

บทความวิจัย

การบัญชีเพื่อการจัดการสิ่งแวดล้อม ภาพลักษณ์องค์กร การมีส่วนร่วมของผู้มีส่วนได้เสีย ความอยู่รอดของกิจการ และความยั่งยืนขององค์กร: หลักฐานจากธุรกิจที่ได้รับการ รับรอง ISO 14000 ในประเทศไทย

ปพฤกษ์บาร์มี อุตสาหะวานิชกิจ¹

บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อทดสอบ ความสัมพันธ์ระหว่างการบัญชีเพื่อการจัดการสิ่งแวดล้อม ภาพลักษณ์องค์กร การมีส่วนร่วมของผู้มีส่วนได้เสีย ความอยู่รอดของกิจการ และความยั่งยืนขององค์กร ซึ่งทำการเก็บรวบรวมข้อมูลจากธุรกิจที่ได้รับการรับรอง ISO 14000 ในประเทศไทย จำนวน 229 บริษัท โดยใช้การวิเคราะห์การถดถอยในการทดสอบสมมุติฐาน ผลการวิจัย พบว่า การลงทุนด้านกิจกรรมสิ่งแวดล้อม การรายงานข้อมูลด้านสิ่งแวดล้อม และการตรวจสอบผลกระทบด้านสิ่งแวดล้อม มีอิทธิพลเชิงบวกต่อผลลัพธ์ของธุรกิจ การวิจัยนี้ได้มุ่งเน้นความสำคัญของการบัญชีเพื่อการจัดการสิ่งแวดล้อมที่ส่งผลต่อความสำเร็จขององค์กร ความมั่นคง และความยั่งยืนในการดำเนินธุรกิจในปัจจุบันและอนาคต

คำสำคัญ: การบัญชีเพื่อการจัดการสิ่งแวดล้อม ภาพลักษณ์องค์กร การมีส่วนร่วมของผู้มีส่วนได้เสีย ความอยู่รอดของกิจการ ความยั่งยืนขององค์กร

¹ รองศาสตราจารย์ ดร. สาขาวิชาการบัญชี คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม
E-Mail: markarlington@hotmail.com

RESEARCH ARTICLE

Environmental Management Accounting, Corporate Image, Stakeholder Involvement, Firm Survival, and Organizational Sustainability: Evidence from ISO 14000 Businesses in Thailand

Phaprukbaramee Ussahawanitchakit¹

Abstract

This study aims at investigating the relationships among environmental management accounting, corporate image, stakeholder involvement, firm survival, and organizational sustainability. Data were collected from 229 ISO 14000 businesses in Thailand. The regression analysis was conducted to examine the hypotheses. The results show that environmental activity investment, environmental information reporting and environmental impact auditing have significant influences on business outcomes. This study emphasizes on the importance of environmental management accounting that affects firms' organizational success, stability and sustainability in current and future aspects.

Keywords: Environmental Management Accounting, Corporate Image, Stakeholder Involvement, Firm Survival, Organizational Sustainability

¹ Associate Professor, Ph.D., Accounting, Mahasarakham Business School, Mahasarakham University,
E-mail: markarlington@hotmail.com

Introduction

Nowadays, business operations in competitive markets have challengingly faced increasing pressure to demonstrate social responsibility for environmental issues, including the related costs, revenues and benefits of environmental impacts and incidents. Environmental issues include any form of global warming; atmospheric, soil and water pollution caused by industrial activities; the quick decline of forest areas; noise pollution; and radioactive and chemical wastes being dumped into oceans and rivers (Xiaomei, 2004). Firms have been increasingly becoming more concerned with environmental matters in order to survive and sustain in competitive uncertainty and complexity. Great compliance of environmental regulations becoming their important activities, practices, functions, and responsibilities through providing environmental management accounting has outstandingly presented their business ethics and corporate governance. Likewise, firms have potentially implemented environmental management accounting as a strategic tool in helping them maintain sustained competitive advantage, gain superior performance and achieve their goals.

Environmental management accounting is a significant part of environmental accounting infrastructure and it is referred to as a management tool that assists firms to manage environmental and economic performance and report environmental information to both internal and external stakeholders via the development and implementation of an appropriate environmental accounting systems and

practices (Jamil et al., 2015). It consists of environmental reporting, and environmental auditing. The success of environmental management accounting implementation definitely helps firms attain their sustainable development in both business profitability and organizational image and reputation. Likewise, environmental management accounting is defined as the identification, measurement, collection, estimation, accumulation, analysis, preparation, interpretation, and communication of environmental cost information that assists executives in decision-making to fulfill organizational objectives (Lee, 2011). It enhances firms to maintain the effective utility of environmental resources, reduce the environmental impacts and diminish the environmental protection costs. Firms with more environmental management accounting implementation tend to have a better understanding of environment-related financial costs and benefits. They have strategically utilized environmental management accounting as a system comprising of methods and techniques that is used gather and provide information to executives that is useful for environmentally sensitive internal decision-making (Debnath, Bose and Dhalla, 2012).

Both environmental practice and investment are also identified as its components. Environmental practice presents the business functions of firms with concerns for environmental issues (Bartolomeo et al., 2000) and environmental investment reflects their business responsibility under the environmental matters (Masanet-Llodra, 2006). Hence, this study is likely to investigate the effects of environmental management accounting on business outcomes, including corporate image, stakeholder involvement,

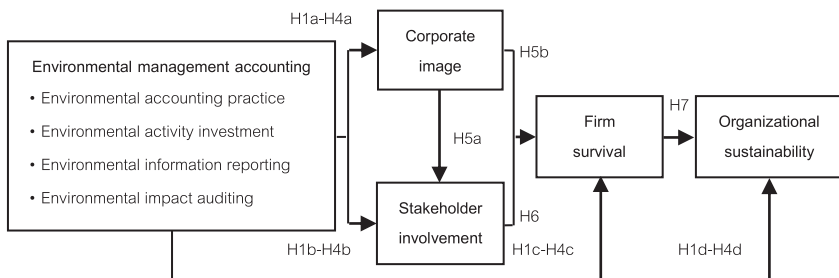
firm survival, and organizational sustainability. In existing literature, environmental accounting practice, environmental activity investment, environmental information reporting, and environmental impact auditing are characteristics of environmental management accounting because they seem to cover all duties and responsibilities relating to environment issues. Here, this study aims at examining the relationships among environmental management accounting, corporate image, stakeholder involvement, firm survival, and organizational sustainability in Thai ISO 14000 businesses. The key research question is how environmental management accounting affects organizational sustainability.

Environmental Management Accounting and the Consequences

The research model of the associations among environmental management accounting and its consequences is showed in Figure 1.

Figure 1

Research model of the environmental management accounting-organizational sustainability relationships



1. Environmental Accounting Practice

Environmental accounting practice is defined as organizing the accounting procedure, recognizing and measuring economic gain or loss in relation to environmental issues during a certain period of time, and providing sufficient environmental information (Xiaomei, 2004). It identifies the cost of environmental liabilities and other significant environmental costs, address the information about material and energy flow, and provide related environmental information to both internal decision makers and external stakeholders. Also, environmental accounting practice refers to recording the impacts arising as a result of the manner of use of environmental resources either positively or negatively (Tanc and Gokoglan, 2015). It focuses on mutual relations between accountants and ecology, awareness of the environmental cost information or settled environmental costs, distribution to the appropriate products and processes, activities in the environmental field, environmental policies and strategies of the organizations. Thus, environmental accounting practice can lead to corporate image, stakeholder involvement, firm survival, and organizational sustainability. Therefore,

H1: Environmental accounting practice has a positive relationship on
(a) corporate image, (b) stakeholder involvement, (c) firm survival,
and (d) organizational sustainability.

2. Environmental Activity Investment

Environmental activity investment refers to the amount of money relating to environmental issues which firms have spent to maintain and

improve environmental resources and protect their effects and problems. Significant capital and operating investment has reduced the release of particular pollutants into the natural environment (Klassen and Vachon, 2003). Firms have invested in environmental maintenance, prevention, protection, and control in order to positively improve the environmental performance of their operations, explicitly increase their economic results and critically enhance their survival and sustainability by strengthening the trusts of stakeholders via environmental efforts. To outstandingly invest in environmental issues, firms seem to have an increasingly greater firm performance (Nakamura, 2011). They also survive and sustain themselves in the competitive markets. Hence, environmental activity investment potentially encourages firms to achieve stakeholder involvement, corporate image, firm survival, and organizational sustainability. Therefore,

H2: Environmental activity investment has a positive relationship on (a) corporate image, (b) stakeholder involvement, (c) firm survival, and (d) organizational sustainability.

3. Environmental Information Reporting

Environmental information reporting is defined as the information disclosure on firms' actions in relation to a full range of the environmental responsibilities (Frost and Seamer, 2002). It presents all voluntary information about environmental matters in both input and output activities, including potentially responsible party status, remediation liabilities, dismantlement liabilities, environmental capital expenditures, and

environmental operating expenses and expenditures. Firms have disseminated information about their environmental actions and impacts that represent their efforts and achievements in order to support stakeholders' successful decision making. These stakeholders need to have reliable and credible information from management about environmental risks. Likewise, environmental information reporting is the vehicle for providing environmental data designed to satisfy the accountability relationships and indicate corporate consciousness through a moral discourse on environmental issues (Sumiani, Haslinda and Lehmqan, 2007). It discloses any quantitative data about the condition and functioning of ecosystems and the availability and use of the goods and services that firms produce. It helps firms promote economic benefits, such as being able to develop stronger business relationships with suppliers, attracting ethical investors and penetrating new markets due to improved environmental performance. Then, environmental information reporting can promote corporate image, stakeholder involvement, firm survival, and organizational sustainability. Therefore,

H3: Environmental information reporting has a positive relationship on
(a) corporate image, (b) stakeholder involvement, (c) firm survival,
and (d) organizational sustainability.

4. Environmental Impact Auditing

Environmental impact auditing is a systematic, documented, periodic, and objective evaluation of how well the environment,

organization, management, and equipment are performing (Cater et al., 1995). It helps safeguard the environment by facilitating the management control of environmental practices and assessing compliance with enterprises' policies and regulations. Similarly, environmental impact auditing refers to the concept of examination and assessment of environmental performance by emphasizing systematic, independent and documented verification process for obtaining audit evidence and evaluating it objectively to determine whether specified environmental activities, events, conditions, management systems, or information about these matters conform to which the audit criteria are fulfilled and communicating results of this process to stakeholders are delivered (Cook, Bommel and Turnhout, 2016). It becomes an important policy instrument to both assess and improve the performance of environmental policies and programs. It explicitly focuses on defining the extent of firms' liabilities toward the environment, checking compliance with environmental legislation and assessing environmental risks, employees' safety, energy consumption, waste streams, or pollutant emissions (Sinclair-Desgagne and Gabel, 1997). Firms have utilized environmental impact auditing in order to provide the assessment of site contamination, the environmental impact assessments of planned investments, the environmental due diligence audits, the audit of corporate environmental performance reports, and the audit of the entity's compliance with environmental laws and regulations (Lightbody, 2000). Hence, environmental impact auditing has a significant effect on corporate image,

stakeholder involvement, firm survival, and organizational sustainability.

Therefore,

H4: Environmental impact auditing has a positive relationship on (a) corporate image, (b) stakeholder involvement, (c) firm survival, and (d) organizational sustainability.

5. Corporate Image

Corporate image refers to the perceptions, mental pictures and impressions of an organization that reside in the minds, feelings, attitudes, and beliefs of individuals (Gotsi, Lopez and Andriopoulos, 2011). These individuals include stockholders, board members, employees, suppliers, channel members, customers, and the community. It helps firms change and transform stakeholder's attitudes regarding quality, buying behavior, loyalty, and competitiveness. Likewise, corporate image is defined as the net result of the interaction of all the experiences, impressions, beliefs, feelings, and knowledge that people have about a company (Melewar, 2003). It is a symbolic link between an organization and its various public dimensions by focusing on the sense, message, cognition, credibility, communication and relationship of the overall corporation. The ability of a successful corporate image attracts the attention of more valuable customers and strengthens firms' intention-to-participation. It represents the unique and individual personality of an organization that differentiates it from its competitors (Kim, Jee and Prideaux, 2014). It reflects credibility, impression of quality, tradition, corporate philosophy, staff education, and

organization and service culture. Thus, corporate image tends to have a critical impact on stakeholder involvement and firm survival. Therefore,

H5: Corporate image has a positive relationship on (a) stakeholder involvement and (b) firm survival.

6. Stakeholder Involvement

Stakeholder involvement refers to the practices that an organization undertakes to involve stakeholders in a positive manner in the organizational activities (Greenwood, 2007). It enhances firms to have superior firm survival. Likewise, with the competitive situations and markets, firms need to ensure that the interests of the various constituencies are fulfilled because these interests are reflected in their effective decision making (Larner and Mason, 2014). It is important to promote firms' survival and sustainability. Also, stakeholder involvement is essential for an organization to give valuable consideration to what is expected from stakeholders, the reasons for carrying it out and what are they willing or able to commit themselves to (Green and Hutton-Clarke, 2003). It presents an increasing degree of commitment by an organization, generates beneficial outcomes and diminishes operational risks. Therefore,

H6: Stakeholder involvement has a positive relationship on firm survival.

7. Firm Survival

Firm survival is defined as the probability that a firm will continue operations rather than exit an industry (Li, Shang and Slaughter, 2010). It

is the critical to the success through operational output, sales quality, value added creation, innovation, and cost reduction. Surviving firms tend to definitely present the continued competency, potentiality and capability of existing business activities in both current and future operations. Moreover, firm survival refers to an ability of firms to continue conducting their operations to meet stakeholders' expectations (Barnabas, Nwuche and Anyanwu, 2016). It reflects the successful goal integration of the organization and the employees. The measurements of firm survival can be indicated through superior goodwill, great reputation and increased customer loyalty. Survival-oriented firms are likely to provide adaptability, maintain high performance standards and achieve functional performance goals. Therefore,

H7: Firm survival has a positive relationship on organizational sustainability.

8. Organizational Sustainability

Organizational sustainability is defined as adopting business strategies and activities that meet the needs of an organization and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future (Karkouliau, Assaker and Hallak, 2016). It explicitly represents the ability of firms to maintain their viable business operations in long-term aspects. Similarly, organizational sustainability refers to the ability of firms to contribute to sustain development delivering simultaneously with economic, social and

environmental benefits (Florea, Cheung and Herndon, 2013). It potentially emphasizes an appropriate balanced organizational approach that considers economic development (corporate growth and profitability), social benefit (social justice and equity) and environmental performance (environmental protection) (Hahn *et al.*, 2015). Firms with achieving sustainability tend to outstandingly meet the needs of the present without compromising the ability of future generations to meet their own needs by maintaining longevity, continuity and capacity. Therefore, organizational sustainability becomes the highest goal achievement via implementing strategic business tool of environmental management accounting.

Research Method

All 895 ISO 14000 businesses in Thailand from a list of Thai Industrial Standards Institute, Thailand were selected as samples of the study because they have outstandingly worked with several activities relating to environment issues that fulfill the requirements of International Organization for Standardization (ISO). This study implemented a questionnaire survey as the research tool (Leekpai *et al.*, 2014). The questionnaire surveys via mail procedures were sent by using accounting executives as the key informants. In a mailing process, 29 surveys were undeliverable because some listed firms had moved to unknown locations. Deducting the undeliverable mailing, the valid mailing was 866 surveys, from which 241 responses were received. Of the surveys completed and returned, there are 229 usable questionnaires that are empirically utilized

to measure validation of the research tool and to analyze data for the research results. The effective response rate was approximately 26.44% as being considered acceptable for the response rate for a mail survey because it is greater than 20% (Aaker, Kumar and Day, 2001).

To test non-response bias and detect and consider possible problems with non-response errors, there is a comparison of the first, the second and the third wave data, such as firm size, firm age and firm capital, as recommended by Armstrong and Overton (1977) to evaluate the non-response-bias. Here, neither procedure explicitly showed significant differences.

Measurements

All constructs were measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), except firm size, firm age, and firm capital. Firstly, four-item scale was developed to measure environmental accounting practice by assessing how firms organize, process and measure economic gain or loss of environmental transactions in an organization. Secondly, four-item scale was introduced to measure environmental activity investment by evaluating how firms spend their funds in both tangible and intangible assets relating to economic issues. Thirdly, four-item scale was established to measure environmental information reporting by gauging how firms present voluntary information about environmental matters in both input and output activities, including potentially responsible party status, remediation liabilities, dismantlement

liabilities, environmental capital expenditures, and environmental operating expenses and expenditures. Fourthly, four-item scale was initiated to measure environmental impact auditing by assessing how firms safeguard the environment by facilitating the management control of environmental practices and assess compliance with enterprises' policies and regulations.

Corporate image is measured by using four-item scale to investigate how firms make the sense, message, cognition, credibility, communication and relationship of the overall corporation to stakeholders. Next, four-item scale was developed to measure stakeholder involvement by examining how firms can motivate stakeholders to participate and engage in their operations, activities and decision makings. Also, four-item scale was introduced to measure firm survival by assessing how firms possibly continue conducting their operations and activities to meet stakeholders' expectations in both current and future operations. Likewise, four-item scale was initiated to measure organizational sustainability by testing how firms contribute to sustain development delivering simultaneously with economic, social and environmental benefits.

To increase the credibility of this study, the control variables are examined. Firm age (FA) was measured by the number of years a firm has been in existence by using a dummy variable as less than 10 years = 0 and equal to or greater than 10 years = 1. Next, firm size (FS) was measured by the number of employees in a firm by using a dummy variable as less than 150 employees = 0 and equal to or greater than 150

employees = 1. Lastly, firm capital (FC) was measured by the amount of money a firm has invested in doing business by using a dummy variable as less than 125 million baht = 0 and equal to or greater than 125 million baht = 1.

Instrument Tests

For verifying a quality of the research tool in this study, factor analysis was firstly utilized to measure the underlying relationships of a large number of items and to determine whether they can be reduced to a smaller set of factors. A higher rule-of-thumb, a cut-off value of 0.40, was adopted (Nunnally and Bernstein, 1994). All factor loadings are greater than the 0.40 cut-off and are statistically significant. Secondly, discriminant power was used to evaluate the validity of the measurements by item-total correlation. In the scale validity, item-total correlation is greater than 0.30 (Churchill, 1979). Lastly, the reliability of the measurements was assessed by Cronbach alpha coefficients. In the scale reliability, Cronbach alpha coefficients are greater than 0.70 (Nunnally and Bernstein, 1994). Thus, the scales of all measures appear to produce internally consistent results and these measures are deemed appropriate for further analysis. Table 1 presents the results of measure validation.

To examine the research relationships, the ordinary least squares (OLS) regression analysis is conducted because all variables were neither nominal data nor categorical data (Wohlgemuth and Wenzel, 2016). The results of this study are presented in the next section.

Table 1

Results of measure validation

Items	Factor loadings	Item-total correlation	Cronbach Alpha
Environmental accounting practice (EP)	0.61-0.88	0.65-0.87	0.79
Environmental activity investment (EI)	0.62-0.84	0.65-0.80	0.78
Environmental information reporting (ER)	0.75-0.85	0.75-0.85	0.80
Environmental impact auditing (EA)	0.69-0.86	0.72-0.85	0.80
Corporate image (CI)	0.78-0.82	0.79-0.82	0.82
Stakeholder involvement (SI)	0.79-0.81	0.78-0.81	0.81
Firm survival (FV)	0.87-0.90	0.82-0.89	0.88
Organizational sustainability (OS)	0.72-0.85	0.72-0.84	0.80

Results and Discussion

Table 2

Descriptive statistics and correlation matrix

Variables	EP	EI	ER	EA	CI	SI	FV	OS
Mean	4.19	4.16	4.04	4.04	3.98	3.99	4.01	4.09
s.d.	0.52	0.46	0.59	0.59	0.66	0.58	0.69	0.53
EP								
EI	0.63***							
ER	0.51***	0.50***						
EA	0.38***	0.51***	0.70***					
CI	0.38***	0.51***	0.66***	0.63***				
SI	0.44***	0.52***	0.66***	0.66***	0.78***			
FV	0.34***	0.45***	0.64***	0.52***	0.60***	0.57***		
OS	0.16	0.34***	0.21**	0.18	0.25**	0.25**	0.37***	

p<.05, *p<.01

Table 2 presents the descriptive statistics and correlation matrix for all variables. Variance inflation factors (VIFs) were used to provide information on the extent to which non-orthogonality among independent variables inflates standard errors. The VIFs range from 1.15 to 2.70, well below the cut-off value of 10 as recommended by Neter, Wasserman and Kutner (1985), means that the independent variables are not correlated with each other. Thus, there are no substantial multicollinearity problems encountered in this study.

Table 3

Results of OLS regression analysis^a

Independent Variables	Dependent variables			
	CI	SI	FV	OS
EP	-0.03 (0.10)	0.09 (0.09)	-0.07 (0.10)	-0.11 (0.13)
EI	0.19* (0.10)	0.11 (0.09)	0.18* (0.10)	0.38*** (0.13)
ER	0.36*** (0.11)	0.27** (0.10)	0.50*** (0.11)	0.12 (0.14)
EA	0.26** (0.10)	0.33*** (0.10)	0.06 (0.11)	-0.13 (0.14)
FA	-0.04 (0.08)	-0.01 (0.07)	0.11 (0.08)	-0.14 (0.10)
FS	0.17** (0.07)	0.09 (0.07)	0.04 (0.07)	0.02 (0.09)
FC	0.01 (0.07)	0.11* (0.06)	0.12* (0.07)	0.20** (0.09)
Adjusted R ²	0.52	0.56	0.48	0.14

*p<.10, **p<.05, ***p<.01, ^a Beta coefficients with standard errors in parenthesis.

Table 3 shows the results of OLS regression analysis of the relationships between environmental management accounting and its consequences. Environmental activity investment has a significant positive impact on corporate image ($b = 0.19, p < 0.06$), firm survival ($b = 0.18, p < 0.09$) and organizational sustainability ($b = 0.38, p < 0.01$). Firms have spent to maintain and improve environmental resources and protect their effects and problems through significant capital and operating investment (Klassen and Vachon, 2003). They can positively improve the environmental performance of their operations, explicitly enhance their economic results and critically promote their survival and sustainability. Thus, environmental activity investment is a main determinant of corporate image, firm survival and organizational sustainability. *Therefore, Hypotheses 2a, 2c and 2d are supported, but Hypothesis 2b is not.*

Environmental information reporting is positively related to corporate image ($b = 0.36, p < 0.01$), stakeholder involvement ($b = 0.27, p < 0.02$) and firm survival ($b = 0.50, p < 0.01$). It enables firms to provide the information disclosure of potentially responsible party status, remediation liabilities, dismantlement liabilities, environmental capital expenditures, and environmental operating expenses and expenditures on the environmental responsibilities (Frost and Seamer, 2002). Firms with great environmental information reporting can outstandingly achieve superior corporate image, stakeholder involvement and firm survival. Then, environmental information reporting plays as a key driver in explaining corporate image, stakeholder involvement and firm survival.

Therefore, Hypotheses 3a, 3b and 3c are supported, but Hypothesis is 3d is not.

Interestingly, environmental impact auditing has an important positive effect on corporate image ($b = 0.26, p < 0.02$) and stakeholder involvement ($b = 0.33, p < 0.01$). Firms with environmental impact auditing can safeguard the environment by facilitating the management control of environmental practices and assessing compliance with enterprises' policies and regulations (Cater *et al.*, 1995). They also achieve corporate image and stakeholder involvement via successfully implementing environmental impact auditing. Hence, environmental impact auditing is critical to encourage firms to have improving corporate image and increasing stakeholder involvement in turbulent and complex markets and situations. *Therefore, Hypotheses 4a and 4b are supported, but Hypotheses 4c and 4d are not.*

Surprisingly, environmental accounting practice is not important in this study. In existing literature, it is the organizing of accounting procedure, recognizing and measuring economic gain or loss in relation to environmental issues during a certain period of time, and providing sufficient environmental information (Xiaomei, 2004). It explicitly represents firms' awareness of environmental importance and commitment to environmental protection. However, environmental accounting is a voluntary approach of business functions and responsibilities and it is not a legitimacy requirement of firms in doing business. The practices of environmental accounting may not help them receive positive outcomes of

business operations and activities. Thus, environmental accounting practice is not an antecedent of corporate image, stakeholder involvement, firm survival, and organizational sustainability. *Therefore, Hypotheses 1a -1d are not supported.*

Table 4

Results of OLS regression analysis^a

Independent Variables	Dependent variables		
	SI	FV	OS
CI	0.73*** (0.07)	0.40*** (0.13)	
SI		0.19 (0.13)	
FV			0.32*** (0.10)
FA	0.01 (0.07)	0.14 (0.09)	-0.16 (0.10)
FS	-0.03 (0.06)	-0.04 (0.08)	-0.01 (0.09)
FC	0.15** (0.06)	0.12 (0.08)	0.17* (0.09)
Adjusted R ²	0.61	0.40	0.15

*p<.10, **p<.05, ***p<.01, ^aBeta coefficients with standard errors in parenthesis.

Table 4 also presents the results of the research relationships. Corporate image has a significant positive influence in both stakeholder involvement ($b = 0.73$, $p < 0.01$) and firm survival ($b = 0.40$, $p < 0.01$). Congruence with prior studies, corporate image is the perceptions, mental pictures and impressions of an organization that reside in the minds,

feelings, attitudes, and beliefs of individuals (Gotsi, Lopez and Andriopoulos, 2011). It focuses on the sense, message, cognition, credibility, communication and relationship of the overall corporation. Firms with best corporate image can motivate stakeholders to participate and engage their operations and activities. They can also apply corporate image as a strategic tool to support their survival in both current and future operations. Accordingly, corporate image has a potential role in enhancing stakeholder involvement and firm survival. *Therefore, Hypotheses 5a-5b are supported.*

In contrast, stakeholder involvement has no associations with firm survival. Firms can succeed in influencing stakeholders to participate in their activities, but stakeholder involvement does not contribute to firm survival. The interests of the various constituencies are fulfilled because these interests are reflected in their effective decision making (Larner and Mason, 2014). Then, greater stakeholder involvement is positively related to superior business outcomes. In this study, firms could not utilize stakeholder involvement in order to improve firm survival because this involvement can link to corporate growth and business profitability, but it does not affect customer loyalty while superior goodwill, great reputation and increased customer loyalty are outcomes of stakeholder involvement (Barnabas, Nwuche and Anyanwu, 2016). Thus, stakeholder involvement is not connected to firm survival. *Therefore, Hypothesis 6 is not supported.*

Importantly, firm survival has an important positive interaction with organizational sustainability ($b = 0.32, p < 0.01$). It definitely encourages firms to achieve organizational sustainability in complex competitive markets and situations. More survival in their businesses is positively linked to greater sustainability. Similarly, firm survival is the probability that a firm will continue operations rather than exit an industry (Li, Shang and Slaughter, 2010). It is critical to provide adaptability, maintain high performance standards and achieve functional performance goals. Firms with more survival have potentially continued their operations and activities to sustain development delivering simultaneously with economic, social and environmental benefits. Thus, firm survival is a critical antecedent and a valuable driver of organizational sustainability. *Therefore, Hypothesis 7 is supported.*

In Tables 3 and 4, firm capital is also important for the research relationships. ISO 14000 businesses as equal to or greater than 125 million baht are likely to be aware of environmental management accounting implementation while other businesses are not. Then, only ISO 14000 businesses as mentioned earlier should be considered for future research. For other control variables of the study, both firm age and firm size have no effects on the research relationships. Generally, all ISO 14000 businesses can pay attention to the development and application of environmental management accounting in an organization.

Contributions and Directions for Future Research

1. Theoretical Contribution and Directions for Future Research

This study clearly presents the relationships between environmental management accounting (environmental accounting practice, environmental activity investment, environmental information reporting, and environmental impact auditing) and its consequences. Only environmental accounting practice is not important to contribute to corporate image, stakeholder involvement, firm survival, and organizational sustainability. To verify and increase the contributions of implementing environmental management accounting, future research may need to do more literatures of environmental accounting practice in its characteristics, antecedents and consequences and re-conceptualize its relationships with valuable outcomes. Also, future research may need to separate the samples of this study to different business types and investigate the aforementioned relationships by focusing on a comparative sample. Likewise, future research may apply several statistical methods, including structural equation model and partial least square in order to increase the reliability, validity and contribution of the study.

2. Managerial Contribution

According to the research results, environmental management accounting plays a significant role in determining and explaining valuable outcomes in turbulent and complex markets and situations. Then, executives need to support an implementation of environmental management accounting in both tangible and intangible perspectives

because successfully implementing environmental management accounting explicitly enhance firms to survive and reach sustainability. Firms need to pay attention to how they manage all components of environmental management accounting effectively and utilize several supports to promote their implementations in order to achieve best organizational outcomes, including customer satisfaction, business profitability, corporate survival and operational sustainability.

Conclusion

Environmental management accounting becomes a valuable approach and a strategic tool of firms for achieving survival and sustainability in current and future operations and activities. Accordingly, the objective of this study is to investigate the influences of environmental management accounting on organizational sustainability of ISO 1400 businesses in Thailand. Environmental management accounting consists of environmental accounting practice, environmental activity investment, environmental information reporting, and environmental impact auditing, and its consequences include corporate image, stakeholder involvement, firm survival, and organizational sustainability. Here, 229 ISO 14000 businesses in Thailand are the samples of the study. In this study, environmental activity investment has an important relationship with corporate image, firm survival and organizational sustainability; environmental information reporting has a significant effect on corporate image, stakeholder involvement and firm survival; and environmental

impact auditing has a potential impact on corporate image and stakeholder involvement. Moreover, corporate image is positively related to both stakeholder involvement and firm survival; and firm survival is effectively connected to organizational sustainability. To verify the effects of environmental management accounting implementation, future research needs to do more literatures on an importance of environmental accounting practice and its effects, separate the samples of this study to different business types, investigate the research relationships by focusing on comparative samples and apply several statistical methods, including structural equation model and partial least square. For the managerial aspect, executives need to manage all components of environmental management accounting effectively and utilize various supports to promote their implementations in order to achieve best organizational outcomes.

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