.873

The results of measure validation show in table 1. Table 1 presents all variables have factor score between 0.713 - 0.964 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 0.830 – 0.960.

3.5 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 five equation models are formulated:

$$\text{Equation 1: SPD} = \alpha_1 + \beta_1 FS + \beta_2 DC + \varepsilon_1$$

$$\text{Equation 2: SPD} = \alpha_2 + \beta_3 EIEO + \beta_4 EPPC + \beta_5 ERTE + \beta_6 EAEF + \beta_7 EIDI + \beta_8 FS + \beta_9 DC + \varepsilon_2$$

$$\text{Equation 3: FSU} = \alpha_3 + \beta_{10} FS + \beta_{11} DC + \varepsilon_3$$

$$\text{Equation 4: FSU} = \alpha_4 + \beta_{12} EIEO + \beta_{13} EPPC + \beta_{14} ERTE + \beta_{15} EAEF + \beta_{16} EIDI + \beta_{17} FS + \beta_{18} DC + \varepsilon_4$$

$$\text{Equation 5: FSU} = \alpha_5 + \beta_{19} SPD + \beta_{20} FS + \beta_{21} DC + \varepsilon_5$$

4. Results and Discussion

Table 2: Descriptive statistics and correlation matrix

Variables	EIEO	EPPC	ERTE	EAEF	EIDI	SPD	FSU	FS	DC
Mean	4.050	4.060	4.151	4.130	3.988	4.054	4.047	n/a	n/a
S.D	.541	.582	.532	.561	.623	.538	.552	n/a	n/a
EIEO	1								
EPPC	.741***	1							
ERTE	.741***	.687***	1						
EAEF	.718***	.729***	.734***	1					
EIDI	.737***	.746***	.768***	.771***	1				
SPD	.711***	.660***	.734***	.739***	.767***	1			
FSU	.621***	.602***	.668***	.643***	.700***	.817***	1		
FS	.074	-.057	.050	.029	.131	-.008	.157	1	
DC	-.198**	-.008	.007	-.043	-.001	-.011	-.006	.198**	1

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

Table 2 shows descriptive statistics and correlation matrix for all variables. Correlation coefficients of variables are ranging from 0.602 - 0.817. With respect to potential problems relating to multicollinearity, variance inflation factors (VIF) were used to test the inter-correlations among independent variable. In this study, the VIFs range from 1.041to 3.791, 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 3: Results of hierarchical regression analysis for effects of each dimension of environmental management accounting capability on its consequences

Independent Variables	Dependent Variables[a]				
	SPD	SPD	FSU	FSU	FSU
Environmental Identification Efficiency Orientation		.218**		.062	
(EIEO : H1a-H1b)		(.106)		(.127)	
Environmental Practice Proficiency Capability		-.056		.083	
(EPPC : H2a-H2b)		(.101)		(.120)	
Environmental Reporting Transparency Emphasis		.182*		.235*	
(ERTE : H3a-H3b)		(.101)		(.120)	
Environmental Auditing Effectiveness Focus		.227**		.137	
(EAEF : H4a-H4b)		(.100)		(.119)	
Environmental Improvement Disclosure		.346***		.293**	
Implementation (EIDI : H5a-H5b)		(.110)		(.131)	
/Sustainable Performance Development					.818***
(SPD : H6)					(.054)
Firm Size (FS)	-.013	-.213	.349*	.222	.359***
	(.212)	(.129)	(.209)	(.153)	(.118)
Duration Certified (DC)	-.023	.145	-.091	-.021	-.072
	(.239)	(.148)	(.236)	(.176)	(.133)
Adjusted R^2	-.019	.663	.007	.523	.686
Maximum VIF	1.041	3.791	1.041	3.791	1.041

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

Table 3 shows the results of OLS regression analysis for effects of each dimension of environmental management accounting capability on its consequences. Also, this table shows the effects of sustainable performance development on firm survival.

For the environmental management accounting capability dimensions, the results show that environmental identification efficiency orientation has a significant positive influence on sustainable performance development ($\beta_3 = 0.218$, $p < 0.05$). Consistent with prior research found that firm that has a good process to identify environmental costs and benefits, it can help firm to enhance financial and environmental performance (Johnson, 2004). Thus, firm with environmental identification efficiency orientation will be able to attain greater sustainable performance development. ***Therefore, Hypothesis 1a is***

supported. Besides, environmental identification efficiency orientation has no significant effects on firm survival (β_{12} = 0.062, $p > 0.10$). It may be implied that firm which has a poor environmental management system, they will unable to accurate identify the opportunities for reduce environmental problems from negatively business activities. It makes the firm unable to create its social and community trust and survives in the market over the long-term. Thus, firm that has inefficient accounting procedures for identifying environmental costs and benefits will not be able to attain firm survival. ***Therefore, Hypothesis 1b is not supported.***

Secondly, environmental practice proficiency capability has no significant effects on sustainable performance development (β_4 = -0.056, $p > 0.10$) and firm survival (β_{13} = 0.083, $p > 0.10$). Consistent with prior research found that if firms cannot adapt to and integrate environmental practice to match with the current accounting practice, it is likely that firm cannot receive benefits from environmental practices to improve environmental and overall performance in the long-term (De Palma and Csutora, 2001). Thus, firm which has incomplete environmental practice will not be able to attain greater sustainable performance development and firm survival. ***Therefore, Hypotheses 2a and 2b are not supported.***

Thirdly, environmental reporting transparency emphasis has a significant effect on sustainable performance development (β_5 = 0.182, $p < 0.10$) and firm survival (β_{14} = 0.235, $p < 0.10$). Consistent with prior research found that firm that can provides useful environmental information to its stakeholders, it may be beneficial to firm image and share price may increase over its competitors (Khuntia, 2014). Thus, firm with environmental reporting transparency emphasis will be able to attain greater sustainable performance development and firm survival. ***Therefore, Hypotheses 3a and 3b are supported.***

Fourthly, environmental auditing effectiveness focus has a significant positive influence on sustainable performance development (β_6 = 0.227, $p < 0.05$). Consistent with prior research found that environmental auditing is the monitoring process of the environmental management system, compliance with laws, regulations, policies, and the development of an action plan to deal with defects leading to enhancing firm performance (Thompson and Wilson, 1994). Thus, firm with environmental auditing effectiveness focus will be able to attain greater sustainable performance development. ***Therefore, Hypothesis 4 is supported.*** Besides, environmental auditing effectiveness focus has no significant effects on firm survival (β_{15} = 0.137, $p > 0.10$). It may be implied that environmental auditing may not help firm reduce or remove environmental problems due to auditing system of firm unable to fairly evaluate business activities that inconsistent with environmental regulations and standards. It can make its stakeholders reduce trustworthy both short and long term. Thus, firm that has inefficient environmental auditing will not be able to attain firm survival. ***Therefore, Hypothesis 4b is not supported.***

Finally, environmental improvement disclosure implementation has a significant positive influence on sustainable performance development (β_7 = 0.346, $p < 0.01$) and firm survival (β_{16} = 0.293, $p < 0.05$). Consistent with prior research found that voluntary environmental disclosure such as environmental conservation activities and an environmental solutions policy of firm is positively influence

on reduce the punitive damage award and improve firm image in the public eye (Lee and Sweeney, 2015). Thus, firm with environmental improvement disclosure implementation will be able to attain greater sustainable performance development and firm survival. ***Therefore, Hypotheses 5a and 5b are supported.***

Additionally, the finding indicates that sustainable performance development has a significant influence on firm survival ($\beta_{19} = 0.818$, $p < 0.01$). Consistent with prior research found that firm that not only focus on improving financial performance, but also to focus on social and environmental performance will allow firm to survive in the long term (Elkington, 1997). ***Therefore, Hypothesis 6 is supported***.

For the control variables, firm size has a positive influence on firm survival. Consistent with prior research found that firm size is one of important determinants of firm survival (Sonmez, 2013). Specifically, larger firms experience higher survival probabilities than smaller firms. Because of larger firms may influence the capacity of a firm to operate its business in order to achieve in the long term such as higher financing and competition capability than smaller firms (Orlitzky, 2001).

5. Contributions

5.1 Theoretical contribution

This research is an attempt to provide a clearer understanding of environmental management accounting capability - sustainable performance development and firm survival relationships. It provides unique theoretical contribution expanding on previous knowledge and literature of environmental management accounting capability on sustainable performance development and firm survival. Likewise, this study explicitly considers environmental management accounting capability in five dimensions, including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. For advancing the field theoretically, this study has attempted to focus on the aforementioned relationships of certified ISO 14000 firms in Thailand.

5.2 Professional contribution

This research has potential implications for certified ISO 14000 firms in Thailand. The first, this research helps firms to identify and justify the main components of environmental management accounting capability that may be more critical in sustainable performance development and firm survival. The findings of this research suggest components of environmental management accounting capability (especially, environmental identification efficiency orientation, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation) which are the main components for enhancing the business outcomes. Secondly, this research can facilitate certified ISO 14000 firms, particularly in Thailand, to understand how their firms achieve success, thus becoming a foundation for firm survival. Finally, for gaining superior performance of firm, firms should generate and utilize environmental management accounting capability which leads to improve sustainable performance development and firm survival.

6. Conclusion

The purpose of this study is to examine the effect of environmental management accounting capability on sustainable performance development and firm survival. The results indicated that two dimensions of environmental management accounting capability (including environmental reporting transparency emphasis and environmental improvement disclosure implementation) have a significant positive influence on sustainable performance development and firm survival, while environmental identification efficiency orientation and environmental auditing effectiveness focus only significant positive influence on sustainable performance development. Furthermore, sustainable performance development has a positive influence on firm survival. From the results, it can be summarized that certified ISO 14000 firms in Thailand with great environmental management accounting capability (especially, environmental identification efficiency orientation, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation) will increase sustainable performance development, which leads these firms to survive in the long term.

This research has some limitations that should be mentioned. Firstly, with regards to the position of respondent's characteristics, approximately 21.50 percent are in other positions instead of chief accounting executive, account director or accounting manager. The rating scale that they answer to might not have the concrete judgment of key informants. Possibility, some answers provided affect the quality of the testing result. Thus, future research should be developing other research methodologies to test this conceptual framework. 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 environmental management accounting capability.

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