ENVIRONMENTAL MANAGEMENT ACCOUNTING CAPABILITY AND FIRM SURVIVAL: EMPIRICAL EVIDENCE FROM ISO 14000 FIRMS IN THAILAND

WORAPAN RATANASONGTHAM

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Accounting at Mahasarakham University

February 2017

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The examining committee has unanimously approved this dissertation, submitted by Miss Worapan Ratanasongtham, as a partial fulfillment of the requirements for the degree of Doctor of Philosophy in Accounting at Mahasarakham University.

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ABSTRACT

For a decade, firms have faced mounting pressure to change, including increased environmental legislation and growing environmental awareness of their stakeholders about the impact of firm operations on the environment and society. These concerns are forcing many firms to seek for new ways to minimize environmental problems. Whereas, managers do not have essential and accurate environmental information to support reasonable decision-making.

Environmental management accounting is a beneficial tool to overcome limitation of conventional management accounting. It focuses on the preparation of information related to physical and monetary environment aspects that involve business decision-making. Additionally, it can help external stakeholders to gain clarity on detailed information about environmental performance of firms. Thus, firms should focus on developing the capability of a firm about environmental management accounting for success in a green society. As a result, it can claim that environmental management accounting capability is one of the beneficial tools to involve achieving environmental management and to establish a long-term competitive superiority.

The objective of this research is to investigate the relationships among the dimensions of environmental management accounting capability, its antecedents and consequences, and the moderating effects of business ethics. The legitimacy theory and contingency theory are applied to explain the relationship among these variables. The population and sample are the certified ISO 14000 firms in Thailand, totaling 107 firms. The data were collected by a mail survey, and questionnaires were sent directly to

the chief accounting executives, the accounting directors or the accounting managers of each firm. Regression analysis was used for hypothesis testing.

The findings indicate that all dimensions of environmental management accounting capability have an influence on all of the consequences. Especially, environmental identification efficiency orientation and environmental reporting transparency emphasis illustrated the positive effect on societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Interestingly, environmental auditing effectiveness focus has positive relationships with all of its consequences, except environmental conservation efficiency. Moreover, environmental practice proficiency capability only has a positive relationship with environmental conservation efficiency. Likewise, environmental improvement disclosure implementation only has a positive relationship with sustainable performance development.

In addition, all of the antecedents have a positive influence on environmental management accounting capability. Particularly, social responsibility vision has a positive effect on all of dimensions of environmental management accounting capability, except environmental practice proficiency capability. Moreover, market culture has a positive effect on all dimensions of environmental management accounting capability, except environmental identification efficiency orientation. However, strategic management accounting system and stakeholder force dynamism fail to show a significant positive effect on environmental auditing effectiveness focus and environmental improvement disclosure implementation. For the moderating effects, business ethics has a significant positive moderating role only in the relationship between market culture and all of the dimensions of environmental management accounting capability, except environmental identification efficiency orientation.

A suggestion for management is to continually supply sufficient resources and technology in order to facilitate the environmental management accounting capability over the rivals. Committing to business environment adaptation could promote continuous business improvement and firm ability to align with the business environment and gain long-term business competitive advantage. In addition, researchers should consider re investigating other industries to compare the findings and gains for greater generalizability in the future.

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CHAPTER I

INTRODUCTION

Overview

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 instance, air, oil, water, natural gas, coal and others produce more superior quality of goods and services than other competitors in order to achieve better long-term financial performance (Namakonzi and 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 of the earth (Ratnatunga and Balachandran, 2009; Khalid, Lord, and Dixon, 2012). 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 (The United Nations Environment Programme, 2015).

Environmental impacts by firms are now a serious problem which should have intense concern from the government sector, non-government sector and the general public sector. The firms are strongly forced by these sectors to take responsibility for environmental effects from their activities, and their attempt to conserve the environment (Kamruzzaman, 2012). Thus, firms must contribute to resolve the environmental problem with integration of sustainability and environmental management issues as part of their management strategies such as project evaluation, providing external environmental reports, efficient energy consumption and waste reduction (Seetharaman, Ismail, and Saravanan, 2007). In addition, these proactive activity efforts require the environmental information quality to support reasonable decision-making. Whereas, 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, firms are forced to provide an accounting solution which is related to environmental responsibility. It is important for firms to reconsider their accounting

structure and emphasize accounting that is related to environmental issues in the annual reports.

Based on the problem above, global organizations for the accountancy profession are now confronting the demand for awareness accounting-related to environmental issues. From the traditional role of accounting, the firm only analyzes records and reports of financial information but it does not provide adequate information for environmental management purposes in the end-of-the year results for supporting the need of a firm. The International Federation of Accountants (IFAC) reviews indicate why firms and accountants should be aware of environmental issues, and then describes how the supply chain, finance providers, regulatory agencies and other stakeholders are pressuring for environmental performance and disclosure. Therefore, a firm tends to increase environmental-related costs in recognition of the potential monetary benefit of environmental performance improvement (IFAC, 2005). For this reason, 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 which is a benefit for both internal and external stakeholder decisions in economic and non-economic aspects (Muza and Magadi, 2014).

For the green society era of today, there are an increasing number of firms adopting and implementing EMA is a new managerial technology in a sector of their management strategies to give essential information involving corporate environmental management (Rikhardsson et al., 2005; Setthasakko, 2010). Moreover, 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 determinants of EMA adoption (Ferreira, Moulang, and Hendro, 2010; Bennett, Schaltegger, and Zvezdov, 2011; Jalaludin, Sulaiman, and Ahmad 2011; Wei, Burritt, and Monroe, 2011). Numerous studies investigated the barriers of EMA adoption (Bartolomeo et al., 1999; Burritt and Saka, 2006; Gale, 2006b; Setthasakko, 2010). Moreover, some studies investigated EMA practices (Bennett, Bouma, and Wolters, 2002; Moor and Beelde, 2005; Chen, 2008; Bhondekar et al., 2011). In addition, other studies focused on the benefits

received from EMA (Hansen and Mowen, 2005; Perez, Ruiz, and Fenech, 2007; Ferreira, Moulang, and Hendro, 2010).

In the above prior research and literature, there are numerous researchers and academicians who have given the definition of EMA in several aspects. EMA has no single, generally accepted definition. 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 process to identify, collect, and analyze data that is related to environmental performance for internal decision-making, and disclosing the quantitatively measured results of environmental activities to external stakeholders (Ministry of the Environment of Japan, 2002). From the discussion of EMA definitions, EMA data is not only used by firms internally, but is also made public though environmental reporting (Ministry of the Environment of Japan, 2005). Therefore, firms should focus on development and improvement of the firm capability about EMA for success in the green society.

In this research, capability is viewed as a comprehensive set of abilities of firms that facilitate and support business strategy (Burgelman, Maidique, and Wheelwright, 2004). Thus, environmental management accounting capability (EMAC) is one of the fundamental tools to achieve the success in the environmental management of the firm. For this research, EMAC 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. EMAC also plays a very important role in significant internal decision-making improvement about environmental management (IFAC, 2005). Moreover, it 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, Comier, and Magnan, 2003). In this research, EMAC consists of five dimensions: related environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation. EMAC assumes the influence

of societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development, and firm survival.

For an interest in the EMAC phenomenon, this research attempts to expand and contribute to EMAC literature. Theoretically, this research applies two principal theoretical frameworks, including the legitimacy theory and the contingency theory. Firstly, the legitimacy theory suggested that management must react to community expectations and changes (Deegan, 2001). Firms seek to operate within the bounds and norms of their respective societies, so they attempt to ensure that their activities are perceived as legitimate by outside parties. This is because the firm is part of a broader social system (Deegan, 2002) and firms must perform to society's expectations when they have to be concerned with the society in which they operate. Thus, firms will adjust their activities to meet public expectations if they need to be sustainable. Secondly, the contingency posits that superior firm performance is a result of the proper alignment of endogenous organizational design and structure with an exogenous context and environmental variable (Donaldson, 2001). In short, it suggested that organizational effectiveness depends on the ability of an organization to adjust or adapt to the environment (Pennings, 1992; Thorgren, Wincent, and Ortqvist, 2009).

Therefore, the legitimacy theory in this research is employed to explain EMAC and its consequences. The contingency theory is also applied to describe the antecedents of EMAC and the moderating effect of the relationships among the antecedents of EMAC and each dimension of EMAC.

From the discussion above, this research focuses on environmental management. ISO 14000 is the most recognized environmental management standard that helps firms manages the impact of their operation on the environment and society. For instance, Castka and Balzarova (2008) stated that ISO 14000 brings value to certify organizations such as in environmental improvement, productivity increase, community relations improvement, and market benefits improvement. In addition, Demirel and Kesidou (2011) revealed that ISO 14000 certification is effective in strengthening the positive impact of environmental management systems and stimulating different types of developed eco-products. Hence, 458 certified ISO 14000 firms in Thailand are appropriately selected as the population because these firms have awareness and

concentrate on managing the impact of their operations on society and the environment (Waenkaeo and Ussahawanitchakit, 2011).

This research proposes three contributions to the literature of EMAC. Firstly, this research proposes five dimensions of EMAC (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation) for theoretical and practical investigation. Secondly, this research is advancing the literature via classification of many antecedents and consequences of EMAC; and it develops a model to test the relationships. EMAC is examining, in terms of quantitative a variable by, collecting the data from certified ISO 14000 firms in Thailand, while most of the previous research proposed the conceptual relationships. Finally, this research proposes the concepts of the legitimacy theory and contingency theory which are adopted to explain the impact of internal and external factors of EMAC, leading to firm survival in the single model, as previous reviews of EMAC literature failed to clearly explain the antecedents and the consequences.

Purposes of the Research

The main purpose of this research is to examine the effects of environmental management accounting capability (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation) and firm survival. In addition, the specific purposes are illustrated as follows:

1. To investigate the relationships among each dimension of environmental management accounting capability (related environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation), societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development;

2. To test the relationships among environmental conservation efficiency, societal expectation fulfillment, and community relationship maintenance;

3. To determine the relationships among environmental conservation efficiency, societal expectation fulfillment, community relationship maintenance and sustainable performance development;

4. To study the relationships among sustainable performance development, and firm survival;

5. To explore the relationships among social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and each dimension of EMAC; and

6. To inspect the moderating effects of business ethics that have influences on the relationships among social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and each dimension of EMAC.

Research Questions

The main research question of this research is how EMAC (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation) has an effect on firm survival? Furthermore, the specific research questions are presented as follows:

1. How does each dimension of EMAC (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation) affect societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development?

2. How does environmental conservation efficiency has an influence on societal expectation fulfillment and community relationship maintenance?

3. How do societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance have an influence on sustainable performance development?

4. How does sustainable performance development has an influence on firm survival?

5. How do social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism have an influence on each dimension of EMAC? and,

6. How does a business ethic moderate the influence of social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and each dimension of EMAC?

Scope of the Research

This research attempts to investigate its antecedents and consequences of EMAC by utilizing two theories explaining the phenomena in this research, including the legitimacy theory and contingency theory. All theories are illustrated in the relationships among five dimensions of EMAC, its antecedents, its consequences, and its moderator constructs in the next chapter. Furthermore, this research proposes theory interaction to describe the relationship of each variable to examine and answer the research questions and objective.

For this research, EMAC is defined as the firm capability 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. In addition, EMAC comprises five dimensions; namely, environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation. Firstly, environmental identification efficiency orientation refers to the firm ability 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. Secondly, environmental practice proficiency capability refers to the firm ability 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. Thirdly, environmental reporting transparency emphasis refers to the preparation and presentation of 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. Fourthly, environmental auditing effectiveness focus refers to the continuous evaluation of 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. Lastly, environmental improvement disclosure implementation refers to the informing 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.

The consequences of EMAC consist of societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival. Subsequently, this research aims to examine the antecedents of EMAC on the five dimensions of EMAC of certified ISO 14000 firms in Thailand. Still, the antecedents of EMAC include social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism. Furthermore, this research attempts to investigate the moderating effect of business ethics factors on the relationships between social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism, and each dimension of EMAC.

With respect to the research objectives and research questions, there are many variables in the research. EMAC is an independent variable. Hence, EMAC is measured by environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation. EMAC is hypothesized to be positively associated with societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival. Within the relationships, firm survival is the dependent variable of the research. Moreover, social

responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism are independent variables. These variables are hypothesized to positively moderate all dimensions of EMAC. Furthermore, business ethics is hypothesized to positively moderate all dimensions of EMAC.

In addition, the research questions and objectives are answer by the analysis which is based on the data collected from groups of certified ISO 14000 firms in Thailand. In Thailand, groups of certified ISO 14000 firms have continuous environmental management and reflect a good environmental management system. Moreover, these firms have more potential in environmental management accounting capability than other groups. The sample in this research is data gathered from the samples drawn from the Thai Industrial Standards Institute Ministry of Industry data that is based online. Therefore, 458 listed firms are designated as a population and sample. A questionnaire mail survey operates as a data collection instrument. Statistical techniques, which include correlation analysis, variance inflation factor, factor analysis, and the ordinary least squares (OLS) regression analysis, are employed to test the postulated hypotheses.

In conclusion, the scope of this research consists of five major parts. The first is to examine the effect of EMAC on societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival. The second is to study the effect of environmental conservation efficiency on societal expectation fulfillment and community relationship maintenance. The third is to examine the influence of societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance on sustainable performance development. The fourth is to investigate the influence of sustainable performance development on firm survival. Finally, the fifth is to examine the relationships among five antecedents and each dimension of EMAC, including the moderating effect of business ethics.

Organization of the Dissertation

This research is organized into five chapters. Chapter one explains the research motivation, purposes of the research, research questions, scope of the research, and organization of the dissertation. Chapter two reviews the prior research and the relevant literature on EMAC, explains the theoretical framework to describe the conceptual model and the relationships among the different variables, and develops the related hypotheses for testing. Chapter three explains the empirical examination of the research methods, including the sample selection and data collection procedure, the variable measurements of each construct, the development and verification of the survey instrument by testing reliability and validity, the statistics and equations to test the hypotheses, and the table of the definitions and operational variables of the constructs. Chapter four reveals a data analysis and statistical results supporting the hypotheses tested. Finally, chapter five shows the discussion, conclusion, theoretical and managerial contributions, limitations, and suggestions for future research directions.

CHAPTER II

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

The previous chapter focuses on the overview of environmental management accounting capability (EMAC) comprising the purposes of the research, research questions, research objectives, and scope of the research. This chapter demonstrates more precisely the understanding of EMAC, the theoretical foundation, the literature review, the conceptual framework, and the hypotheses development. Therefore, this chapter is organized into three sections. The first section represents the discussion of principal theoretical perspectives employed to explain the research phenomenon. These theories include the legitimacy and contingency theories. The second section provides the relevant literature of all constructs in the conceptual framework, definitions, and previous studies on the subject that are relevant to EMAC. Also, a conceptual model is presented with the definition of all constructs and relevant previous literature. Finally, the final section illustrates the summary of hypotheses relationships among EMAC, its antecedents, and consequences that are discussed in this chapter.

Theoretical Foundations

Based on the literature reviewed, there is little empirical research on EMAC integrating theory to describe the complete phenomena. To clearly understand the relationships among EMAC, its antecedents, consequences, and moderators; the legitimacy and contingency theories are elaborated to explain the aforementioned relationships. These theories use synergy to describe, explain and predict all variables and relationships purpose in this research. Each of the applied theories is detailed as follows.

Legitimacy Theory

The legitimacy theory is defined as a generalized perception or assumption that the actions of any entity are desirable, proper, or appropriate within some socially construct system of norms, values, beliefs and definitions (Suchman, 1995). It is similar to Deegan (2002) who stated that the goal of the firm is to establish agreement between the social values associated with its operations and the social norms or acceptable behavior in the larger social system of which they are a part of. However, when the firm actions do not conform to the social norms, these actions represent a legitimacy gap (Alcantara, Mitsuhashi, and Hoshino, 2006). The definition of a legitimacy gap is the difference between the societal expectations about how the firm should act and how the firm does act (Lindblom, 1994). Thus, when a legitimacy gap occurs, the firms try to continuously reduce the gap in order to maximize the legitimate area (O'Donovan, 2002). Rationality reduces the legitimacy gap because firms avoid losing the benefit that is not only financial but also non-financial such as reputation and image, and eventually suffering bankruptcy.

The highlight of the legitimacy theory is to focus on the relationships between corporate social disclosure and community concerns. This theory suggests that a firm must react to community expectations and changes because a firm is a part of the society system (Deegan, 2001). In adopting a legitimacy theory, firm would voluntarily report on activities if management perceives that these activities respond to the societal expectations for maintaining its legitimacy (Cormier and Gordon, 2001). Moreover, firms should be responsible to the society by improving their activities to be compliant with society expectations. Apparently, these legitimacy actions can assist firms in overcoming problems encountered in a changing environment which leads to survival in the long-term (Pagalung, 2016).

Interestingly, the legitimacy theory is widely used in accounting research, especially in accounting ethics research working in the area of the reporting of social and environmental matters (Milne and Patten, 2002; Campbell, Craven, and Shrives, 2003; Deegan and Unerman, 2011; Mousa and Hassan, 2015; Omran, 2015). From the previous study, Patten (1992) applied the legitimacy theory to estimate the effect of the Exxon Valdez oil spill in the annual report. The result of the study supported the legitimacy theory, and the firm attempts to address this threat by increasing

environmental disclosure to retain legitimacy. Likewise, the legitimacy theory is the motives of managers on the annual report disclosure for communicating their environmental activities and thus gains legitimacy from the community (Pagalung, 2016). In addition, in European countries, as well as Anglo-American countries, the legitimacy theory is important in explaining motivations for corporate social disclosure (Adams, Hill, and Roberts, 1998). Moreover, the legitimacy theory describes the systematic changes in annual reports about environmental disclosure policies around the time of environmental impeachment. The finding of the research presented that in the years of impeachment, Australian firms provided more positive environmental information disclosures (Deegan and Rankin, 1996). Furthermore, Lindblom (1994) found that information disclosure about social and environmental performance is the best way for firms to retain their legitimacy in the eyes of society.

From prior research and the literature above, the legitimacy theory is one of the most discussed theories to explain the phenomenon of voluntary social and environmental disclosures in corporate communication. It can recommend for firms to adjust their activities to meet community expectations if the firms need to maintain firm survival. However, a firm does not need to ensure support from all of society.
It can achieve legitimacy by obtaining support from enough parties to ensure its survival (Johnson and Holub, 2003).

In conclusion, the legitimacy theory is applied to explain the effect in the context of EMAC. Mostly, the legitimacy theory explains the reasons why firms make voluntary environmental information disclosure or how EMAC fulfills these norms, due to society's expectations and acceptable behavior. Moreover, the legitimacy theory explains how EMAC helps firms survive in the long-term. Hence, in this research, the legitimacy theory explains the effect of EMAC on firm survival and it also used to establish hypotheses to link each construct.

Contingency Theory

The contingency theory explains there is no best way to organize a corporation, to lead a company, or to make decisions so that an organization which is effective in some situations may not be successful in others. In essence, the optimal action is contingent or dependent on the internal and external situation (Fiedler, 1964).

Likewise, the best way to manage any firms depends on the nature of the environment to which the firms have to relate. There are four important principles consistent with the contingency theory for the firm. Firstly, there is no universal or one best way to perform. Secondly, the design of a firm must fit with the environment. Next, effective firms have a proper fit, not only with the environment, but also between its subsystems. Finally, the needs of a firm are more satisfied when it is appropriately designed both to the tasks undertaken and the nature of the work group (Fiedler, 1964).

The heart of the contingency theory posits that if the firm needs to survive or effectively perform business operations, then the organizational structure and process of a firm must fit with its exogenous and endogenous contextual factors (Luther and Longden, 2001). Exogenous factors are environmental or industrial factors such as industry competition, government regulations, business environmental uncertainty (Khandwalla, 1972), stakeholder involvements and expectations, technological change, society, and economic conditions (Sauser, Reilly, and Shenhar, 2009); while endogenous factors are the organizational factors or internal factors such as corporate vision, organizational climate, firm resources, experience, leadership and firm policy (Baines and Langfiled-Smith, 2003; Abdel-Kader and Luther, 2008; Waweru, 2008). Thus, superior firm performance results in the proper alignment of internal and external contextual factors and operational management (Phokha and Ussahawanitchakit, 2010).

The contingency theory view of social responsibility accounting posits that the determinants of social responsibility accounting adoption in each firm would vary according to the context such as external elements, and firm structure and processes (Husted, 2000; Udayasankar, 2008). However, the contingency theory in which the firm responds to social issues, especially in social responsibility accounting, should depend on the nature of the social issues. Essentially, the nature of the social issues, in turn, depend on the expectation gaps that happen between views of what is and/or what ought to be firm performance or stakeholder perception of firm performance (Wartick and Mahon, 1994). Ultimately, the firm's response needs to constantly match the nature of social issues diversity. It faces the achievement of a sustained level of high corporate social performance (Husted, 2000).

This research implies that EMAC is a function of the fit between the nature of the social issue and its corresponding accounting concept. Furthermore, the

contingency theory gives relative consideration to terms of the factors that influence EMAC. It explores the relationships between accounting within an organization and the features of the organization. Also, it is possible to view the accounting ethics and disclosure practice as the result of an internal process, which is influenced by outside contingencies (Elsayed and Hoque, 2010). This research identifies contingency in two general types of factors contributing to EMAC that are internal and external factors. Internal factors are social responsibility vision, strategic management accounting system, market culture, and business ethics; and the external factor is stakeholder force dynamism. Therefore, the contingency theory provides a useful framework to develop hypotheses used to establish hypotheses to link each construct.

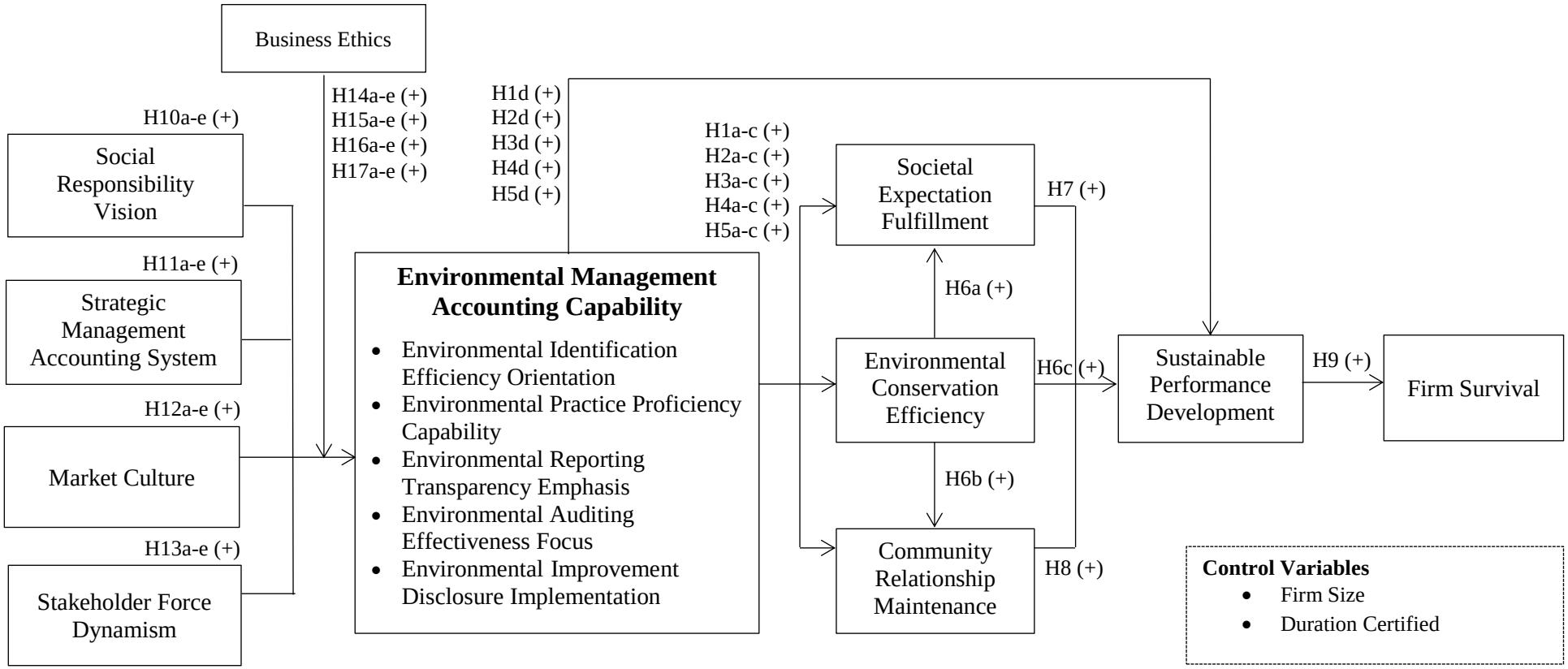
Therefore, the legitimacy theory, in this research, is employed to explain EMAC and its consequences. The contingency theory is also applied to describe the antecedents of EMAC, the moderating effect of the relationships among the antecedents of EMAC, and each dimension of EMAC.

Relevant Literature Review and Research Hypotheses

According to the theoretical foundations, this research is developed toward the integration of the legitimacy theory and contingency theory. EMAC is the main variable and the center of this research. As described earlier, this research purposes that EMAC is positively and directly associated with firm survival. Moreover, societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development are the mediating effects of the research. Societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development are supposed to have a positive relationship with firm survival.

Secondly, the four antecedents of EMAC (social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism), are investigated, and expected to yield positive relationships. Lastly, this research also purposes that the strength of business ethics increases the relationships between EMAC and its antecedents. Thus, Figure 1 illustrates the relationships among EMAC, antecedents, consequences, and moderating variables.

Figure 1 Conceptual Model of the Relationships between EMAC and Firm Survival



Environmental Management Accounting Capacity (EMAC)

For a decade, 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 seek for new, creative, and cost effective ways to minimize environmental problems (Muza and Magadi, 2014). Whereas, managers do not have accurate environmental information to support reasonable decision-making. Therefore, firms should be looking for environment-related accounting for giving essential environmental information (Rikhardsson et al., 2005). As aforementioned, environmental management accounting (EMA) can resolve such a problem. EMA is a beneficial tool to overcome limitation of conventional management accounting practice. It focuses on providing environmental information for internal decision-making purposes both in economic and non-economic aspects (Muza and Magadi, 2014). Additionally, EMA can help external stakeholders to gain clarity on detailed information about environmental performance of a firm (Pagalung, 2016).

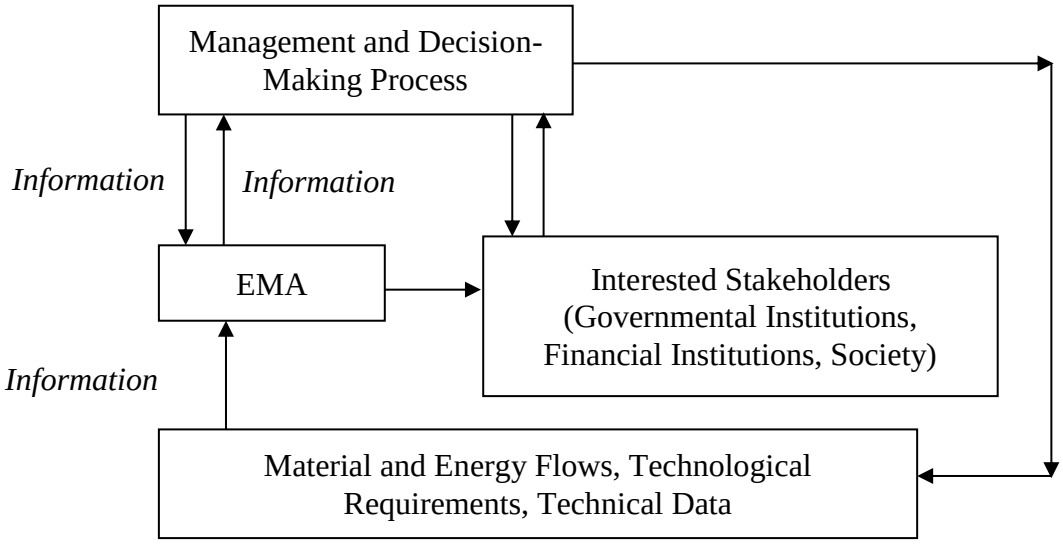
EMA was developed out of environmental accounting to address the management accounting aspects surrounding environmental performance (Debnath, Bose, and Dhalla, 2012) because the origin of environmental accounting does not focus on management accounting. Whereas, it leaned towards public disclosure information on environment-related financial operation to their stakeholders (Christmann, 2000). Many recent studies have explored the effect of non-environmental operations of firms. These studies supported that EMA could resolve the problem of conventional environmental accounting (Muza and Magadi, 2014). Thus, EMA is a part of environmental accounting (IFAC, 2005). Environmental accounting is an unmbrella term that covers financial and management accounting. The following are split between environmental financial accounting (EFA) and environmental management accounting (EMA). Table 1 shows the environmental accounting dimension of financial and management accounting.

Table 1 Environmental Accounting Dimension of Financial Accounting and Management Accounting

Branch of Accounting	Environmental Accounting Dimensions	Associated Mandatory External Reporting	Other External Reporting Links
Financial Accounting	EFA: The assessment and disclosure of environment-related financial information such as expense of environment-related investment, environmental liability, and other expense related to environmental performance.	Financial reporting to the public by national laws and international standards, which include environment-related financial information.	Firm uses some information of environment-related information for environmental regulatory reporting, national reporting, and sustainability reporting.
Management Accounting	EMA: The management of environmental and economic performance via management accounting practice focus on both physical and monetary information.	No external reporting requirement specifically. Some firm include such information voluntarity.	Firm uses some information gathered under EMA for environmental regulatory reporting, national reporting, and sustainability reporting.

For 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. EMA is divided into two functions that include internal and external functions (Ministry of Environment of Japan, 2005). Figure 2 summarizes the role of EMA.

Figure 2 The Role of Environmental Management Accounting



The figure above shows the many beneficial roles of EMA for both internal and external users (Staniskis and Stasiskiene, 2006). On the part of internal function, EMA focuses on the preparation of appropriate information related to physical and monetary environmental aspects that involve both financial and non-financial information. 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 (Burritt, Hahn, and Schaltegger, 2002). Physical EMA data is essential to the identification of different environmental aspects and allows the firm to the assessment and reporting of the physical aspects of its environmental performance. It reflects the relevant cost of firms (Tsui, 2014). Meanwhile, monetary EMA data refer to the costs of the firm's consumption of natural resources (e.g. water, energy) and costs for controlling or preventing environmental damage (Tsui, 2014). It presents in terms of monetary units such as costs of fines for breaking environmental laws, investment in capital projects that improve the environment, and monetary values of environmental assets (Burritt, Hahn, and Schaltegger, 2002). As aforementioned, EMA is a new managerial technology in a part of their management strategies to give essential environmental information for supporting the internal management and decision-making process of a firm.

In the part of external function, EMA can be placed within the concept of social accounting (Cullen and Whelan, 2006). A firm uses some of the environmental information gathered by EMA for the purpose of reducing the impact of the firm operations on the environment and society. EMA data enables interested parties to accurately assess and decide on economic and environmental performance of a firm (Deegan, 2002). Likewise, UNDSD (2001) concluded that the external function of EMA can help a firm to prepare external environmental or sustainability reporting, other reporting of environmental data to statistical agencies and local authorities, and disclosing the quantitative measurable results of environmental activities to external stakeholders. Collectively, EMA is a beneficial tool that helps firms to manage environmental performance and report environmental information to both internal and external stakeholders (Chang, 2007).

As aforementioned, firms should focus on development and improvement of the capability of a firm about EMA for success in the green society. In this research, capability is viewed as a comprehensive set of abilities of firms that facilitate and support business strategy (Burgelman, Maidique, and Wheelwright, 2004). Thus, environmental management accounting capability (EMAC) is one of the fundamental tools to achieve success in the environmental management of the firm. For this research, EMAC 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.

Based on a review of relevant literature and theories, this research argues that EMAC includes environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation. The model also introduces antecedents, consequences and moderators which focus on the link among EMAC at the organizational level. Although this research acts as a literature review of EMAC, the result is that the distinguished definitions are obtained. Initially, the various accounting scholars provide the meaning in terms of EMA as shown in Tables 2 and 3 which summarize key literature reviews on EMAC, which are presented as following.

Table 2 The Definition Stream of Environmental Management Accounting

Author(s)	Definitions of EMA
Bartolomeo et al. (2000)	The generation, analysis and use of financial and non-financial information in order to combine environmental and economic aspects into business policies, and to achieve sustainable performance.
Deegan (2002)	The collection, identification, and use of environmental cost information for support the environmental management systems of firm and provide environmental reporting to interested parties.
United Nations Division of Sustainable Development: UNDSD (2002)	The process of identification and measurement of environmental costs in the current manufacturing processes and the economic benefits of pollution protection or cleaner process, and to integrate these environmental costs and benefits to make decision.
Ministry of the Environment of Japan (2002)	The process to identify, collect and analyze data related to the environmental performance for internal decision-making and disclosing the quantitatively measure results of environmental activities to external stakeholders.
Epstein (2004)	The measurement and reporting about the impact of the firm's operations on the environment, society and economy to interest groups.
Burritt and Saka (2006)	The relatively modern environmental management tool initially designed to trace the cost of environmental costs and physical environmental flows.

Table 2 The Definition Stream of Environmental Management Accounting (continued)

Author(s)	Definitions of EMA
IFAC (2005)	The management of environmental and economic performance through the development of accounting structure which related to environmental responsibility and practices which may include reporting and auditing in some firms.
Beer and Friend (2006)	The new tool to overpower limitation of traditional management accounting to get better understanding and quantifying environment related issue for business decision-making process.
Scavone (2006)	The beneficial tool to identify the issues about environment and allow firm to manage the impact of their business activities upon the environment, as well as to report their performance to interest groups.
Chang (2007)	The tool that helps firms to manage environmental performance and report environmental information to both the internal and external stakeholders.
Setthasakko (2010)	The business tool that gives necessary data for business environmental management with comprehensive processes which link both physical and monetary information to make decision.
Vasile and Man (2012)	The process to identify collect, calculate and analyze information about environmental costs from production process of the firm in order to support the reasonable decisions about environmental protection.
Bodle and Nalder (2013)	The useful processes to provide the way for to report about environmental performance and environmental measurement of the firm.

Table 2 The Definition Stream of Environmental Management Accounting (continued)

Author(s)	Definitions of EMA
Saeidil and Sofian (2014)	The modern tool of managerial accounting which seeks to overcome restrictions and shortcomings through integration environmental management (physical information) with managerial accounting (monetary information).
Reyes (2015)	The procedure for identification collection, calculation, analyzes and reporting information related environmental issues for environmental decision-making within the firm and used for external reporting.
Sands and Lee (2015)	The way that firm provides new technique to support their sustainability performance by quantifying environmental impacts and reporting the environmental information to the workers, community, and other stakeholders.

Table 3 Summary of Key Literature Reviews on Environmental Management Accounting Capability (EMAC)

Authors	Title	Independent Variables	Dependent Variables	Results
Gibson and Martin (2004)	Demonstrating Value Through The Use of Environmental Management Accounting	EMA	Firm Performance	EMA can help firm identify its cost savings and performance on environmental, health and safety activities.
Li (2004)	Theory and Practice of Environmental Management Accounting	EMA	Environmental Decision-Making	If environmental costs information that produced from EMA is suitably traced back to product or service costs, governments sector can use this information to direct the market through taxation, help manufacturers modify manufacturing processes and set appropriate product prices.
Burritt and Saka (2006)	Environmental Management Accounting Applications and Eco-Efficiency: Case Studies from Japan	EMA Application	Eco-Efficiency	The practice of EMA can be linked to eco-efficiency. It helps Japanese business to design production processes and consumption of its products towards sustainability.

Table 3 Summary of Key Literature Reviews on Environmental Management Accounting Capability (EMAC) (continued)

Authors	Title	Independent Variables	Dependent Variables	Results
Dunk (2007)	Assessing the Effects Of Product Quality and Environmental Management Accounting on the Competitive Advantage of Firm	- Product Quality - EMA Adoption	Firm Performance	Product quality and EMA implementation are positively influence quality their performance than other firms.
Ferreira, Moulang, and Hendro (2010)	Environmental Management Accounting and Innovation: An Exploratory Analysis	EMA	Innovation Production Process	Implementation of environmental approach in the part of EMA, firms can get new ways to reduce environmental destruction from the production process, improve present production systems to reduce life cycle impacts, and create new products with lower life cycle expenses.

Table 3 Summary of Key Literature Reviews on Environmental Management Accounting Capability (EMAC) (continued)

Authors	Title	Independent Variables	Dependent Variables	Results
Jalaludin, Sulaiman, and Ahmad, (2011)	Understanding Environmental Management Accounting (EMA) Adoption: A New Institutional Sociology Perspective	Institutional Pressure	EMA Adoption	Institutional pressure has a positive impact on EMA adoption. Of these, normative pressure in training and accounting body membership are the most forceful that affects the adoption of EMA.
Wei, Burritt, and Monroe (2011)	Environmental Management Accounting in Local Government: A Case of Waste Management	- Social Structure - Organizational Context	EMA Adoption	Social structure (regulatory pressures, societal expectation, and peer councils pressures) and organizational context have strong positive effect on EMA adoption within the local government organizations of Australia.
Van (2012)	Environmental Benefits and Its Statement in Environmental Management Accounting	EMA	Firm Performance	EMA is a management tool that helps firms benchmarking the cost of environment to achieve better environmental and economic performance.

Table 3 Summary of Key Literature Reviews on Environmental Management Accounting Capability (EMAC) (continued)

Authors	Title	Independent Variables	Dependent Variables	Results
Ramli and Ismail (2013)	Environmental Management Accounting Practices: A Survey of ISO 14001 Certified Malaysian Organizations	EMA Practice	- Competitive Advantage - Firm Performance	EMA practice helps firms to achieve competitive advantage and improve firm performances because the fact that firms were able to attract more customers due to customers nowadays are more environmentally careful and would choose firms that encourage environmental protection practices
Saeidi et al. (2013)	Moderating Effect of Environmental Management Accounting on Innovation and Firm Performance: Review of Contemporary Literature	Innovation	Firm Performance	EMA as the moderator on the relationship between innovation (Product Innovation, Process Innovation, and Administrative Innovation) and firm performance. It is also stated that improvement of innovation through applies EMA leads to an increase of competitive advantage, and accordingly enhances the firm performance.

Table 3 Summary of Key Literature Reviews on Environmental Management Accounting Capability (EMAC) (continued)

Authors	Title	Independent Variables	Dependent Variables	Results
Larojan and Thevaruban (2014)	Impact of Environmental Management Accounting Practices on Financial Performance of Listed Manufacturing Companies in Sri Lanka	EMA Practices	Financial Performance	EMA Practices (environmental information, environmental evaluation, environmental cost savings and environmental laws) is positively related to financial performance. EMA Practices can help firm enhance profitability and revenue growth.
Doorasamy and Garbharran (2015)	Assessing the Use of Environmental Management Accounting As a Tool to Calculate Environmental Costs and Their Impact on A Company's Environmental Performance	EMA	Environmental Performance	EMA can improve environmental and economic performance of the firm through the provision of accurate information on environmental costs for the reasonable environmental decision-making within the firm.

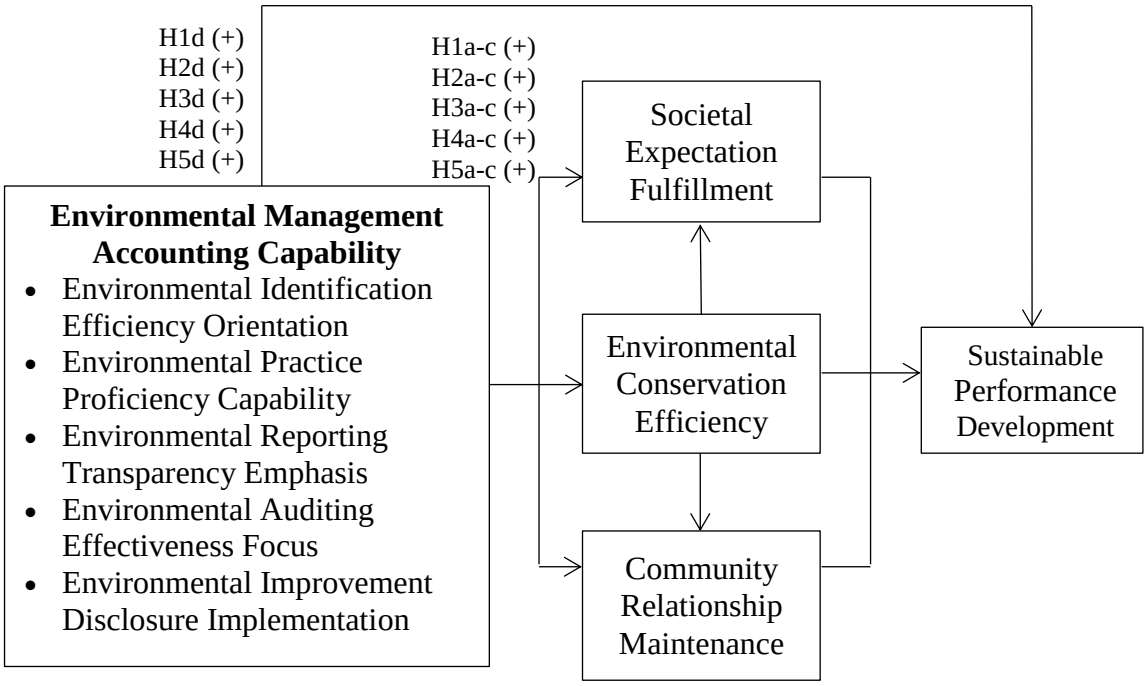
Table 3 Summary of Key Literature Reviews on Environmental Management Accounting Capability (EMAC) (continued)

Authors	Title	Independent Variables	Dependent Variables	Results
Ong et al. (2016)	Environmental Management System and Financial Performance	EMA Adoption	Financial Performance	Firms in Malaysia that adopt EMA standards such as ISO 14001 can help firms to improve financial performance in terms of ROA and ROE. The reason is the EMA adoption does offer many benefits to firms such as greater reputation and brand awareness, higher sales and investors' confidence.

The Relationships among EMAC and Its Consequences

This section shows the investigation of the relationships among EMAC which consists of five purposed dimensions: environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation; and four critical consequences which are societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. These relationships are presented as below:

Figure 3 The Effects of EMAC on Societal Expectation Fulfillment, Environmental Conservation Efficiency, Community Relationship Maintenance, and Sustainable Performance Development



Environmental Identification Efficiency Orientation

In the past few decades, firms started to consider the protection of the environment as a necessary part of their business strategy. The firm believes that it will help to improve the environmental performance to build a competitive advantage (Esty and Winston, 2009). This growing trend leads to the requirement of clearly measuring a firm's results from an environmental perspective. Ministry of Environment of Japan (2005) described that the first step in the process of environmental management for sustainable development is the correct identification of environmental costs and benefits from the firm's operations during the regular operation of business. Whereas, traditional management accounting lacks a standard definition of environmental costs and benefits. Rikhardsson et al. (2005) stated that these environmental costs are often not traced as the costs of the actual operation process, but the firm usually summary up from the general overhead. Thus, environmental managers hardly have access to the real environmental cost documents of the firm and realize just a little of the sum of environmental costs. It is difficult for firms to identify the cost of the product or service correctly (Jasch, 2010).

Based on the problem above, IFAC provides specific instructions for EMA to solve the problem of traditional management accounting practices by representing a broader term of environmental information. EMA provides a set of principles and procedures to identifying environmental costs and benefits. Furthermore, EMA provides the definition of environmental costs and benefits. It helps managers to identify environmental costs and benefits that are usually hidden in a general accounting system. There are numerous researchers and academicians who have given the definition of environmental costs and benefits. IFAC (2005) defined environmental costs as what is invested in terms of the costs associated with protection to reduce and avoid impacts from the removal of environmental remediation and other activities on the environment. Meanwhile, the environmental benefits can be evaluated in monetary benefits resulting from the match to gain the business of taking care and protecting the environment including, revenue from the sale of junk and subsidies (Jasch, 2003). Moreover, UNDSD (2003) recognized the importance of the environmental costs identification process because each firm has a variety of environmental costs such as environmental remediation cost, environmental prevention cost, research and development cost, and

social activity cost. Thus, UNDSD attempts to classify five environmental costs/expenditures that include: 1) waste disposal and emission treatment that includes all costs to maintain, remove and clean up waste and emissions; 2) prevention and environmental management that includes annual costs incurred for the protection of waste and emissions; 3) material purchases value of non-product output that includes waste material costs due to ineffective production; 4) processing costs of non-product output that includes labor hours, depreciation of machinery and operating materials, and financing costs. These costs will add up to the environmental cost, based on related-production cost and; 5) environmental revenues are the last category that includes revenue from sales of waste and subsidies from the government.

In this research, environmental identification efficiency orientation is the first dimension of EMAC. It is the dimension of the accounting procedure that focuses on the efficiency of the firm to identify environmental costs and benefits. Therefore, environmental identification efficiency orientation in this research is defined as 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 (Ministry of Environment of Japan, 2002; Vasile and Man, 2012).

The previous literature shows that EMA allows managers to identify the opportunities and accurately calculate for cost savings from good environmental management (Jasch, 2003). In addition, if the firm has a good process to identify environmental cost for cost saving in the long run, it can help a firm improve the performance over the long-term (Johnson, 2004). Moreover, the firm efforts to identify the environmental damages generate benefits to its society, community, and environment (Vasile and Man, 2012).

Therefore, firm with environmental identification efficiency orientation cues in EMAC will be able to attain greater societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Thus, the hypotheses are proposed as follows:

Hypothesis 1a: Environmental identification efficiency orientation is positively related to societal expectation fulfillment.

Hypothesis 1b: Environmental identification efficiency orientation is positively related to environmental conservation efficiency.

Hypothesis 1c: Environmental identification efficiency orientation is positively related to community relationship maintenance.

Hypothesis 1d: Environmental identification efficiency orientation is positively related to sustainable performance development.

Environmental Practice Proficiency Capability

Today, there is an increasing awareness about the importance of corporate social responsibility among all the stakeholders, particularly as to green concepts.
This is driven by the need to maintain and protect the environment along with the development of the industry. Thus, when the environment changes, business operations change as well. That is, the operations should modify the achievement of optimum performance consistent within the context of the changes.

From the discussion above, management accounting practice is a highlight that allows a firm to operate successfully in today's business environment because the key functions of management accounting focuses on providing the information to management for internal decision-making, both monetary and non-monetary. However, traditional management accounting ignored the environmental impacts on firms (Milne, 1996). It lacks standards about accounting practices that focus on monetary and physical information about environment-related costs, earnings, and savings. It may bring many problems to the firm. For example, a firm has a case study of costs associated with environmental litigation. Firms also have many problems about the turbidity in accounting practice such as when recognized, how much, how report, and how period. Also a firm must disclose to be accurate and appropriate (IFAC, 2005). Importantly, in matters related to the environment, the firm must be very careful not to disclose too much so as to damage the reputation or image of the firm.

In accounting practices, if accounting information is unclear, it causes wrong decisions which will impact the firm through the loss of business or loss of opportunity cost. For example, waste management cost is 500,000 baht per year. Its executives expect expenses to increase in the long-term. This issue receives attention from the administration as a special case, and they discuss how the method can reduce the cost to 50 percent of the proposed project as an investment 300,000 baht which is based on traditional accounting. In fact, to pay 300,000 baht to reduce costs, 250,000 baht is unsatisfactory. However, the new concept of EMA will be able to clearly collect, calculate and analyze information about the costs associated with the environment in which there is more than 500,000 baht because the actual costs are related to several items such as waste management cost, storage, maintenance and other costs associated with the waste. Thus, the total waste cost is 800,000 baht. However, if the firm invest 300,000 baht in order to reduce costs of 400,000 baht, this project may be considered satisfactory. Therefore, best environmental practice of the firm can give accurate accounting information that affects the right decision as well (Jing and Songqing, 2011). Hence, 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 control, cost allocation, capital budgeting, and product pricing.

In this research, environmental practice proficiency capability is the second dimension of EMAC. It is the dimension of the accounting practices. Environmental practice proficiency capability is defined as 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 (Ministry of Environment of Japan, 2002; Munteanu, 2013). The value of environmental practice proficiency has results under EMAC which is to be forwarded to the executive for a decision. If such information is accurate and clear, it would be useful for decision-making (Jing and Songqing, 2011). The method of accounting under the EMAC may lead to opportunities for cost savings or as an opportunity to create value (Jasch, 2003; Gale, 2006a).

In accounting research, there is much research that studies the best EMA practices and its consequences. Ministry of Environment of Japan (2002) reported that accounting practice related to the environment helps firm to increase its society trust and confidence because firms are fair to assess the environmental impact. Similarly, EMA practice is a beneficial procedure for management with an interest in the environment. 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 helps firms to identify business activities that negatively impact society and the environment. Moreover, accounting practice related to the environment that is aware of environmental costs and benefits. It can help managers in their strategic planning and can help them to reduce environmental problems in the business activities (Howes, 2004). In addition, the concept of EMA practice helps a firm to collect, calculate, and analyze the amount of any costs that are derived from the use or destruction of environmental resources, and non-use of those resources. This information consists of three issues. The first is direct use value, associated with its use of resources according to commercial or recreational purposes. The second is indirect use value which is a benefit of society. Finally, option values are opting to pay to use the resources in the future; the resources are not for commercial use, but for environmental conservation (Navrud and Pruchner, 1997; Damigos, 2006). In contrast, according to the work of De Palma and Csutora (2001) it was found that if firms cannot adapt and integrate EMA practice to match with current accounting practice, it is unlikely that the firm can enhance its performance from the accounting practice related to the environment.

Therefore, a firm with environmental practice proficiency capability cues in EMAC will be able to attain greater societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Thus, the hypotheses are proposed as follows:

Hypothesis 2a: Environmental practice proficiency capability is positively related to societal expectation fulfillment.

Hypothesis 2b: Environmental practice proficiency capability is positively related to environmental conservation efficiency.

Hypothesis 2c: Environmental practice proficiency capability is positively related to community relationship maintenance.

Hypothesis 2d: Environmental practice proficiency capability is positively related to sustainable performance development.

Environmental Reporting Transparency Emphasis

Developmental trends related to environmental issues may represent a major challenge as well as provide opportunities for the business (Brammer, Pavelin, and Porter, 2006). Therefore, firms need to be able to respond to environmental challenges effectively through the environmental reporting of firm. However, in general, the firm report refers to documents or information from the firms which are prepared to provide information and are used as a communication tool that can create confidence in the transparency of the firm (Lungu et al., 2011). The purpose of the firm report is to provide useful information for decision-making, especially in financial reporting (Mahdavikhou and Khotanlou, 2011). Whereas, financial reporting ignored the environmental impacts on the firms; while at present, stakeholders focuses on the environment even more (Milne, 1996).

From the discussion above, firms are facing increasing pressure from various stakeholders to request better environmental disclosures in annual reports and accounts. The different stakeholders request a variety of types of environmental information (Staniskis and Stasiskiene, 2006). For example, the corporate executive needs environmental information on costs, revenues and profits. However, in environmental organizations, environmental protection agencies and the community requests information on its environmental impacts. Moreover, shareholders, investors, and tax authorities are concerned about environmental assets and liabilities. Thus, firms are

trying to prepare and present environmental reporting to all parties for the correct decision-making (Dixon, Mousa, and Woodhead, 2005). Therefore, firms should focus on the preparation and presentation of information related to environmental reporting effectiveness.

The environmental reporting is a voluntary report to the public for communicating the information about the environmental activities of the firm and to provide useful information to those who are interested (Moor and Beelde, 2005). The environmental report will be reported to firm responsibility for things related to the environment such as environmental policy, environmental practices, environmental activities, and future directions (Azzone et al., 1997; Dixon, Mousa, and Woodthad, 2005). The purpose of the environmental reporting is similar to that of financial reporting. That is, to provide current information relevant to the decisions of stakeholders. Environmental reporting includes two fundamental functions (Ministry of Environment of Japan, 2007). The first function is an external (or social) function. It serves about disclosure of information based on corporate social responsibility and provides valuable information for stakeholders for economic decision-making. The second function is an internal function. It serves to review the environmental policy, environmental objectives and action plans about the environment, and encourages executives and employees featured in environmental activities. Moreover, the quality of environmental reporting requires a transparency feature to prepare the report. When disclosing environmental information, it should be represented reliably, faithfully represented, neutrality, complete, and verifiability. Hence, environmental reporting transparency emphasis in this research 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 (Dixon, Mousa, and Woodhead, 2005; Khuntia,2014).

In an accounting empirical perspective, prior research indicated that the reporting about environment issues that produce information by EMA has an ability to improve the relationship of customers, society, shareholders, employees, and the community; and it gives extra information exceeding stakeholder expectations. Similarly, the firm that can represent good environmental performance in the

environmental reporting to its stakeholders. It may be beneficial to financial and non-financial performance. Particularly, its share price may increase, improving the firm image and building better relations with relevant stakeholders (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 and Magnan, 2003). Furthermore, environmental reporting improves decision-making, business planning, and increases overall performance of firm (Staniskis and Stasiskiene, 2006). Ultimately, the awareness of environmental issues by reporting about the environmental performance and activities on the website of the firm can help a firm to present its environmental and social responsibility (Zhang, Gao, and Zhang, 2007).

Therefore, a firm with environmental reporting transparency emphasis cues in EMAC will be able to attain greater societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Thus, the hypotheses are proposed as follows:

Hypothesis 3a: Environmental reporting transparency emphasis is positively related to societal expectation fulfillment.

Hypothesis 3b: Environmental reporting transparency emphasis is positively related to environmental conservation efficiency.

Hypothesis 3c: Environmental reporting transparency emphasis is positively related to community relationship maintenance.

Hypothesis 3d: Environmental reporting transparency emphasis is positively related to sustainable performance development.

Environmental Auditing Effectiveness Focus

Environmental auditing is an important component of environmental management systems. During the last decade there was dramatic growth in the development and implementation of environmental auditing. The environmental auditing processes are changing significantly. These audits are now becoming sustainability auditing that focus on both the social and environmental impact of the firm by comparing it with the goals of the firm and its stakeholders. These sustainability audits are necessary to repeat, compare, be faithful, be systematic, be representative in content and disclose the findings to the public (Mohr-Swart, 2008).

Generally, environmental auditing is a tool of environmental management. Environmental auditing is the system which has documents including schedule, time and objectives for the environmental assessment of the firm. It focuses on the physical or monetary environmental information that checks and verifies the data, information, and processes (Gui-zhen et al., 2007). The main use of environmental auditing is as a checklist of compliance with firm policies and regulatory requirements and standards (Schaltegger and Burritt, 2000). 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). Therefore, environmental auditing effectiveness focus in this research is defined as the ability of firm to evaluate of 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 (Moor and Beelde, 2005; Gui-zhen et al., 2007).

Previous literature found that the purpose of environmental auditing is to ensure compliance with local environmental laws and regulations and respond to society's needs (Delakowitz and Hoffmann, 2000). Likewise, environmental auditing supports a relationship between a firm and its external stakeholders such as qualified technician professionals, individual industries, other public authorities, industrial associations, and their communities (Selvam, 2003). Furthermore, Uberoi (2003) confirmed that environmental auditing in India serves as an important environmental management tool for the development performance of firms and industries in the long-term. Similarly, Thompson and Wilson (1994) explained that environmental auditing is

the monitoring process of the environmental management system, compliance with laws and regulations, compliance with policies, and the development of an action plan to deal with defects leading to enhancing firm performance. In addition, environmental auditing provides an indication to firm management about how the environmental organization system is best practice in order to conserve air, water, soil, plant and animal life from the business operation (Ingole, 2012). Moreover, the Confederation of British Industry revealed that environmental auditing includes the planning for monitoring emissions into the atmosphere, water, soil, neighborhood effects, and public recognition of the community about the firm's activities (Betianu and Georgescu, 2008). Whereas, Augustine et al. (2013) noted that if the firm cannot evaluate objectively the business activities with significant environmental impact, environmental auditing may not help the firm reduce environmental problems and achieve the environmental objectives and targets.

Therefore, a firm with environmental auditing effectiveness focus cues in EMAC will be able to attain greater societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Thus, the hypotheses are proposed as follows:

Hypothesis 4a: Environmental auditing effectiveness focus is positively related to societal expectation fulfillment.

Hypothesis 4b: Environmental auditing effectiveness focus is positively related to environmental conservation efficiency.

Hypothesis 4c: Environmental auditing effectiveness focus is positively related to community relationship maintenance.

Hypothesis 4d: Environmental auditing effectiveness focus is positively related to sustainable performance development.

Environmental Improvement Disclosure Implementation

The traditional business model before the business pays interest to environmental issues is that it has a conflict between business operations and environmental interest groups because they have different objectives. The business desires to maximize profit but the environmental interest groups want to improve a sustainable environment. Thus, there is an increasing request from the environmental interest groups on the importance of the environmental improvement from the firm (Howes, 2002). Accordingly, over the past decade, the concept of sustainable development has been explained together with consideration of economic growth, environment, and society. This concept is used in business planning and decision-making (Schmidheiny, 1992). The large firms in multinational corporations begin to pay attention to environmental problems through supporting and encouraging environmental improvement, while their reports make the environmental improvement of businesses available to the public (Axelrod, 1998).

Currently, there are many ways, both directly and indirectly, that firms can take responsibility for encouraging environmental improvement. Directly, the firm should adopt the concept of cleaner production within the firm (Parker, 1998). This concept will introduce the firm by integrating the environmental strategy, especially environmental improvement issues into the core strategy of the firm. Cleaner production aims to optimize the use of resources and enhances operational efficiency over the entire lifecycle, continuously minimizing waste disposal and environmental remediation according to society's needs. It is the concept of continuous improvement in environmental and economic performance (Environment Institute of Australia, 1995).

Indirectly, more accounting information disclosure about environmental improvement of a firm shows awareness of environment problems. 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 concerned 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). Therefore, in today's globalized economy, the firm is encouraged more to disclose environmental improvement for helping the firm to build

good relationship of environmental interest groups, communities, and governments. This works more effectively toward the achievement among of business (Rondinelli and Berry, 1997). Therefore, environmental improvement disclosure implementation in this research is defined as informing 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 and Mathur, 2000).

However, based on the literature review, one empirical research also investigated how potential investors reacted to the offsetting of the impacts of positive environmental solution disclosures when firms operating in environmentally sensitive industry, are faced with negative liabilities (Milne and Patten, 2002). Similarly, the work of Lee and Sweeney (2015) explored the effect of corporate environmental disclosure on litigation awards. The results found those voluntary environmental disclosures 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. Moreover, the firm, encouraging environmental, improvement would create a commitment and willingness of customers to purchase products of firm because they believe that this product is an environmentally friendly (Ottman, 1998). Furthermore, 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. Likewise, community and society give more attention to the policy of reduction and protection as to pollution, and guides the environmental solutions of the firm (Bristol-Myers, 1998). Interestingly, environmental information disclosure is a tool of the public in decisions about the environmental performance of the firm. It allows firms to reduce operating inefficiencies, improve environmental performance and increase awareness of regulatory requirements. However, on the other hand, more environmental disclosure is not essentially good for the firm. Jia and Sulkowski (2010) concluded that more environmental solution disclosures may represent potential environmental problems within the firm. These environmental disclosures affect the firm image in the public eye. Moreover, the firms may receive punishment from the public if the firms disclose the

environmental data beyond the actual environmental operations or is unable to operate in accordance with environmental policy which is disclosed to the public (Monz, 2012).

Therefore, a firm with environmental improvement disclosure implementation cues in EMAC will be able to attain greater societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Thus, the hypotheses are proposed as follows:

Hypothesis 5a: Environmental improvement disclosure implementation is positively related to societal expectation fulfillment.

Hypothesis 5b: Environmental improvement disclosure implementation is positively related to environmental conservation efficiency.

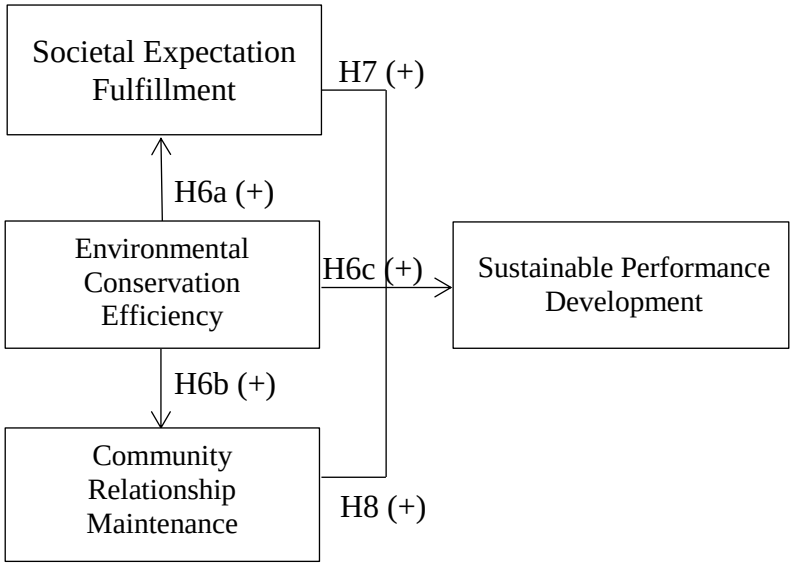
Hypothesis 5c: Environmental improvement disclosure implementation is positively related to community relationship maintenance.

Hypothesis 5d: Environmental improvement disclosure implementation is positively related to sustainable performance development.

The Relationships among the Consequences of EMAC

This section examines the relationships among the consequences of EMAC consisting of societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance on sustainable performance development. The literature review on the definition of each construct and purposed hypotheses are discussed below.

Figure 4 The Effects among Societal Expectation Fulfillment, Environmental Conservation Efficiency, and Community Relationship Maintenance, and Sustainable Performance Development



Environmental Conservation Efficiency

In the past few decades, environmental impacts by firms are now attracting severe concern from the public (Namakonzi and Inanga, 2014). Many industries have come under criticism for environmental destruction, although these industries are trying to present projects to improve the environment. The concerns of the public have increased in accordance with rising investment in these industries. The United Nations (2002) proposed development projects to support human rights and the environment by requesting cooperation from the business sector. This project expects that these member firms will have greater responsibility to society and the environment; especially the industries who are the big polluters include the auto, mining, oil and chemical industries. The United Nations Environment Programme (2015) has reported a growing gap between the efforts of firms to reduce the impact of the firms operation that affects the environment, and the increase of the investment in business concerning environmental destruction. Apparently, this gap shows that member firms are not truly eager in the safeguard environment.

As aforementioned, in today's globalized economy, there is an increasing awareness from stakeholders on the importance of environmental conservation (Howes,

2002). Many environmental pressure groups request better environment The examples of such pressure groups include Green Peace, United Nation Environment Programme (UNEP), and Organization for Economic Co-operation and Development (OECD) which are among the international organizations currently supporting better environmental management (Namakonzi and Inanga, 2014). These pressure groups campaign on various environmental issues such as environmentally friendly products, and cleaner production of business operations. Thus, many firms become more responsible towards the environment and invest a substantial amount of money and effort to conserve the environment (Kamruzzaman, 2012).

Environmental conservation is the broad term for anything that furthers the goal of firms making for more sustainability for the planet. Environmental conservation is defined as the protection, reduction and avoidance of the impacts on the environment, the removal of such effects, restoration after occurrence of environmental problems, and other activities (Ministry of Environment of Japan, 2002). It is divided into three types, including environmental conservation cost, environmental conservation benefit, and economic benefit associated with environmental conservation activities during the normal course of business. Firstly, environmental conservation cost is defined as the investment and costs from the prevention, reduction, and avoidance of environmental impacts, removal of such impacts, restoration following the occurrence of a disaster, and other activities. Secondly, environmental conservation benefit is defined as the benefits obtained from the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities that are measured in physical units. Lastly, economic benefit associated with environmental conservation activities is defined as the benefits to a firm's profit as a result of carrying forward with environmental conservation activities that are measured in monetary value. Importantly, Ministry of Environment of Japan (2002) highlighted that environmental conservation activities of firm cannot reduce all the impacts to the society and environment from its business operations. Nevertheless, these environmental conservation activities can help firm to establish firm image and reputation.

In this research, environmental conservation efficiency is defined as the achievement of the firm to protect, reduce and avoid the impacts on the environment

from the business operation, the removal of such effects, renewal after the occurrence of environmental problems, and other environmental safeguarding activities (Ministry of Environment of Japan, 2002). From the literature review found that there are several academics who study the issues about environmental conservation. Welch and Hibiki (2002) revealed that the firm's efforts to solve the pollution problems caused by the manufacturing processes will make a good image in the eyes of a neighborhood or community group. Likewise, environmental conservation activities are an effective way to maintain firm image and increase social satisfaction (Ministry of Environment of Japan, 2002). Moreover, environmental conservation activities such as investment in energy conservation have positive correlations with the cost savings of raw materials and fuel, and increase the profitability and growth potential of firms (Hibiki and Arimura, 2004). Importantly, pollution reduction activity is positively related to corporate performance development both financial and environmental aspects (Guenster et al., 2011). Likewise, recognizing the benefits of environmental conservation activities will lead to improving the management strategy of the firm for better environmental performance (Clarke, 2006). Similarly, Brouwers et al. (2014) supported that the attempt to prevent emission of air pollution has a positive relationship with firm performance. Ultimately, Hibiki and Arimura (2004) explored motivations with respect to the environmental conservation of a firm. The results indicated that regulatory compliance, firm image, and cost savings are strong motivations for a firm to change its manufacturing processes which reduce pollution emissions and other environmental problems.

In summary, environmental conservation efficiency has the potential possibility to provide greater sustainable performance development. Hence, the hypotheses are proposed below:

Hypothesis 6a: Environmental conservation efficiency is positively related to societal expectation fulfillment.

Hypothesis 6b: Environmental conservation efficiency is positively related to community relationship maintenance.

Hypothesis 6c: Environmental conservation efficiency is positively related to sustainable performance development.

Societal Expectation Fulfillment

Generally, society is a large group of people who share similar values, laws, traditions and are living in the same geographic areas for joint benefits. Moreover, society members often share religions, politics or culture together (Jenkins, 2002; Hasegawa, Shinohara, and Broadbent, 2007). The social-political approach indicates that social influence is one of several external factors that affect business operations, because business is one part of society. The changes in common societal expectation will affect the needs and demands of the society on business. These changes present both threats and opportunities for the business. It may kill some businesses or propel other businesses to high profits, and provide opportunities to create new markets. As aforementioned, firms should give priority to social expectation in order to survive in the long term.

In prior research and literature reviews, there are numerous researchers and academicians who have given the definition of social expectation in several aspects. Social expectation is defined as the general emotion of a society about what all members of society should do (Hasegawa, Shinohara, and Broadbent, 2007). Furthermore, social expectation is a set of the hopes that develop through the practice of public conversation and joint action, so that it works as a motivation for socially meaningful activities (Bellah et al., 1991). The sociology approach describes several major goals of a business role on social expectation. First, it serves internal and external stakeholders in the economic activity of the business such as consumers, employees, and shareholders. Second, it involves the physical environment of the business, including such activities as the prevention of air pollution and other environmental hazards. Finally, businesses attempt to address social problems and promote the welfare of the community (Rahahleh and Sharairi, 2008). Thus, in the context of business, several firms pay more attention to establish social responsibility activities to fulfill social expectation because these firms believe that social expectation is able to increase firm performance and enhance good relations with the community and environment. (Henriques and Sadorsky, 1999).

This research defines societal expectation fulfillment as the accomplishment of the firm that is able to respond to society's needs in all aspects, and can operate in accordance with the values, laws, and traditions of the society (Bellah et al., 1991; Jenkins, 2002). Prior studies suggested that firms which focus on the society need as primary goal of business operations are that likely to design business processes in accordance with the social perspective in order to increase transactions, customer reliability in products, or services over competitors and greater profitability (Berry and Rondinelli, 1999; Rachael, Jennifer, and Stephane, 2009). Similarly, the work of Berman et al. (1999) found that a firm that cares for society's needs will lead itself to superior business performance. Also, a response to social requirements can improve stakeholder relationships and enhance firm reputation (Eiadat et al., 2008). Furthermore, the previous research suggested that investors believe that the firm which has business ethics and corporate social responsibility will positively affect stock prices or abnormal returns (Brammer, Brooks, and Pavelin, 2009).

In summary, societal expectation fulfillment has the potential possibility to provide greater sustainable performance development. Hence, the hypothesis is proposed below:

Hypothesis 7: Societal expectation fulfillment is positively related to sustainable performance development.

Community Relationship Maintenance

A community is a social unit (a group of three or more people) that shares common values, norms, identity and is located in a given geographic area (Paul, 2006). Group members are linked with strong relationships that extend beyond relationships within the family. Freeman (1984) stated that the community is a group that can affect or is affected by achievement of the firm goal. A social-political approach cited that modern business should pay attention to maintaining community relationships. Accordingly, in recent years, several firms continuously focus on the community relationship issues.

Recently, academics interested in community relationship maintenance implying that the firm and community need practice to understand each other, the same

as in consulting with each other. Community relationships mirror the need in practice for firms to understand, listen, and develop a dialogue with their community. The community relationship is assume to consist of interactive, mutually-engaged and responsive relationships that establish the very context of doing modern business, and creates the groundwork for transparency and accountability of the firm (Andriof, 2002). Moreover, in an empirical aspect, one study indicated that trust, commitment, satisfaction, control of mutuality and dialogue could all be considered to be essential characteristics of good firm-community relationships (Kent and Taylor, 2002), because without them, the relationships would be bad (Jahansoozi, 2006). Hence, the firms should manage relationships with the community that influences business to lead to superior satisfaction that is critical for successful firms in a hypercompetitive environment (D'Aveni and Gunther, 2011).

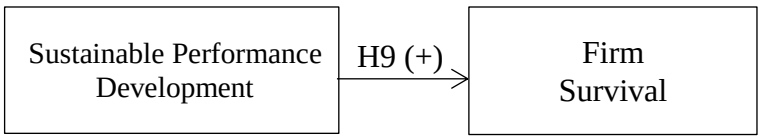
In this research, community relationship maintenance focuses on the development of a long-term mutual relationship between a firm and its community. Thus, community relationship maintenance is defined as the continuous keeping of trust, commitment, satisfaction, control of mutuality and dialogue between a firm and its community in order to build mutual benefit in both the short term and long term. In an accounting empirical perspective, one study indicated that community relationship maintenance impacts firm performance in both financial and non-financial aspects. Chang (2007) suggested that good relationships with the community impacts market value, trading volume, employee commitment, and stakeholder acceptance. Likewise, D'Aveni and Gunther (2011) showed that good relationships among firms, society, and community are the key factors that help a firm to build sustainable financial performance and overall performance. Moreover, Rais and Goedegebuure (2009) found that charitable activities of a firm toward its community can improve the competitive advantage. Interestingly, Post, Preston, and Sachs (2002) mentioned that community orientation helps a firm to create wealth. Lastly, community involvement positively influences firm reputation and image (Weber, 2008).

In summary, community relationship maintenance has the potential possibility to provide greater sustainable performance development. Hence, the hypothesis is proposed below:

Hypothesis 8: Community relationship maintenance is positively related to sustainable performance development.

This part examines the effects of sustainable performance development on firm survival.

Figure 5 The Effects of Sustainable Performance Development on Firm Survival



Sustainable Performance Development

The concept of performance is essential in the business domain. Many scholars have tried to define it from past to present, so there is still no generally accepted definition of this concept (Capron and Quairel-Lanoizelee, 2005). Many various definitions have been submitted in the literature. For instance, performance is about the accomplishment of the business goals, whatever their nature and their variety (Bourguignon, 2000). However, due to the evolution of the business roles in terms of economy and society, the concept of performance has evolved (Cramer, 2002). The traditional vision of performance was limited to the short term and the financial vision of the firm. Subsequently, it was replaced with a larger vision. This new vision recommends the concept of the Triple Bottom Line (TBL), contained in financial, social, and environmental aspects. According to this concept, firms need to achieve a minimum performance in all three aspects in order to be labeled as having sustainable performance (Elkington, 1997). Thus, in this respect, a firm has sustainable performance if the firm achieves its financial, social and environmental objectives.

As aforementioned, the sustainable performance of the firm divides into two groups, which are financial performance and non-financial performance (Prempanichnukul and Ussahawanitchakit, 2010). Financial performance is defined as the degree of the actual attainment of organizational financial goals such as sales,

profits, cost, return on assets, and return on investment (Miller, 1992; Chenhall and LangfieldSmith, 1998; Choe, 2004). Some empirical EMA research investigated the associations between EMA and sustainable performance and has experienced positive relationship results. Prior research found that EMA adoption increases material efficiency, reduces risk and cost of environmental protection, and identifies total costs of the inefficiency process (Gadenne and Zaman, 2002; Petcharat and Mula, 2012). Moreover, in the context of Thailand, EMA provides information for firms about the environmental prevention cost (such as research and development cost and environmental cost dealing with training and consultants), and environmental-related revenues (such as government subsidies and revenue from sales of re-used products) for improving financial performance in terms of cost reduction from environmental taxes and fees, productivity improvement, and waste management effectiveness (Sirisom and Sonthiprasat, 2011). Accordingly, sustainable performance in the financial performance aspect of empirical EMA research focuses on cost-saving in the long term.

Besides, on the part of non-financial performance, Prachsriphum and Ussahawanitchakit (2009) stated that in the context of accounting for social responsibility, non-financial performance refers to nonmonetary and qualitative measures, such as customer satisfaction, stakeholder acceptance, and number of new customers. Some prior EMA studies suggested that EMA and sustainable performance have experience positive relationship results. According to the work of Jasch (2003) it was shown that EMA practice helps a firm to improve non-financial performance through an increase their reputation and image in the eyes of stakeholders such as employees, customers, finance providers, society, communities, and the government. So, sustainable performance in the non-financial performance aspect of empirical EMA research focuses on customer satisfaction, stakeholder acceptance, and the number of new customers. Therefore, this research defines sustainable performance development as the supreme potential of the firm in continuously increasing and maintaining its business performance both in financial and non-financial performance, to achieve its operational goals and competitive advantage in the long run (Holliday, 2001: Dyllick and Hockerts, 2002).

Firm Survival

In the short term, businesses attempt to archive their short-run goals, superior performance, cost reduction, and market share (Venkatraman and Ramanujam, 1986). However, in general, the purpose of the firm is to retain the business to survive over a long period of time. Thus, long-term business goals, such as firm survival, are now becoming a hot issue of interest. For businesses, survival performance involves sustaining and expanding economic growth, shareholder value, prestige, corporate reputation, customer relationships, and the quality of products and services (Szekely and Knirsch, 2005). Accordingly, firm survival is important to businesses that have the desire to happen with the business.

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 (Dyllick and Hockerts, 2002; Szekely and Knirsch, 2005). The 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, Post, and Preston, 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 summary, sustainable performance development has the potential possibility to provide greater firm survival. Hence, the hypothesis is proposed below:

Hypothesis 9: The higher the sustainable performance development is, the more likely that firms will gain greater firm survival.

The Relationships among EMAC and Its Antecedents

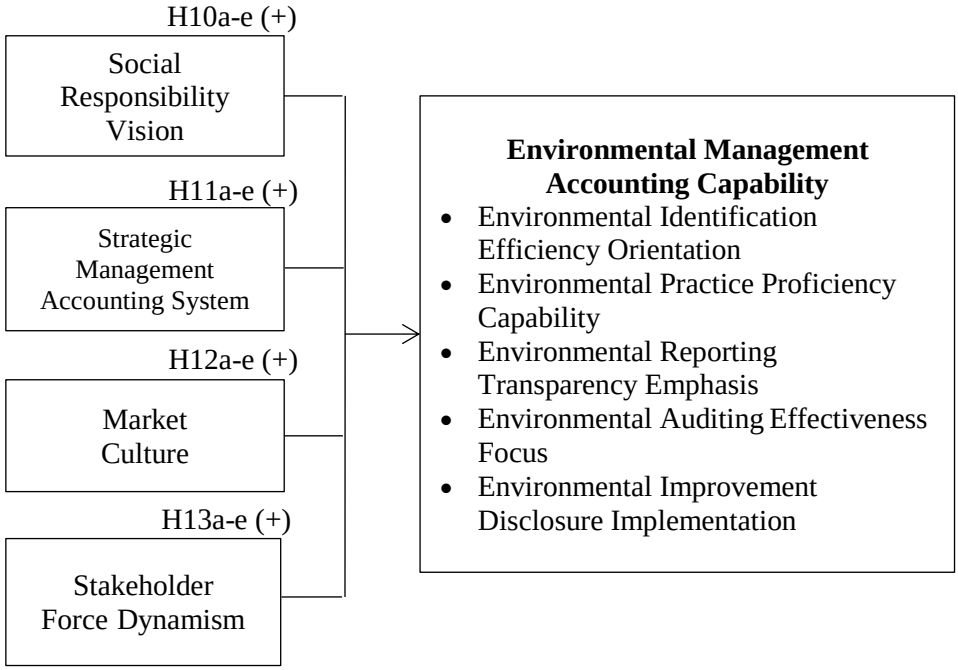
This section presents the influence of the purposed antecedents of EMAC. With regard to the contingency theory, this research purposes social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism as the significant antecedents of EMAC dimensions: environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Therefore, the aforementioned relationships are illustrated in Figure 6.

Social Responsibility Vision

Nowadays, the world has quickly and extensively changed. Some changes have signs that enable firms to respond and keep pace. However, some changes occur suddenly without warning such as the effects of natural disasters on a financial crisis. Changes make management difficult and have a dramatic impact on social survival. The changes occur at any time and are difficult to avoid. However, adjustment is important because those represent an advantage or disadvantage of the firm. If firm can quickly adapt itself, a firm can survive in the long term. This means that the management of firm must have a vision that is the key concept (Collins and Porras, 1991).

Vision is a reality, not a dream, which acts as a force within a leader, and which means the leader has the ability to see the formulae of future growth and improve the present firm operations (Snyder and Graves, 1994). Executives whose vision has to change and develop over time, leads to achieve goals (Bloomfield and Vurdubakis, 1997). Interestingly, Srikarsem and Ussahawanitchakit (2009) concluded the definition of 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. The vision supports strategy planning and design appropriate for course actions. Especially, strong vision as fundamental values, creates credibility for the stakeholders (Bonn and Fisher, 2011).

Figure 6 The Effects of the Antecedents on EMAC



In recent years, social responsibility vision is an interesting concept to the firm. It is a concept about the integration of ethics and social and environmental business practices with voluntary disclosure (Jones, Comfort, and Hillier, 2005). Moreover, social responsibility vision needs to respond to economic, social and environmental factors which focus on the benefits to the individual, community and society. However, social responsibility vision can serve as the foundation of the long-term development and growth of firm (Persic and Markic, 2013). 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 (Jones, Comfort, and Hillier, 2005; Lin, Yang, and Liou, 2009). Thus, this research defines social responsibility vision as the concept of the goals for future-oriented management that reflects awareness and features society's needs which give rise to balancing the economy, society and the environment, and surviving in the society for the long term (Warhurst and Mitchell, 2000; Waenkaeo and Ussahawanitchakit, 2011).

Prior research found that the executive vision for sustainability development impacts social responsibility accounting (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 considerations (London, 2008). Moreover, many researchers mention that social responsibility concentration is positively related to the environmental performance of the firm (Goll and Rasheed, 2004; Rodriguez and Cruz, 2007).

In summary, from the evidence above, there is a possibility that social responsibility vision will affect EMAC under the contingency theory. At this point, in order to analyze the influence of social responsibility vision that affects the five dimensions of EMAC, the hypotheses are proposed as follows:

Hypothesis 10a: Social responsibility vision is positively related to environmental identification efficiency orientation.

Hypothesis 10b: Social responsibility vision is positively related to environmental practice proficiency capability.

Hypothesis 10c: Social responsibility vision is positively related to environmental reporting transparency emphasis.

Hypothesis 10d: Social responsibility vision is positively related to environmental auditing effectiveness focus.

Hypothesis 10e: Social responsibility vision is positively related to environmental improvement disclosure implementation.

Strategic Management Accounting System

Management accounting is important and necessary to firm success. The role of management accounting is to prepare accurate and useful management accounting information for management decisions (Mia and Clarke, 1999). Interestingly, management accounting functions generally support two main objectives. Firstly, they generate routine reports containing information regarding cost control as well as the planning and controlling of operations. Secondly, management accountants produce special reports for the executive to be used for strategic decisions on certain matters such as choosing products to emphasize or de-emphasize, pricing products or services, investing in equipment, formulating overall policies and long-range planning (Valanciene and Gimzauskiene, 2007). Moreover, Chenhall and Langfield-Smith (1998) stated that management accounting consists of three parts that include budgeting, cost, and performance evaluation. Therefore, firms should develop and improve the quality of management accounting system because accounting information that is produced from such systems is valuable information to support a wide range of strategies and business decision-making (Valanciene and Gimzauskiene, 2007).

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. Moreover, the information produced by the management accounting system provides an explanation for the usage of resources and operations (Hammad, Jusoh, and Oon, 2010). Importantly, several researchers studied about key success factors of the management accounting system concept. 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. Similarly, management accounting system efficiency is based on the quality of the accounting procedures of a firm (Kara and Kilic, 2011). Moreover, Hammad, Jusoh and Oon (2010) showed that the key success factors of a management accounting system enhance performance that includes skills, perspectives, and behaviors of employees for effective execution.

In addition, 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 (Reid and Smith, 2000; Auzair and Langfield-Smith, 2005; Cadez and Guilding, 2008). 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 or using new practices 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 by the strategic management accounting system that focuses on the preparation and reporting of information related to the environment.

Apparently, in the present, firm survival depends on the ability of a strategic management accounting system to provide useful information related to the current business environment for improving the quality of business decision-making. Moreover, the management accounting system must fit with the firm structure and strategy to enhance performance. Thus, this research defines strategic management accounting system as 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 (Bruggeman and Slagmulder, 1995; Zhang and Zhou, 2007; 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, management accounting system adds the preparation of environmental information to the system (Milne, 1996). Thus, modern strategic management accounting 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, a community is concerned about environmental information. Interestingly, Anthony and Govindarajan (2007) mentioned that the effectiveness of a firm is dependent on a match between the design of the management accounting system and the firm's strategic posture. Similarly, the work of De Palma and Csutora (2001) found that if firms can adapt and integrate the current management accounting practice to match with EMA practice, it is likely that the firm can enhance firm performance.

In summary, from the evidence above, there is a possibility that strategic management accounting system will affect EMAC under the contingency theory. At this point, in order to analyze the influence of strategic management accounting system that affects the five dimensions of EMAC, the hypotheses are proposed as follows:

Hypothesis 11a: Strategic management accounting system is positively related to environmental identification efficiency orientation.

Hypothesis 11b: Strategic management accounting system is positively related to environmental practice proficiency capability.

Hypothesis 11c: Strategic management accounting system is positively related to environmental reporting transparency emphasis.

Hypothesis 11d: Strategic management accounting system is positively related to environmental auditing effectiveness focus.

Hypothesis 11e: Strategic management accounting system is positively related to environmental improvement disclosure implementation.

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 said to have an external focus, where the organization's personnel work towards common goals, a competitive advantage and a superior market.

From the concept of market culture, there are five dimensions of marketing culture, including service quality, interpersonal relationships, selling tasks of 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).

As mentioned above, this research defines market culture as 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; Syers and Ussahawanitchakit, 2011). However, there has been little research so far that focuses on related market culture and its influences on EMAC which would be very interesting and useful to business practices. One empirical research explored the relationship between market status and environmental management system. The result indicated that environmental management system adoption is a tool to differentiate the firm from its competitors (Hibiki and Arimura, 2004). Likewise, Welch, Yasufumi, and Midori (2002) mentioned that main customers have greater influence on the adoption of an environmental management system in the firm. Customers increasingly require environmentally friendly products, ecological products and cleaner production of business operations because they more concerned about the environmental performance of the firms (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). Ultimately, Hibiki and Arimura (2004) revealed that the development of new products and technologies of firm is a motive for environmental practices implementation, and pointed out that environmental practices implementation could be more supported because new products and technologies development lead to environmental conservation representing business opportunities.

In summary, from the evidence, there is a possibility that market culture will affect EMAC under the contingency theory. At this point, in order to analyze the influence of market culture that affects the five dimensions of EMAC, the hypotheses are proposed as follows:

Hypothesis 12a: Market culture is positively related to environmental identification efficiency orientation.

Hypothesis 12b: Market culture is positively related to environmental practice proficiency capability

Hypothesis 12c: Market culture is positively related to environmental reporting transparency emphasis.

Hypothesis 12d: Market culture is positively related to environmental auditing effectiveness focus.

Hypothesis 12e: Market culture is positively related to environmental improvement disclosure implementation.

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 include, but are not limited to, customers, regulating agencies, non-governmental organizations (NGO), shareholders, manufacturers, and suppliers

(Prunell, 2012). Business stakeholders are employees, customers, suppliers, bondholders, shareholders, financial institutions, and local authorities (Aabo, 2004).

In general, narrow views of stakeholders attempt to define relevant groups in terms of their direct relevance to the firm's core economic interests (Mitchell, Agle, and Wood, 1997). Some scholars define stakeholders in terms of their necessity for the firm's survival (Freeman and Reed, 1983; Bowie, 1988). This is because stakeholder forces will have an impact on corporation operations and disclosure policies so that corporations will respond to those concerns. Stakeholders put something at risk in relationship to the firm (Clarkson, 1994). Apparently, stakeholder forces are powered to influence the firm. They are essential to the inception, development, and survival of firms (Bhide and Stevenson, 1999). Thus firms should focus on stakeholder forces management in order to survive in the long term (Roberts, 1992).

As aforementioned, firms are facing increasing forces from various stakeholders to reduce their negative impacts and increase positive ones. Interestingly, stakeholder's forces will change according to the current business situation. Hillman and Keim (2001) mentioned that stakeholder forces will lead to the determination of policies on protection and improvement of social well-being. Moreover, stakeholders encourage a business's implementation based on a social marketing concept and against organization non-conscience to social issue. Thus, this research defines stakeholder force dynamism as 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 (Clarkson, 1994; Jurgens et al., 2010). Apparently, the major role of corporate management is to continuously assess the needs of stakeholders in order to survive in the long term (Roberts, 1992). Furthermore, in competition intensity, firms should establish and maintain a good relationship with stakeholders. While the firms have a better relationship with stakeholder, they will create firm reputation and image, as well as building reliable clients who lead to buying decisions.

From the literature review, the growing power and influence of stakeholders also have brought new demands and expectations to the roles and responsibilities of business in society (Clarkson, 1994). Accountability mechanisms include corporate social, environmental, economic and ethical governance that has become an important concern

for stakeholders (Unerman and Bennett, 2004). Stakeholders give 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). Furthermore, customer behavior will make purchase decisions or boycott business depending on the ethical, social, and environmental friendliness of the firms (Nurittamont and Ussahawanitchakit, 2010).

In summary, from the evidence, there is a possibility that stakeholder force dynamism will affect EMAC. Therefore, the hypotheses are proposed as follows:

Hypothesis 13a: Stakeholder force dynamism is positively related to environmental identification efficiency orientation.

Hypothesis 13b: Stakeholder force dynamism is positively related to environmental practice proficiency capability.

Hypothesis 13c: Stakeholder force dynamism is positively related to environmental reporting transparency emphasis.

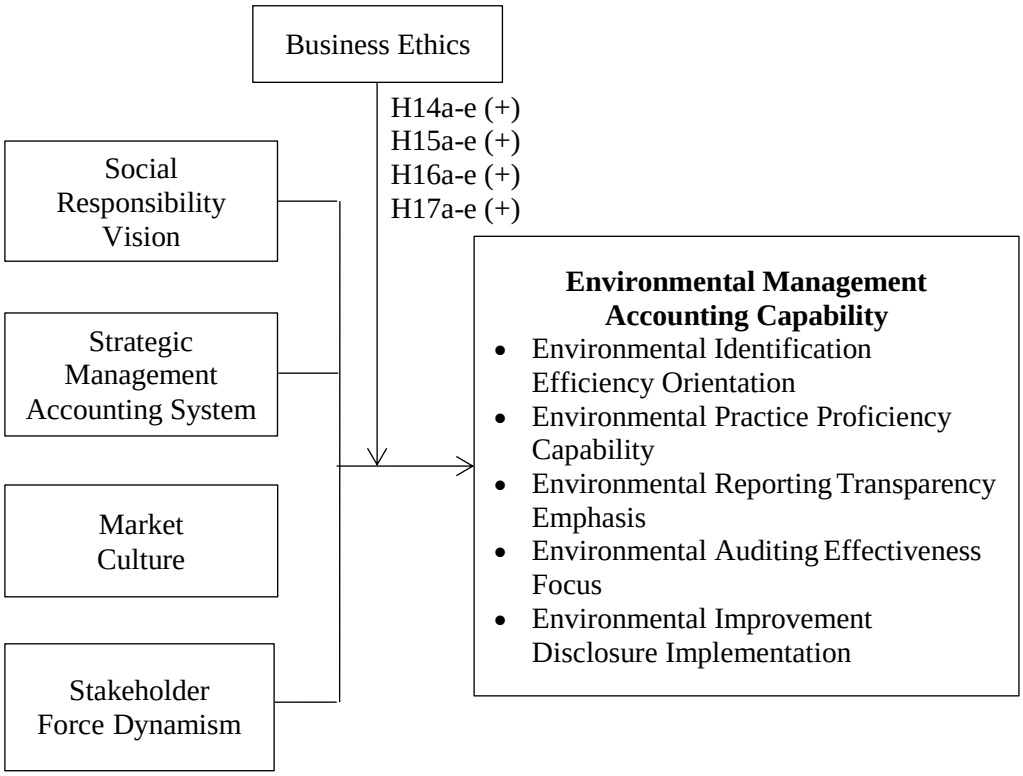
Hypothesis 13d: Stakeholder force dynamism is positively related to environmental auditing effectiveness focus.

Hypothesis 13e: Stakeholder force dynamism is positively related to environmental improvement disclosure implementation.

The Moderators of EMAC

This section emphasizes the moderating effects of business ethics that focus on the relationship among social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism, and EMAC as shown in Figure 7.

Figure 7 Roles of Business Ethics as a Moderator



Business Ethics

The word "ethics" has been derived from the Greek word "ethos" which means customs, conduct, or character (Irani, 2010). Ethics refers to the ways and habits of a group of people translated into the actual traditions and practices that characterize specific cultures (Fieser, 1996). In other words, ethics is a systematic approach to moral judgments based on reason, analysis, synthesis, and reflection on what is moral or what people think is good or right (Hull, 1979).

Currently, the 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). Moreover, business ethics usually means one of three principles. First, firm has to avoid any behavior that violates criminal law. Second, a firm has to avoid any action that may result in civil law suits against. Lastly, a firm has to avoid any bad manner that destroys its image (Fieser, 1996). Collectively, firms are especially concerned with these principles because they involve the loss of money and company reputation.

Essentially, the role of ethics in corporate management depends on the extent to which a firm is willing to take responsibility (Jamali, 2008). The moral principles should be beyond what the law requires. Firm must assume that it should commit to obligation beyond the law (Donaldson and Preston, 1995). Thus, this research defines business ethics as 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). There are three factors including profit motive, restricting regulations and laws, and moral obligations that induce firms to set business ethics standards (Fieser, 1996). The first factor is profit motive, since good ethics results in good business (Cohen and Bennie, 2006). Firms can make profit from producing safe goods and/or services. It will reduce lawsuits on issues of product liability. Similarly, it also results in financial performance of businesses in the long run (Verschoor, 1998). The second factor is restricting regulations and laws. In other words, moral obligations in business are restricted to what the law requires (Robertson, Gilley, and Street, 2003).The last one is general moral obligations that are morality, introduced as a factor that is external from both the profit motive and laws. Apparently, business ethics helps a firm to stand on the principles of integrity, fairness, and trust (Parulekar, 2010).

From the literature review, one empirical research indicated that firms use the process of society and ethics for informing about environmental information for the public, and they use it to create investor surprise (Solomon and Darby, 2005). Similarly, the work of Farrell and Cobbin (2000) revealed that business ethics concepts are a major factor to provide quality accounting services to society. 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, Rozuel and Lee-Davies, 2005). 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 review above, business ethics has the potential possibility to affect the relationships between social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism, and EMAC. Therefore, the hypotheses are proposed as follows:

Hypothesis 14a: Business ethics positively moderates the relationship between social responsibility vision and environmental identification efficiency orientation.

Hypothesis 14b: Business ethics positively moderates the relationship between social responsibility vision and environmental practice proficiency capability.

Hypothesis 14c: Business ethics positively moderates the relationship between social responsibility vision and environmental reporting transparency emphasis.

Hypothesis 14d: Business ethics positively moderates the relationship between social responsibility vision and environmental auditing effectiveness focus.

Hypothesis 14e: Business ethics positively moderates the relationship between social responsibility vision and environmental improvement disclosure implementation.

Hypothesis 15a: Business ethics positively moderates the relationship between strategic management accounting system and environmental identification efficiency orientation.

Hypothesis 15b: Business ethics positively moderates the relationship between strategic management accounting system and environmental practice proficiency capability.

Hypothesis 15c: Business ethics positively moderates the relationship between strategic management accounting system and environmental reporting transparency emphasis.

Hypothesis 15d: Business ethics positively moderates the relationship between strategic management accounting system and environmental auditing effectiveness focus.

Hypothesis 15e: Business ethics positively moderates the relationship between strategic management accounting system and environmental improvement disclosure implementation.

Hypothesis 16a: Business ethics positively moderates the relationship between market culture and environmental identification efficiency orientation.

Hypothesis 16b: Business ethics positively moderates the relationship between market culture and environmental practice proficiency capability.

Hypothesis 16c: Business ethics positively moderates the relationship between market culture and environmental reporting transparency emphasis.

Hypothesis 16d: Business ethics positively moderates the relationship between market culture and environmental auditing effectiveness focus.

Hypothesis 16e: Business ethics positively moderates the relationship between market culture and environmental improvement disclosure implementation.

Hypothesis 17a: Business ethics positively moderates the relationship between stakeholder force dynamism and environmental identification efficiency orientation.

Hypothesis 17b: Business ethics positively moderates the relationship between stakeholder force dynamism and environmental practice proficiency capability.

Hypothesis 17c: Business ethics positively moderates the relationship between stakeholder force dynamism and environmental reporting transparency emphasis.

Hypothesis 17d: Business ethics positively moderates the relationship between stakeholder force dynamism and environmental auditing effectiveness focus.

Hypothesis 17e: Business ethics positively moderates the relationship between stakeholder force dynamism and environmental improvement disclosure implementation.

Summary

In conclusion, environmental management accounting capability (EMAC) is the main concern of this research that is focused on its antecedents and its consequences. In this research, EMAC has five dimensions comprised of environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Moreover, this research investigates the impact of societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development on firm survival. Furthermore, this research also investigates the influence of four antecedents including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism on each dimension of EMAC. In addition, business ethics is the moderators that have influence on the relationships among social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and each dimension of EMAC.

This chapter discusses the theoretical foundations, the literature review, and the hypotheses development. Consequently, this chapter has detailed the two theoretical foundations, including the legitimacy theory and the contingency theory. Moreover, this chapter demonstrates the literature review with all its constructs in the conceptual model of EMAC, as well as its antecedents, its consequences, and its moderators. Finally, the hypotheses development has proposed a set of seventeen testable hypotheses. Therefore, the related hypotheses are postulated and the summary of all hypotheses are presented in Table 4 as shown below.

The next chapter describes the research methods, including the sample selection and data collection procedure, the variable measurements of each construct, the instrumental verification, the statistics and equations to test all seventeen hypotheses, and the summary definitions and operational variables of the constructs for the research.

Table 4 Summary of Hypothesized Relationships

Hypotheses	Description of Hypothesized Relationships
H1a	Environmental identification efficiency orientation is positively related to societal expectation fulfillment.
H1b	Environmental identification efficiency orientation is positively related to environmental conservation efficiency.
H1c	Environmental identification efficiency orientation is positively related to community relationship maintenance.
H1d	Environmental identification efficiency orientation is positively related to sustainable performance development.
H2a	Environmental practice proficiency Capability is positively related to societal expectation fulfillment.
H2b	Environmental practice proficiency Capability is positively related to environmental conservation efficiency.
H2c	Environmental practice proficiency Capability is positively related to community relationship maintenance.
H2d	Environmental practice proficiency Capability is positively related to sustainable performance development.
H3a	Environmental reporting transparency emphasis is positively related to societal expectation fulfillment.
H3b	Environmental reporting transparency emphasis is positively related to environmental conservation efficiency.
H3c	Environmental reporting transparency emphasis is positively related to community relationship maintenance.
H3d	Environmental reporting transparency emphasis is positively related to sustainable performance development.
H4a	Environmental auditing effectiveness focus is positively related to societal expectation fulfillment.

Table 4 Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H4b	Environmental auditing effectiveness focus is positively related to environmental conservation efficiency.
H4c	Environmental auditing effectiveness focus is positively related to community relationship maintenance.
H4d	Environmental auditing effectiveness focus is positively related to sustainable performance development.
H5a	Environmental improvement disclosure implementation is positively related to societal expectation fulfillment.
H5b	Environmental improvement disclosure implementation is positively related to environmental conservation efficiency.
H5c	Environmental improvement disclosure implementation is positively related to community relationship maintenance.
H5d	Environmental improvement disclosure implementation is positively related to sustainable performance development.
H6a	Environmental conservation efficiency is positively related to societal expectation fulfillment.
H6b	Environmental conservation efficiency is positively related to community relationship maintenance.
H6c	Environmental conservation efficiency is positively related to sustainable performance development.
H7	Societal expectation fulfillment is positively related to sustainable performance development.
H8	Community relationship maintenance is positively related to sustainable performance development.
H9	Sustainable performance development is positively related to firm survival.

Table 4 Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H10a	Social responsibility vision is positively related to environmental identification efficiency orientation.
H10b	Social responsibility vision is positively related to environmental practice proficiency capability.
H10c	Social responsibility vision is positively related to environmental reporting transparency emphasis.
H10d	Social responsibility vision is positively related to environmental auditing effectiveness focus.
H10e	Social responsibility vision is positively related to environmental improvement disclosure implementation.
H11a	Strategic management accounting system is positively related to environmental identification efficiency orientation.
H11b	Strategic management accounting system is positively related to environmental practice proficiency capability.
H11c	Strategic management accounting system is positively related to environmental reporting transparency emphasis.
H11d	Strategic management accounting system is positively related to environmental auditing effectiveness focus.
H11e	Strategic management accounting system is positively related to environmental improvement disclosure implementation.
H12a	Market culture is positively related to environmental identification efficiency orientation.
H12b	Market culture is positively related to environmental practice proficiency capability.
H12c	Market culture is positively related to environmental reporting transparency emphasis.

Table 4 Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H12d	Market culture is positively related to environmental auditing effectiveness focus.
H12e	Market culture is positively related to environmental improvement disclosure implementation.
H13a	Stakeholder force dynamism is positively related to environmental identification efficiency orientation.
H13b	Stakeholder force dynamism is positively related to environmental practice proficiency capability.
H13c	Stakeholder force dynamism is positively related to environmental reporting transparency emphasis.
H13d	Stakeholder force dynamism is positively related to environmental auditing effectiveness focus.
H13e	Stakeholder force dynamism is positively related to environmental improvement disclosure implementation.
H14a	Business ethics positively moderates the relationship between social responsibility vision and environmental identification efficiency orientation.
H14b	Business ethics positively moderates the relationship between social responsibility vision and environmental practice proficiency capability.
H14c	Business ethics positively moderates the relationship between social responsibility vision and environmental reporting transparency emphasis.
H14d	Business ethics positively moderates the relationship between social responsibility vision and environmental auditing effectiveness focus.
H14e	Business ethics positively moderates the relationship between social responsibility vision and environmental improvement disclosure implementation.

Table 4 Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H15a	Business ethics positively moderates the relationship between strategic management accounting system and environmental identification efficiency orientation.
H15b	Business ethics positively moderates the relationship between strategic management accounting system and environmental practice proficiency capability.
H15c	Business ethics positively moderates the relationship between strategic management accounting system and environmental reporting transparency emphasis.
H15d	Business ethics positively moderates the relationship between strategic management accounting system and environmental auditing effectiveness focus.
H15e	Business ethics positively moderates the relationship between strategic management accounting system and environmental improvement disclosure implementation.
H16a	Business ethics positively moderates the relationship between market culture and environmental identification efficiency orientation.
H16b	Business ethics positively moderates the relationship between market culture and environmental practice proficiency capability.
H16c	Business ethics positively moderates the relationship between market culture and environmental reporting transparency emphasis.
H16d	Business ethics positively moderates the relationship between market culture and environmental auditing effectiveness focus.
H16e	Business ethics positively moderates the relationship between market culture and environmental improvement disclosure implementation.

Table 4 Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H17a	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental identification efficiency orientation.
H17b	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental practice proficiency capability.
H17c	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental reporting transparency emphasis.
H17d	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental auditing effectiveness focus.
H17e	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental improvement disclosure implementation.

CHAPTER III

RESEARCH METHODS

The previous chapter illustrates a comprehensive review of relevant literature detailing EMAC, theoretical foundations, antecedents, consequences, moderators, and the hypothesis development. Consequently, this chapter demonstrates the research methods that help to clarify the understanding of the hypothesis testing process. Thus, this chapter is organized into four sections as follows. Firstly, the sample selection and data collection procedures, including population and sample, data collection, and test of non-response bias are detailed. Secondly, the variable measurements are developed. Thirdly, the instrumental verifications, including test of validity and reliability, and the statistical analysis are presented. Finally, the table of summary of definitions and operational variables of constructs is included.

Sample Selection and Data Collection Procedure

The globalized world has high growth in aspects of economic and technology. This growth brings industry sectors to require continuous consumption of natural resources for producing superior quality of goods and services over other competitors in order to achieve better long-term financial performance (Namakonzi and Inanga, 2014). These manufacturing activities can cause air, water and soil pollution such as by producing waste from industry, and sending greenhouse gases into the atmosphere of the earth (Ratnatunga and Balachandran, 2009; Khalid and Dixon, 2012). Due to these problems, the International Organization for Standardization has developed an environmental management standard for organizations which is known as the ISO 14000 Series.

ISO 14000 is a series of environmental management standards and guidelines. The series comprises many standards and the structure of the standard is demonstrated in Table 5.

Table 5 Summary of ISO 14000 Series Standards

Standard No.	Title
14000	Guide to Environmental Management Principles, Systems, and Supporting Techniques
14001	Environmental Management Systems: Guidance for Use
14004	Guidelines on the Elements of an Environmental Management System
14010-14013	Environmental Auditing
14020-14024	Environmental Labeling
14031	Environmental Performance Evaluation
14040-14043	Life Cycle Assessment
14050	Terms and Definitions
14060	Guide for the Inclusion of Environmental Aspects in Product Standards

ISO 14000 strives to establish the environmental ethics of a firm and enhance its ability to attain and measure environmental performance. ISO 14000 is composed of the total quality of the environment, an integrated marketing environment, the environmental policy of the firm, and total quality management (Miles and Russell, 1997). Thus, ISO 14000 brings value to certify firms such as in environmental improvements, productivity increases, community relations improvement, and market benefits improvement.

In Thailand, many firms have increasing attention to ISO 14000 on a voluntary basis because environmental impacts by firms are now a serious problem which should cause intense concern from the public. Any activities of each firm may cause environmental aspects and impacts such as noise, dust, and waste, contaminants in the manufacturing process and ineffective resources consumption in servicing.
Thus, these firms believe that ISO 14000 certification of firms is the good way to environmental management that helps firm manages the impact of their operations on the environment and society. Jaipiem and Ussahawanitchakit (2011) revealed that certified ISO 14000 firms in Thailand have a defined mission and responsibility towards improving the quality of human life, responding to sustainable development, and having

the potential for EMA practices more than in other groups. Therefore, certified ISO 14000 firms in Thailand are appropriately selected as the population for this research because these firms have awareness and concentration on managing the impact of their operations on society and environment.

Population and Sample

The population is certified ISO 14000 firms in Thailand. In order to illustrate the research phenomenon, a list of 458 certified ISO 14000 firms in Thailand were provided from the online database of the Thai Industrial Standards Institute, Ministry of Industry, Thailand (www. http://app.tisi.go.th/, accessed April 15, 2016). The equation under the 95% confidentiality rule is used to calculate the appropriate sample size using Krejcie and Morgan (1970). Accordingly, an appropriate sample size is 210 certified ISO 14000 firms under the 95% confidentiality rule (Krejcie and Morgan, 1970). However, previous research suggests that the average response rate of the mailed questionnaire survey is 20 percent (Aaker, Kumar, and Day, 2001). Therefore, oversampling is needed to ensure a minimum sample size (Bartlett II, Kotrlik, and Higgins, 2001). To maximize the possibility of a response rate, this research determines 1,050 firms for a sampling frame (210 x 5); however, this number exceeds the total population. As a result, this research finally uses 458 firms as a sample population.

Data Collection

Questionnaires are appropriately used to collect data in this research. The reasons to use this tool are because a mail survey reaches a greater number of firms at a lower cost, saves time, has less distribution bias, puts less pressure for an immediate response on the potential informants, and gives respondents a greater feeling of autonomy. Besides, in reducing a possible desirability bias, the researcher promises all individual responses will be kept completely confidential, and no information would be revealed or shared with any outside party without an informant’s written permission (Neuman, 2006).

The key informants are the chief accounting executive, the accounting director or the accounting manager of each certified ISO 14000 firm in Thailand. The chief accounting executive, the accounting director or the accounting manager are selected as

the key informants because these positions have a major responsibility in the accounting function of the firm. Moreover, these key informants are appropriate because they determine the accounting policy and strategy, as well as can provide the real information and true understanding of their business. Thus, the information is more valid.
The questionnaires were directly distributed to the key informants of each certified ISO 14000 firm in Thailand by a mail survey. Then, the reply from participants, a postcard is complete after four weeks from the first mailing to remind them to complete and return the questionnaires. Additionally, the questionnaire survey was conducted in compliance with the ethics and accountability rules to protect the rights, liberties and safety of the participants. Finally, this research reserved the returned questionnaires in a secured place. Then, the complete questionnaires were sent directly to the researcher by the prepared returned envelopes for ensuring the confidentiality within four weeks.
Each instrument package consists of a cover letter containing an explanation of the research, a questionnaire, and a postage pre-paid envelope. For the convenience of a follow-up mailing, each questionnaire was assigned a coded number on the first page of the questionnaire.

This research employed a mailed questionnaire as the instrument for collecting data which consists of seven parts. The choice of questionnaire uses multiple choices and scale questions, because it is easier and quicker for respondents to answer and easier to code and statistically analyze (Neuman, 2006). Part one asks the key informants for personal information such as gender, age, marital status, educational level, working experience. Part two contains questions about the general information and history of the business, such as number of employees at present, operational capital, average annual income per year, and period of time in business. Parts three through six requests to measure each of the constructs in the conceptual model, of which 63 items are composed in total. These items are adapted from the previous literature and designed on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Part three requests information for five dimensions of EMAC, that consists of environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Next, part four asks for the perceptions of societal expectation fulfillment, environmental

conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival. Part five enquires about the perceptions of the internal factors that influence EMAC, comprised of social responsibility vision, strategic management accounting system, market culture, and business ethics. Respectively, part six contains the questions about the perceptions of the variables of the external factor, that is, stakeholder force dynamism which has an impact on EMAC. Finally, part seven includes an open-ended question for the informant's suggestions and opinions. Appendices F and G present both English and Thai versions of the questionnaire in this research.

According to the questionnaire mailing, seven surveys were undeliverable because some of these firms had moved to unknown locations. Deducting the undeliverable from the original 458 mailed, the valid mailing was 451 mailed. Finally, a collection of 111 responses was received. However, only 107 complete questionnaires were usable for further analysis. 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, and Day, 2001). Hence, 107 firms are a sufficient sample size for employing multiple regression analysis. The details of the questionnaire mailing are shown in Table 6.

Table 6 The details of Questionnaire Mailing

Detail of Mail Survey Questionnaires	**Number**
Questionnaires Mailed	458
Number of undelivered questionnaires	7
Number of successful questionnaire mailed	451
Returned Questionnaires	111
Unusable questionnaires	4
Usable questionnaires	107
Response Rate (107/451)*100	**23.73%**

Test of Non-Response Bias

In regards to Armstrong and Overton (1977), a t-test comparison of demographics information between early and late respondents is tested to prevent and assure possible response bias problems. By extrapolation methods, the assumption is that subjects who answer later, or require more prodding to answer, are more likely to be treated as non-respondents. If there are no statistically significant differences between early and late respondents, then there is no non-response bias between respondents and non-respondents (Rogelberg and Stanton, 2007; Lewis, Hardy, and Snaith, 2013).

All 107 received questionnaires were divided into two equal groups: the first 54 responses are treated as the early respondents (the first group) and the other 53 responses are treated as the late respondents (the second group). The first group represented the early respondents and the second group represented the late respondents. By employing a t-test statistic, the differences of organizational demographics in terms of the business entity, the operating capital, the average annual income, and the reward for environmental management were compared. The results are as follows: the business entity ($t = 0.049$, $p > 0.05$), the operating capital ($t = -0.010$, $p > 0.05$), the average annual income ($t = -.639$, $p > 0.05$), and the reward in environmental management ($t = 0.559$, $p > 0.05$). These results provide the evidence that there were no statistically significant differences between the two groups at a 95% confidence level. It can be confidently mentioned that non-response bias is not a serious problem in this research (Armstrong and Overton, 1977). The results of the non-response bias test are presented in Appendix B.

Measurements

The measurement procedures involve the multiple items development for measuring each construct in the conceptual model. All constructs are abstractions that cannot be directly measured or observed, and should be measured by multiple items (Churchill, 1979). These constructs are transformed to the operational variables for true measuring. The measurement of each construct in the conceptual model is measured by a Likert scale. A Likert scales typically range from 2 to 10. Prior research suggested that

5 or 7 point Likert scale is more widely used in the survey research (Dawes, 2008). Thus, this research apply a five-point Likert scale to measure all of construct because it can reduce the frustration level of respondents and get higher response rate than 7 point Likert scale (Saris and Gallhofer, 2007). A five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). All constructs are developed for measuring from the definition of each construct as shown in Table 5, which provides the definition of each construct, operational variables, and scale source. Hence, the variable measurements of the dependent variable, independent variables, mediating variable, moderating variable, and control variables of this research are described as follows.

Dependent Variable

Firm survival. With regard to research on firm survival, this survival construct is measured by the adapted scale from Pothong and Ussahawanitchakit (2011); Naidoo (2010) including a five-item scale. It illustrates the perception of business overall outcome in sustaining and expanding economic growth, building credibility to those involved; and having good corporate reputation, customer relationships, and product and service quality over competitors in the long-run, an under uncertain business environment.

Independent Variables

This research consists of 13 independent variables which are separated into three categories: core construct, consequential variables, and antecedent variable. Firstly, EMAC is the center and core construct of this research. It can be measured through five distinctive attribute dimensions: environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. These attributes reflect the good characteristics of EMAC. The measure of each attribute depends on its definition which is detailed below.

Environmental identification efficiency orientation. Environmental identification efficiency orientation is measured is through 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 developed as a new scale from the definition and literature including a five-item scale.

Environmental practice proficiency capability. Environmental practice proficiency capability is evaluated by 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 developed as a new scale regarding its definition and literature reviews, including a four-item scale.

Environmental reporting transparency emphasis. Environmental reporting transparency emphasis is measured through 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 developed as a new scale regarding its definition and literature reviews, including a four-item scale.

Environmental auditing effectiveness focus. Environmental auditing effectiveness focus is evaluated by the managerial perception on how activity monitoring, processes, and management relate to environmental issues. This measurement is adapted scale from Jaipiem and Ussahawanitchakit (2012), including a four-item scale.

Environmental improvement disclosure implementation. Environmental improvement disclosure implementation is evaluated by 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 developed as a new scale from the definition and literature including a four-item scale.

Consequent Variables

The second category is the consequences of EMAC, namely, societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. The measure of each consequent variable regarding its definition and literature reviews, discussed as follows.

Societal expectation fulfillment. Societal expectation fulfillment is measured by organizational perception toward values, laws, and traditions of a society for responding society needs that is constantly changing and uncertain. This construct is developed as a new scale from the definition and literature including a four-item scale.

Environmental conservation efficiency. Environmental conservation efficiency is measured through the perception of business which regards improvement and development the environment, saving natural resources, and reducing waste from the firm's operations. This construct is developed as a new scale from the definition and literature including a four-item scale.

Community relationship maintenance. Community relationship maintenance is measured by a firm perception toward the increasing business participation, cooperation, and relationships among the organizations and their significant community. This construct is adapted from Kent and Taylor (2002), including a four-item scale.

Sustainable performance development. The measurement of sustainable performance development is developed as a new scale from the definition and literature. It can be evaluated by 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. So, this construct is developed as a new scale from the definition and literature review, including a four-item scale.

Antecedent Variables

Lastly, the third category is the four antecedents of EMAC comprised of social responsibility vision, strategic management accounting system, market culture, and

stakeholder force dynamism. All antecedent variables align with their definitions and the prior literature. The measure of each variable is discussed as follows.

Social responsibility vision. The measurement of social responsibility vision is developed as a new scale from the definition and literature. It can be estimated by 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 adapted from Chang and Deegan (2010), including a four-item scale.

Strategic management accounting system. 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. So, this construct is developed as a new scale from the definition and literature review, including a four-item scale.

Market culture. 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. So, this construct is developed as a new scale from the definition and literature review, including a five-item scale.

Stakeholder force dynamism. 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 adapted from Huse and Rindova (2001), and Prasertsang, Ussahawanitchakit and Jhundra-Indra (2012), including a five-item scale.

Moderating Variables

Business ethics, on the internal perspective, purposes to enhance the influence between four antecedents of EMAC(namely, social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism) and

five dimensions of EMAC (including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation). Like other variables, this moderator is developed from the definition of each, as well as from the related literature.
The measurements of these variables use a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Business ethics. Business ethics is measured by 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 adapted from Cullen, Parboteeah, and Victor (2003) including a four-item scale.

Control Variables

Firm size. Firm size was measured by the total operational capital of a firm (Tontiset and Ussahawanitchakit, 2010). Firm size may affect the EMAC of a firm because of the pressures from the shareholders and investment analysts for greater environmental management accounting. Bigger firms are likely to have a higher level of innovation; to have a greater base of human, technical, and financial resources under environmental management accounting than smaller ones (Ferreira, Moulang and Hendro, 2010); and to have more and higher environmental disclosures than smaller ones (Cormier and Gordon, 2001). Likewise, large firms are sensitive to disclosure and environmental quality (Buniamin, 2010). Moreover, previous research has shown that firm size may influence the capacity of a firm to operate its business in order to achieve performance (Ussahawanitchakit, 2005). In this research, firm size is represented by a dummy variable (0= total capital of the firm that is less than or equal 250,000,000 baht; while 1 = total capital of the firm with more than 250,000,000 baht).

Duration certified. Duration certified may affect EMAC. The time periods of certified environmental management systems (ISO 14000) that are different may affect the research. Each firm has different certifications. Prior research indicates that firm experience has an effect on environmental disclosure (Jaipiem and Ussahawanitchakit,

2011). However, experience is important for environmental management. Particularly as to the duration of ISO 14000 certification, this indicates that the business is continuously focused on environmental management. Here, the control variable is the duration of certification which was measured by the number of certified ISO 14000 years, which is a dummy variable (0 = less than or equal 10 years; 1 = more than 10 years).

Methods

This research collected the data by using a questionnaire mailed survey for most constructs in the conceptual model that are developed as a new scale and adapted from prior research. Hence, a pre-test method is appropriate to estimate the validity and reliability of the questionnaire. In this research, two academic experts reviewed the instrument and adjusted it to the best possible scale measure. In this case, the first sets of thirty questionnaires that have been returned were included in the pre-test, in order to verify the validity and reliability of each measure used in the questionnaire. Therefore, these thirty questionnaires are included in the final data analysis for hypotheses and assumption-testing of multiple regression analysis.

Validity and Reliability

Validity and reliability are the criteria upon which the validity and credibility of the research findings are judged, and are important in all research for the methods of achieving these qualities. Validity and reliability are a concern in this research because both ideas help establish the truthfulness, credibility, or believability of the findings (Neuman, 2006).

Validity is the degree to which a measure precisely represents the correct and accurate instrument (Hair et al., 2010). Especially, the validity testing of measurement in this research accurately confirms the concept or construct of study. Therefore, this research tests the validity of the instrument to confirm that a measure or set of measures accurately represents the concept of study. This research examines the face, content, and constructs validity of the questionnaire.

Face and content validity. Face validity reflects the extent to which it is intended to measure. It is a subjective assessment of the correspondence between individual items and the concept by individual judges or experts (Trochim, 2006). Content validity is an inspection system to reflect the content universe to which the instrument will be generalized. In this case, face and content validity are improved by an extensive review of the literature questionnaires (Hair et al., 2010). Moreover, two professionals in academic research are requested to review and suggest necessary recommendations to review the instrument, in order to ensure that all constructs are sufficient to cover the contents of the variables. After those two experts designed the questionnaires, they could provide comments, improvements, and choose the best possible scale of measure corresponding with the conceptual definitions.

Construct validity. Construct validity refers to the congruence between a theoretical concept and a specific concept measuring the instrument or procedure which is internally consistent (Trochim, 2006). Construct validity was evaluated by testing both convergent and discriminant validity. Convergent validity refers to the degree to which two measures are designed to measure the same construct related to that convergence, and it will be found if the two measures are highly correlated (Kwok and Sharp, 1998). Discriminant validity assesses the degree to which an operation is not similar to other operations that theoretically should not be similar (Trochim, 2006). Hence, this research tested the validity of the instrument to confirm that a measure or set of measures accurately represented the concept of the research. Factorial validity is tested by using factor analysis, including exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Fisher, Maltz, and Jaworski, 1997). Factor analysis is applied to identify important factors, and reduce low-correlated items. Exploratory factor analysis is used for constructs that are measured by new items, while confirmatory factor analysis is deployed for constructs that are measured by the item scales which are adapted from existing measurements. The acceptable cut-off score is 0.40, as a minimum (Nunnally and Bernstein, 1994).

Table 7 and Table 1D in Appendix D present the factor loading and the Cronbach's alpha coefficient of all variables from thirty auditors in the pre-test. The factor loadings are ranged from 0.685 to 0.967. The lowest factor loading is

strategic management accounting system and the highest factor loading is social responsibility vision. All factor loadings are greater than 0.40 cut-off score and statistically significant according to the rule-of-thumb (Nunnally and Bernstein, 1994). Thus, the construct validity of this research is tapped by the items in the measure as theorized.

Table 7 The Results of the Measure Validation of Pilot Test Sample (N = 30)

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
Environmental Conservation Efficiency (ECE)	.866-.935	.925
Societal Expectation Fulfillment (SEF)	.774-.915	.880
Community Relationship Maintenance (CRM)	.872-.947	.933
Sustainable Performance Development (SPD)	.855-.904	.909
Firm Survival (FSU)	.713-.930	.873
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

Reliability. Reliability is the degree to which the measurement is true and error-free of the observed variable; it indicates the degree of internal consistency between the multiple variables. Cronbach's alpha coefficient is commonly used as a measure of the internal consistency or reliability of the constructs (Hair et al., 2010). Thus, it is applied to evaluate the reliability. As suggested by Nunnally and Bernstein (1994), Cronbach's alpha coefficient is recommended that its value should be equal to

or greater than 0.70, as widely accepted.

The results shown in Table 7, the Cronbach's alpha coefficients range is 0.830 – 0.960, that is greater than 0.70. The lowest coefficient is in environmental practice proficiency capability and the highest coefficient is in environmental identification efficiency orientation. The reliability scale of all measures appeared to confirm the internal consistency of the measures which were used in this research. Thus, these measures are deemed appropriate for further analysis because they express an accepted validity and reliability.

Statistical Techniques

Before hypotheses testing, all of the raw data was checked, encoded, and recorded in a data file. Then, the assumption basis of regression analysis, such as the outlier, normality, linearity, homoscedasticity, and autocorrelation was tested. Moreover, the results of assumption testing are shown in Appendix E.

Variance inflation factor (VIF). To deal with the multicollinearity problem, this research employed a variance inflation factor (VIF) and a tolerance value as indicators to indicate a high degree of multicollinearity among the independent variables. Regarding Hair et al. (2010) when a tolerance value must is greater than 0.10, and the VIF should be less than 10, then multicollinearity is not a concern (Hair et al., 2010). In this research, the results of regression analysis in table E1 of Appendix E provide evidence that the VIF values of each regression model are in the range of 1.041–7.177, well below the cut-off value of 10 recommended by Hair et al. (2010). Hence, this VIF values imply that there are no substantial multicollinearity problems encountered in this research.

Correlation analysis. Correlation analysis was illustrated to test the correlation among all variables, and a correlation matrix was provided to show the intercorrelations among all variables for the initial analysis. If the variables become highly correlated, and the correlation coefficient is greater than 0.8 and shows significance, then multicollinearity may occur (Hair et al., 2010). In this research, the results of an

investigation of the correlation matrix for EMAC and all constructs (as shown in Table 9) reveal that the correlations among EMAC and all constructs are in the range 0.462–0.817. Besides, the relationships among the independent variables are lower than 0.80 which mean that each independent variable is not correlated with all other independent variables at a high level which might cause multicollinearity problems. So, the initial assumption assumes that there are no multicollinearity problems in this research.

Multiple regression analysis. The ordinary least squares (OLS) regression analysis is used to test all hypotheses following the conceptual model. Multiple regression analysis is appropriate to examine the relationships between the dependent variables and independent variables in which all variables are categorical and interval data (Hair et al., 2010). As a result, all proposed hypotheses in this research are transformed into eighteen statistical equations. Each equation conforms to the hypotheses development described in the previous chapter. The equations are depicted below.

The first section contains statistical equations examining the relationships among EMAC (including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation), societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development as presented in equations 1-4 below:

Equation 1: $SEF = \alpha_1 + \beta_1 EIEO + \beta_2 EPPC + \beta_3 ERTE + \beta_4 EAEF + \beta_5 EIDI + \beta_6 FS + \beta_7 DC + \varepsilon_1$

Equation 2: $ECE = \alpha_2 + \beta_8 EIEO + \beta_9 EPPC + \beta_{10} ERTE + \beta_{11} EAEF + \beta_{12} EIDI + \beta_{13} FS + \beta_{14} DC + \varepsilon_2$

Equation 3: $CRM = \alpha_3 + \beta_{15} EIEO + \beta_{16} EPPC + \beta_{17} ERTE + \beta_{18} EAEF + \beta_{19} EIDI + \beta_{20} FS + \beta_{21} DC + \varepsilon_3$

Equation 4: $SDP = \alpha_4 + \beta_{22} EIEO + \beta_{23} EPPC + \beta_{24} ERTE + \beta_{25} EAEF + \beta_{26} EIDI + \beta_{27} FS + \beta_{28} DC + \varepsilon_4$

The second sub-model equation used to examine the relationships among societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance and sustainable performance development, and firm survival is presented in equations 5-8 below:

Equation 5: $SEF = \alpha_5 + \beta_{29}ECE + \beta_{30}FS + \beta_{31}DC + \varepsilon_5$

Equation 6: $CRM = \alpha_6 + \beta_{32}ECE + \beta_{33}FS + \beta_{34}DC + \varepsilon_6$

Equation 7: $SPD = \alpha_7 + \beta_{35}SEF + \beta_{36}ECE + \beta_{37}CRM + \beta_{38}FS + \beta_{39}DC + \varepsilon_7$

Equation 8: $FSU = \alpha_8 + \beta_{40}SPD + \beta_{41}FS + \beta_{42}DC + \varepsilon_8$

The third sub-model examination of the relationships among four antecedents, namely, social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and five dimensions composed in EMAC is presented in equations 9-13 as follows.

Equation 9: $EIEO = \alpha_9 + \beta_{43}SRV + \beta_{44}SMAS + \beta_{45}MKC + \beta_{46}SFD + \beta_{47}FS + \beta_{48}DC + \varepsilon_9$

Equation 10: $EPPC = \alpha_{10} + \beta_{49}SRV + \beta_{50}SMAS + \beta_{51}MKC + \beta_{52}SFD + \beta_{53}FS + \beta_{54}DC + \varepsilon_{10}$

Equation 11: $ERTE = \alpha_{11} + \beta_{55}SRV + \beta_{56}SMAS + \beta_{57}MKC + \beta_{58}SPD + \beta_{59}FS + \beta_{60}DC + \varepsilon_{11}$

Equation 12: $EAEF = \alpha_{12} + \beta_{61}SRV + \beta_{62}SMAS + \beta_{63}MKC + \beta_{64}SFD + \beta_{65}FS + \beta_{66}DC + \varepsilon_{12}$

Equation 13: $EIDI = \alpha_{13} + \beta_{67}SRV + \beta_{68}SMAS + \beta_{69}MKC + \beta_{70}SFD + \beta_{71}FS + \beta_{72}DC + \varepsilon_{13}$

The fourth sub-model examination of the role of the moderator, namely, business ethics, which moderates social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and five dimensions of EMAC, is as presented in equations 14-18 below:

Equation 14: $EIEO = \alpha_{14} + \beta_{73}SRV + \beta_{74}SMAS + \beta_{75}MKC + \beta_{76}SFD + \beta_{77}(SRV*BET) + \beta_{78}(SMAS*BET) + \beta_{79}(MKC*BET) + \beta_{80}(SFD*BET) + \beta_{81}FS + \beta_{82}DC + \varepsilon_{14}$

Equation 15: $EPPC = \alpha_{15} + \beta_{83}SRV + \beta_{84}SMAS + \beta_{85}MKC + \beta_{86}SFC + \beta_{87}(SRV*BET) + \beta_{88}(SMAS*BET) + \beta_{89}(MKC*BET) + \beta_{90}(SFD*BET) + \beta_{91}FS + \beta_{92}DC + \varepsilon_{15}$

Equation 16: $ERTE = \alpha_{16} + \beta_{93}SRV + \beta_{94}SMAS + \beta_{95}MKC + \beta_{96}SFC + \beta_{97}(SRV*BET) + \beta_{98}(SMAS*BET) + \beta_{99}(MKC*BET) + \beta_{100}(SFD*BET) + \beta_{101}FS + \beta_{102}DC + \varepsilon_{16}$

Equation 17: $EAEF = \alpha_{17} + \beta_{103}SRV + \beta_{104}SMAS + \beta_{105}MKC + \beta_{106}SFC + \beta_{107}(SRV*BET) + \beta_{108}(SMAS*BET) + \beta_{109}(MKC*BET) + \beta_{110}(SFD*BET) + \beta_{111}FS + \beta_{112}DC + \varepsilon_{17}$

Equation 18: $EIDI = \alpha_{18} + \beta_{113}SRV + \beta_{114}SMAS + \beta_{115}MKC + \beta_{116}SFC + \beta_{117}(SRV*BET) + \beta_{118}(SMAS*BET) + \beta_{119}(MKC*BET) + \beta_{120}(SFD*BET) + \beta_{121}FS + \beta_{122}DC + \varepsilon_{18}$

Where,

EIEO = Environmental Identification Efficiency Orientation

EPPC= Environmental Practice Proficiency Capability

ERTE = Environmental Reporting Transparency Emphasis

EAEF= Environmental Auditing Effectiveness Focus

EIDI = Environmental Improvement Disclosure Implementation

SEF = Societal Expectation Fulfillment

ECE = Environmental Conservation Efficiency

CRM = Community Relationship Maintenance

SPD = Sustainable Performance Development

FSU = Firm Survival

SRV = Social Responsibility Vision

SMAS= Strategic Management Accounting System

MKC = Market Culture

SFD = Stakeholder Force Dynamism

BET = Business Ethics

FS = Firm size

DC = Duration Certified

ε = Error Term

α = Constant

β = Beta

Summary

This chapter summarizes the research methods used in the investigation for this research, from simple selection to data gathering, examining all constructs purposed in the conceptual model, and to answer the research questions. To be specific, there are four main parts in this chapter: (1) sample selection and data collection procedures, (2) measurement of variables, (3) verification of instruments, and (4) statistical techniques. A total list of 458 certified ISO 14000 firms in Thailand. The key informants completing the questionnaire are the chief accounting executive, the accounting director or the accounting manager. Moreover, a valid and reliable questionnaire is the primary instrument of data collection. This chapter also provides the measurements of each construct in the model, which are based on the existing literature. For multiple regression analysis, eighteen testable statistical equations were formulated. Finally, a summary of the constructs' definitions and the operational explanation are given in Table 8.

In the next chapter, the descriptive statistics and correlation analysis that show the respondent characteristics and the main characteristics of ISO 14000 firms in Thailand are discussed. Then, the results of the hypotheses testing, which include the important points, and the seventeen hypotheses proposed are tested and fully-discussed to be clearly understood.

Table 8 The Definitions and Operational Variables of Constructs

Constructs	Definition	Operational Variables	Scale Source
Dependent variable ***Firm survival (FSU)***	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 (Dyllick and Hockerts, 2002; Szekely and Knirsch, 2005).	The perception of business overall outcome and goal achievement in both the short and long term an under uncertain business environment.	Naidoo (2010), Pothong and Ussahawanitchakit (2011)
Independent Variable ***Environmental Identification Efficiency Orientation (EIEO)***	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 (Ministry of Environment of Japan, 2002; Vasile and Man, 2012;).	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.	New scale

Table 8 The Definitions and Operational Variables of Constructs (continued)

Constructs	Definition	Operational Variables	Scale Source
Environmental Practice Proficiency Capability (EPP)	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; Ministry of Environment of Japan, 2002).	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.	New scale
Environmental Reporting Transparency Emphasis (ERTE)	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 (Dixon, Mousa, and Khuntia, 2014).	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.	New scale

Table 8 The Definitions and Operational Variables of Constructs (continued)

Constructs	Definition	Operational Variables	Scale Sources
Environmental Auditing Effectiveness Focus (EAEF)	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 (Moor and Beelde, 2005; Gui-zhen et al., 2007).	The managerial perception on how activity monitoring, processes, and management relate to environmental issues.	Jaipiem and Ussahawanitchakit (2012)
Environmental Improvement Disclosure Implementation (EIDI)	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 and Mathur, 2000).	Managerial perception toward the firm ability and proficiency to provide information about ongoing environmental improvements, environmental budget, and environmental activities to the public.	New scale

Table 8 The Definitions and Operational Variables of Constructs (continued)

Constructs	Definition	Operational Variables	Scale Sources
Consequent variable ***Environmental Conservation Efficiency (ECE)***	The achievement of the firm to protect, reduce and avoid the impacts on the environment from the business operation, the removal of such effects, renewal after the occurrence of environmental problems, and other environmental safeguarding activities (Ministry of Environment of Japan, 2002).	The perception of business which regards improvement and development the environment, saving natural resources, and reducing waste from the firm's operations.	New scale
Societal Expectation Fulfillment (SEF)	The accomplishment of the firm that is able to respond to society's needs in all aspects, and can operate in accordance with the values, laws, and traditions of the society (Bellah et al., 1991; Jenkins, 2002).	Organizational perception toward values, laws, and traditions of a society for responding a society needs that is constantly changing and uncertain.	New scale

Table 8 The Definitions and Operational Variables of Constructs (continued)

Constructs	Definition	Operational Variables	Scale Sources
Community Relationship Maintenance (CRM)	The continuous keeping of trust, commitment, satisfaction, control of mutuality and dialogue between a firm and its community in order to build mutual benefit in both the short term and long term.	Firm perception toward the increasing business participation, cooperation, and relationships among the organizations and their significant community.	Kent and Taylor (2002)
Sustainable performance development (SPD)	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	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.	New scale

Table 8 The Definitions and Operational Variables of Constructs (continued)

Constructs	Definition	Operational Variables	Scale Sources
Antecedent variables ***Social responsibility vision (SRV)***	The concept of the goals for future-oriented management that reflects awareness and features society's needs which give rise to balancing the economy, society and the environment, and surviving in the society for the long term (Warhurst and Mitchell, 2000; Waenkaeo and Ussahawanitchakit, 2011).	The firm perception focusing on the executive vision for social responsibility in the concept of management to balance the economy, society and the environment.	Chang and Deegan (2010)
Strategic management accounting system (SMS)	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 (Bruggeman and Slagmulder, 1995; Zhang and Zhou, 2007; Hammad, Jusoh, and Oon, 2010).	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.	New scale

Table 8 The Definitions and Operational Variables of Constructs (continued)

Constructs	Definition	Operational Variables	Scale Sources
Market culture (MKC)	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; Syers and Ussahawanitchakit, 2012).	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.	New scale
Stakeholder force dynamism (SFD)	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 (Clarkson, 1994; Jurgens et al., 2010).	The managerial perception toward the continuous change of stakeholder's needs and expectations that influence shaping the decision-making of a firm.	Huse and Rindova (2001), Prasertsang, Ussahawanitchakit and Jhundra-Indra (2012)

Table 8 The Definitions and Operational Variables of Constructs (continued)

Constructs	Definition	Operational Variables	Scale Sources
Moderating variables ***Business ethics (BET)***	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).	Firm perception focusing on the ability of a firm to learn, understands, and applies ethics or professional ethics in all aspects of a business operation.	Cullen, Parboteeah and Victor (2003)
Control Variables ***Firm size (FS)***	The total operational capital of the firm.	Dummy variable 0 = total operational capital ⩽ 250,000,000 baht; 1= total operational capital > 250,000,000 baht	Actual Corrected Data
Duration Certified (DC)	The number of certified ISO 14000 years.	Dummy variable 0 = period times ⩽10 years; 1 = period times > 10 years	Actual Corrected Data

CHAPTER IV

RESULTS AND DISCUSSION

The prior chapter has described the research methods which concern the sample selection, the data collection method, and the test of non-response bias. Accordingly, research methods help to clarify the testable hypotheses in order to achieve the research objectives and research questions. This chapter presents the results of statistical testing beginning with the presentation of respondent characteristics and descriptive statistics to increase understanding of sample characteristics. The results of correlation analysis and hypotheses testing by using multiple regression analysis are detailed. Finally, the summary of all hypotheses testing is also provided.

Respondent Characteristics and Descriptive Statistics

Respondent Characteristics

In this research, the key informants are the chief accounting executive, the accounting director or the accounting manager who represent the completed questionnaires of this research. The respondent characteristics are described by the demographic characteristics including gender, age, and marital status, educational level, working experience, average monthly income at present, and working position at present.

The demographic characteristics of 107 respondents are as the following. Approximately 78.50 percent of respondents are female. The age span of respondents is more than 45 years old (43.92 percent). The majority of respondents are married (52.33 percent). A total of 59.81 percent earned a bachelor's degree or equal. Of the respondents, 68.22 percent have working experience of more than 15 years. The average monthly income of respondents ranges between 50,000 and 80,000 baht (30.84 percent). Finally, the majority of the respondents hold a position as accounting manager (46.73 percent). For more details, see Table 1C in Appendix C.

Firm Characteristics

The results of demographic characteristics of 107 certified ISO 14000 firms indicate that the majority of firm respondents has registered as a limited company (79.44 percent) and most of the industrial categories of the firms' respondents are machinery and equipment (15.89 percent). In addition, of the respondents, 65.42 percent have employed more than 300 full-time employees. The majority of the firm respondents have operating capital of more than 250,000,000 baht (56.07 percent). Nearly half of firm respondents have an average annual income of more than 1,000,000,000 baht (53.27 percent). Approximately 71.97 percent of firm respondents has operating in certified ISO 14000 firms more than 20 years. The length of time in certified ISO 14000 of the firms' respondents is more than 10 years (57.01 percent). Lastly, 69.16 percent of the firm respondents achieved a reward in environmental management.

Results of Descriptive Statistics

Table 9 demonstrates the descriptive statistics including the means and standard deviation. Overall, the range of mean scores for all constructs is 3.988 - 4.262. Especially, the mean scores for all perspectives of EMAC consist of environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation which are high, and they are 4.050, 4.060, 4.151, 4.130, and 3.988, respectively. It indicates that certified ISO 14000 firms in Thailand recognize the importance of EMAC. In addition, EMAC has a standard deviation value of 0.532– 0.623. Moreover, the results also show that the mean score of EMAC consequences consist of societal expectation fulfillment (4.224), which environmental conservation efficiency (4.140), community relationship maintenance (4.079), sustainable performance development (4.054), and firm survival (4.047) are rather high. The standard deviation value of the consequences of EMAC is 0.498–0.599.

The results also indicate that the mean score of EMAC antecedences consisting of social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism are 4.030, 4.012, 4.150, and 4.192, respectively.

The results indicate that certified ISO 14000 firms in Thailand have a high degree of social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism. The standard deviation value of the EMAC antecedences is between 0.564-0.621. Additionally, the mean score of the moderating effect of business ethics is 4.262. The standard deviation value of the moderating effect of business ethics is 0.643.

Results of Correlation Analysis

The Pearson's correlation for bivariate analysis of each variable pair is initially utilized to check the presence of a multicollinearity problem as well as exploring the relationships among variables. Multicollinearity problem is indicated when the independent variables have an inter-correlation that exceeds 0.80 (Hair et al., 2010). Table 9 shows the results of the correlation analysis of all constructs. The bivariate correlation procedure is subject to a two-tailed test of statistical significance at two levels as $p < 0.05$ and $p < 0.01$.

The correlation matrix can prove the correlation between two variables and verify the multicollinearity problems by the intercorrelations among the independent variables. The evidence suggests that they are significantly related among the five dimensions of EMAC between 0.687 and 0.771, $p < 0.01$. These correlations are less than 0.80, as recommended by Hair et al. (2010). As a result, the multicollinearity problems should not be a concern. The correlation matrix reveals a correlation between the consequences of the dimensions of EMAC. The result indicates the dimensions of EMAC relating to societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival which have a significant, positive correlation between 0.585 and 0.800, $p < 0.01$. Most definitely, the antecedent construct including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism are significantly related to the dimensions of EMAC ($r = 0.522 – 0.735$, $p < 0.01$). Finally, the moderating variable, including business ethics has correlations with all variables in the range of 0.462– 0.799, $p < 0.01$. However, most correlations are less than 0.80, as recommended by Hair et al. (2010). As a result, the multicollinearity problems should not be a concern.

Table 9 Descriptive Statistics and Correlation Matrix of EMAC and All Constructs

Variables	EIEO	EPPC	ERTE	EAEF	EIDI	ECE	SEF	CRM	SPD	FSU	SRV	SMAS	MKC	SFD	BET	FS	DC
Mean	4.050	4.060	4.151	4.130	3.988	4.140	4.224	4.079	4.054	4.047	4.030	4.012	4.150	4.192	4.262	n/a	n/a
S.D	.541	.582	.532	.561	.623	.549	.498	.599	.538	.552	.621	.602	.575	.564	.643	n/a	n/a
EIEO	1																
EPPC	.741***	1															
ERTE	.741***	.687***	1														
EAEF	.718***	.729***	.734***	1													
EIDI	.737***	.746***	.768***	.771***	1												
ECE	.765***	.728***	.800***	.706***	.749***	1											
SEF	.704***	.596***	.686***	.690***	.643***	.833***	1										
CRM	.678***	.585***	.662***	.683***	.646***	.752***	.774***	1									
SPD	.711***	.660***	.734***	.739***	.767***	.762***	.759***	.780***	1								
FSU	.621***	.602***	.668***	.643***	.700***	.707***	.675***	.680***	.817***	1							
SRV	.578***	.571***	.591***	.654***	.735***	.641***	.630***	.696***	.746***	.760***	1						
SMAS	.560***	.632***	.542***	.522***	.681***	.557***	.499***	.635***	.681***	.715***	.797***	1					
MKC	.548***	.623***	.575***	.570***	.628***	.696***	.670***	.641***	.686***	.698***	.670***	.706***	1				
SFD	.590***	.557***	.594***	.573***	.587***	.626***	.640***	.620***	.685***	.706***	.699***	.650***	.711***	1			
BET	.462***	.492***	.582**	.512***	.526***	.614***	.579***	.616***	.613***	.672***	.646***	.631***	.799***	.655***	1		
FS	.074	-.057	.050	.029	.131	.060	.075	.217**	-.008	.157	.179	.147	.118	.095	.123	1	
DC	-.198**	-.008	.007	-.043	-.001	-.068	-.119	-.004	-.011	-.006	.090	.057	-.032	-.032	-.060	.198**	1

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

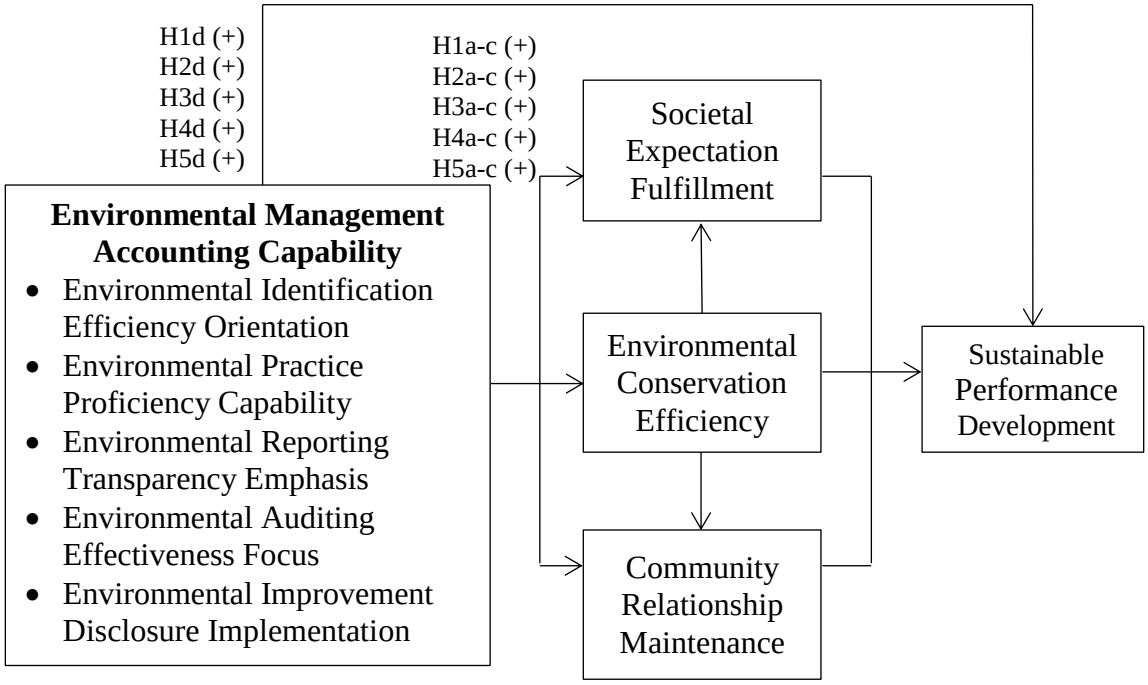
Hypotheses Testing and Results

The ordinary least squares (OLS) regression analysis is conducted in this research. The regression equation generated is a linear combination of the independent variables that best explains and predicts the dependent variable. Therefore, the OLS is an appropriate method for examining the hypothesized relationships. In this research, all hypotheses are transformed into 18 equations. Moreover, there are two dummy variables, including firm size and duration certified of certified ISO 14000 firms, which is consistent with the data collection included in those equations for testing as follows.

The Relationships among Each Dimension of EMAC on Its Consequences

This research posits EMAC as the antecedent. For the independent variables, five dimensions of EMAC consist of environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. In addition, societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development are the consequences of EMAC as illustrated in Figure 8.

Figure 8 The Effects of EMAC on Societal Expectation Fulfillment, Environmental Conservation Efficiency, Community Relationship Maintenance, and Sustainable Performance Development



In summary, this research proposes that EMAC is positively associated with the overall consequences consist of societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. These hypotheses are analyzed by the regression equation in models 1– 4 according to chapter 3. The results of the OLS regression analysis are provided in Table 11 that shows the scale of adjusted R^2 range from 0.558– 0.714 (Models 1– 4).

The correlations among each dimension of EMAC and its consequences are shown in Table 10. The results show that each dimension of EMAC consists of environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation are significantly and positively correlated with the consequence variables. Firstly, the relationships between each dimension of EMAC are significantly and positively

correlated to societal expectation fulfillment as r = 0.704, $p < 0.01$; r = 0.596, $p < 0.01$; r = 0.686, $p < 0.01$; r = 0.690, $p < 0.01$; r = 0.643, $p < 0.01$. Secondly, each dimension of EMAC has a significant and positive correlation with environmental conservation efficiency as r = 0.765, $p < 0.01$; r = 0.728, $p < 0.01$; r = 0.800, $p < 0.01$; r = 0.706, $p < 0.01$; r = 0.749, $p < 0.01$.Thirdly, the relationships between each dimension of EMAC are significantly and positively correlated to community relationship maintenance as r = 0.678, $p < 0.01$; r = 0.585, $p < 0.01$; r = 0.662, $p < 0.01$; r = 0.683, $p < 0.01$; r = 0.646, $p < 0.01$. Finally, the relationship between each dimension of EMAC are significantly and positively correlated to sustainable performance development as r = 0.711, $p < 0.01$; r = 0.660, $p < 0.01$; r = 0.734, $p < 0.01$; r = 0.739, $p < 0.01$; r = 0.767, $p < 0.01$.

However, these correlations are less than 0.80 as recommended by Hair et al. (2010). Moreover, variance inflation factors (VIFs) are utilized to test the intercorrelation among five dimensions of EMAC on its consequences. In Table 11 the maximum value of VIF is 3.791, well below the cut-off value of 10 (Hair et al., 2010). As a result, there are no substantial multicollinearity problems encountered in this regression analysis.

Table 10 Descriptive Statistics and Correlation Matrix of EMAC on Its Consequences

Variables	EIEO	EPPC	ERTE	EAEF	EIDI	ECE	SEF	CRM	SPD	FS	DC
Mean	4.050	4.060	4.151	4.1301	3.988	4.140	4.224	4.079	4.054	n/a	n/a
S.D	.541	.582	.532	.561	.623	.549	.498	.599	.538	n/a	n/a
EIEO	1										
EPPC	.741***	1									
ERTE	.741***	.687***	1								
EAEF	.718***	.729***	.734***	1							
EIDI	.737***	.746***	.768***	.771***	1						
ECE	.765***	.728***	.800***	.706***	.749***	1					
SEF	.704***	.596***	.686***	.690***	.643***	.833***	1				
CRM	.678***	.585***	.662***	.683***	.646***	.752***	.774***	1			
SPD	.711***	.660***	.734***	.739***	.767***	.762***	.759***	.780***	1		
FS	.074	-.057	.050	.029	.131	.060	.075	.217**	-.008	1	
DC	-.198**	-.008	.007	-.043	-.001	-.068	-.119	-.004	-.011	.198**	1

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

For the hypotheses testing, Table 11 shows the results of OLS regression analysis from equations 1– 4 because the first set of hypotheses focuses on the effect of five dimensions of EMAC on its consequences as aforementioned hypotheses 1– 5.

Firstly, the evidence in Table 11 relates to environmental identification efficiency orientation (Hypotheses 1a–1d). The findings show that the environmental identification efficiency orientation is a significant, positive effect on societal expectation fulfillment ($\beta_1 = 0.298$, $p < 0.05$), environmental conservation efficiency ($\beta_8 = 0.215$, $p < 0.05$), community relationship maintenance ($\beta_{15} = 0.280$, $p < 0.05$), and sustainable performance development ($\beta_{22} = 0.218$, $p < 0.05$). These findings suggest that environmental identification efficiency orientation tends to achieve on societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development.

Table 11 Results of the Regression Analysis for Effects of Each Dimension of EMAC on Its Consequences

Independent Variables	Dependent Variables[a]			
	Societal Expectation Fulfillment Model 1	**Environmental Conservation Efficiency Model 2**	**Community Relationship Maintenance Model 3**	**Sustainable Performance Development Model 4**
Environmental Identification Efficiency Orientation: Environmental Identification Efficiency Orientation (EIEO : H1a-d)	**.298**** (.122)	**.215**** (.098)	**.280**** (.122)	**.218**** (.106)
Environmental Practice Proficiency Capability (EPPC : H2a-d)	-.019 (.115)	**.185**** (.093)	.013 (.115)	-.056 (.101)
Environmental Reporting Transparency Emphasis (ERTE : H3a-d)	**.252**** (.115)	**.400***** (.093)	**.194*** (.115)	**.182*** (.101)
Environmental Auditing Effectiveness Focus (EAEF : H4a-d)	**.289**** **(.114)**	.027 (.092)	**.312***** (.115)	**.227**** (.100)
Environmental Improvement Disclosure Implementation (EIDI : H5a-d)	.015 (.125)	.121 (.101)	.017 (.126)	**.346***** (.110)
Control Variables: Firm size (FS)	.085 (.147)	.050 (.119)	**.361**** (.147)	-.213 (.129)
Duration Certified (DC)	-.138 (.169)	-.072 (.136)	.072 (.169)	.145 (.148)
Adjusted R^2	.562	.714	.558	.663
Maximum VIF	3.791	3.791	3.791	3.791

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

Previous researchers have suggested that the firm seeks to identify the environmental damages for generating and maintaining the benefits to their society, community, and the environment (Vasile and Man, 2012). Moreover, the firm has a good process to identify environmental cost-for-cost saving in the long run. It can help firms improve the performance over the long term (Johnson, 2004). Specifically, EMA allows managers to identify the opportunities and accurately calculate for cost savings

from good environmental management (Jasch, 2003). ***Therefore, Hypotheses 1a, 1b, 1c, and 1d are strongly supported.***

Secondly, in light of environmental practice proficiency capability (Hypotheses 2a – 2d), the results indicate that environmental practice proficiency capability has no significant effects on societal expectation fulfillment (β_2 = -0.019, $p > 0.10$), community relationship maintenance (β_{16} = 0.013, $p > 0.10$), and sustainable performance development (β_{23} = -0.056, $p > 0.10$). These findings suggest that environmental practice proficiency capability is not positively effecting societal expectation fulfillment, community relationship maintenance, and sustainable performance development. It may be implied that if any firms cannot adapt to and integrate EMA practice to match with the current accounting practice of firm, it is unlikely that EMA practice can achieve the environmental performance (De Palma and Csutora, 2001). Moreover, Munteanu (2013) explained that accounting practice related to environment is a strategic role in policy and planning for managers in decision-making such as material flow tracing, product pricing decisions, investment appraisal decisions. Thus, it may be that external stakeholders such as society and community may have difficultly to recognize the environmental practice proficiency capability of the firm. ***Therefore, Hypotheses 2a, 2c, and 2d are not supported.***

Besides, environmental practice proficiency capability has a significant effect on environmental conservation efficiency (β_9 = 0.185, $p < 0.05$). These results suggest that environmental practice proficiency capability tends to achieve environmental conservation efficiency. It is possible that EMA practice is a beneficial procedure for management that has more interest in the environment. The principles of EMA practice not only give the environmental cost information for business decision-making, but also give the physical flow of information. For example, in the use of raw materials and rate of waste can helps firms to identify business activities that negatively impact an environment (Burritt et al., 2002). Moreover, accounting practice is related to an environment of being aware of environmental costs and benefits. It can help managers in their strategic planning, and help them reduce the environmental problems from the business activities (Howes, 2004). ***Therefore, Hypothesis 2b is supported.***

Thirdly, the results relate to environmental reporting transparency emphasis (Hypotheses 3a – 3d). The evidence reveals that environmental reporting transparency emphasis has a significant positive influence on societal expectation fulfillment ($\beta_3 = 0.252$, $p < 0.05$), environmental conservation efficiency ($\beta_{10} = 0.400$, $p < 0.01$), community relationship maintenance ($\beta_{17} = 0.194$, $p < 0.10$), and sustainable performance development ($\beta_{24} = 0.182$, $p < 0.10$). These results indicated that a firm with higher environmental reporting transparency emphasis has greater societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance. It is said that the reporting about environmental issues that produce information by EMA has an ability to improve the relationship of customers, society, shareholders, employees, and the community because the firm gives extra information exceeding stakeholder expectations (Ministry of Environment of Japan, 2002). In addition, awareness of environmental issues by reporting about the environmental performance and activities on the website of firm can help firm to present the environmental and social responsibility (Zhang, Gao, and Zhang, 2007). Likewise, if the firm can represent good environmental performance in the environmental reporting to its stakeholders, it may be beneficial to financial and non-financial performance particularly, its share price may increase, improving the firm image and building better relations with relevant stakeholders (Khuntia, 2014). Importantly, Cormier and Magnan (2003) supported that environmental reporting may influence the interpretation of stakeholders on the financial performance of firm and increase investor confidence, leading to a lower cost of capital. Moreover, environmental reporting improves decision-making, business planning, and increases overall performance of a firm (Staniskis and Stasiskiene, 2006). ***Therefore, Hypotheses 3a, 3b, 3c, and 3d are strongly supported.***

Fourthly, in regard to environmental auditing effectiveness focus (Hypotheses 4a – 4d), the results indicate that environmental auditing effectiveness focus has a significant positive influence on societal expectation fulfillment ($\beta_4 = 0.289$, $p < 0.05$), community relationship maintenance ($\beta_{18} = 0.312$, $p < 0.01$), and sustainable performance development ($\beta_{25} = 0.227$, $p < 0.05$). These relationships indicated that firms with higher environmental auditing effectiveness focus have greater societal expectation fulfillment, community relationship maintenance, and sustainable

performance development. This is because the purpose of environmental auditing is to ensure compliance with local environmental laws and regulations and respond to the society's needs (Delakowitz and Hoffmann, 2000). Statistically, environmental auditing supports relationships among external stakeholders such as qualified technician professionals, individual industries, other public authorities, industrial associations, and their community (Selvam, 2003). Moreover, environmental auditing is the monitoring process of the environmental management system, is compliant with laws, regulations, and policies. It helps firms to develop the action plan to deal with defects leading to enhancing firm performance (Thompson and Wilson, 1994). Similarly, Uberoi (2003) confirmed that environmental auditing in India serves as an important environmental management tool for the development performance of firms and industries in the long term. ***Therefore, Hypotheses 4a, 4c, and 4d are supported.***

Besides, environmental auditing effectiveness focus has no significant effects on environmental conservation efficiency (β_{11} = 0.027, p > 0.10). This result indicates that environmental auditing effectiveness focus does not positively influence environmental conservation efficiency. This is because environmental audit is a managerial tool of a systemic, documented, objective and regular assessment of the firm performance in order to control the business activities that have an impact on the environment and to assess compliance with the firm's environmental policies. Whereas, if the firm cannot objectively evaluate the business activities with significant environmental impact, environmental auditing may not help the firm reduce environmental problems and achieve the environmental objectives and targets (Augustine et al., 2013). ***Therefore, Hypothesis 4b is not supported.***

Finally, in light of environmental improvement disclosure implementation (Hypotheses 5a – 5d), the results reveal that environmental improvement disclosure implementation has no significant effects on societal expectation fulfillment (β_5 = 0.015, p > 0.10), environmental conservation efficiency (β_{12} = 0.121, p > 0.10), and community relationship maintenance (β_{19} = 0.017, p > 0.10). This result indicates that environmental improvement disclosure implementation has no positive influence on societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance. It is possible that more environmental disclosure is not essentially good for the firm. A study by Jia and Sulkowski (2010) concluded that more

environmental solution disclosures may represent potential environmental problems within the firm. These environmental disclosures affect the firm image in the public eye. Moreover, the firms may receive punishment from the public if firms disclose the environmental information beyond the actual environmental operation or are unable to operate in accordance with environmental policy which is disclosed to the public (Monz, 2012). ***Therefore, Hypotheses 5a, 5b, and 5c are not supported.***

Interestingly, environmental improvement disclosure implementation has a significant effect on sustainable performance development ($\beta_{26} = 0.346$, $p < 0.01$). These findings suggest that environmental improvement disclosure implementation has a positive influence on sustainable performance development. These results suggest that environmental improvement disclosure implementation tends to achieve sustainable performance development. Previous researchers have suggested that potential investors reacted to the offsetting of the impacts of positive environmental solution disclosures when the firms operating in environmentally sensitive industry were faced with negative liabilities (Milne and Patten, 2002). Similarly, the work of Lee and Sweeney (2015) explored the effect on corporate environmental disclosure on litigation awards. The results found that voluntary environmental disclosures such as environmental conservation activities and environmental solution policies on the firm website are positively related to litigation outcomes in the form of a reduced punitive damage award. Moreover, the firm encouraging environmental improvement would create commitment and willingness of customers to purchase products of a firm because they believed that these products were environmentally friendly (Ottman, 1998). Furthermore, Rondinelli and Berry (2000) mentioned that Toyota Motors disclosed their environmental policy and promoted environmental activities in order to strengthen the reputation of their firm in the long term. Ultimately, environmental information disclosure is a tool of the public in decisions about the environmental performance of the firm. It allows firms to reduce operating inefficiencies, improve environmental performance and increase awareness of regulatory requirements. ***Therefore, Hypothesis 5d is supported.***

Overall, these results can indicate that two of the five dimensions of EMAC (including environmental identification efficiency orientation, and environmental reporting transparency emphasis) have a significant, positive effect on societal

expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development; while environmental practice proficiency capability only has a significant, positive association with environmental conservation efficiency. Moreover, environmental improvement disclosure implementation only, significant, positive effect on sustainable performance development. Furthermore, environmental auditing effectiveness focus has a significant impact on societal expectation fulfillment, community relationship maintenance, and sustainable performance development. ***Therefore, Hypotheses 1(a-d), 2b, 3 (a-d), (4a, c, d), and 5d are supported while Hypotheses 2(a, c, d,) 4b and 5(a-c) are not supported.***

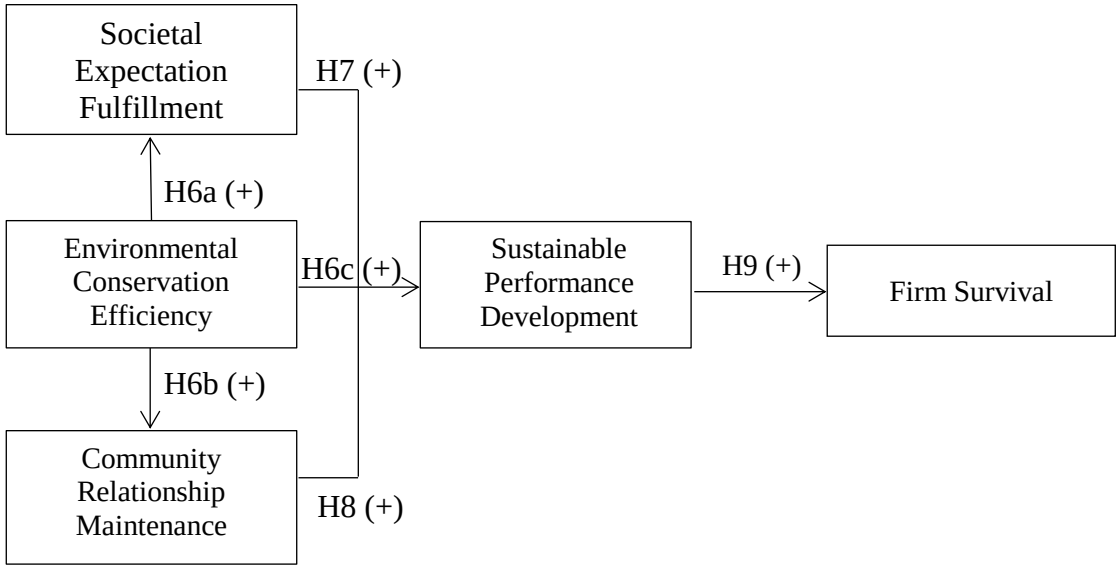
For the control variable, the results indicate that firm size has significant, positive effect on community relationship maintenance ($\beta_{20} = 0.361$, $p < 0.05$), meaning that firms with a firm size of more than 250,000,000 baht have greater community relationship maintenance than those firms with less than 250,000,000 baht. It is because the behavior of small and big firms has difference in social responsibility practice to contribute toward achieving community and regional development outcomes (Lowe, 2015). Especially, bigger firms are likely to have higher environmental disclosures than smaller ones (Cormier and Gordon, 2001). It may be beneficial to shareholders, employees, and the community because firm gives extra information exceeding stakeholder expectations (Ministry of Environment of Japan, 2002).

<u>The Impacts of Societal Expectation Fulfillment, Environmental Conservation Efficiency, Community Relationship Maintenance on Sustainable Performance Development, and Firm Survival</u>

Figure 9 demonstrates the relationship of among societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance on sustainable performance development, and firm survival based on Hypotheses 6–9. This research proposes that environmental conservation efficiency has a positive effect on societal expectation fulfillment, community relationship maintenance, and sustainable performance development (Hypotheses 6a– 6c). Also, this research forecasts that societal expectation fulfillment, community relationship

maintenance have a positive effect on sustainable performance development (Hypotheses 7– 8). Finally, this research proposes that sustainable performance development has a positive effect on firm survival (Hypothesis 9). These hypotheses are examined by the regression equation in Models 5– 8 according to Chapter 3.

Figure 9 The Effects of EMAC Consequences on Firm Survival



The correlations among societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival are shown in Table 12. Firstly, societal expectation fulfillment is significantly and positively correlated to sustainable performance development (r = 0.759, $p < 0.01$). Secondly, environmental conservation efficiency has a significant, positive correlation with societal expectation fulfillment, community relationship maintenance, and sustainable performance development (r = 0.833, $p < 0.01$; r = 0.752, $p < 0.01$; r = 0.762, $p < 0.01$). Thirdly, community relationship maintenance has significant positive correlation to sustainable performance development (r = 0.780, $p < 0.01$). Finally, sustainable performance development is significantly and positively correlated to firm survival (r = 0.817, $p < 0.01$), respectively. Environmental conservation efficiency and community relationship maintenance have a significant, positive correlation (r = 0.752, $p < 0.01$).

Table 12 Descriptive Statistics and Correlation Matrix of Societal Expectation Fulfillment, Environmental Conservation Efficiency, Community Relationship Maintenance on Sustainable Performance Development, and Firm Survival

Variables	ECE	SEF	CRM	SPD	FSU	FS	DC
Mean	4.140	4.224	4.079	4.054	4.047	n/a	n/a
S.D	.549	.498	.599	.538	.552	n/a	n/a
ECE	1						
SEF	.833***	1					
CRM	.752***	.774***	1				
SPD	.762***	.759***	.780***	1			
FSU	.707***	.675***	.680***	.817***	1		
FS	.060	.075	.217**	-.008	.157	1	
DC	-.068	-.119	-.004	-.011	-.006	.198**	1

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

As a result, those correlations those are higher than 0.80 that have the first indication of substantial multicollinearity. To assess multicollinearity problem, a second measure VIF is used to test the correlation among independent variables in each regression analysis. The results show that the maximum value of VIF is 4.009, or well below the cut-off value of 10 (Hair et al., 2010). As a result, multicollinearity problems should not of concern.

The results of OLS regression analysis of the relationships between EMAC outcomes, namely, societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival as aforementioned in Hypotheses 6–9, are demonstrated in Table 13 as shown that the scale of adjusted R^2 range from 0.583– 0.698.

Table 13 The Results of the Regression Analysis for Effects of Societal Expectation Fulfillment, Environmental Conservation Efficiency, Community Relationship Maintenance on Sustainable Performance Development, and Firm Survival

Independent Variables	Dependent Variables[a]			
	Societal Expectation Fulfillment Model 5	**Community Relationship Maintenance Model 6**	**Sustainable Performance Development Model 7**	**Firm Survival Model 8**
Environmental Conservation Efficiency (ECE : H6a-c)	**.825***** (.054)	**.743***** (.063)	**.257**** (.102)	-
Societal Expectation Fulfillment (SEF : H7)	-	-	**.209*** (.107)	-
Community Relationship Maintenance (CRM : H8)	-	-	**.458***** (.092)	-
Sustainable Performance Development (SPD : H9)	-	-	-	**.818***** (.054)
Control Variables: Firm size (FS)	.084 (.117)	**.361***** (.136)	**-.320***** (.120)	**.359***** (.118)
Duration Certified (DC)	-.169 (.132)	.031 (.153)	.151 (.132)	-.072 (.133)
Adjusted R^2	.690	.583	.698	.686
Maximum VIF	1.048	1.048	4.009	1.041

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

The Table 13 shows that environmental conservation efficiency has a significant, positive, direct effect on societal expectation fulfillment ($\beta_{29} = 0.825$, $p < 0.01$), community relationship maintenance ($\beta 32 = 0.743$, $p < 0.01$), and sustainable performance development ($\beta 36 = 0.257$, $p < 0.05$). This result can assume that the firm with high levels of environmental conservation efficiency is more likely to have an increase of societal expectation fulfillment, community relationship maintenance and sustainable performance development. One empirical research indicated that a firm's efforts to solve the pollution problems caused by the manufacturing processes will make for a good image in the eyes of a neighborhood or community group (Welch and Hibiki,

2002). Likewise, environmental conservation activities are an effective way to maintain firm image and enhance social satisfaction (Ministry of Environment of Japan. 2002). Moreover, previous research has suggested that environmental conservation activities such as investment in energy conservation have positive correlations with cost saving of raw materials and fuel, increased profitability and growth potential of firms (Hibiki and Arimura, 2004). Likewise, pollution reduction activity is positively related to corporate performance development in both financial and environmental aspects (Guenster et al., 2011). Furthermore, Brouwers et al. (2014) disclosed that the attempt to prevent emission of air pollution has a positive relationship with firm performance. Similarly, Hibiki and Arimura (2004) explored the motivations with respect to environmental conservation of a firm. The results indicated that regulatory compliance, firm image, and cost savings in the long term are strong motivations of a firm to change manufacturing processes which reduce pollution emissions and other environmental problems. ***Therefore, Hypotheses 6a, 6b, and 6c are supported.***

Moreover, the findings show that societal expectation fulfillment and community relationship maintenance have a significant, positive effect on sustainable performance development ($\beta_{35} = 0.209$, $p < 0.10$; $\beta_{37} = 0.458$, $p < 0.01$). This result can assume that the firms which high levels of societal expectation fulfillment and community relationship maintenance are more likely to have an increase of sustainable performance development. One empirical research indicated that firms which focus on the society needs as a primary goal of the business operation are likely to design business processes in accordance with social perspective in order to increase the transactions, customer reliability in products or services over competitors, and greater profitability (Rachael, Jennifer and Stephane, 2009; Berry and Rondinelli, 1999). Furthermore, good relationships among firm, society, and community are the key factors that help firms to build financial performance and overall performance (D'Aveni and Gunther, 1994). ***Therefore, Hypotheses 7 and 8 are supported.***

Additionally, the findings indicate that sustainable performance development has a significant influence on firm survival ($\beta 40 = 0.818$, $p < 0.01$). These findings confirm that sustainable performance development is an important in that it makes for firm survival. It is possible that firms can survive over the long run if they respond to the needs of all their stakeholders and have efforts to improve their business

performance over their competitors (Sachs, Post and Preston, 2002). Especially, the best way to help firms survive in the long term is not only a focus to improve financial performance, but also a focus on social and environmental performance (Elkington, 1997). ***Therefore, Hypothesis 9 is supported.*** From the results above, it can be summarized that firms with environmental conservation efficiency will increase societal expectation fulfillment and community relationship maintenance, which leads them to sustainable performance development and firm survival.

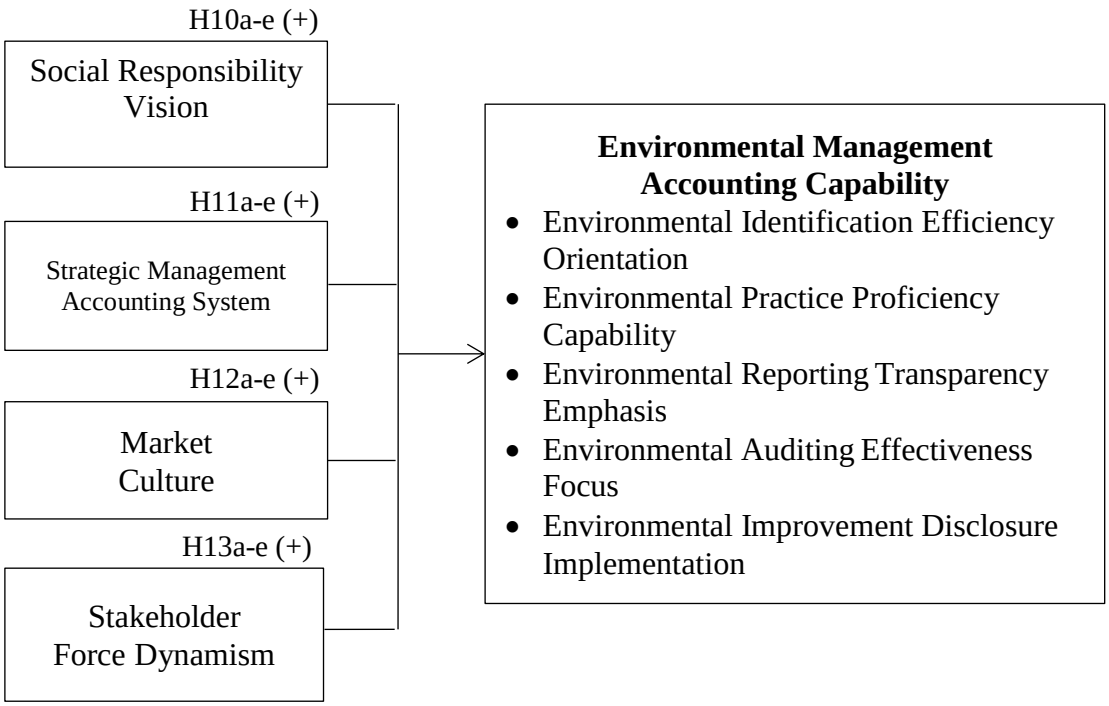
For the control variables, firm size has significant, positive effect on community relationship maintenance ($\beta_{33} = 0.361$, $p < 0.01$) and firm survival ($\beta_{41} = 0.359$, $p < 0.01$). These findings confirm that bigger firm is an important in that it makes for community relationship maintenance and firm survival more than smaller firm. It is because the behaviors between small and big firms have difference in social responsibility practice to contribute toward achieving community and regional development outcomes (Lowe, 2015). Especially, bigger firm is likely to have higher environmental disclosures than smaller ones (Cormier and Gordon, 2001). It may be beneficial to shareholders, employees, and the community because firm gives extra information exceeding stakeholder expectations (Ministry of Environment of Japan, 2002). Moreover, 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). In contrast, firm size has significant, negative effect on sustainable performance development ($\beta_{38} = -0.320$, $p < 0.01$). This result can assume that firms with a firm size of less than 250,000,000 baht have greater sustainable performance development than those firms with more than 250,000,000 baht. It is because small firms are likely to be relatively strong in innovations for enhance firm performance because these firms can make use of their flexibility and proximity to market demand, such as new products or modifications to existing products for niche markets (Vossen, 1998). However, duration certified has no statistically significant effect on societal expectation fulfillment ($\beta_{31} = -0.169$, $p > 0.10$), community relationship maintenance ($\beta_{34} = 0.031$, $p > 0.10$), sustainable performance development ($\beta_{39} = 0.151$, $p > 0.10$), and firm survival ($\beta_{42} = -0.072$, $p > 0.10$). It implies

that in the context of certified ISO 14000 firms in Thailand, societal expectation fulfillment, community relationship maintenance, sustainable performance development, and firm survival are not affected by the influence of duration certified.

The Effects of Antecedents on EMAC

Figure 10 exhibits the influences of the antecedent variables of EMAC, namely, social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism on five dimensions of EMAC (including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation), which are based on Hypotheses 10(a-e) –13(a-e).

Figure 10 The Effects of Antecedents of EMAC on Each Dimension of EMAC



This research proposes that social responsibility vision, strategic management accounting system, market culture, and stakeholder force have a positive influence on five dimensions of EMAC. These hypotheses are analyzed by the regression equation in Model 9–13 according to Chapter 3. The results of the OLS regression analysis are demonstrated in Table 15 that shows the scale of adjusted R^2 range from 0.402 to 0.560.

For the correlation analysis of the four antecedent variables and five dimensions of EMAC are shown in Table 14. The results reveal that four antecedents consist of social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism and are significantly and positively correlated with five dimensions of EMAC. Firstly, social responsibility vision is significantly and positively correlated to all dimensions of EMAC, namely, environmental identification efficiency orientation ($r = 0.578$, $p < 0.01$), environmental practice proficiency capability ($r = 0.571$, $p < 0.01$), environmental reporting transparency emphasis ($r = 0.591$, $p < 0.01$), environmental auditing effectiveness focus ($r = 0.654$, $p < 0.01$), and environmental improvement disclosure implementation ($r = 0.735$, $p < 0.01$).

Secondly, strategic management accounting system has a significant and positive correlation with environmental identification efficiency orientation ($r = 0.560$, $p < 0.01$), environmental practice proficiency capability ($r = 0.632$, $p < 0.01$), environmental reporting transparency emphasis ($r = 0.542$, $p < 0.01$), environmental auditing effectiveness focus ($r = 0.522$, $p < 0.01$), and environmental improvement disclosure implementation ($r = 0.681$, $p < 0.01$).

Thirdly, market culture is significantly and positively correlated to environmental identification efficiency orientation ($r = 0.548$, $p < 0.01$), environmental practice proficiency capability ($r = 0.623$, $p < 0.01$), environmental reporting transparency emphasis ($r = 0.575$, $p < 0.01$), environmental auditing effectiveness focus ($r = 0.570$, $p < 0.01$), and environmental improvement disclosure implementation ($r = 0.628$, $p < 0.01$). Finally, stakeholder force dynamism is significantly and positively correlated to environmental identification efficiency orientation ($r = 0.590$, $p < 0.01$), environmental practice proficiency capability ($r = 0.557$, $p < 0.01$), environmental reporting transparency emphasis ($r = 0.594$, $p < 0.01$), environmental auditing effectiveness focus ($r = 0.573$, $p < 0.01$), and environmental improvement disclosure implementation ($r = 0.587$, $p < 0.01$).

However, these correlations are less than 0.80 as recommended by Hair et al. (2010). In addition, variance inflation factors (VIFs) are utilized to test the intercorrelation among four antecedents of EMAC on each dimension of EMAC. In this case, the maximum value of VIF is 3.353 as shown in Table 15, which is well below the cut-off value of 10 (Hair et al., 2010). As a result, there are no substantial multicollinearity problems encountered in this regression analysis.

Table 14 Correlation Matrix of Effects of Four Antecedent Variables on Each Dimension of EMAC

Variables	EIEO	EPPC	ERTE	EAEF	EIDI	SRV	SMAS	MKC	SFD	FS	DC
Mean	4.050	4.060	4.151	4.1301	3.988	4.030	4.012	4.150	4.192	n/a	n/a
S.D	.541	.582	.532	.561	.623	.621	.602	.575	.564	n/a	n/a
EIEO	1										
EPPC	.741***	1									
ERTE	.741***	.687***	1								
EAEF	.718***	.729***	.734***	1							
EIDI	.737***	.746***	.768***	.771***	1						
SRV	.578***	.571***	.591***	.654***	.735***	1					
SMAS	.560***	.632***	.542***	.522***	.681***	.797***	1				
MKC	.548***	.623***	.575***	.570***	.628***	.670***	.706***	1			
SFD	.590***	.557***	.594***	.573***	.587***	.699***	.650***	.711***	1		
FS	.074	-.057	.050	.029	.131	.179	.147	.118	.095	1	
DC	-.198**	-.008	.007	-.043	-.001	.090	.057	-.032	-.032	.198**	1

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

The results of OLS regression analysis of the effect of social responsibility vision, strategic management accounting system, market culture, and stakeholder force on EMAC as aforementioned in Hypotheses 10(a-e) –13(a-e) are provided in Table 15.

The finding from Table 15 demonstrates that social responsibility vision has a positive impact on environmental identification efficiency orientation ($\beta_{43} = 0.233$, $p < 0.10$), environmental reporting transparency emphasis ($\beta_{55} = 0.260$, $p < 0.10$), environmental auditing effectiveness focus ($\beta_{61} = 0.544$, $p < 0.01$), and environmental improvement disclosure implementation ($\beta_{67} = 0.469$, $p < 0.01$). These findings indicated that social responsibility vision can help firms to have an EMAC increase (environmental identification efficiency orientation, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation). Prior studies suggested that the executives who are using social legitimacy vision will have more incentives to disclose environmental information and provide increasing information to the public about the real change of their business operations that impact society and the environment (Healy and Palepu, 2001). Moreover, firms which incorporate the vision and strategy of social responsibility principles into their business plans help firm to decrease the environmental impact from business operations (Persic and Markic, 2013). ***Therefore, Hypotheses 10a, 10c, 10d, and 10e are supported.***

In contrast, social responsibility vision has no significant influence on environmental practice proficiency capability ($\beta_{49} = 0.075$, $p > 0.10$). This may imply that social responsibility vision cannot help firms to have an environmental practice proficiency capability. This result can assume that environmental practice proficiency capability is needed to rely on other factors, not only social responsibility vision. Consistent with Jalaludin, Sulaiman and Ahmad (2011), the influence of institutional pressures include normative pressures in training and accounting memberships that are the main affect EMA practice. ***Therefore, Hypothesis 10b is not supported.***

Table 15 The Results of the Regression Analysis for Effects of Social Responsibility Vision, Strategic Management Accounting System, Market Culture, and Stakeholder Force Dynamism on Each Dimension of EMAC

Independent Variables	**Dependent Variables[a]**				
	EIEO Model 9	**EPPC Model 10**	**ERTE Model 11**	**EAEF Model 12**	**EIDI Model 13**
Social Responsibility Vision (SRV : H10a-e)	**.233*** (.134)	.075 (.130)	**.260*** (.138)	**.544***** (.132)	**.469***** (.118)
Strategic Management Accounting System (SMAS : H11a-e)	.152 (.131)	**.321**** (.128)	.037 (.135)	-.133 (.129)	.172 (.116)
Market Culture (MKC : H12a-e)	.099 (.118)	**.293**** (.114)	**.206*** (.121)	**.211*** (.116)	**.175*** (.104)
Stakeholder Force Dynamism (SFD : H13a-e)	**.248**** (.116)	.103 (.112)	**.246**** (.119)	.134 (.114)	.020 (.102)
Control Variables: Firm size (FS)	.039 (.161)	**-.349**** (.156)	-.109 (.165)	-.159 (.158)	.019 (.141)
Duration Certified (DC)	**-.525***** (.180)	.028 (.175)	.013 (.185)	-.139 (.177)	-.116 (.159)
Adjusted R^2	.433	.465	.402	.452	.560
Maximum VIF	3.353	3.353	3.353	3.353	3.353

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

Moreover, strategic management accounting system has no significant influence on environmental identification efficiency orientation (β_{44} = 0.152, p > 0.10), environmental reporting transparency emphasis (β_{56} = 0.037, p > 0.10), environmental auditing effectiveness focus (β_{62} = -0.133, p > 0.10), and environmental improvement disclosure implementation (β_{68} = 0.172, p > 0.10). These findings indicated that strategic management accounting system cannot help firms to have EMAC such as identification efficiency orientation, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. This may imply that firms which use traditional strategic management accounting system will not achieve preparation of

identification, reporting and auditing of information related to the environmental impact of the firm to a group of interested parties. It is because traditional strategic management accounting system ignored the environmental impacts of the firms (Milne, 1996). Moreover, this system is ill-equipped to deal adequately with environmental costs. It attributes environmental costs to general overheads which make it impossible for managers to trace (Jasch, 2003). ***Therefore, Hypotheses 11a, 11c, 11d, and 11e are not supported.***

Conversely, strategic management accounting system has a significant influence on environmental practice proficiency capability ($\beta_{50} = 0.321$, $p < 0.05$). These findings indicated that strategic management accounting system can help firms have an environmental practice proficiency capability increase. This may imply that any firm which can adapt and integrate the modern strategic management accounting practice to support EMA, it is likely that the firm can enhance the capability of environmental practice. This is because modern strategic management accounting system focuses on the practice, preparation and presentation of information related environmental performance of firm (Milne, 1996; De Palma and Csutora, 2001). ***Therefore, Hypothesis 11b is supported.***

Additionally, the findings indicate that market culture has a significant influence on environmental practice proficiency capability ($\beta_{51} = 0.293$, $p < 0.05$), environmental reporting transparency emphasis ($\beta_{57} = 0.206$, $p < 0.10$), environmental auditing effectiveness focus ($\beta_{63} = 0.211$, $p < 0.10$), and environmental improvement disclosure implementation ($\beta_{69} = 0.175$, $p < 0.10$). This may imply that market culture can help firms to have environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Consistent with the research of Hibiki and Arimura (2004) it was revealed that the development of new products and technologies of a firm, is a motive for environmental practices implementation, lead to environmental conservation representing business opportunities. Essentially, an environmental friendly product or ecological product of firm can respond to customer needs. Moreover, customers and media severe expect the firm to not only have environmental management policies, but its stakeholders also request the firm to have transparent disclosure on its environmental information. Thus, the firm should focus on

the preparation and presentation of environmental information in order to improve the firm operation and respond to customer needs (Che-Ahmad, 2015). ***Therefore, Hypotheses 12b, 12c, 12d and 12e are supported.***

Conversely, market culture has no significant influence on environmental identification efficiency orientation (β_{45} = 0.099, p > 0.10). This may imply that market culture cannot help firms have environmental identification efficiency orientation because market culture is inadequate for developing EMAC. EMAC depends on several factors, including skills, perspectives, and behaviors of employees for effective environmental operations (Pagalung, 2016). ***Therefore, Hypothesis 12a is not supported.***

Furthermore, the finding shows that stakeholder force dynamism has no significant impact on environmental practice proficiency capability (β_{52} = 0.103, p > 0.10), environmental auditing effectiveness focus (β_{64} = 0.134, p > 0.10), and environmental improvement disclosure implementation (β_{70} = 0.020, p > 0.10). These findings indicated that stakeholder force dynamism cannot help firms to have environmental practice proficiency capability, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. This may imply that environmental management tools such as accounting practice related to environment, evaluation of environmental performance, and environmental improvement may not be the key issue or hardly to recognize for stakeholders leading to build the pressure to firm because they are often evaluate overall environmental performance more than put the pressure in the sub issue (Munteanu , 2013; Uberoi, 2003; Schmidheiny, 1992). ***Therefore, Hypotheses 13b, 13d, and 13e are not supported.***

Ultimately, stakeholder force dynamism has a significant influence on environmental identification efficiency orientation (β_{46} = 0.248, p < 0.05), and environmental reporting transparency emphasis (β_{58} = 0.246, p < 0.05). These findings indicated that stakeholder force dynamism can help firms to have environmental identification efficiency orientation and environmental reporting transparency emphasis. This may imply that stakeholders expect a firm to identify the utilization rate of natural resources in order to reduce energy consumption, increasing energy efficiency, and increase the use of renewables (Johnsson et al., 2010). Moreover, stakeholders give more attention to corporate sustainability development (economic, societal and

environmental aspects) such in sustainable reporting (Jonge, 2006). Importantly, 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). ***Therefore, Hypotheses 13a and 13c are supported.***

Overall, this research proposes that EMAC has been stimulated by the influence of four antecedents, including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism. The result reveals that social responsibility vision has a significant, positive influence on environmental identification efficiency orientation, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. In addition, strategic management accounting system has a significant positive influence on environmental practice proficiency capability. Interestingly, market culture has a significant, positive influence on environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Ultimately, stakeholder force dynamism has a significant positive influence on environmental identification efficiency orientation, and environmental reporting transparency emphasis. ***Therefore, Hypotheses 10a, 10(c-e), 11b, 12(b-d), 13a, and 13c are supported, but Hypotheses10b, 11a, 11(c-e), 12a, 13b, 13(d-e) are not supported.***

For the control variables, firm size has significant, negative effect on environmental practice proficiency capability (β_{53} = -0.349, $p < 0.05$). The results mean that firms with a firm size of less than 250,000,000 baht have greater environmental practice proficiency capability than those firms with more than 250,000,000 baht. It is because the structural characteristics of small firms such as flexibility in structure, specialization and strong ties with clients will support the application of new innovation practices within firms (Yusof and Mohd, 2011). Smaller firms able to quickly and flexibly restructure to support environmental practice capability more than bigger firms.

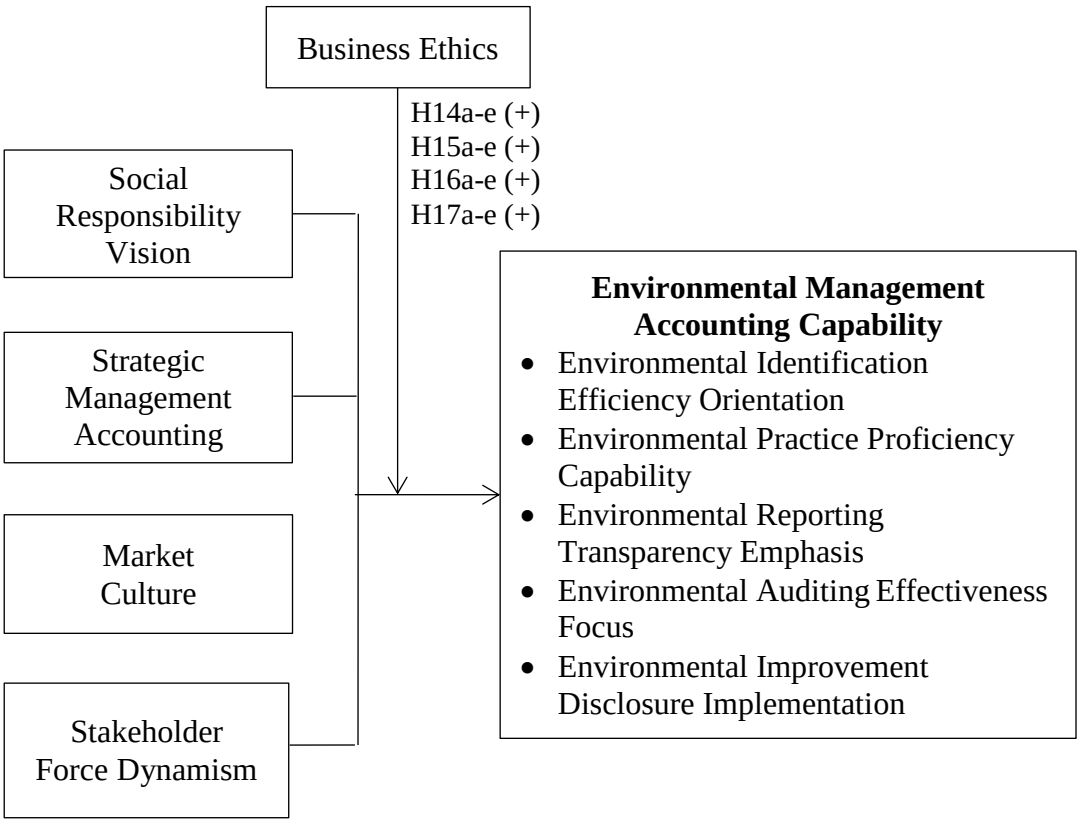
Additionally, duration certified has a significant negative influence on environmental identification efficiency orientation (β_{48} = -0.525, $p < 0.01$). The results mean that firms with duration certified less than 10 years have greater EMAC than those firms with over 10 years. It is because firm that has been certified ISO 14000 will be guaranteed the quality of environmental management system for three years. However, during this period, managers and clients will closely monitor the firm's operations to ensure its operations comply with ISO 14000 requirements (Nga, 2009). Thus, a firm that recently received certified ISO 14000 will receive more tremendous pressure from its stakeholders than firm which has been certified ISO 14000 for a long time. It may be implied that firms recently received certified ISO 14000 may have a good environmental management system to accurately and thoroughly identify of environmental costs and benefits from the firm's operations to demonstrate the operational quality in the eyes of its stakeholders.

The Moderating Effects of Business Ethics

This is an important part in analyzing the moderating effect of business ethics on the relationships among antecedents of EMAC and four dimensions of EMAC. Figure 11 shows the relationships among antecedents of EMAC and four dimensions of EMAC (including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation) via the moderating role of business ethics, which are based on Hypotheses 14(a-e) –17(a-e).

This research proposes that business ethics has a positive moderating effect on the relationships among social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism, and five dimensions of EMAC. These hypotheses are analyzed by the regression equation in Models 14–18 according to Chapter 3. The results of the OLS regression analysis are provided in Table 17 that shows the scale of adjusted R^2 range from 0.412 to 0.601.

Figure 11 The Moderating Effects of Business Ethics



The correlation analysis among business ethics, four antecedents of EMAC and five dimensions of EMAC are demonstrated in Table 16. The results reveal that business ethics is significantly and positively correlated to four antecedents of EMAC (including social responsibility vision, strategic management accounting system, market culture, and stakeholder force), on environmental identification efficiency orientation ($r = 0.578$, $p < 0.01$; $r = 0.560$, $p < 0.01$; $r = 0.548$, $p < 0.01$; $r = 0.590$, $p < 0.01$; $r = 0.462$, $p < 0.01$), environmental practice proficiency capability ($r = 0.571$, $p < 0.01$; $r = 0.632$, $p < 0.01$; $r = 0.623$, $p < 0.01$; $r = 0.557$, $p < 0.01$; $r = 0.492$, $p < 0.01$), environmental reporting transparency emphasis ($r = 0.591$, $p < 0.01$; $r = 0.542$, $p < 0.01$; $r = 0.575$, $p < 0.01$; $r = 0.594$, $p < 0.01$; $r = 0.582$, $p < 0.01$), environmental auditing effectiveness focus ($r = 0.654$, $p < 0.01$; $r = 0.522$, $p < 0.01$; $r = 0.570$, $p < 0.01$; $r = 0.573$, $p < 0.01$; $r = 0.512$, $p < 0.01$), and environmental improvement disclosure implementation ($r = 0.735$, $p < 0.01$; $r = 0.681$, $p < 0.01$; $r = 0.628$, $p < 0.01$; $r = 0.587$, $p < 0.01$; $r = 0.526$, $p < 0.01$).

Table 16 Descriptive Statistics and Correlation Matrix of Four Antecedent of EMAC on the Each Dimension of EMAC and Moderating Role of Business Ethics

Variables	EIEO	EPPC	ERTE	EAEF	EIDI	SRV	SMAS	MKC	SFD	BET	FS	DC
Mean	4.050	4.060	4.151	4.1301	3.988	4.030	4.012	4.150	4.192	4.262	n/a	n/a
S.D	.541	.582	.532	.561	.623	.621	.602	.575	.564	.643	n/a	n/a
EIEO	1											
EPPC	.741***	1										
ERTE	.741***	.687***	1									
EAEF	.718***	.729***	.734***	1								
EIDI	.737***	.746***	.768***	.771***	1							
SRV	.578***	.571***	.591***	.654***	..735***	1						
SMAS	.560***	.632***	.542***	.522***	.681***	.797***	1					
MKC	.548***	.623***	.575***	.570***	.628***	.670***	.706***	1				
SFD	.590***	.557***	.594***	.573***	.587***	.699***	.650***	.711***	1			
BET	.462***	.492***	.582***	.512***	.526***	.646***	.631***	.799***	.655***	1		
FS	.074	-.057	.050	.029	.131	.179	.147	.118	.095	.123	1	
DC	-.198**	-.008	.007	-.043	-.001	.090	.057	-.032	-.032	-.060	.198**	1

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

Therefore, these correlations are less than 0.80 as recommended by Hair et al. (2010). In addition, variance inflation factors (VIFs) are utilized to test the intercorrelation among business ethics and four antecedents of EMAC. In this case, the maximum value of VIF is 7.173 as shown in Table 17, and is well below the cut-off value of 10 (Hair et al., 2010). As a result, the multicollinearity problems should not be a concern in this research.

Table 17 Results of Moderating Effect of Business Ethics

Independent Variables	Dependent Variables				
	EIEO Model 14	**EPPC Model 15**	**ERTE Model 16**	**EAEF Model 17**	**EIDI Model 18**
Social Responsibility Vision (SRV)	**.256*** (.139)	.136 (.131)	**.245*** (.139)	**.588***** (.135)	**.545***** (.115)
Strategic Management Accounting System (SMAS)	.141 (.138)	**.300**** (.130)	.008 (.138)	-.181 (.134)	.148 (.115)
Market Culture (MKC)	.167 (.143)	**.362***** (.134)	.077 (.142)	.214 (.138)	**.250**** (.119)
Stakeholder Force Dynamism (SFD)	**.259**** (.120)	.079 (.113)	.196 (.120)	.113 (.116)	-.013 (.100)
Business Ethics (BET)	-.114 (.134)	-.124 (.126)	**.259*** (.133)	-.003 (.130)	.142 (.111)
SRV * BET (H14a-e)	-.052 (.165)	.078 (.155)	.087 (.164)	.196 (.160)	.137 (.137)
SMAS * BET (H15a-e)	.007 (.138)	-.214 (.130)	-.198 (.138)	-.196 (.134)	**-.281**** (.115)
MKC * BET(H16a-e)	.105 (.109)	**.185*** (.102)	**.231**** (.108)	.127 (.105)	**.175*** (.090)
SFD * BET (H17a-e)	-.130 (.128)	-.193 (.121)	-.179 (.128)	**-.210*** (.124)	**-.189*** (.107)
Control Variables: Firm Size (FS)	.042 (.167)	**-.307*** (.157)	-.080 (.166)	-.141 (.162)	.070 (.138)
Duration Certified (DC)	**-.548***** (.186)	.034 (.175)	.087 (.185)	-.124 (.180)	-.105 (.154)
Adjusted R^2	.424	.492	.429	.459	.603
Maximum VIF	7.177	7.177	7.177	7.177	7.177

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

Table 17 tests the moderating effects of business ethics on the relationships between antecedents of EMAC (social responsibility vision, strategic management accounting system, market culture, and stakeholder force) and five dimensions of EMAC. The results reveal that business ethics has no significant impact on the relationships among social responsibility vision and environmental identification efficiency orientation (β_{77} = -0.052, p > 0.10), environmental practice proficiency capability (β_{87} = 0.078, p > 0.10), environmental reporting transparency emphasis

(β_{97} = 0.087, p > 0.10), environmental auditing effectiveness focus (β_{107} = 0.196, p > 0.10), and environmental improvement disclosure implementation (β_{117} = 0.137, p > 0.10). It means business ethics is not the moderator of the relationships between social responsibility vision and environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. ***Therefore, Hypotheses 14a, 14b, 14c, 14d, and 14e are not supported.***

Likewise, business ethics has no positive, significant effect on the relationships between strategic management accounting system and environmental identification efficiency orientation (β_{78} = 0.007, p > 0.10), environmental practice proficiency capability (β_{88} = -0.214, p > 0.10), environmental reporting transparency emphasis (β_{98} = -0.198, p > 0.10), and environmental auditing effectiveness focus (β_{108} = -0.196, p > 0.10). It means business ethics is not the moderator of the relationships between strategic management accounting system and environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental auditing effectiveness focus. ***Therefore, Hypotheses 15a, 15b, 15c, and 15d are not supported.*** In contrast, it has a negative, significant effect on the relationships between strategic management accounting system and environmental improvement disclosure implementation (β_{118} = -0.281, p < 0.05). It means the interaction of strategic management accounting system and business ethics influence decreases environmental improvement disclosure implementation. ***Therefore, Hypothesis 15e is not supported.***

Moreover, business ethics has a significant impact on the relationships among market culture and environmental practice proficiency capability (β_{89} = 0.185, p < 0.10), environmental reporting transparency emphasis (β_{99} = 0.231, p < 0.05), and environmental improvement disclosure implementation (β_{119} = 0.175, p < 0.10). It means business ethics is the moderator of the relationships between market culture and environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental improvement disclosure implementation. Previous researchers have suggested that the strategy of firm, which is capable of implementing ethical codes and moral values, as well as socially responsible behaviors

of employees while carrying on their business activity, leads to the adoption of social responsibility accounting of a firm (Kakabase, Rozuel, and Lee-Davies, 2005). Moreover, in the intense competitive market, social and environmental impacts are being increasingly considered in Australia, Denmark, Netherlands, Norway, Sweden and the US. All stakeholders in these countries have mandatory requirements for the firms to prepare ethical reporting (including social and environmental) for the public (Carol, 2004). ***Therefore, Hypotheses 16b, 16c, and 16e are supported.*** At the same time, business ethics has no significant impact on the relationships among market culture and environmental identification efficiency (β_{79} = 0.105, p > 0.10), and environmental auditing effectiveness focus (β_{109} = 0.127, p > 0.10). It means that business ethics is not the moderator of the relationships between market culture and environmental identification efficiency, and environmental auditing effectiveness focus. ***Therefore, Hypotheses 16a and 16d are not supported.***

Finally, the results reveal that business ethics has a negative effect on the relationships of stakeholder force dynamism and environmental auditing effectiveness focus (β_{110} = -0.210, p < 0.10) and environmental improvement disclosure implementation (β_{120} = -0.189, p < 0.10). It means the interaction of stakeholder force dynamism and business ethics influence decreases environmental practice proficiency capability, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. ***Therefore, Hypotheses 17b, 17d, and 17e are not supported.*** At the same time, business ethics has no positive effect on the relationships between stakeholder force dynamism and environmental identification efficiency orientation (β_{80} = -0.130, p > 0.10), environmental practice proficiency capability (β_{88} = -0.193, p > 0.10), and environmental reporting transparency emphasis (β_{100} = -0.179, p > 0.10). This means that business ethics is not the moderator of the relationships between stakeholder force dynamism, environmental identification efficiency orientation, and environmental reporting transparency emphasis**.** ***Therefore, Hypotheses 17a and 17c are not supported.***

Thus, the summary that business ethics does not help promotes social responsibility vision, strategic management accounting system, and stakeholder force dynamism contributes to EMAC because business ethics are inadequate in developing EMAC. Importantly, 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). Interestingly, EMAC depends on several factors, including customer environmental sensitivity, board size, board independence, audit committee independence and managerial ownership concentration. Consistent with Hontou, Diakoulaki, and Papagiannakis (2007), level of customer environmental awareness increases as time goes, and will push environmental responsiveness level further. Thus, for influence put on a firm by customers' environmental sensitivity, executives would be more tempted to adopt environmental management practices. Moreover, board characteristics interact with environmental reporting quality. The result concluded that board size, board independence, board gender (except for gender mix), foreign directors, and audit committees have positive and significant relationships with environmental reporting quality (Oba and Fodio, 2012; Mobiauddin and Karbhari, 2010). Likewise, Sufian and Zahan (2013) noted that managerial ownership concentration encourages a low level of environmental disclosure.

In summary, this research proposes that business ethics has a positive moderate effect on the relationships among five dimensions of EMAC, environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. The result reveals that business ethics has no moderate effect on the relationships among social responsibility vision – environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Statistically, business ethics has no moderate effect on the relationships among strategic management accounting system – environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental auditing effectiveness focus. Simultaneously, business ethics has a negative moderate effect on the relationships between strategic management accounting system and environmental

improvement disclosure implementation. Business ethics has a positive, moderate effect on the relationships among market culture–environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental improvement disclosure implementation. While business ethics has no moderate effect on the relationships among market culture - environmental identification efficiency orientation, and environmental auditing effectiveness focus. Finally, business ethics has a negative moderate effect on the relationships among stakeholder force dynamism–environmental practice proficiency capability, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Meanwhile, business ethics has no moderate effect on the relationships among stakeholder force dynamism–environmental identification efficiency orientation, and environmental reporting transparency emphasis. ***Thus, Hypotheses 16b, 16c, and 16e are supported, while Hypotheses 14(a-e), 15(a-e), 16a, 16d, and 17(a-e) are not supported.***

For the control variables, firm size has significant, negative effect on environmental practice proficiency capability (β_{91} = -0.307, $p < 0.10$). The results mean that firms with a firm size of less than 250,000,000 baht have greater environmental practice proficiency capability than those firms with more than 250,000,000 baht. It is because the structural characteristics of small firms such as flexibility in structure, specialization and strong ties with clients will support the application of new innovation practices within firms (Yusof and Mohd, 2011). Smaller firms able to quickly and flexibly restructure to support environmental practice capability more than bigger firms.

Additionally, duration certified has a significant negative influence on environmental identification efficiency orientation (β_{82} = -0.548, $p < 0.01$). The results mean that firms with duration certified less than 10 years have greater EMAC than those firms with over 10 years. It is because firm that has been certified ISO 14000 will be guaranteed the quality of environmental management system for three years. However, during this period, managers and clients will closely monitor the firm's operations to ensure its operations comply with ISO 14000 requirements (Nga, 2009). Thus, a firm that recently received certified ISO 14000 will receive more tremendous pressure from its stakeholders than firm which has been certified ISO 14000 for a long time. It may be implied that firms recently received certified ISO 14000 may have a good environmental management system to accurately and thoroughly identify of

environmental costs and benefits from the firm's operations to demonstrate the operational quality in the eyes of its stakeholders.

Summary

In conclusion, this chapter presents the results of the multiple regression analysis which provide the understanding of the relationship between EMAC and firm survival. According to 17 hypotheses in Chapter 2, the result of the OLS regression analysis indicates that there are six fully–supported hypotheses (H1, 3, 6, 7, 8, and 9), eight partially–supported hypotheses (H2, 4, 5, 10, 11, 12, 13, and 16), and three non-supported hypotheses (H14, 15, and 17).

This finding provides an insight into the relationship between EMAC and firm survival by drawing on the empirical evidence from certified ISO 14000 firms in Thailand. The legitimacy theory and the contingency theory are utilized to generate the theoretical linkage of this research. These results clearly indicate that EMAC (including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation) have an importance for the firms in order to achieve firm survival via the outcomes of EMAC.

This research finds that five dimensions of EMAC (including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation) have a positive effect on sustainable performance development via three outcomes of EMAC (including societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance).

Importantly, three outcomes of EMAC – societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance – have a positive influence on sustainable performance development; and ultimately sustainable performance development has a positive influence on firm survival.

Additionally, this finding provides an empirical evidence for a better understanding of the four antecedents of EMAC. EMAC has been encouraged by social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism as a whole.

Moreover, this research also includes business ethics as moderators on the relationship between antecedents of EMAC and five dimensions of EMAC. Interestingly, business ethics has a positive, moderate effect on the relationships among market culture, environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental improvement disclosure implementation. Moreover, business ethics has a negative, moderate effect on the relationships between strategic management accounting system and environmental improvement disclosure implementation. Also, business ethics has a negative, moderate effect on the relationships among stakeholder force dynamism, environmental practice proficiency capability, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Finally, for two control variables – firm size and duration certified – the result indicates that firm size has a significant, negative influence on environmental practice proficiency capability. Besides, duration certified has a significant, negative influence on environmental identification efficiency orientation.

Consequently, the summary of the results of hypothesis testing is demonstrated in Table 18 as shown below. The next chapter will conclude this research and explain the theoretical and managerial contributions, limitations, and useful suggestions for further research.

Table 18 The Summary of Results of Hypothesis Testing

Hypotheses	Description of Hypothesized Relationships	Results
H1a	Environmental identification efficiency orientation is positively related to societal expectation fulfillment.	Supported
H1b	Environmental identification efficiency orientation is positively related to environmental conservation efficiency.	Supported
H1c	Environmental identification efficiency orientation is positively related to community relationship maintenance.	Supported
H1d	Environmental identification efficiency orientation is positively related to sustainable performance development.	Supported
H2a	Environmental practice proficiency Capability is positively related to societal expectation fulfillment.	Not Supported
H2b	Environmental practice proficiency Capability is positively related to environmental conservation efficiency.	Supported
H2c	Environmental practice proficiency Capability is positively related to community relationship maintenance.	Not Supported
H2d	Environmental practice proficiency Capability is positively related to sustainable performance development.	Not Supported
H3a	Environmental reporting transparency emphasis is positively related to societal expectation fulfillment.	Supported
H3b	Environmental reporting transparency emphasis is positively related to environmental conservation efficiency.	Supported
H3c	Environmental reporting transparency emphasis is positively related to community relationship maintenance.	Supported

Table 18 The Summary of Results of Hypothesis Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H3d	Environmental reporting transparency emphasis is positively related to sustainable performance development.	Supported
H4a	Environmental auditing effectiveness focus is positively related to societal expectation fulfillment.	Supported
H4b	Environmental auditing effectiveness focus is positively related to environmental conservation efficiency.	Not Supported
H4c	Environmental auditing effectiveness focus is positively related to community relationship maintenance.	Supported
H4d	Environmental auditing effectiveness focus is positively related to sustainable performance development.	Supported
H5a	Environmental improvement disclosure implementation is positively related to societal expectation fulfillment.	Not Supported
H5b	Environmental improvement disclosure implementation is positively related to environmental conservation efficiency.	Not Supported
H5c	Environmental improvement disclosure implementation is positively related to community relationship maintenance.	Not Supported
H5d	Environmental improvement disclosure implementation is positively related to sustainable performance development.	Supported
H6a	Environmental conservation efficiency is positively related to societal expectation fulfillment.	Supported
H6b	Environmental conservation efficiency is positively related to community relationship maintenance.	Supported
H6c	Environmental conservation efficiency is positively related to sustainable performance development.	Supported

Table 18 The Summary of Results of Hypothesis Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H7	Societal expectation fulfillment is positively related to sustainable performance development.	Supported
H8	Community relationship maintenance is positively related to sustainable performance development.	Supported
H9	Sustainable performance development is positively related to firm survival.	Supported
H10a	Social responsibility vision is positively related to environmental identification efficiency orientation.	Supported
H10b	Social responsibility vision is positively related to environmental practice proficiency capability.	Not Supported
H10c	Social responsibility vision is positively related to environmental reporting transparency emphasis.	Supported
H10d	Social responsibility vision is positively related to environmental auditing effectiveness focus.	Supported
H10e	Social responsibility vision is positively related to environmental improvement disclosure implementation.	Supported
H11a	Strategic management accounting system is positively related to environmental identification efficiency orientation.	Not Supported
H11b	Strategic management accounting system is positively related to environmental practice proficiency capability.	Supported
H11c	Strategic management accounting system is positively related to environmental reporting transparency emphasis.	Not Supported
H11d	Strategic management accounting system is positively related to environmental auditing effectiveness focus.	Not Supported

Table 18 The Summary of Results of Hypothesis Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H11e	Strategic management accounting system is positively related to environmental improvement disclosure implementation.	Not Supported
H12a	Market culture is positively related to environmental identification efficiency orientation.	Not Supported
H12b	Market culture is positively related to environmental practice proficiency capability.	Supported
H12c	Market culture is positively related to environmental reporting transparency emphasis.	Supported
H12d	Market culture is positively related to environmental auditing effectiveness focus.	Supported
H12e	Market culture is positively related to environmental improvement disclosure implementation.	Supported
H13a	Stakeholder force dynamism is positively related to environmental identification efficiency orientation.	Supported
H13b	Stakeholder force dynamism is positively related to environmental practice proficiency capability.	Not Supported
H13c	Stakeholder force dynamism is positively related to environmental reporting transparency emphasis.	Supported
H13d	Stakeholder force dynamism is positively related to environmental auditing effectiveness focus.	Not Supported
H13e	Stakeholder force dynamism is positively related to environmental improvement disclosure implementation.	Not Supported

Table 18 The Summary of Results of Hypothesis Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H14a	Business ethics positively moderates the relationship between social responsibility vision and environmental identification efficiency orientation.	Not Supported
H14b	Business ethics positively moderates the relationship between social responsibility vision and environmental practice proficiency capability.	Not Supported
H14c	Business ethics positively moderates the relationship between social responsibility vision and environmental reporting transparency emphasis.	Not Supported
H14d	Business ethics positively moderates the relationship between social responsibility vision and environmental auditing effectiveness focus.	Not Supported
H14e	Business ethics positively moderates the relationship between social responsibility vision and environmental improvement disclosure implementation.	Not Supported
H15a	Business ethics positively moderates the relationship between strategic management accounting system and environmental identification efficiency orientation.	Not Supported
H15b	Business ethics positively moderates the relationship between strategic management accounting system and environmental practice proficiency capability.	Not Supported
H15c	Business ethics positively moderates the relationship between strategic management accounting system and environmental reporting transparency emphasis.	Not Supported
H15d	Business ethics positively moderates the relationship between strategic management accounting system and environmental auditing effectiveness focus.	Not Supported

Table 18 The Summary of Results of Hypothesis Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H15e	Business ethics positively moderates the relationship between strategic management accounting system and environmental improvement disclosure implementation.	Not Supported
H16a	Business ethics positively moderates the relationship between market culture and environmental identification efficiency orientation.	Not Supported
H16b	Business ethics positively moderates the relationship between market culture and environmental practice proficiency capability.	Supported
H16c	Business ethics positively moderates the relationship between market culture and environmental reporting transparency emphasis.	Supported
H16d	Business ethics positively moderates the relationship between market culture and environmental auditing effectiveness focus.	Not Supported
H16e	Business ethics positively moderates the relationship between market culture and environmental improvement disclosure implementation.	Supported
H17a	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental identification efficiency orientation.	Not Supported
H17b	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental practice proficiency capability.	Not Supported

Table 18 The Summary of Results of Hypothesis Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H17c	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental reporting transparency emphasis.	Not Supported
H17d	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental auditing effectiveness focus.	Not Supported
H17e	Business ethics positively moderates the relationship between stakeholder force dynamism and environmental improvement disclosure implementation.	Not Supported

CHAPTER V

CONCLUSION

The previous chapter reveals the results and discussion that involve respondent characteristics and descriptive statistics, correlation analysis, and hypotheses testing and results. Therefore, this chapter aims to describe the overview of all findings, comprising the summary of the findings and hypothesis testing, theoretical and managerial contributions; and then concludes with a discussion of the research and directions for future research.

Summary of Results

This research newly proposes five dimensions of EMAC (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation), which allow one to create a better understanding relating to the components of EMAC. Also, this research investigates the relationships among each dimension of EMAC, societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival in certified ISO 14000 firms in Thailand. In addition, the relationships among societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival are also examined.

Meanwhile, the effect of four antecedents, including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism pressure on five dimensions of EMAC is also examined. Finally, business ethics, designed to moderate the relationships among the antecedents and each of five dimensions of EMAC, are examined as well.

The key question of this research is how EMAC (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and

environmental improvement disclosure implementation) has an effect on firm survival. The specific research questions are as follows: (1) How does each dimension of EMAC (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus and environmental improvement disclosure implementation) affect societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development? (2) How does environmental conservation efficiency has an influence on societal expectation fulfillment and community relationship maintenance? (3) How do societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance have an influence on sustainable performance development? (4) How does sustainable performance development has an influence on firm survival? (5) How do social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism have an influence on each dimension of EMAC? and finally, (6) How does business ethic moderate the influence of social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and each dimension of EMAC?

There are two theories applied to explain the phenomena in the research, namely, the legitimacy theory and the contingency theory. The legitimacy theory is used to illustrate the dimensions of EMAC and the consequences of its relationships. Meanwhile, the contingency theory is used to describe the relationships among the dimensions of EMAC and the antecedents.

This research selected certified ISO 14000 firms in Thailand as the population due to these firms having more awareness and concentration on managing the impact of their operations on society and environment than other groups. The population sample of this research is provided by the Thai Industrial Standards Institute, Ministry of Industry, Thailand, accessed on April 15, 2016. For the data collection, the self-administrated questionnaire was employed to gather the data. Thus, 458 questionnaires were sent to the chief accounting executive, the accounting director or the accounting manager who are the key informants of certified ISO 14000 firms in Thailand. The mail survey resulted in 111 returned mailings with 107 usable for hypotheses testing. The effective response rate was approximately 23.73%.

The conceptual model was tested by the using the collected data which was received from 107 mailed surveys of certified ISO 14000 firms in Thailand. Then, the multiple regression analysis was used to test and examine all hypotheses following the conceptual model after the measurements had been successfully validated for the validity and reliability. The results of the OLS regression analyses indicated that the hypotheses derived from the conceptual model had been partially supported.

The overall results demonstrate that EMAC including environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation, positively influences its consequences which are societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance. Especially, environmental identification efficiency orientation, and environmental reporting transparency emphasis are the key elements of EMAC to obtain these consequences. In addition, societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance have an effect on sustainable performance development which, in turn, impacts firm survival.

In terms of the relationships among the antecedents and EMAC, the findings illustrated that there are no antecedent variables that have an influence on all five dimensions of EMAC. However, social responsibility vision has a positive impact on environmental identification efficiency orientation, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. In addition, strategic management accounting system has a significant influence on environmental practice proficiency capability. Moreover, market culture has a significant influence on environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Finally, stakeholder force dynamism has a significant influence on environmental identification efficiency orientation and environmental reporting transparency emphasis.

Interestingly, business ethics has a positive, moderate effect on the relationships among market culture – environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental improvement disclosure implementation. Meanwhile, business ethics has a negative, moderate effect on the relationships between strategic management accounting system and environmental improvement disclosure implementation, and the relationships among stakeholder force dynamism - environmental practice proficiency capability, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Furthermore, for two control variables – firm size and duration certified–the result indicates that firm size has a significant negative influence on environmental practice proficiency capability. Likewise, duration certified has a significant negative influence on environmental identification efficiency orientation.

In conclusion, it is clear that the certified ISO 14000 firms, which have EMAC, can encourage societal expectation fulfillment, environmental conservation efficiency, and community relationship maintenance in order to increase sustainable performance development, and ultimately achieve firm survival. Moreover, EMAC is encouraged by four internal factors – social responsibility vision, strategic management accounting system, market culture, and business ethics – and one external factor that is stakeholder force dynamism. As mentioned earlier, the summary of all research questions and the results is exhibited in Table 19 and Figure 12 as shown below.

Table 19 Summary of Results in All Hypotheses Testing

Research Questions	Hypotheses	Results	Conclusions
(1) How does each dimension of EMAC affect societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development?	H1a-d H2a-d H3a-d H4a-d H5a-d	• Environmental identification efficiency orientation has a significant positive association with societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. • Environmental practice proficiency capability has a significant positive association with environmental conservation efficiency. • Environmental reporting transparency emphasis has a significant positive association with societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development.	Partially Supported

Table 19 Summary of Results in All Hypotheses Testing (continued)

Research Questions	Hypotheses	Results	Conclusions
		• Environmental auditing effectiveness focus has a significant positive association with societal expectation fulfillment, community relationship maintenance and sustainable performance development. • Environmental improvement disclosure implementation has a significant positive association with sustainable performance development.	
(2) How does environmental conservation efficiency has an influence on societal expectation fulfillment and community relationship maintenance?	H6a-b	• Environmental conservation efficiency has a significant positive impact on societal expectation fulfillment and community relationship maintenance	Fully supported
(3) How do societal expectation fulfillment, environmental conservation efficiency, community relationship	H6c H7 H8	• Environmental conservation efficiency has a significant positive impact on sustainable performance development.	Fully supported

Table 19 Summary of Results in All Hypotheses Testing (continued)

Research Questions	Hypotheses	Results	Conclusions
maintenance have an influence on sustainable performance development?		• Societal expectation fulfillment has a significant positive impact on sustainable performance development. • Community relationship maintenance has a significant positive impact on sustainable performance development.	
(4) How does sustainable performance development has an influence on firm survival?	H9	• Sustainable performance development significantly positively influences on firm survival.	Fully supported
(5) How do social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism have an influence on each dimension of EMAC?	H10a-e H11a-e H12a-e H13a-e	• Social responsibility vision has a significant positive relationship to four dimensions of EMAC – environmental identification efficiency orientation, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation.	Partially Supported

Table 19 Summary of Results in All Hypotheses Testing (continued)

Research Questions	Hypotheses	Results	Conclusions
		• Strategic management accounting system has a significant positive relationship one dimensions of EMAC that is environmental practice proficiency capability. • Market culture has a significant positive relationship to four dimensions of EMAC – environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. • Stakeholder force dynamism has a significant positive relationship to two dimensions of EMAC- environmental identification efficiency orientation, environmental reporting transparency emphasis	

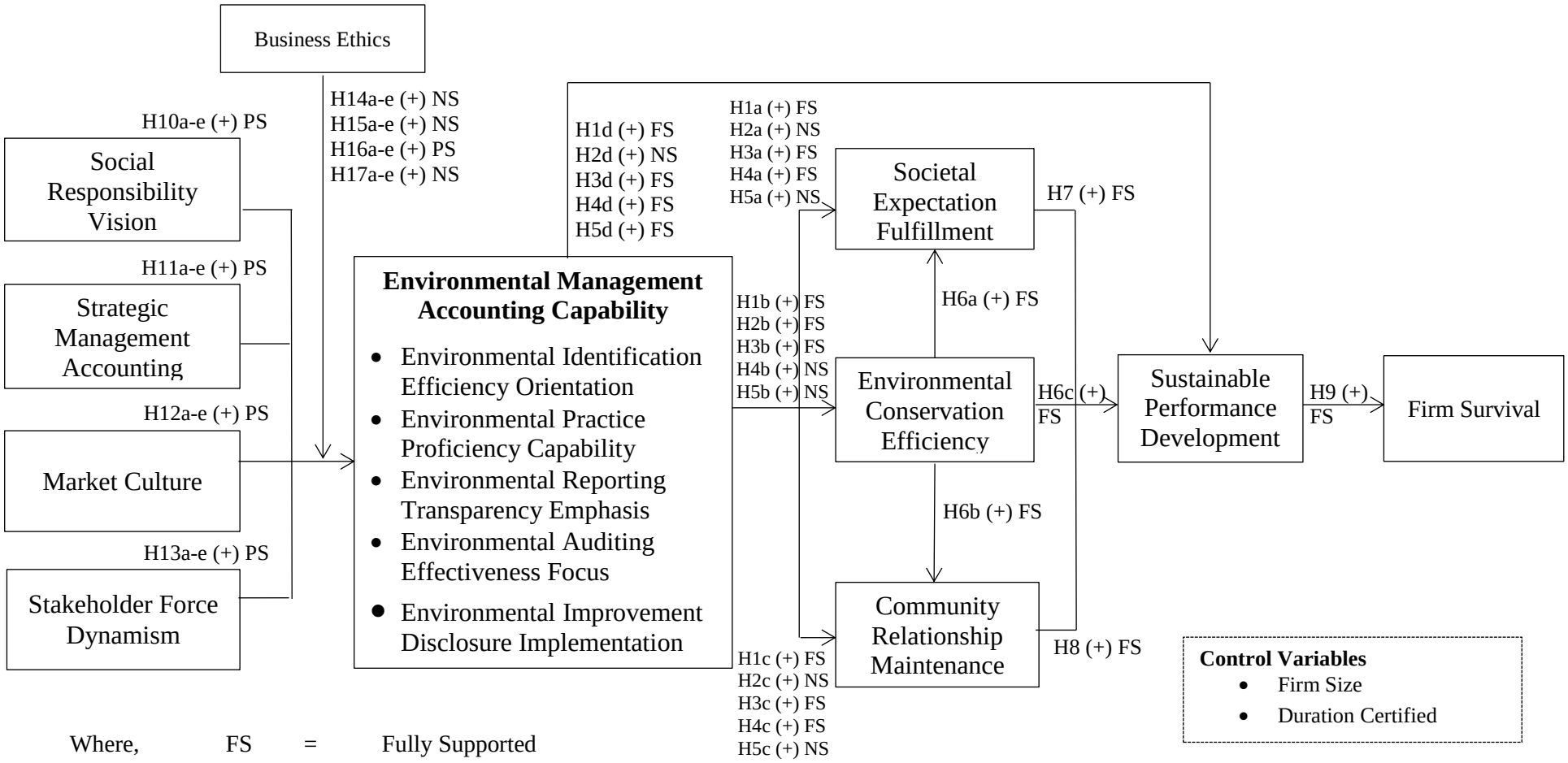
Table 19 Summary of Results in All Hypotheses Testing (continued)

Research Questions	Hypotheses	Results	Conclusions
(6) How does a business ethics moderate the influence of social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism and each dimension of EMAC orientation?	H14a-e H15a-e H16a-e H17a-e	• Business ethics has no significant influence on the relationship among social responsibility vision, and all dimensions of EMAC. • Business ethics has no significant influence on the relationship among strategic management accounting system, environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental auditing effectiveness focus. In contrast it has a significant negative influence on the relationship between strategic management accounting system and environmental improvement disclosure implementation. • Business ethics has significant positive influence on the relationship among market culture, environmental practice proficiency capability,	Partially Supported

Table 19 Summary of Results in All Hypotheses Testing (continued)

Research Questions	Hypotheses	Results	Conclusions
		environmental reporting transparency emphasis, and environmental improvement disclosure implementation. In contrast, it has no significant influence on the relationship among market culture, environmental identification efficiency orientation, and environmental auditing effectiveness focus. • Business ethics has significant negative influence on the relationship among stakeholder force dynamism, environmental practice proficiency capability, environmental auditing effectiveness focus and environmental improvement disclosure implementation. In contrast, it has no significant influence on the relationship among stakeholder force dynamism, environmental identification efficiency orientation, and environmental reporting transparency emphasis.	

Figure 12 The Results of All Hypotheses Testing



Where, FS = Fully Supported

PS = Partially Supported

NS = Not Supported

Theoretical and Managerial Contributions

Theoretical Contribution

This research provides a clear understanding of the relationships among EMAC and firm survival of certified ISO 14000 firms in Thailand via societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Furthermore, this research also provides an insight into the influence of four antecedents (including social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism) on each dimension of EMAC. EMAC comprises five dimensions – environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation.
In addition, two theories, namely, the legitimacy theory and the contingency theory, are utilized to describe the overall relationship of variables in the conceptual model.

This research makes three contributions to expand the theoretical contributions and the prior literature of EMAC. Firstly, this research proposes five dimensions of EMAC in accounting discipline that are comprised of environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation; whereas, prior research was lacking. This is a major theoretical contribution due to the form of the identification of five dimensions of EMAC, for the empirical testing provides an important theoretical insight which expands from the positive relationships among each dimension of EMAC, and the outcomes of EMAC. The finding reveals that environmental identification efficiency orientation and environmental reporting transparency emphasis are a key element of EMAC encourages societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance; and ultimately, increase sustainable performance development and firm survival.

Secondly, this research advances the literature by classifying many antecedents (include social responsibility vision, strategic management accounting system, market culture, stakeholder force dynamism), consequences (include societal expectation

fulfillment, environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival), and moderators of EMAC (include business ethics); and develops a model to test the relationships. The relationships among EMAC, the consequences, the antecedents, and the moderator are empirically tested in terms of the quantitative testing by collecting the data from certified ISO 14000 firms in Thailand, while most past research proposes the conceptual relationships.

Lastly, the results in this research conform to two theories, namely, the legitimacy theory and the contingency theory which support the overall association of variables in this model. The concept of legitimacy theory is to focus on the relationships between corporate social disclosure and community concerns. This theory suggests that a firm must react to society and community expectations and changes because a firm is a part of the society system. These legitimacy actions can assist firms in overcoming problems encountered in a changing environment which leads to survival in the long-term. Likewise, the results of this research confirm that firm that should thoroughly understand, manage, and then utilize EMAC (especially, environmental identification efficiency orientation and environmental reporting transparency emphasis are a key element of EMAC) are more likely to achieve their business operations (societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance; and ultimately, increase sustainable performance development and firm survival). Moreover, the contingency theory posits that if the firm wants to survive or effectively perform business operations, then firm structure and process of a firm must fit with its contexts: firm characteristics, culture, business environment, market conditions, and technology. The fits between organizational exogenous and endogenous factors are deliberate organizational and firm performance. Likewise, the results of this research confirm that the concept of the contingency theory appropriately explains the phenomenon among the internal factors (include social responsibility vision, strategic management accounting system, market culture, and business ethics), external factors (include stakeholder force dynamism) and each dimension of EMAC.

Managerial Contribution

The research results have managerial implications for practitioners. This research contributes to EMAC. Especially, firms which have EMAC are likely to have firm survival. Therefore, the executives who are responsible should be concerned with EMAC, especially for environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. In addition, EMAC helps lead to important firm competencies (which are societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development) toward firm competitiveness. Accordingly, these firm competencies eventually enhance firm survival. Also interestingly, this research provides a better understanding of how the firm can encourage EMAC. These findings show that firms should focus on social responsibility vision, strategic management accounting system, and market culture as internal factors to support EMAC. Then, managers should emphasize stakeholder force dynamism as the external factor for EMAC as well. More importantly, the results reveal that EMAC may be promoted by business ethics in which sometimes the manager should be careful as well.

In summary, EMAC is important for firm survival. Managers should thoroughly understand, manage, and then utilize EMAC (environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation) by supporting and allocating resources and capabilities within the firm; and for firm members to provide societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development. Consequently, firms can generate societal expectation fulfillment, environmental conservation efficiency, community relationship maintenance, and sustainable performance development for firm survival.

Limitations and Future Research Directions

Limitations

Although the results of the study have theoretical and managerial implications for management accounting researchers and practitioners respectively, some caution should be taken due to the limitations of the study. Firstly, with regards to the position of respondent's characteristics, approximately 21.50 percent are in other positions instead of account director/ 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. Secondly, the majority of literature reviews are prior studies that are obtained from a foreign country. Although the concept is able to describe the relationship as a positive effect, this research is empirically verified in a Thai the certified ISO 14000 firms context which many have unexpected support assumptions. Finally, the undelivered mail survey and unusable questionnaires was rejected from the statistical test in this research. This sample might be a key answer to more support of the hypothesis if the questionnaires were returned and completed.

Future Research Directions

The results of this research are derived from the data solely collected from certified ISO 14000 firms in Thailand. Therefore, future research may employ other sampling populations with differentiation in types and characteristics or separate the originally sample into manufacturer and service businesses in order to verify the generalizability of the results, to gain more research credibility, and confirm the generalizability of the research. For example, future research may separate the population of certified ISO 14000 firms in Thailand into two groups including manufacturer and service businesses to compare the results of such two groups. Moreover, future research may study only manufacturer businesses of certified ISO 14000 firms in Thailand because business operations of these firms have potential environmental impacts and can explain the development and enhancement of environmental management accounting capability more than service firms.

Secondly, this research uses only questionnaires for collection data. Therefore, future research could develop other research methodologies to test this conceptual framework of EMAC. 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 EMAC.

Importantly, according to the results of this research, there are very few positively significant for business ethics as the moderating effect on the relationships among the dimensions of EMAC and its antecedents. Business ethics has positive moderating effects on only the relationships among market culture and three dimensions of EMAC (including environmental practice proficiency capability, environmental reporting transparency emphasis, and environmental improvement disclosure implementation), but it does not moderate other antecedents and dimensions of EMAC. As a result, the requirement for future research is to require other more moderating variables to enhance the relationships between each dimension of EMAC and its antecedents. Therefore, future research may shed light on board characteristics (i.e., board size, board independence, board gender) as the alternative moderating variables of EMAC framework, because it interacts with the level of environmental practice quality.

Summary

This chapter revealed the effects of EMAC on firm survival the certified ISO 14000 firms. The contents involve both a theoretical contribution and managerial contribution. Moreover, limitations and future research directions are presented. The conceptual model of EMAC on firm survival of the certified ISO 14000 firms is supported by the theoretical frameworks, including the legitimacy theory and the contingency theory. EMAC comprises five dimensions, namely, environmental identification efficiency orientation, environmental practice proficiency capability, environmental reporting transparency emphasis, environmental auditing effectiveness focus, and environmental improvement disclosure implementation. Meanwhile, the consequences of EMAC are composed of societal expectation fulfillment,

environmental conservation efficiency, community relationship maintenance, sustainable performance development, and firm survival. Moreover, factors such as social responsibility vision, strategic management accounting system, market culture, and stakeholder force dynamism are also assumed to become the antecedents of the conceptual model. In addition, business ethics is the moderate variable in this research model. Finally, Figure 12, as shown above, concludes the results of all hypotheses testing of this research.

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APPENDICES

APPENDIX A

The Original Items

Table 1A Original Items in Scales

Construct	Items
Environmental Identification Efficiency Orientation (EIEO)	
EIEO1	Firm believes that the ability to identify the costs and benefits associated with the environment clearly will enhance the efficiency of environmental management.
EIEO2	Firm focus on the identification of environmental costs in a systematic and concrete will help firm to achieve the goal of environmental performance.
EIEO3	Firm emphasizes to clearly identification of environmental benefits that gained from good environmental management which allows the operation more successfully.
EIEO4	Firm support the recording in all aspects of the environment correctly that enable firm to improve the environment management.
EIEO5	Firm concentrates on determination and seeking the concrete criteria for classification the environmental element which enables to manage the cost more effectively.
Environmental Practice Proficiency Capability (EPPC)	
EPPC1	Firm believes that good environmental practice will help the environmental management more success.
EPPC2	Firm concentrates on the application of accounting practice systematically which enables the accounting practice more achievement.
EPPC3	Firm greater support the use of new technologies in the field of environmental accounting practice to help the environmental information management higher quality.
EPPC4	Firm focus on the analysis of the environmental impact on the community and society which enables the operation to be more acceptable.
Environmental Reporting Transparency Emphasis (ERTE)	
ERTE1	Firm believes that the preparation of environmental reporting with integrity will help the operation to be more acceptable.
ERTE2	Firm emphasizes to disclose data of actual environment in both benefits and side effects Which help to get cooperation from the stakeholders regularly.

Table 1A Original Items in Scales (continued)

Construct	Items
Environmental Reporting Transparency Emphasis (ERTE)	
ERTE3	Firm concentrates on the preparation of the environmental reporting completely in both quantitative and qualitative which allows the comprehensive information for planning and operational management of the firm.
ERTE4	Firm focuses on identifying the sources of environmental information with accurately and completely which will make reliable data received for the firm operations in both present and future.
Environmental Auditing Effectiveness Focus (EAEF)	
EAEF1	Firm believes that the assessment of environmental performance continually will help the management more effectively.
EAEF2	Firm always monitor the environmental performance which enables to solve various problems related to the environment timely.
EAEF3	Firm focuses on the monitoring the activity, process and environmental management systematically which enables the operating achieve the goal in both present and future.
EAEF4	Firm emphasizes on the concrete determination of operational guidelines in environmental auditing aspect which enables the operation auditing more efficiently.
Environmental Improvement Disclosure Implementation (EIDI)	
EIDI1	Firm believes that the dissemination of information related to ongoing environmental improvements will help the operation to be more accepted from those involved.
EIDI2	Firm focuses on the presentation the budget for the development and improvement the environment systematically which allows the environmental management of the environment to be more trusted.

Table 1A Original Items in Scales (continued)

Construct	Items
Environmental Improvement Disclosure Implementation (EIDI)	
EIDI3	Firm featured on the preparation the concrete database of the environment development and improvement which allows the presentation, disclosure and dissemination the information to the public faster and timely.
EIDI4	Firm intends to dissemination the development activities related to the environment development and improvement which allows the management achieve the goal both present and future.
Environmental Conservation Efficiency (ECE)	
ECE1	Firm confidences that the firm is an important part to help improvement and development the environment continuously.
ECE2	Firm has a good management with regard to the use of natural resources and conservation benefits.
ECE3	Firm is operating successfully with regard to the survival and sustainability of the environment regularly.
ECE4	Firm has the ability to reduce the waste that will impact on environmental degradation continuously and concretely.
Societal Expectation Fulfillment (SEF)	
SEF1	Firm can deliver the quality products and services to customers continuously.
SEF2	Firm can operate according to the rules, regulations and legislation completely
SEF3	Firm has been honored and trusted from the society as the firm that recognizes the social responsibility regularly.
SEF4	Firm has the potential to fully respond the social needs in all aspects.
Community Relationship Maintenance (CRM)	
CRM1	Firm receives the collaboration in the operation from the community consistently
CRM2	Firm has the ability to generate the participation from the community in all activities as well.

Table 1A Original Items in Scales (continued)

Construct	Items
Community Relationship Maintenance (CRM)	
CRM3	Firm adopts the recommendations and suggestions of the community to guide the operation consistently.
CRM4	Firm communicate the operational information in all aspects to the community invariably.
Sustainable Performance Development (SPD)	
SPD1	Firm can reduce cost of the operations as well and continuously.
SPD2	Firm has been recognized from the customers and those involved as the firm which has a good management regularly.
SPD3	Firm has the operational performance achieved its goals consistent with the current situation.
SPD4	Firm is able to retain an old customer and add new customers continuously.
Firm Survival (FSU)	
FSU1	Firm is able to survive under the fierce competition in both the present and future.
FSU2	Firm has the reputation and build credibility to those involved continuously.
FSU3	Firm received an award on good management about recognizing social responsibility continuously.
FSU4	Firm has outstanding management to can more growth and expansion in the past, present, and future.
Social Responsibility Vision (SRV)	
SRV1	Firm believes that the policy that focus on social responsibility and the good environment will enables firm to succeed in the competition.
SRV2	Firm supports the guideline for social responsibility concretely which enhance management efficiency.
SRV3	Firm focuses on the integration knowledge of social expectations as a guideline for good management will promotes the success of the management both the present and future.

Table 1A Original Items in Scales (continued)

Construct	Items
Social Responsibility Vision (SRV)	
SRV4	Firm emphasizes on analyze and predict the society needs systematically which provides the good information for the operational planning.
Strategic Management Accounting System (SMAS)	
SMAS1	Firm believes that good management accounting system will facilitates firm to apply the information in management more efficiency.
SMAS2	Firm recognizes the importance of ongoing development the management accounting system will enhance good information for develop and improve the business operations.
SMAS3	Firm encourages the application of new techniques and methods in management accounting regularly will promotes the business management more successful.
SMAS4	Firm promotes on linking of management accounting system and other management systems together which enable firm to apply the information more efficiently and effectively.
Market Culture (MKC)	
MKC1	Firm believes that the operation that focuses on marketing and related issues will allow the management success both in the present and future.
MKC2	Firm focused on the analysis of the changing needs of customers regularly will promote the development of products and services.
MKC3	Firm emphasizes on creating consciousness in the good services consistently which helps to response the customer needs as well.
MKC4	Firm recognizes the importance of the continuous learning of customer requirement which enable the operational planning more efficiently.
MKC5	Firm always recognizes that great ability to respond the customer needs will enhance the success in business operations.

Table 1A Original Items in Scales (continued)

Construct	Items
Stakeholder Force Dynamism (SFD)	
SFD1	The needs of stakeholders continuously changing which cause firms focus on the development the capacity and ability in the operation continuously.
SFD2	Customer needs increasingly diverse which cause firms focus on the development products and services in order to better respond the customer needs.
SFD3	Competitors are increasing in the present which cause firms need to continuously develop the potential of the firm.
SFD4	Competition is more violence at the present which cause firms focus on the development of the operational strategy more efficiently.
SFD5	Rules and regulations are increasing which cause firms intend to study and understand in order to take advantage of it.
Business Ethics (BET)	
BET1	Firms believes that the operation that always adhering to ethical principles will help the operation more successful.
BET2	Firm encourage staff to continuously learn and understand the moral principles and the laws related to the business operations in order to achieve the business goal.
BET3	Firm emphasizes on adherence ethics in their business operations which makes its operations to be recognized from those involved continuously.
BET4	Firm supports the implementation of standards of conduct that is socially acceptable standard which makes the firm achieve the operational goals both in the present and in future.

APPENDIX B

Non-Response Bias Tests

Table B Non-Response Bias Tests

Comparison	N	Mean	S.D.	t	Sig.*
Business Entity:					
• First Group	54	1.80	.40	.049	.961
• Second Group	53	1.79	.40		
Operational Capital:					
• First Group	54	3.11	1.14	-.010	.992
• Second Group	53	3.11	1.10		
Average Annual Incomes:					
• First Group	54	3.07	1.04	-.639	.524
• Second Group	53	3.20	1.12		
Reward in Environmental Management:					
• First Group	54	1.33	.48	.559	.577
• Second Group	53	1.28	.45		

* $p < 0.05$

Early respondents (n=54) and the last respondents (n=53), different in respondents group because exclude missing value.

APPENDIX C

Respondent Characteristic

Table 1C Demographic Characteristics of Respondents

Descriptions	Categories	Frequencies	Percent (%)
Gender	Male	23	21.50
	Female	84	78.50
	Total	107	100.00
Age	Less than 35 years old	19	17.76
	35 – 40 years old	11	10.28
	41 – 45 years old	30	28.04
	More than 45 years old	47	43.92
	Total	107	100.00
Marital Status	Single	43	40.19
	Married	56	52.33
	Divorced	8	7.48
	Total	107	100.00
Educational Level	Bachelor's degree or equal	64	59.81
	Higher than bachelor's degree	43	40.19
	Total	107	100.00
Working Experience	Less than 5 years	8	7.48
	5-10 years	11	10.29
	11-15 years	15	14.01
	More than 15 years	73	68.22
	Total	107	100.00
Average monthly income at present	Less than50,000 Baht	30	28.04
	50,000 – 80,000 Baht	33	30.84
	80,001 – 110,000 Baht	16	14.95
	More than 110,000 Baht	28	26.17
	Total	107	100.00

Table 1C Demographic Characteristics of Respondents (continued)

Descriptions	Categories	Frequencies	Percent (%)
Working position at present	Account Director	11	10.27
	Accounting Manager	50	46.73
	Accountant	23	21.50
	Other	23	21.50
Total		107	100.00

Table 2C Characteristics of ISO 14000 firms in Thailand

Descriptions	Categories	Frequency	Percentage
Business Entity	Public limited company	22	20.56
	Limited Companies	85	79.44
Total		107	100.00
Industrial Category	1. Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats	8	7.48
	2. Beverages	2	1.88
	3. Paper & paper products	4	3.74
	4. Basic chemicals	10	9.35
	5. Rubber products	4	3.74
	6. Cement/concrete	6	5.61
	7. Metal products	12	11.22
	8. Electrical machinery	-	-
	9. Production of electricity	3	2.80
	10. Manufacture of gas	1	0.93
	11. Wholesale/retail trade	1	0.93
	12. Transport & supporting activities	-	-
	13. Grain mill products, starches and prepared animal feeds	-	-
	14. Other food products	3	2.80
	15. Textiles	7	6.54
	16. Petroleum products	3	2.80
	17. Other chemical products	9	8.41
	18. Plastic products	5	4.68
	19. Casting of metals	1	0.93
	20. Machinery and equipment	17	15.89
	21. Radio, TV, communication equipment	2	1.87

Table 2C Characteristics of ISO 14000 firms in Thailand (continued)

Descriptions	Categories	Frequency	Percentage
Industrial Category	22. Motor vehicles/transport equipment	3	2.80
	23. Collection, purification and distribution of water	-	-
	24. Maintenance and repair of motor vehicles	-	-
	25. Real estate activities	1	0.93
	26. Other	5	4.67
Total		126	100.00
Number of employees at present	Less than 100 employees	10	9.35
	100 – 200 employees	16	14.95
	201 – 300 employees	11	10.28
	More than 300 employees	70	65.42
Total		107	100.00
Operational Capital	Less than 50,000,000 Baht	13	12.15
	50,000,001 - 150,000,000 Baht	22	20.56
	150,000,001 - 250,000,000 Baht	12	11.22
	More than 250,000,000 Baht	60	56.07
Total		107	100.00
Average annual income per year	Less than 100,000,000 Baht	10	9.35
	100,000,001-500,000,000 Baht	24	22.43
	500,000,001-1,000,000,000 Baht	16	14.95
	More than 1,000,000,000 Baht	57	53.27
Total		107	100.00
The period of time in business	Less than 10 years	3	2.80
	10 – 15 years	11	10.28
	16 – 20 years	16	14.95
	More than 20 years	77	71.97
Total		107	100.00

Table 2C Characteristics of ISO 14000 firms in Thailand (continued)

Descriptions	Categories	Frequency	Percentage
Number of certified ISO 14000 years	Less than 5 years	8	7.48
	5 – 7 years	16	14.95
	8 – 10 years	22	20.56
	More than 10 years	61	57.01
Total		107	100.00
Awarded in environmental management	Yes	74	69.16
	Never	33	30.84
Total		107	100.00

APPENDIX D

Tests of Validity and Reliability

Table 1D Factor Loadings and Alpha Coefficients of Constructs

Constructs	Items	Factor Loadings	Alpha Coefficient
Environmental Identification Efficiency Orientation (EIEO)	EIEO1	.963	.960
	EIEO2	.963	
	EIEO3	.936	
	EIEO4	.881	
	EIEO5	.895	
Environmental Practice Proficiency Capability (EPPC)	EPPC1	.729	.830
	EPPC2	.885	
	EPPC3	.827	
	EPPC4	.814	
Environmental Reporting Transparency Emphasis (ERTE)	ERTE1	.911	.913
	ERTE2	.914	
	ERTE3	.921	
	ERTE4	.817	
Environmental Auditing Effectiveness Focus (EAEF)	EAEF1	.887	.932
	EAEF2	.929	
	EAEF3	.924	
	EAEF4	.907	
Environmental Improvement Disclosure Implementation (EIDI)	EIDI1	.878	.930
	EIDI2	.902	
	EIDI3	.892	
	EIDI4	.964	
Environmental Conservation Efficiency (ECE)	ECE1	.935	.925
	ECE2	.925	
	ECE3	.889	
	ECE4	.866	

Table 1D Factor Loadings and Alpha Coefficients of Constructs (continued)

Constructs	Items	Factor Loadings	Alpha Coefficient
Societal Expectation Fulfillment (SEF)	SEF1	.774	.880
	SEF2	.885	
	SEF3	.915	
	SEF4	.857	
Community Relationship Maintenance (CRM)	CRM1	.885	.933
	CRM2	.943	
	CRM3	.947	
	CRM4	.872	
Sustainable Performance Development (SPD)	SPD1	.855	.909
	SPD2	.904	
	SPD3	.897	
	SPD4	.889	
Firm Survival (FSU)	FSU1	.713	.873
	FSU2	.930	
	FSU3	.831	
	FSU4	.928	
Social Responsibility Vision (SRV)	SRV1	.875	.953
	SRV2	.967	
	SRV3	.955	
	SRV4	.949	
Strategic Management Accounting System (SMAS)	SMAS1	.845	.928
	SMAS2	.880	
	SMAS3	.889	
	SMAS4	.685	

Table 1D Factor Loadings and Alpha Coefficients of Constructs (continued)

Constructs	Items	Factor Loadings	Alpha Coefficient
Market Culture (MKC)	MKC1	.820	.909
	MKC2	.899	
	MKC3	.906	
	MKC4	.892	
	MKC5	.761	
Stakeholder Force Dynamism (SFD)	SFD1	.864	.898
	SFD2	.836	
	SFD3	.813	
	SFD4	.863	
	SFD5	.838	
Business Ethics (BET)	BET1	.877	.949
	BET2	.936	
	BET3	.948	
	BET4	.964	

Table 2D Results of Validity and Reliability Testing

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
Environmental Conservation Efficiency (ECE)	.866-.935	.925
Societal Expectation Fulfillment (SEF)	.774-.915	.880
Community Relationship Maintenance (CRM)	.872-.947	.933
Sustainable Performance Development (SPD)	.855-.904	.909
Firm Survival (FSU)	.713-.930	.873
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

APPENDIX E

Test the Assumption of Regression Analysis

Autocorrelation, Normality and Multicollinearity

Durbin and Watson statistic is employed to detect the presence of autocorrelation (a relationship between values separated from each other by a given time lag) in the residuals from a regression analysis. Critical values 1.50 – 2.50 indicating autocorrelation is not a problem (Durbin and Watson, 1971). From the results in Table E1 below, we can assume that there is no first order linear auto-correlation in our multiple linear regression data.

Meanwhile, the assumption of normality is just the supposition that the underlying random variable of interest is distributed normally, or approximately. Kolmogolov-Smirnov is a statistical test for normality of variance. Kolmogolov-Smirnov test should not be significant. From the results in Table E1 below, we can assume that majority of the results no significant.

Multicollinearity refers to the assumption that the independent variables are uncorrelated. The researcher is able to interpret regression coefficients as the effects of the independent variables on the dependent variables when Multicollinearity is low (Keith, 2006). Multicollinearity is checked by variance inflation factor (VIF). VIF more than 10 there is an indication for multicollinearity to be present (Hair et al., 2010).

The results of autocorrelation, normality and multicollinearity are represent in Table E1 below.

Table E1 Summary Statistical Tests of Assumptions for Multiple Regressions

Equation	Dependent Variable	Durbin - Watson value	Test for Normality Kolmogorov-Smirnov		Maximum VIF
			Statistic	Sig.	
1	SEF	1.811	.065	.200	3.791
2	ECE	1.575	.078	.116	3.791
3	CRM	2.034	.101	.009***	3.791
4	SDP	1.942	.053	.200	3.791
5	SEF	1.934	.064	.200	1.048
6	CRM	1.981	.097	.015**	1.048
7	SDP	1.777	.082	.072	4.009
8	FSU	2.193	.107	.004***	1.041
9	EIEO	1.820	.060	.200	3.353
10	EPPC	2.225	.053	.200	3.353
11	ERTE	1.916	.045	.200	3.353
12	EAEF	1.614	.084	.063	3.353
13	EIDI	2.129	.118	.001***	3.353
14	EIEO	1.883	.064	.200	7.177
15	EPPC	2.114	.045	.200	7.177
16	ERTE	1.960	.048	.200	7.177
17	EAEF	1.629	.114	.002***	7.177
18	EIDI	2.057	.070	.200	7.177

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

Normality, Linearity and Heteroscedasticity

Normality

The multiple linear regression analysis requires that the error between observed and predicted values (i.e., the residuals of the regression) should be normally distributed. This assumption can best be checked by plotting residual values on a histogram with a fitted normal curve or by reviewing a Q-Q-Plot.

Linearity

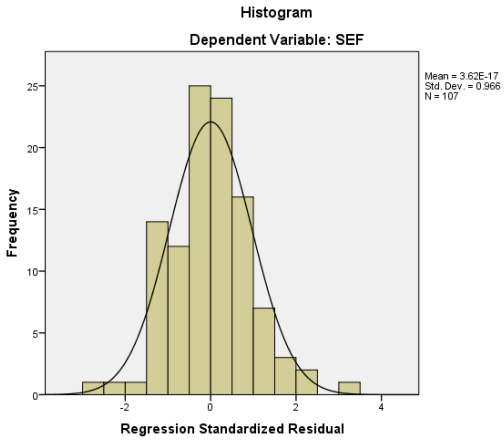
The multiple regression analysis needs the relationship between the independent and dependent variables to be linear. The linearity assumption can best be tested with scatter plots. Residual plots showing the standardized residuals vs. the predicted values and are very useful in detecting violations in linearity (Stevens, 2009).

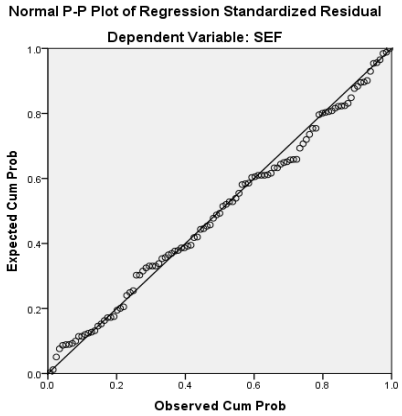
Heteroscedasticity

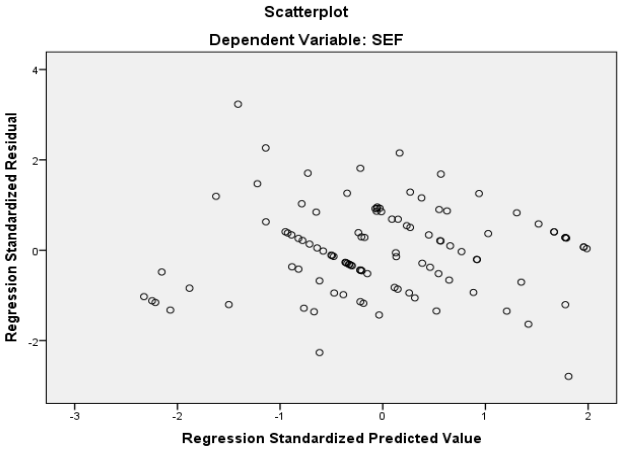
The assumption of homoscedasticity refers to equal variance of errors across all levels of the independent variables (Osborne and Waters, 2002). The scatter plot is good way to check whether homoscedasticity (that is the error terms along the regression line are equal) is given.

The results of normality, linearity and heteroscedasticity are depicted below.

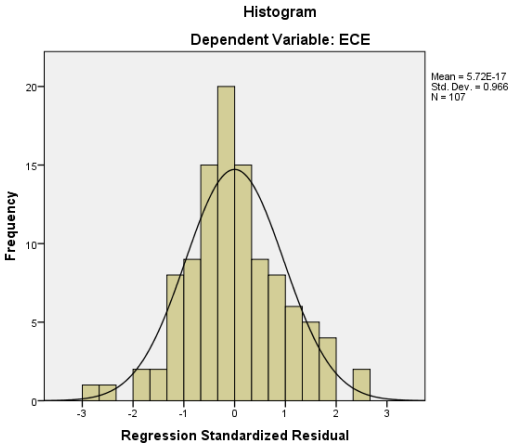
Normality and Heteroscedasticity

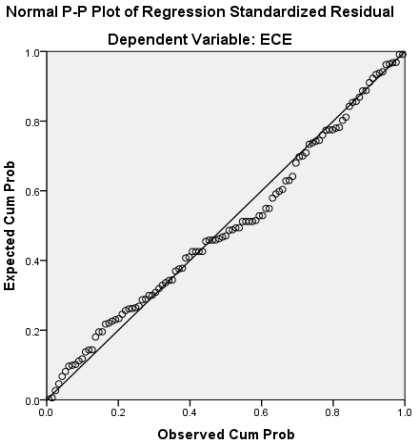


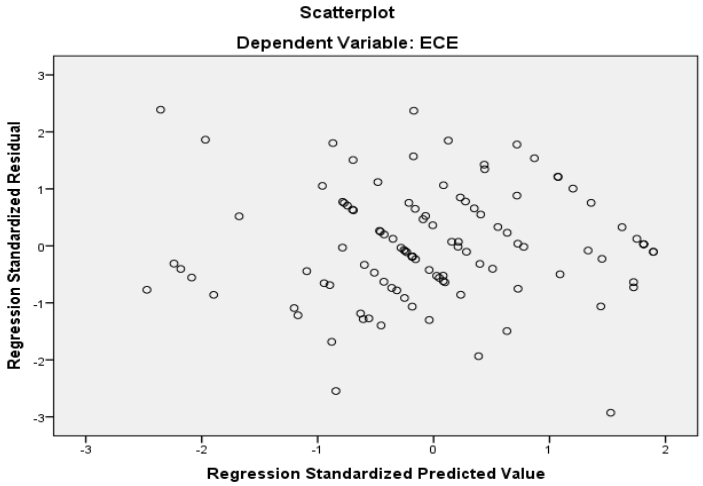




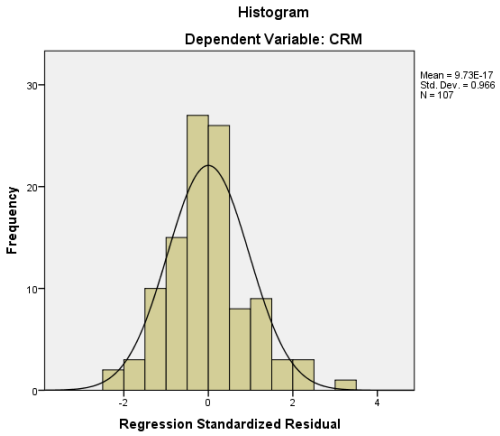
Equation 1: $SEF = \alpha 1 + \beta_1 EIEO + \beta_2 EPPC + \beta_3 ERTE + \beta_4 EAEF + \beta_5 EIDI + \beta_6 FS + \beta_7 DC + \varepsilon_1$

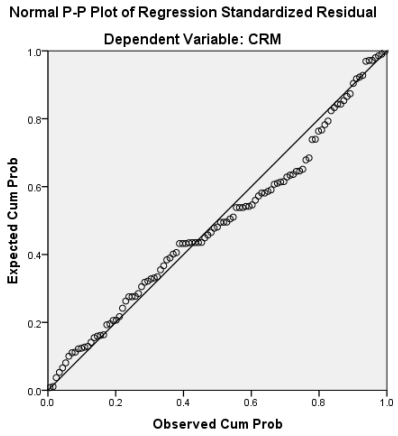


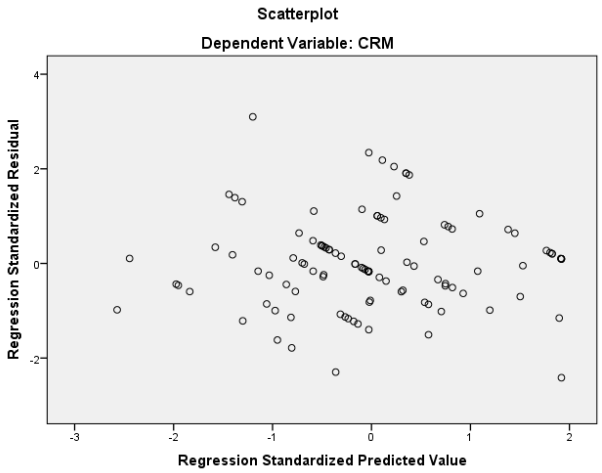




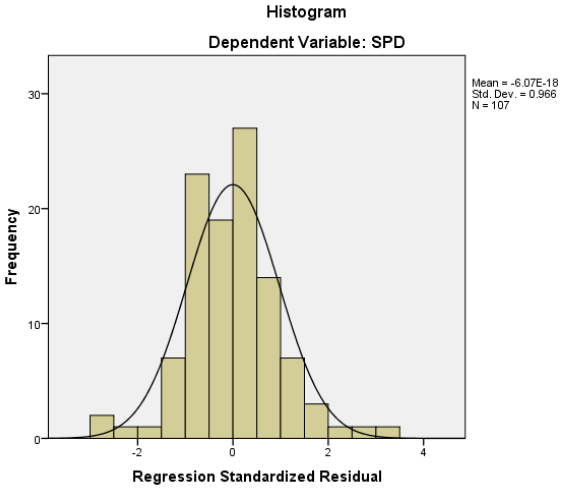
Equation 2: ECE $= \alpha_2 + \beta_8 EIEO + \beta_9 EPPC + \beta_{10} ERTE + \beta_{11} EAEF + \beta_{12} EIDI + \beta_{13} FS + \beta_{14} DC + \varepsilon_2$

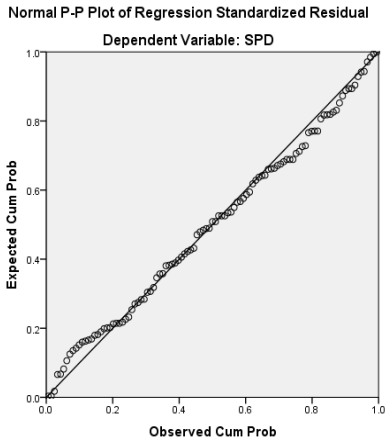


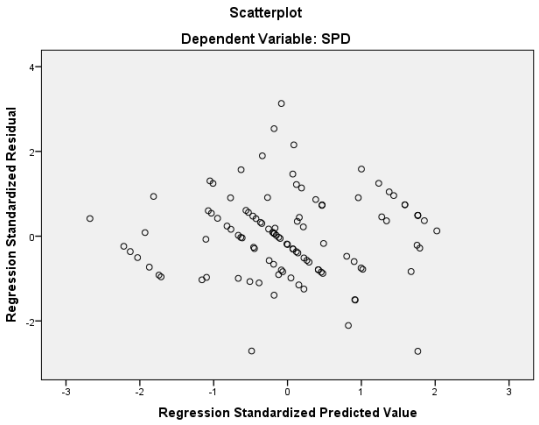




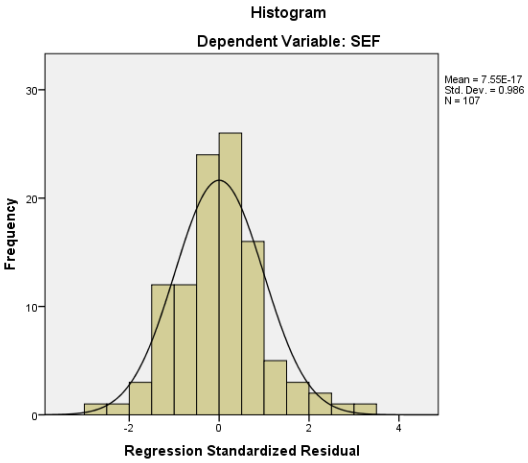
Equation 3: CRM $= \alpha_3 + \beta_{15} EIEO + \beta_{16} EPPC + \beta_{17} ERTE + \beta_{18} EAEF + \beta_{19} EIDI + \beta_{20} FS + \beta_{21} DC + \varepsilon_3$

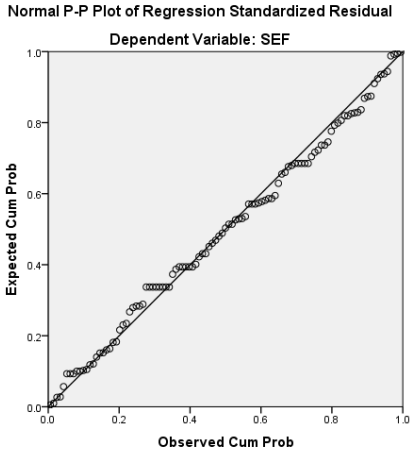


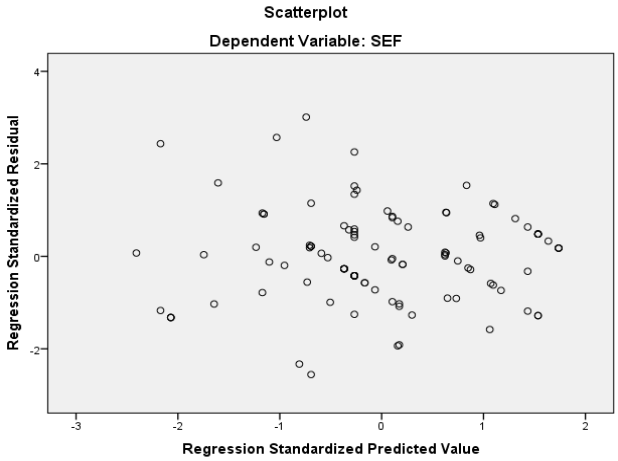




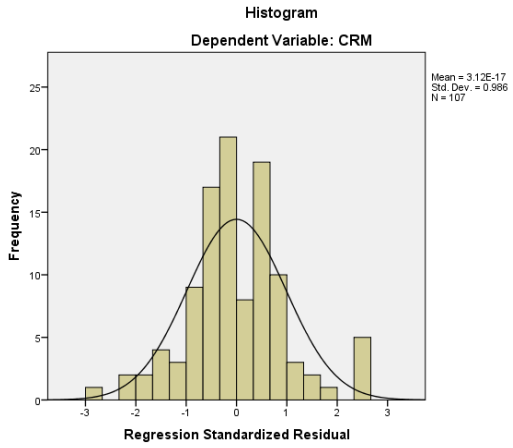
Equation 4: SDP $= \alpha_4 + \beta_{22}EIEO + \beta_{23}EPPC + \beta_{24}ERTE + \beta_{25}EAEF + \beta_{26}EIDI + \beta_{27}FS + \beta_{28}DC + \varepsilon_4$

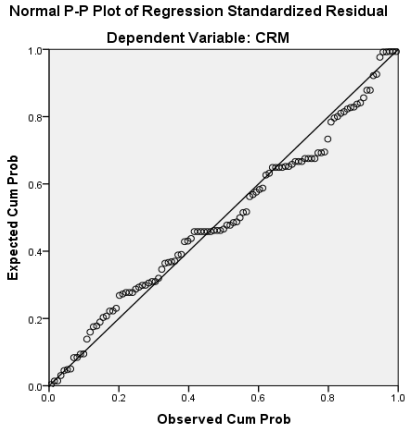


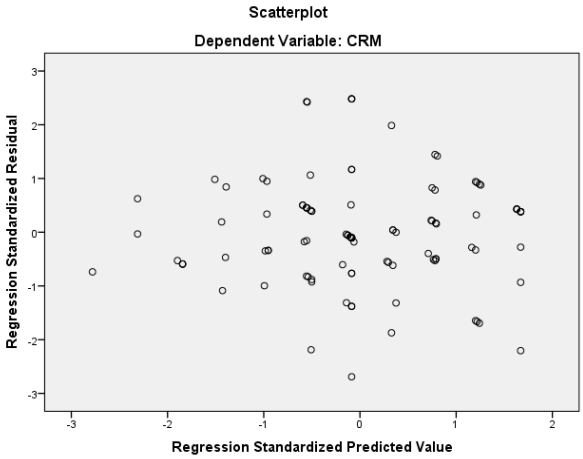




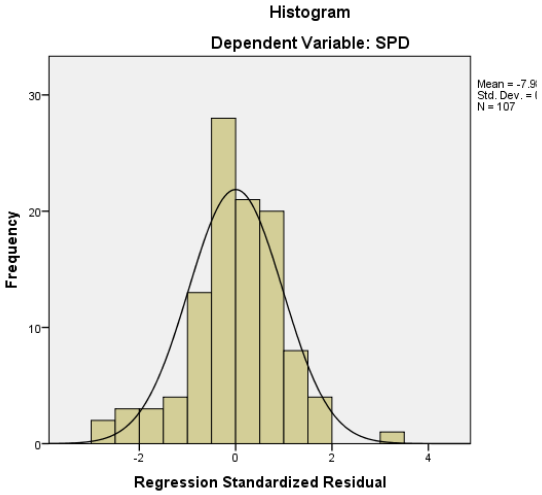
Equation 5: SEF $= \alpha_5 + \beta_{29}ECE + \beta_{30}FS + \beta_{31}DC + \varepsilon_5$

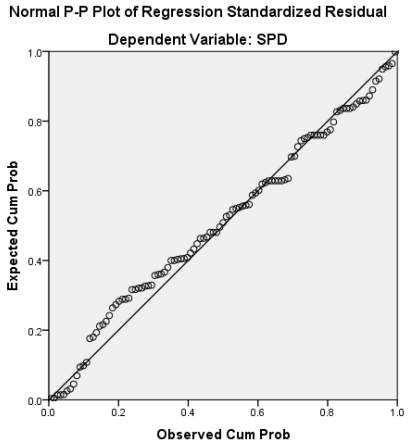


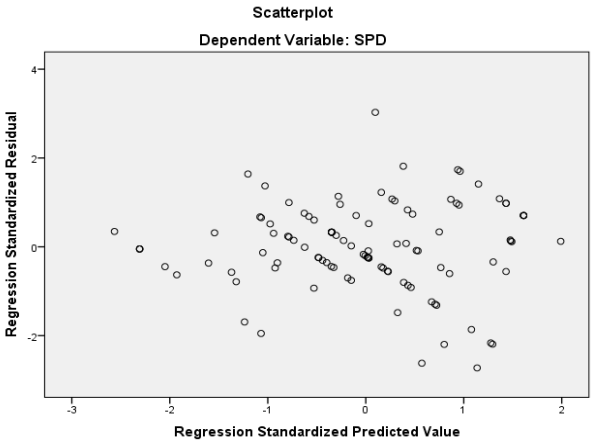




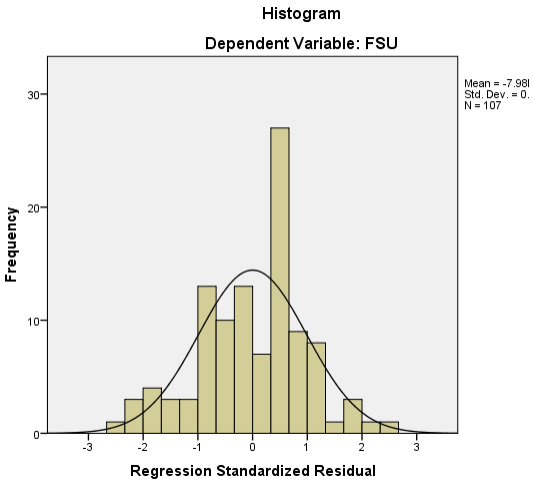
Equation 6: CRM $= \alpha_6 + \beta_{32}ECE + \beta_{33}FS + \beta_{34}DC + \varepsilon_6$

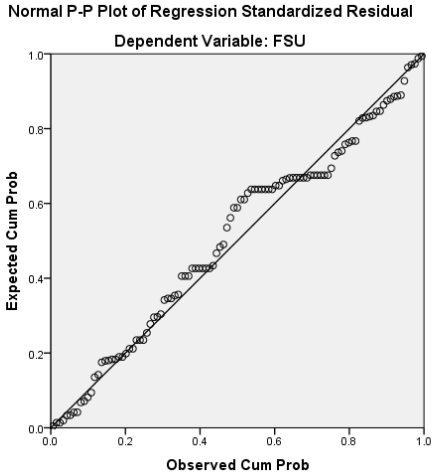


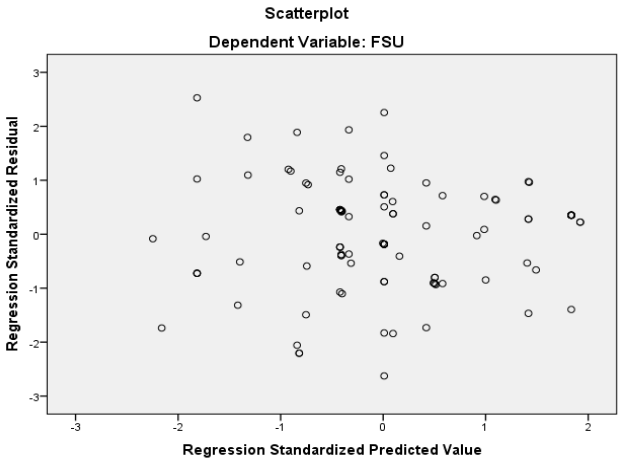




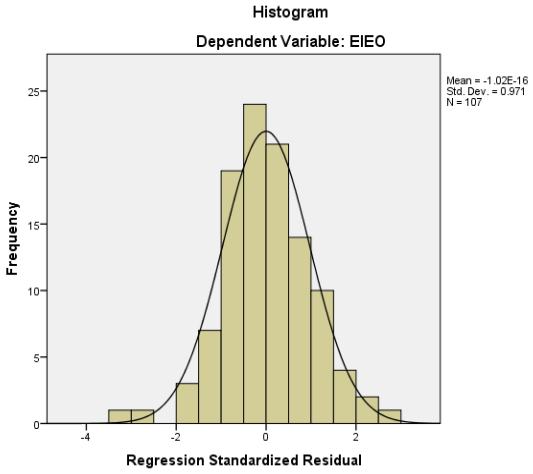
Equation 7: SPD $= \alpha_7 + \beta_{35}SEF + \beta_{36}ECE + \beta_{37}CRM + \beta_{38}FS + \beta_{39}DC + \varepsilon_7$

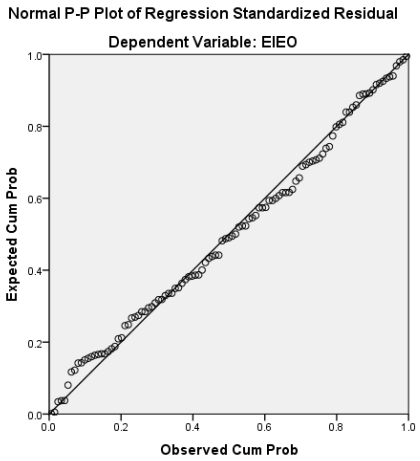


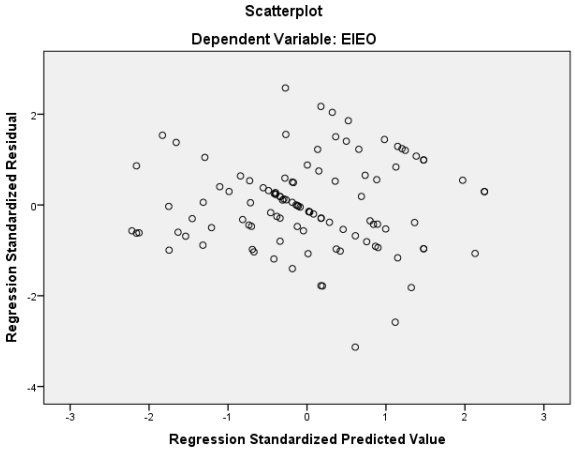




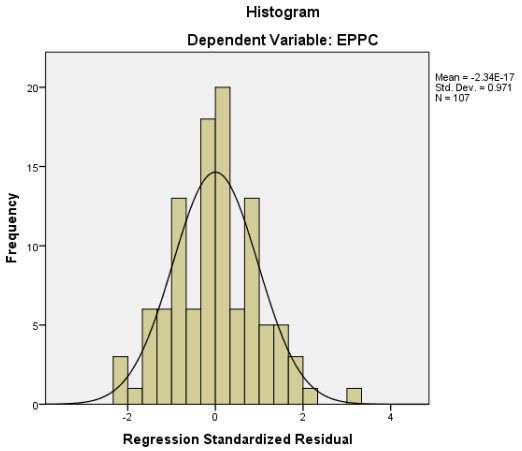
Equation 8: FSU $= \alpha_8 + \beta_{40}SPD + \beta_{41}FS + \beta_{42}DC + \varepsilon_8$

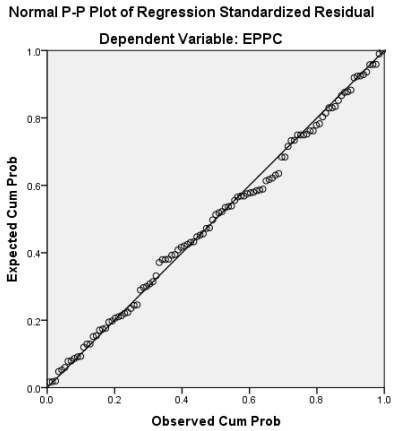


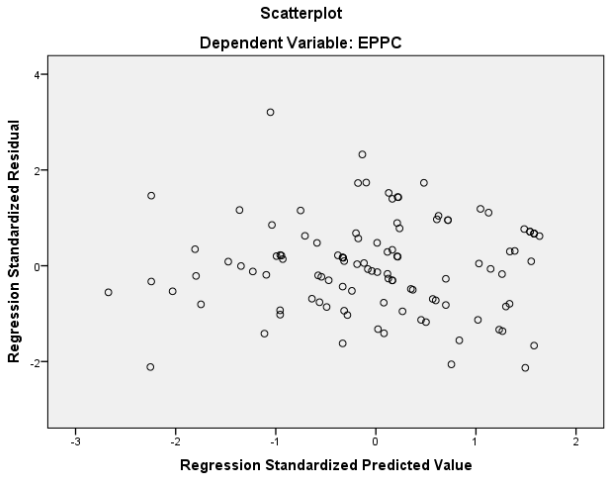




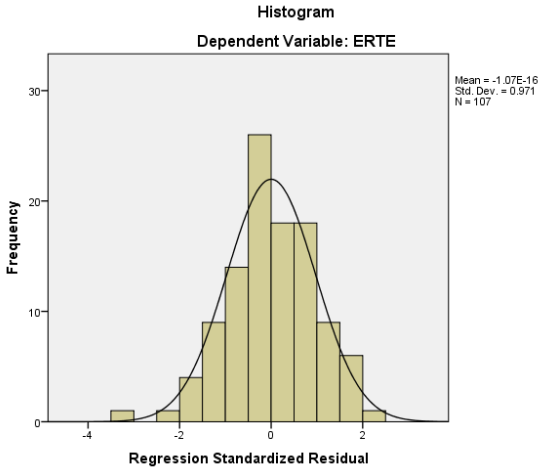
Equation 9: EIEO $= \alpha_9 + \beta_{43}SRV + \beta_{44}SMAS + \beta_{45}MKC + \beta_{46}SFD + \beta_{47}FS + \beta_{48}DC + \varepsilon_9$

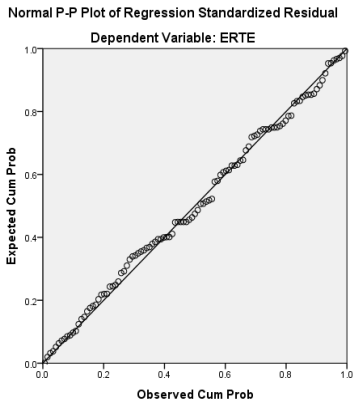


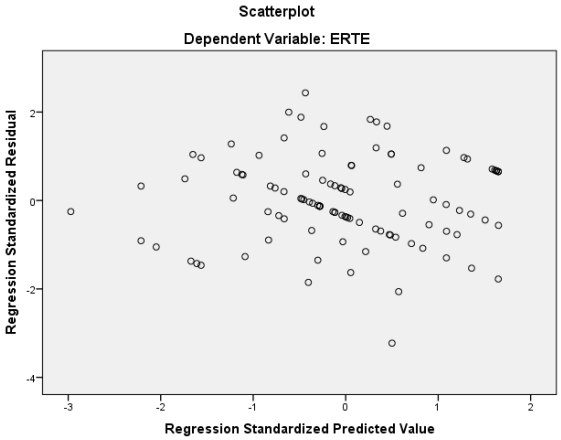




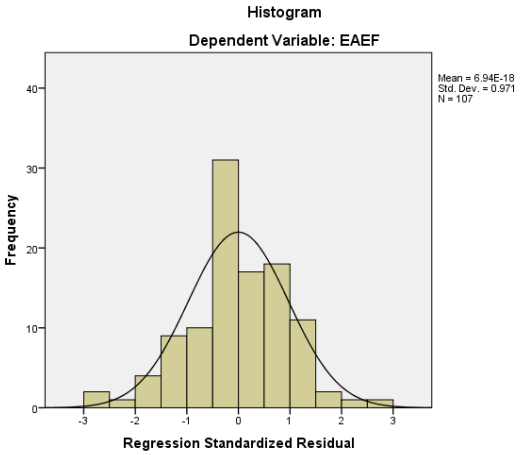
Equation 10: EPPC $= \alpha_{10} + \beta_{49} SRV + \beta_{50} SMAS + \beta_{51} MKC + \beta_{52} SFD + \beta_{53} FS + \beta_{54} DC + \varepsilon_{10}$

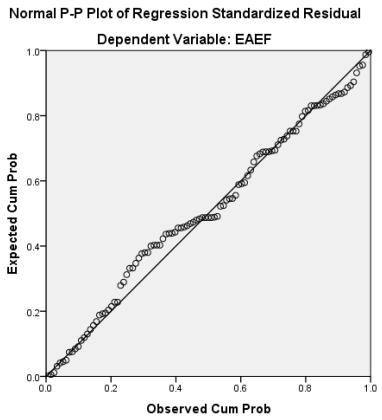


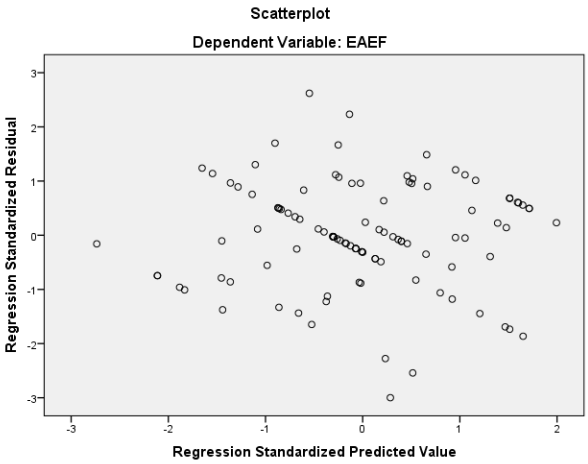




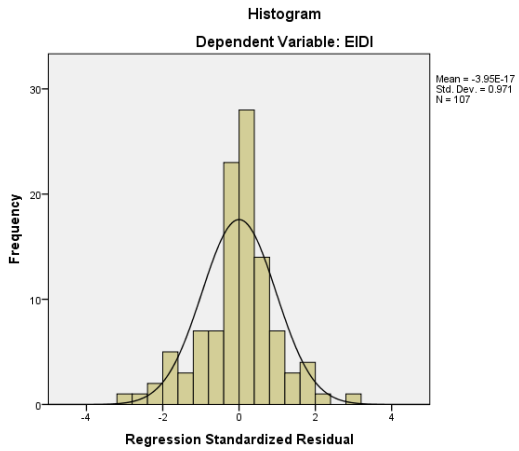
Equation 11: ERTE $= \alpha_{11} + \beta_{55} SRV + \beta_{56} SMAS + \beta_{57} MKC + \beta_{58} SPD + \beta_{59} FS + \beta_{60} DC + \varepsilon_{11}$

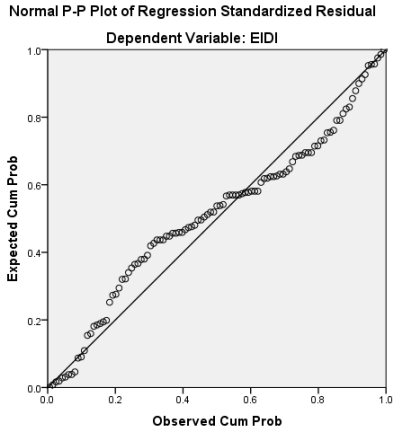


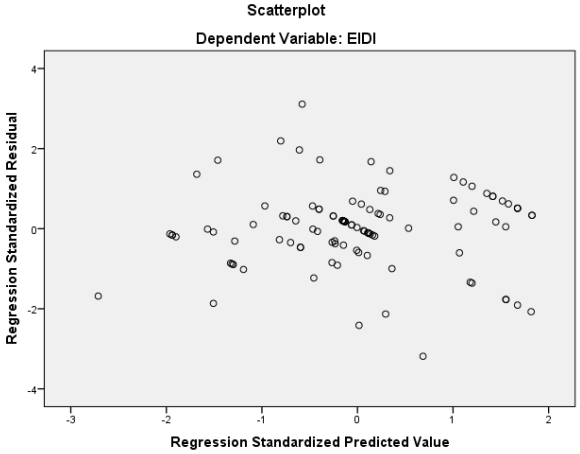




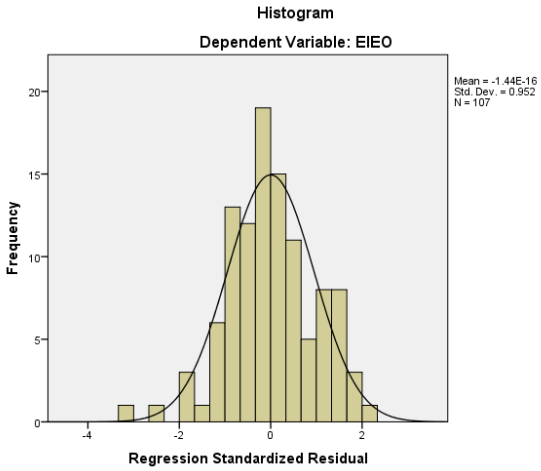
Equation 12: EAEF $= \alpha_{12} + \beta_{61} SRV + \beta_{62} SMAS + \beta_{63} MKC + \beta_{64} SFD + \beta_{65} FS + \beta_{66} DC + \varepsilon_{12}$

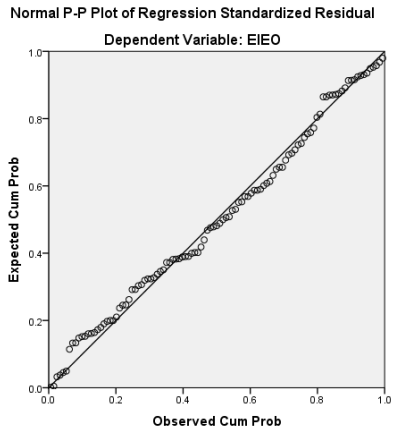


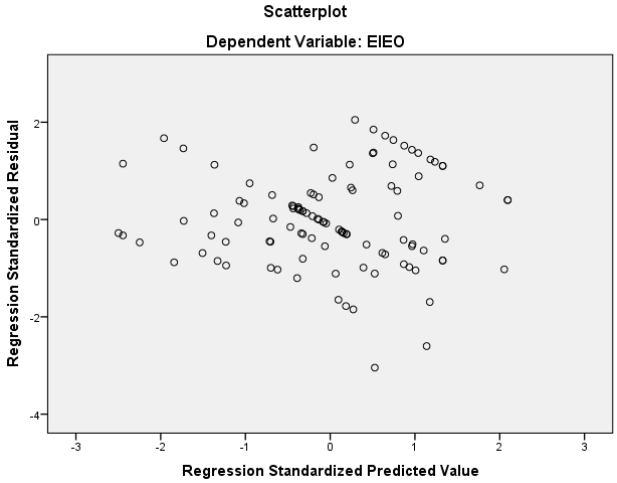




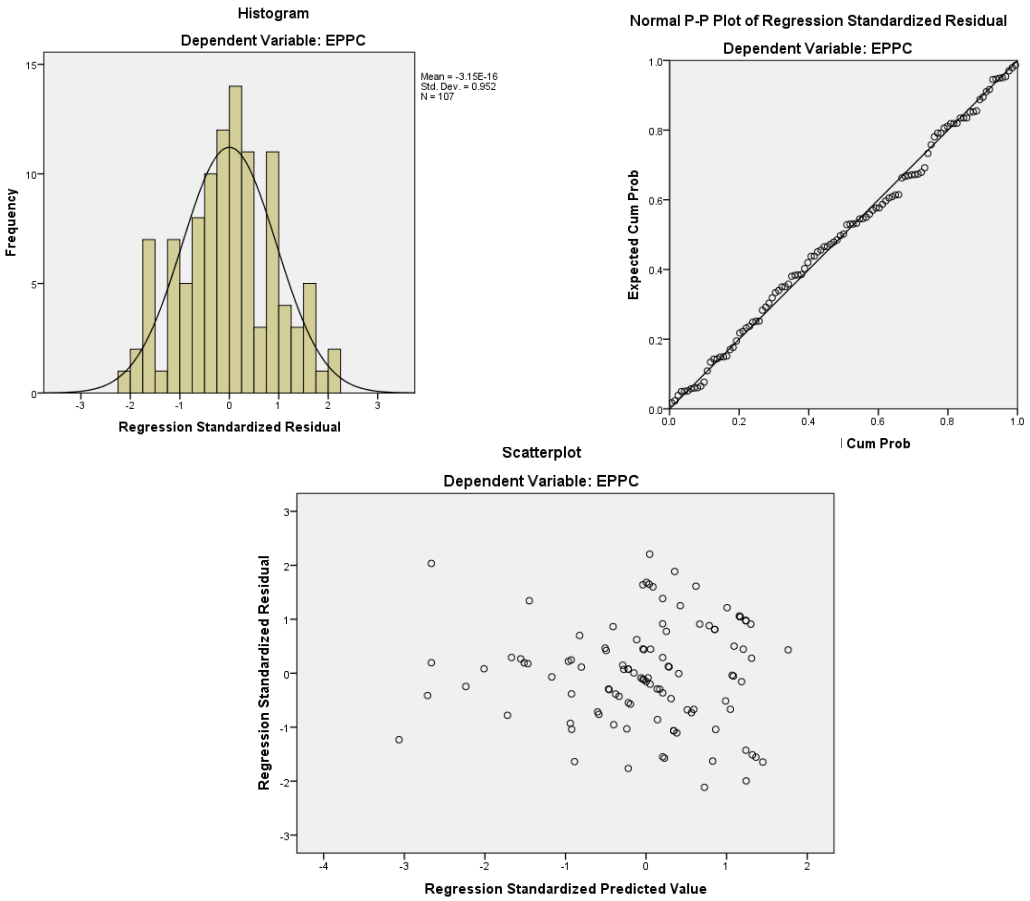
Equation 13: EIDI $= \alpha_{13} + \beta_{67}SRV + \beta_{68}SMAS + \beta_{69}MKC + \beta_{70}SFD + \beta_{71}FS + \beta_{72}DC + \varepsilon_{13}$



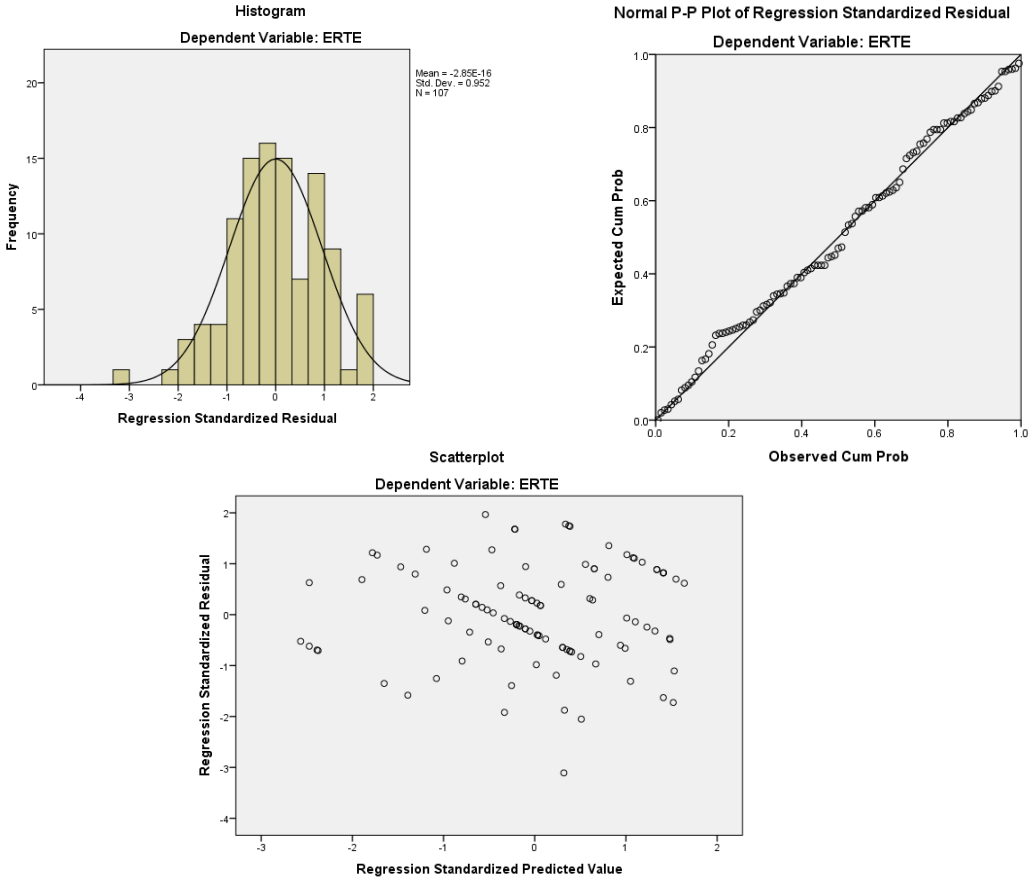




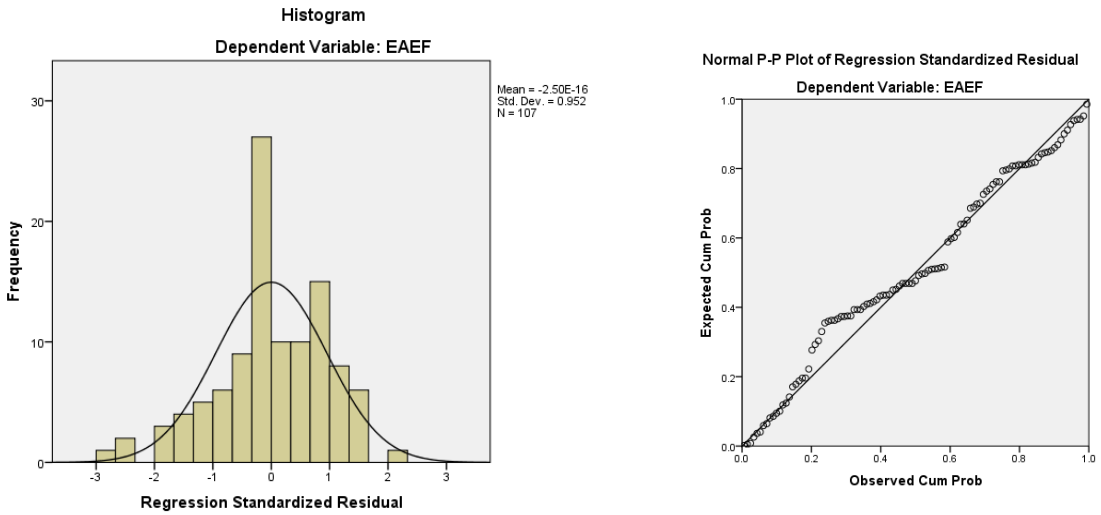
Equation 14: EIEO $= \alpha_{14} + \beta_{73}SRV + \beta_{74}SMAS + \beta_{75}MKC + \beta_{76}SFD + \beta_{77}(SRV*BET) + \beta_{78}(SMAS*BET) + \beta_{79}(MKC*BET) + \beta_{80}(SFD*BET) + \beta_{81}FS + \beta_{82}DC + \varepsilon_{14}$

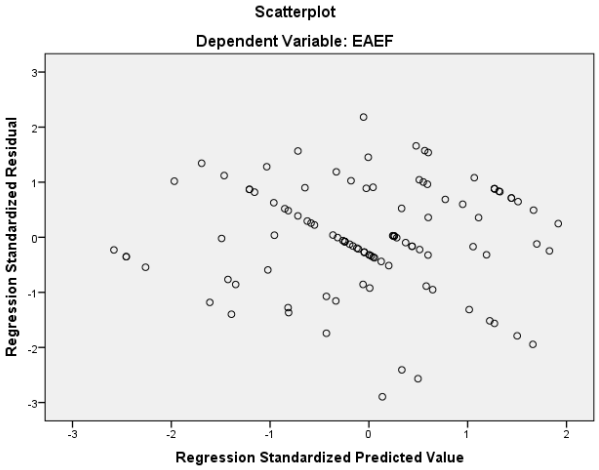


Equation 15: EPPC $= \alpha_{15} + \beta_{83}SRV + \beta_{84}SMAS + \beta_{85}MKC + \beta_{86}SFC + \beta_{87}(SRV*BET) + \beta_{88}(SMAS*BET) + \beta_{89}(MKC*BET) + \beta_{90}(SFD*BET) + \beta_{91}FS + \beta_{92}DC + \varepsilon_{15}$

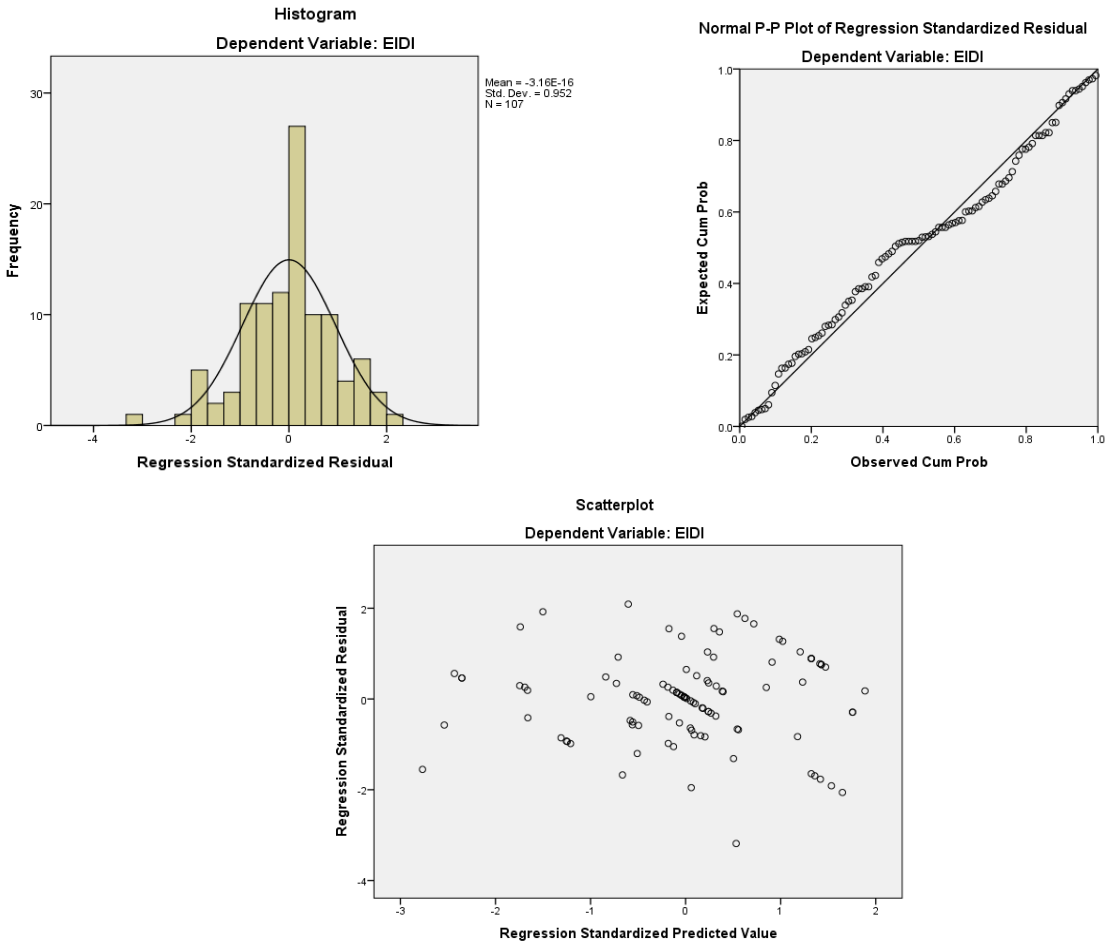


Equation 16: $ERTE = \alpha_{16} + \beta_{93}SRV + \beta_{94}SMAS + \beta_{95}MKC + \beta_{96}SFC + \beta_{97}(SRV*BET) + \beta_{98}(SMAS*BET) + \beta_{99}(MKC*BET) + \beta_{100}(SFD*BET) + \beta_{101}FS + \beta_{102}DC + \varepsilon_{16}$





Equation 17: $EAEF = \alpha_{17} + \beta_{103}SRV + \beta_{104}SMAS + \beta_{105}MKC + \beta_{106}SFC + \beta_{107}(SRV*BET) + \beta_{108}(SMAS*BET) + \beta_{109}(MKC*BET) + \beta_{110}(SFD*BET) + \beta_{111}FS + \beta_{112}DC + \varepsilon_{17}$



Equation 18: $EIDI = \alpha_{18} + \beta_{113}SRV + \beta_{114}SMAS + \beta_{115}MKC + \beta_{116}SFC + \beta_{117}(SRV*BET) + \beta_{118}(SMAS*BET) + \beta_{119}(MKC*BET) + \beta_{120}(SFD*BET) + \beta_{121}FS + \beta_{122}DC + \varepsilon_{18}$

APPENDIX F

Cover Letters and Questionnaire (Thai Version)

ที่ ศธ 0530.10/770

คณะการบัญชีและการจัดการ
มหาวิทยาลัยมหาสารคาม
อำเภอกันทรวิชัย จังหวัดมหาสารคาม
44150

10 มิถุนายน 2559

เรื่อง ขอความอนุเคราะห์กรอกแบบสอบถาม

เรียน ผู้อำนวยการฝ่ายบัญชี

ด้วย นางสาววรพรรณ รัตนทรงธรรม นิสิตระดับปริญญาเอก คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม กำลังศึกษาวิทยานิพนธ์ เรื่อง " ศักยภาพการบัญชีบริหารสิ่งแวดล้อมและความอยู่รอดของบริษัท : หลักฐานเชิงประจักษ์จากบริษัทที่ได้รับ ISO 14000 ในประเทศไทย" ซึ่งเป็นส่วนหนึ่งของการทำวิทยานิพนธ์ หลักสูตรปรัชญาดุษฎีบัณฑิต (ปร.ด.) และการศึกษาในครั้งนี้ได้เน้นให้นิสิตศึกษาข้อมูลด้วยตนเอง ดังนั้น เพื่อให้การจัดทำวิทยานิพนธ์เป็นไปด้วยความเรียบร้อยและบรรลุวัตถุประสงค์ คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม จึงใคร่ขออนุญาตให้ นางสาววรพรรณ รัตนทรงธรรม ศึกษาและเก็บรวบรวมในรายละเอียดตามแบบสอบถามที่แนบมาพร้อมนี้

คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม หวังเป็นอย่างยิ่งว่าจะได้รับความอนุเคราะห์จากท่านในการให้ข้อมูลในครั้งนี้ และขอขอบคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.ปพฤกษ์บารมี อุตสาหะวาณิชกิจ)
คณบดีคณะการบัญชีและการจัดการ
มหาวิทยาลัยมหาสารคาม

สำนักบริหารหลักสูตรระดับบัณฑิตศึกษาและวิจัย
คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม
โทรศัพท์ (043) 754333 ต่อ 3408

แบบสอบถามเพื่อการวิจัย
เรื่อง ศักยภาพการบัญชีบริหารสิ่งแวดล้อมและความอยู่รอดของบริษัท:
หลักฐานเชิงประจักษ์จากบริษัทที่ได้รับ ISO 14000 ในประเทศไทย

เรียน ผู้บริหารฝ่ายบัญชี

โครงการวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาศักยภาพการบัญชีบริหารสิ่งแวดล้อมและและความอยู่รอดของกิจการ ของธุรกิจที่ได้รับ ISO 14000 ในประเทศไทย ข้าพเจ้าขอขอบพระคุณท่านที่ได้สละเวลาตอบแบบสอบถามทุกข้ออย่างถูกต้อง โดยสอดคล้องต่อความเห็นของท่าน และขอความกรุณาส่งกลับคืนโดยการพับและใส่ซองที่แนบมาพร้อมกันนี้ หากท่านมีความประสงค์จะขอรับข้อมูลเกี่ยวกับรายงานสรุปผลโครงการวิจัยนี้ โปรดแสดงความจำนงมาตามที่อยู่ที่แสดงไว้ข้างล่าง ทั้งนี้ข้าพเจ้าจะได้จัดส่งข้อมูลให้ท่านตามที่ท่านได้แสดงความจำนงไว้

แบบสอบถามเพื่อการวิจัยชุดนี้ แบ่งออกเป็น 7 ตอน ดังนี้

ตอนที่ 1 ข้อมูลทั่วไปของผู้บริหารฝ่ายบัญชีของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย
ตอนที่ 2 ข้อมูลทั่วไปของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย
ตอนที่ 3 ความคิดเห็นเกี่ยวกับศักยภาพการบัญชีบริหารสิ่งแวดล้อมของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย
ตอนที่ 4 ความคิดเห็นเกี่ยวกับผลการดำเนินงานของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย
ตอนที่ 5 ความคิดเห็นเกี่ยวกับปัจจัยภายในที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อมของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย
ตอนที่ 6 ความคิดเห็นเกี่ยวกับปัจจัยภายนอกที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อมของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย
ตอนที่ 7 ข้อคิดเห็นและข้อเสนอแนะเกี่ยวกับศักยภาพการบัญชีบริหารสิ่งแวดล้อมของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย

คำตอบของท่านจะถูกเก็บรักษาเป็นความลับ และจะไม่มีการใช้ข้อมูลใด ๆ ที่เปิดเผยเกี่ยวกับบริษัทหรือธุรกิจของท่านในการรายงานข้อมูล รวมทั้งจะไม่มีการร่วมใช้ข้อมูลดังกล่าวกับบุคคลภายนอกอื่นใด โดยไม่ได้รับอนุญาตจากท่านโดยเด็ดขาด

หากท่านมีข้อสงสัยประการใดโปรดติดต่อได้ที่ข้าพเจ้า นางสาววรพรรณ รัตนทรงธรรม นิสิตปริญญาเอก (สาขาวิชาการบัญชี) คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม ตำบลตลาด อำเภอเมือง จังหวัดมหาสารคาม 44000 หมายเลขโทรศัพท์ 08-62025462 E-mail: viewvip_vip@hotmail.com

ท่านต้องการรายงานสรุปผลโครงการวิจัยหรือไม่ ☐ ต้องการ ☐ ไม่ต้องการ

หากท่านต้องการรายงานสรุปผลโครงการวิจัยฯ โปรดแนบนามบัตรหรือเขียนอีเมล์ของท่านมาพร้อมกับแบบสอบถามชุดนี้ จักขอบคุณยิ่ง

ขอขอบพระคุณที่ท่านได้ให้ข้อมูลไว้ ณ โอกาสนี้

(นางสาววรพรรณ รัตนทรงธรรม)
นิสิตปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาการบัญชี
คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม

ตอนที่ 1 ข้อมูลทั่วไปของผู้บริหารฝ่ายบัญชีของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย

1. เพศ

☐ ชาย ☐ หญิง

2. อายุ

☐ น้อยกว่า 35 ปี ☐ 35 – 40 ปี

☐ 41-45 ปี ☐ มากกว่า 45 ปี

3. สถานภาพ

☐ โสด ☐ สมรส

☐ หม้าย/หย่าร้าง ☐ อื่น ๆ (โปรดระบุ) .....

4. ระดับการศึกษา

☐ ปริญญาตรีหรือเทียบเท่า ☐ สูงกว่าปริญญาตรี

5. ประสบการณ์ในการทำงาน

☐ น้อยกว่า 5 ปี ☐ 5 - 10 ปี

☐ 11 - 15 ปี ☐ มากกว่า 15 ปี

6. รายได้เฉลี่ยต่อเดือนที่ท่านได้รับในปัจจุบัน

☐ ต่ำกว่า 50,000 บาท ☐ 50,000 – 80,000 บาท

☐ 80,001 – 110,000 บาท ☐ มากกว่า 110,000 บาท

7. ตำแหน่งงานในปัจจุบัน

☐ ผู้อำนวยการฝ่ายบัญชี ☐ ผู้จัดการฝ่ายบัญชี

☐ สมุห์บัญชี ☐ อื่น ๆ (โปรดระบุ)

ตอนที่ 2 ข้อมูลทั่วไปของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย

1. รูปแบบของธุรกิจ

☐ บริษัทมหาชนจำกัด ☐ บริษัทจำกัด

2. ประเภทอุตสาหกรรม

☐ การผลิต แปรรูปและการถนอมอาหาร ☐ ผลิตภัณฑ์อาหารอื่น
☐ เครื่องดื่ม ☐ สิ่งทอ
☐ กระดาษและผลิตภัณฑ์กระดาษ ☐ ผลิตภัณฑ์ปิโตรเลียม
☐ สารเคมีขั้นมูลฐาน ☐ ผลิตภัณฑ์เคมีภัณฑ์อื่น ๆ
☐ ผลิตภัณฑ์ยาง ☐ ผลิตภัณฑ์พลาสติก
☐ ปูนซีเมนต์/คอนกรีต/ใยหิน ☐ การหล่อโลหะ
☐ ผลิตภัณฑ์โลหะ ☐ เครื่องจักรกลและอุปกรณ์
☐ เครื่องมือทางไฟฟ้าและอุปกรณ์ ☐ วิทยุ/โทรทัศน์/อุปกรณ์โทรคมนาคม
☐ การผลิต/จ่ายไฟฟ้า ☐ ยานยนต์ อุปกรณ์ขนส่งและการบำรุงรักษา
☐ การผลิต/จ่ายก๊าซ ☐ การเก็บกรองน้ำและจ่ายน้ำ
☐ การขายส่ง/ปลีก ☐ การบำรุงรักษา และการซ่อมแซมยานยนต์
☐ การขนส่งและกิจกรรมสนับสนุน ☐ อสังหาริมทรัพย์
☐ ผลิตภัณฑ์ที่ได้จากการโม่ สี สตาร์ชและอาหารสำเร็จรูป ☐ อื่นๆ (โปรดระบุ).....

3. จำนวนพนักงานในปัจจุบัน

☐ น้อยกว่า 100 คน ☐ 100 - 200 คน
☐ 201 - 300 คน ☐ มากกว่า 300 คน

4. ทุนในการดำเนินงาน

☐ ต่ำกว่า 50,000,000 บาท ☐ 50,000,001 – 150,000,000 บาท
☐ 150,000,001 – 250,000,000 บาท ☐ มากกว่า 250,000,000 บาท

5. รายได้เฉลี่ยต่อปี

☐ ต่ำกว่า 100,000,000 บาท ☐ 100,000,001 – 500,000,000 บาท
☐ 500,000,001 – 1,000,000,000 บาท ☐ มากกว่า 1,000,000,000บาท

6. ระยะเวลาในการดำเนินงาน

☐ น้อยกว่า 10 ปี ☐ 10 – 15 ปี
☐ 16 – 20 ปี ☐ มากกว่า 20 ปี

7. ระยะเวลาที่กิจการได้การรับรองมาตรฐานสากลระบบการจัดการสิ่งแวดล้อม (ISO 14000)

☐ น้อยกว่า 5 ปี ☐ 5 - 7 ปี
☐ 8 - 10 ปี ☐ มากกว่า 10 ปี

8. กิจการเคยได้รับรางวัลที่เกี่ยวข้องกับการบริหารจัดการ

☐ เคย ☐ ไม่เคย

ตอนที่ 3 ความคิดเห็นเกี่ยวกับศักยภาพการบัญชีบริหารสิ่งแวดล้อมของบริษัทที่ได้รับ ISO14000 ในประเทศไทย

ศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
การมุ่งเน้นประสิทธิภาพการระบุองค์ประกอบด้านสิ่งแวดล้อม (Environmental Identification Efficiency Orientation) 1.กิจการเชื่อมั่นว่าการมีความสามารถในการระบุองค์ประกอบด้านต้นทุนและผลประโยชน์ที่เกี่ยวข้องกับสิ่งแวดล้อมอย่างชัดเจน จะช่วยให้การดำเนินงานด้านการบริหารสิ่งแวดล้อมมีประสิทธิภาพมากยิ่งขึ้น					
2. กิจการให้ความสำคัญกับการจำแนกต้นทุนด้านสิ่งแวดล้อมอย่างเป็นระบบและเป็นรูปธรรม จะช่วยให้การดำเนินงานด้านสิ่งแวดล้อมบรรลุเป้าหมายได้เป็นอย่างดี					
3.กิจการมุ่งเน้นให้มีการระบุผลประโยชน์ที่ได้รับจากการบริหารจัดการด้านสิ่งแวดล้อมที่ดีอย่างชัดเจน ซึ่งจะช่วยให้การดำเนินงานบรรลุผลสำเร็จได้มากยิ่งขึ้น					
4.กิจการสนับสนุนให้มีการบันทึกข้อมูลด้านสิ่งแวดล้อมทุกด้านอย่างถูกต้องครบถ้วน ซึ่งจะช่วยให้การพัฒนาการบริหารสิ่งแวดล้อมมีประสิทธิภาพมากยิ่งขึ้น					
5.กิจการมุ่งเน้นในการกำหนดและแสวงหาหลักเกณฑ์ในการจำแนกองค์ประกอบด้านสิ่งแวดล้อมให้เป็นรูปธรรม ซึ่งจะช่วยให้การบริหารจัดการด้านต้นทุนมีประสิทธิภาพมากยิ่งขึ้น					
ศักยภาพในการสร้างประสิทธิภาพการปฏิบัติด้านสิ่งแวดล้อม (Environmental Practice Proficiency Capability) 6. กิจการเชื่อมั่นว่าการมีการปฏิบัติทางด้านสิ่งแวดล้อมอย่างที่ดีจะช่วยให้การบริหารสิ่งแวดล้อมประสบความสำเร็จมากยิ่งขึ้น					
7. กิจการมุ่งเน้นให้มีการประยุกต์ใช้วิธีการในการปฏิบัติทางการบัญชีอย่างเป็นระบบ ซึ่งจะช่วยให้บรรลุผลสำเร็จในการปฏิบัติทางด้านการบัญชีมากยิ่งขึ้น					
8. กิจการสนับสนุนให้มีการประยุกต์ใช้เทคโนโลยีสมัยใหม่ ในการปฏิบัติด้านการบัญชีสิ่งแวดล้อมมากยิ่งขึ้น ซึ่งจะช่วยให้การบริหารข้อมูลด้านสิ่งแวดล้อมมีคุณภาพมากยิ่งขึ้น					
9.กิจการมุ่งเน้นให้มีการวิเคราะห์ถึงผลกระทบของสิ่งแวดล้อมที่มีต่อชุมชนและสังคมอย่างเป็นรูปธรรม ซึ่งจะช่วยให้การดำเนินงานได้รับการยอมรับมากยิ่งขึ้น					

ตอนที่ 3 (ต่อ)

ศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
การมุ่งเน้นความโปร่งใสการรายงานด้านสิ่งแวดล้อม (Environmental Reporting Transparency Emphasis) 10. กิจการเชื่อมั่นว่าการจัดทำรายงานด้านสิ่งแวดล้อมอย่างตรงไปตรงมา จะช่วยให้การดำเนินงานได้รับการยอมรับมากยิ่งขึ้น					
11. กิจการมุ่งมั่นให้มีการนำเสนอข้อมูลที่เกี่ยวข้องกับสิ่งแวดล้อมทั้งด้านผลประโยชน์และผลกระทบที่เกิดขึ้นตามความเป็นจริง ซึ่งจะช่วยให้ได้รับความร่วมมือจากผู้ที่มีส่วนเกี่ยวข้องอยู่เสมอ					
12. กิจการให้ความสำคัญกับการจัดทำรายงานด้านสิ่งแวดล้อมอย่างครบถ้วน ทั้งข้อมูลเชิงปริมาณและเชิงคุณภาพ ซึ่งจะช่วยให้มีข้อมูลที่รอบด้านในการวางแผนและจัดการการดำเนินงานขององค์กรมากยิ่งขึ้น					
13. กิจการมุ่งเน้นให้มีการระบุถึงแหล่งที่มาของข้อมูลด้านสิ่งแวดล้อมอย่างถูกต้องและครบถ้วน ซึ่งจะทำให้ข้อมูลที่ได้รับที่มีความน่าเชื่อถือต่อการปฏิบัติงานขององค์กรทั้งในปัจจุบันและอนาคต					
การมุ่งเน้นประสิทธิผลการตรวจสอบด้านสิ่งแวดล้อม (Environmental Auditing Effectiveness Focus) 14. กิจการเชื่อมั่นว่าการประเมินผลการดำเนินงานด้านสิ่งแวดล้อมอย่างต่อเนื่อง จะช่วยให้การบริหารงานมีประสิทธิภาพมากยิ่งขึ้น					
15. กิจการมุ่งมั่นให้มีการตรวจสอบการดำเนินงานด้านสิ่งแวดล้อมอยู่เสมอ ซึ่งจะช่วยให้สามารถแก้ปัญหาต่าง ๆ ที่เกี่ยวข้องกับสิ่งแวดล้อมได้อย่างทันถ่วงที					
16. กิจการให้ความสำคัญกับการตรวจสอบกิจกรรม กระบวนการและการจัดการด้านสิ่งแวดล้อมอย่างเป็นระบบ ซึ่งจะช่วยให้การดำเนินงานบรรลุเป้าหมายได้เป็นอย่างดีทั้งปัจจุบันและอนาคต					
17. กิจการมุ่งเน้นให้มีการกำหนดแนวทางการปฏิบัติงานการตรวจสอบด้านสิ่งแวดล้อมอย่างเป็นรูปธรรม ซึ่งจะช่วยให้การปฏิบัติงานตรวจสอบมีประสิทธิภาพมากยิ่งขึ้น					

ตอนที่ 3 (ต่อ)

ศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
การดำเนินการเปิดเผยข้อมูลการปรับปรุงด้านสิ่งแวดล้อม (Environmental Improvement Disclosure Implementation) 18. กิจการเชื่อมั่นว่าการเผยแพร่ข้อมูลที่เกี่ยวข้องกับการปรับปรุงสิ่งแวดล้อมอย่างต่อเนื่อง จะช่วยให้การดำเนินงานได้รับการยอมรับจากผู้ที่เกี่ยวข้องมากยิ่งขึ้น					
19. กิจการมุ่งเน้นให้มีการนำเสนอข้อมูลที่เกี่ยวข้องกับงบประมาณการพัฒนาและปรับปรุงสิ่งแวดล้อมอย่างเป็นระบบ ซึ่งจะช่วยให้การบริหารสิ่งแวดล้อมได้รับความเชื่อถือมากยิ่งขึ้น					
20. กิจการให้ความสำคัญกับการจัดทำฐานข้อมูลที่เกี่ยวข้องกับการพัฒนาและปรับปรุงสิ่งแวดล้อมอย่างเป็นรูปธรรม ซึ่งจะช่วยให้การนำเสนอ เปิดเผยและเผยแพร่ข้อมูลต่อสาธารณชนรวดเร็วและทันต่อสถานการณ์มากยิ่งขึ้น					
21. กิจการมุ่งมั่นให้มีการเผยแพร่การพัฒนากิจกรรมที่เกี่ยวข้องกับการพัฒนาและปรับปรุงสิ่งแวดล้อมมากยิ่งขึ้น ซึ่งจะช่วยให้การบริหารงานบรรลุเป้าหมายทั้งปัจจุบันและอนาคตได้เป็นอย่างดี					

ตอนที่ 4 ความคิดเห็นเกี่ยวกับผลการดำเนินงานของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย

ผลการดำเนินงาน	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
ประสิทธิภาพการอนุรักษ์สิ่งแวดล้อม (Environmental Conservation Efficiency) 1. กิจการมั่นใจว่ากิจการมีส่วนสำคัญในการช่วยปรับปรุงและพัฒนาสิ่งแวดล้อมอย่างต่อเนื่อง					
2. กิจการมีการบริหารงานที่ดีอยู่เสมอ โดยคำนึงถึงการใช้ทรัพยากรธรรมชาติอย่างประหยัดและเกิดประโยชน์สูงสุด					
3. กิจการมีการดำเนินงานที่ประสบความสำเร็จ โดยคำนึงถึงความอยู่รอดและความยั่งยืนของสิ่งแวดล้อมต่าง ๆ ที่เกี่ยวข้องอยู่เสมอ					
4. กิจการมีความสามารถในการลดของเสียที่จะมีผลกระทบกับการทำลายสิ่งแวดล้อมได้อย่างต่อเนื่องและเป็นรูปธรรม					

ตอนที่ 4 (ต่อ)

ผลการดำเนินงาน	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
การเติมเต็มความคาดหวังของสังคม (Societal Expectation Fulfillment) 5. กิจการสามารถส่งมอบสินค้าและบริการที่มีคุณภาพและดีที่สุดให้กับลูกค้าได้อย่างต่อเนื่อง					
6. กิจการมีการดำเนินงานที่เป็นไปตามระเบียบ ข้อบังคับและกฎหมายได้อย่างครบถ้วน					
7. กิจการได้รับการยกย่องและไว้วางใจจากสังคมว่าเป็นกิจการที่ตระหนักถึงความรับผิดชอบต่อสังคมด้วยดีเสมอมา					
8. กิจการมีศักยภาพในการตอบสนองต่อความต้องการสังคมในทุกด้านได้อย่างเต็มที่					
การรักษาความสัมพันธ์กับชุมชน (Community Relationship Maintenance) 9. กิจการได้รับความร่วมมือในการดำเนินงานจากชุมชนเป็นอย่างดีเสมอมา					
10. กิจการมีความสามารถในการสร้างการมีส่วนร่วมจากชุมชนในทุกกิจกรรมเป็นอย่างดี					
11. กิจการมีการนำข้อแนะนำและข้อเสนอแนะของชุมชนมาปรับประยุกต์ใช้เป็นแนวทางในการดำเนินงานอยู่เสมอ					
12. กิจการมีการสื่อสารข้อมูลทุกด้านที่เกี่ยวข้องกับการดำเนินงานของกิจการกับชุมชนอย่างเป็นระบบด้วยดีเสมอมา					
การพัฒนาผลการดำเนินงานอย่างยั่งยืน (Sustainable Performance Development) 13. กิจการสามารถลดต้นทุนในการดำเนินงานได้เป็นอย่างดีและต่อเนื่อง					
14. กิจการได้รับการยอมรับจากลูกค้าและผู้มีส่วนเกี่ยวข้องว่าเป็นกิจการที่มีการบริหารที่ดีอยู่เสมอ					
15. กิจการมีผลการดำเนินงานที่เป็นไปตามเป้าหมายที่ตั้งไว้สอดคล้องกับสถานการณ์ที่เกิดขึ้นอย่างชัดเจน					
16. กิจการสามารถรักษาลูกค้าเก่าและเพิ่มลูกค้าใหม่ได้อย่างต่อเนื่อง					

ตอนที่ 4 (ต่อ)

ผลการดำเนินงาน	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
ความอยู่รอดของบริษัท (Firm Survival)					
17. กิจการมั่นใจว่ากิจการจะสามารถอยู่รอดภายใต้การแข่งขันที่รุนแรงทั้งปัจจุบันและอนาคต					
18. กิจการมีชื่อเสียงและสามารถสร้างความเชื่อถือต่อผู้ที่มีส่วนเกี่ยวข้องได้อย่างต่อเนื่อง					
19. กิจการได้รับรางวัลที่เกี่ยวกับการบริหารงานที่ดีภายใต้การตระหนักถึงความรับผิดชอบต่อสังคมอย่างต่อเนื่อง					
20. กิจการสามารถบริหารงานให้มีการเจริญเติบโตและขยายตัวมากยิ่งขึ้น ตั้งแต่อดีตจนถึงปัจจุบันอย่างโดดเด่น					

ตอนที่ 5 ความคิดเห็นเกี่ยวกับปัจจัยภายในที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อมของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย

ปัจจัยภายในที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
วิสัยทัศน์ความรับผิดชอบต่อสังคม (Social Responsibility Vision)					
1. กิจการเชื่อมั่นว่าการมีนโยบายการทำงานที่มุ่งเน้นความรับผิดชอบต่อสังคมและสิ่งแวดล้อมที่ดี จะช่วยให้บรรลุความสำเร็จในการแข่งขัน					
2. กิจการผลักดันให้มีการกำหนดแนวทางการดำเนินงานที่แสดงออกถึงความรับผิดชอบต่อสังคมอย่างเป็นรูปธรรม ซึ่งจะช่วยให้การบริหารงานมีประสิทธิภาพมากยิ่งขึ้น					
3. กิจการมุ่งเน้นให้มีการบูรณาการความรู้ที่เกี่ยวข้องกับความคาดหวังของสังคมมาใช้เป็นแนวทางในการบริหารจัดการที่ดี ซึ่งจะช่วยให้การบริหารงานประสบความสำเร็จทั้งในปัจจุบันและอนาคต					
4. กิจการมุ่งมั่นให้มีการวิเคราะห์และคาดการณ์ถึงความต้องการของสังคมอย่างเป็นระบบ ซึ่งจะช่วยมีข้อมูลในการวางแผนการดำเนินงานได้เป็นอย่างดี					

ตอนที่ 5 (ต่อ)

ปัจจัยภายในที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
ระบบบัญชีบริหารเชิงกลยุทธ์ (Strategic Management Accounting System) 5. กิจการเชื่อมั่นว่าการมีระบบบัญชีบริหารที่ดี จะช่วยให้กิจการมีสามารถประยุกต์ใช้ข้อมูลในการบริหารจัดการได้ดียิ่งขึ้น					
6. กิจการให้ความสำคัญกับการพัฒนาระบบบัญชีบริหารอย่างต่อเนื่อง ซึ่งจะช่วยให้มีข้อมูลในการการพัฒนาและปรับปรุงการดำเนินงานที่ดีมากยิ่งขึ้น					
7. กิจการสนับสนุนให้มีการประยุกต์ใช้เทคนิค และวิธีการทางบัญชีบริหารใหม่ ๆ อยู่เสมอ ซึ่งจะช่วยทำให้การบริหารงานขององค์กรประสบความสำเร็จมากยิ่งขึ้น					
8. กิจการส่งเสริมให้มีการเชื่อมโยงระบบบัญชีบริหารและระบบการบริหารจัดการอย่างอื่นเข้าด้วยกันเป็นอย่างดี จะช่วยให้สามารถประยุกต์ใช้ข้อมูลได้อย่างมีประสิทธิภาพและประสิทธิผลมากยิ่งขึ้น					
วัฒนธรรมตลาด (Market Culture) 9. กิจการเชื่อมั่นว่าการดำเนินงานที่ให้ความสำคัญกับการตลาดและประเด็นต่าง ๆ ที่เกี่ยวข้อง จะช่วยให้การบริหารงานประสบความสำเร็จทั้งในปัจจุบันและอนาคต					
10. กิจการมุ่งเน้นการวิเคราะห์ความต้องการของลูกค้าที่เปลี่ยนแปลงไปอยู่เสมอ จะช่วยให้สามารถพัฒนาปรับปรุงสินค้าและบริการได้ดียิ่งขึ้น					
11. กิจการให้ความสำคัญกับการสร้างจิตสำนึกในการให้บริการที่ดีอย่างต่อเนื่อง ซึ่งจะช่วยให้สามารถตอบสนองต่อความต้องการของลูกค้าได้เป็นอย่างดี					
12. กิจการให้ความสำคัญในการศึกษาความต้องการของลูกค้าอย่างต่อเนื่อง ซึ่งจะช่วยให้สามารถวางแผนการดำเนินงานได้มีประสิทธิภาพมากยิ่งขึ้น					
13. กิจการตระหนักเสมอว่าการมีความสามารถในการตอบสนองต่อความต้องการของลูกค้าที่ดี จะช่วยให้ประสบความสำเร็จในการดำเนินงานมากยิ่งขึ้น					

ตอนที่ 5 (ต่อ)

ปัจจัยภายในที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
จริยธรรมทางธุรกิจ (Business Ethics)					
14. กิจการเชื่อมั่นว่าการดำเนินงานโดยยึดมั่นหลักจริยธรรมในการดำเนินงานอยู่เสมอ จะช่วยให้การดำเนินงานประสบความสำเร็จมากยิ่งขึ้น					
15. กิจการส่งเสริมให้บุคลากรมีการเรียนรู้และเข้าใจถึงหลักคุณธรรม ศีลธรรมและกฎหมายที่เกี่ยวข้องทางธุรกิจอย่างต่อเนื่อง ซึ่งจะช่วยให้การดำเนินงานบรรลุเป้าหมายได้เป็นอย่างดี					
16. กิจการมุ่งเน้นให้มีการดำเนินธุรกิจอยู่ภายใต้หลักคุณธรรมและจริยธรรมอย่างเคร่งครัด ซึ่งจะส่งผลให้การดำเนินงานได้รับการยอมรับจากผู้ที่มีส่วนเกี่ยวข้องอย่างต่อเนื่อง					
17. กิจการสนับสนุนให้มีการดำเนินงานให้เป็นไปตามมาตรฐานการปฏิบัติงานที่ดีและกฎระเบียบของสังคมอยู่เสมอ ซึ่งจะส่งผลให้บรรลุเป้าหมายการดำเนินงานทั้งในปัจจุบันและอนาคตได้เป็นอย่างดี					

ตอนที่ 6 ความคิดเห็นเกี่ยวกับปัจจัยภายนอกที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อมของบริษัทที่ได้รับ ISO 14000 ในประเทศไทย

ปัจจัยภายนอกที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
ความเป็นพลวัตรของแรงกดดันของผู้มีส่วนได้เสียของกิจการ (Stakeholder Force Dynamism)					
1. ผู้มีส่วนได้เสียมีความต้องการที่เปลี่ยนแปลงอย่างต่อเนื่อง ทำให้กิจการต่าง ๆ ต้องมุ่งเน้นการพัฒนาศักยภาพและความสามารถในการดำเนินงานอย่างต่อเนื่อง					
2. ลูกค้ามีความต้องการที่หลากหลายมากขึ้น ทำให้กิจการต้องมุ่งเน้นการพัฒนาสินค้าและบริการให้สามารถตอบสนองความต้องการให้ได้ดียิ่งขึ้น					
3. ในปัจจุบันคู่แข่งขันมีจำนวนมากยิ่งขึ้น ทำให้กิจการต่าง ๆ ต้องมีการพัฒนาศักยภาพขององค์กรอย่างต่อเนื่อง					

ตอนที่ 6 (ต่อ)

ปัจจัยภายนอกที่ส่งผลต่อศักยภาพการบัญชีบริหารสิ่งแวดล้อม	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
4. การแข่งขันในปัจจุบันมีความรุนแรงมากยิ่งขึ้น ทำให้กิจการต่าง ๆ ต้องมุ่งเน้นในการพัฒนากลยุทธ์ในการดำเนินงานให้มีประสิทธิภาพมากยิ่งขึ้น					
5. กฎระเบียบและข้อบังคับมีจำนวนมากยิ่งขึ้น ทำให้กิจการต่าง ๆ ต้องมุ่งศึกษาและทำความเข้าใจ เพื่อให้สามารถใช้ประโยชน์ได้ดียิ่งขึ้น					

ตอนที่ 7 ข้อเสนอแนะหรือความคิดเห็นเพิ่มเติม

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ขอขอบพระคุณท่านที่ได้สละเวลาตอบแบบสอบถามทุกข้อ และได้โปรดพับแบบสอบถามใส่ซองที่แนบมาพร้อมนี้ส่งคืนตามที่อยู่ที่ระบุ หากท่านต้องการรายงานสรุปผลการวิจัยครั้งนี้ ได้โปรดแสดงความประสงค์ในหน้าแรกของแบบสอบถามนี้ ข้าพเจ้ายินดีที่จะจัดส่งรายงานสรุปฉบับสมบูรณ์ให้แก่ท่านภายหลังเสร็จสิ้นการนำเสนอรายงานวิจัยแล้ว

APPENDIX G

Cover Letters and Questionnaire (English Version)

Questionnaire to the Ph. D. Dissertation Research

"Environmental Management Accounting Capability and Firm Survival:

An Empirical Investigation of ISO 14000 Firms in Thailand"

Dear Sir,

This research is a part of doctoral dissertation of Miss. Worapan Ratanasongtham at the Mahasasakham Business School, Mahasarakham University, Thailand. The objective of this research is to examine the effect of environmental management accounting capability and firm survival from ISO 14000 firms in Thailand. The questionnaire is divided into 7 parts

- **Part 1:** Personal information about executives of accounting department of ISO 14000 firms in Thailand,
- **Part 2:** General information about ISO 14000 firms in Thailand,
- **Part 3:** Opinion on environmental manage mental accounting capability of ISO 14000 firms in Thailand,
- **Part 4:** Opinion on consequences of environmental management accounting capability of ISO 14000 firms in Thailand,
- **Part 5:** Opinion on internal environmental operation of ISO 14000 firms in Thailand,
- **Part 6:** Opinion on external environmental operation of ISO 14000 firms in Thailand, and
- **Part 7:** Recommendations and suggestions in environmental management accounting capability of ISO 14000 firms in Thailand.

Your answer will be kept confidentiality and your information will not be shared with any outside party without your permission.

If you want a summary of this research, please indicate your E-mail address or attach your business card with this questionnaire. The summary will be mailed to you as soon as the analysis is completed.

Thank you for your time answering all the questions. I have no doubt that your answer will provide valuable information for academic advancement. If you have any questions with respect to this research, please contact me directly.

Sincerely yours,

(Miss Worapan Ratanasongtham)
Ph. D. Student
Mahasasakham Business School,
Mahasarakham University, Thailand

Contact Info:
Office No: 043 - 754333
Cell phone: 086- 2025462
E-mail: viewvip_vip@hotmail.com

Section 1: Personal information about executives of ISO 14000 firms in Thailand,

1. Gender
   - ❑ Male
   - ❑ Female

2. Age
   - ❑ Less than 35 years old
   - ❑ 35-40 years old
   - ❑ 41-45 years old
   - ❑ More than 45 years old

3. Marital status
   - ❑ Single
   - ❑ Married
   - ❑ Divorced

4. Educational level
   - ❑ Bachelor's degree or lower
   - ❑ Higher than bachelor's degree

5. Working experience
   - ❑ Less than 5 years
   - ❑ 5-10 years
   - ❑ 11-15 years
   - ❑ More than 15 years

6. Average monthly income at present
   - ❑ Less than 50,000 Baht
   - ❑ 50,000-80,000 Baht
   - ❑ 80,001-110,000 Baht
   - ❑ More than 110,000 Baht

7. Working position at present
   - ❑ Accounting director
   - ❑ Accounting manager
   - ❑ Accountant
   - ❑ Other……

Section 2: General information about ISO 14000 firms in Thailand

1. Business entity
   - ❑ Public limited company
   - ❑ Company limited

2. Industrial category
   - ❑ Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats
   - ❑ Beverages
   - ❑ Other food products
   - ❑ Paper & paper products
   - ❑ Textiles
   - ❑ Basic chemicals
   - ❑ Petroleum products
   - ❑ Rubber products
   - ❑ Other chemical products
   - ❑ Cement/concrete
   - ❑ Plastic products
   - ❑ Metal products
   - ❑ Casting of metals
   - ❑ Electrical machinery
   - ❑ Machinery and equipment
   - ❑ Production of electricity
   - ❑ Radio, TV, communication equipment
   - ❑ Manufacture of gas
   - ❑ Motor vehicles/transport equipment
   - ❑ Wholesale/retail trade
   - ❑ Collection, purification and distribution of Water
   - ❑ Transport & supporting activities
   - ❑ Maintenance and repair of motor vehicles
   - ❑ Grain mill products, starches and prepared animal feeds
   - ❑ Real estate activities
   - ❑ Other ……

3. Number of employees at present
   - ❑ Less than 100 employees
   - ❑ 100-200 employees
   - ❑ 201-300 employees
   - ❑ More than 300 employees

4. Operational capital
   - ❑ Less than 50,000,000 Baht
   - ❑ 50,000,001 – 150,000,000 Baht
   - ❑ 150,000,001 – 250,000,000 Baht
   - ❑ More than 250,000,000 Baht

5. Average annual income per year
   - ❑ Less than 100,000,000 Baht
   - ❑ 100,000,001 – 500,000,000 Baht
   - ❑ 500,000,001 – 1,000,000,000 Baht
   - ❑ More than 1,000,000,000 Baht

6. The period of time in business
   - ❑ Less than 10 years
   - ❑ 10-15 years
   - ❑ 16-20 years
   - ❑More than 20 years

7. Number of certified ISO 14000 years
   - ❑ Less than 5 years
   - ❑ 5-7 years
   - ❑ 8 -10 years
   - ❑ More than 10 years

8. Awarded in environmental management
   - ❑ Yes
   - ❑ Never

Section 3: Opinions on environmental management accounting capability of ISO 14000 firms in Thailand

Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
Environmental Identification Efficiency Orientation 1. Firm believes that the ability to identify the costs and benefits associated with the environment clearly will enhance the efficiency of environmental management.					
2. Firm focus on the identification of environmental costs in a systematic and concrete will help firm to achieve the goal of environmental performance.					
3. Firm emphasizes to clearly identification of environmental benefits that gained from good environmental management which allows the operation more successfully.					
4. Firm support the recording in all aspects of the environment correctly that enable firm to improve the environment management.					
5. Firm concentrates on determination and seeking the concrete criteria for classification the environmental element which enables to manage the cost more effectively.					
Environmental Practice Proficiency Capability 6. Firm believes that good environmental practice will help the environmental management more success.					
7. Firm concentrates on the application of accounting practice systematically which enables the accounting practice more achievement.					
8. Firm greater support the use of new technologies in the field of environmental accounting practice to help the environmental information management higher quality.					
9. Firm focus on the analysis of the environmental impact on the community and society which enables the operation to be more acceptable.					

Section 3: Opinions on environmental management accounting practices of ISO 14000 firms in Thailand (Continued)

Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
Environmental Reporting Transparency Emphasis 10. Firm believes that the preparation of environmental reporting openly will help the operation to be more acceptable.					
11. Firm emphasizes to disclose data of actual environment in both benefits and side effects which help firm get more cooperation from the stakeholders regularly.					
12. Firm concentrates on the preparation of the environmental reporting completely in both quantitative and qualitative which allows the comprehensive information for planning and operational management of the firm.					
13. Firm focuses on identifying the sources of environmental information with accurately and completely which will make reliable data received for the firm operations in both present and future.					
Environmental Auditing Effectiveness Focus 14. Firm believes that the assessment of environmental performance continually will help the management more effectively.					
15. Firm always monitor the environmental performance which enables to solve various problems related to the environment timely.					
16. Firm focuses on the monitoring the activity, process and environmental management systematically which enables the operating achieve the goal in both present and future.					

Section 3: Opinions on environmental management accounting practices of ISO 14000 firms in Thailand (Continued)

Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
17. Firm emphasizes on the concrete determination of operational guidelines in environmental auditing aspect which enables the operation auditing more efficiently.					
Environmental Improvement Disclosure Implementation 18. Firm believes that the dissemination of information related to ongoing environmental improvements will help the operation to be more accepted from those involved.					
19. Firm focuses on the presentation the budget for the development and improvement the environment systematically which allows the environmental management of the environment to be more trusted.					
20. Firm featured on the preparation the concrete database of the environment development and improvement which allows the presentation, disclosure and dissemination the information to the public faster and timely.					
21. Firm intends to dissemination the development activities related to the environment development and improvement which allows the management achieve the goal both present and future.					

Section 4: Opinions on Consequences of Environmental Management Accounting Practices of ISO 14000 Firms in Thailand

Consequences of Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
Environmental Conservation Efficiency 1. Firm confidences that the firm is an important part to help improvement and development the environment continuously.					
2. Firm has a good management with regard to the use of natural resources and conservation benefits.					

Section 4: Opinions on Consequences of Environmental Management Accounting Practices of ISO 14000 Firms in Thailand

Consequences of Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
3. Firm is operating successfully with regard to the survival and sustainability of the environment regularly.					
4. Firm has the ability to reduce the waste that will impact on environmental degradation continuously and concretely.					
Societal Expectation Fulfillment 5. Firm can deliver the quality products and services to customers continuously.					
6. Firm can operate according to the rules, regulations and legislation completely					
7. Firm has been honored and trusted from the society as the firm that recognizes the social responsibility regularly.					
8. Firm has the potential to fully respond the social needs in all aspects.					
Community Relationship Maintenance 9. Firm receives the collaboration in the operation from the community consistently					
10. Firm has the ability to generate the participation from the community in all activities as well.					
11. Firm adopts the recommendations and suggestions of the community to guide the operation consistently.					
12. Firm communicate the operational information in all aspects to the community invariably.					
Sustainable Performance Development 13 Firm can reduce cost of the operations as well and continuously.					
14. Firm has been recognized from the customers and those involved as the firm which has a good management regularly.					

Section 4: Opinions on Consequences of Environmental Management Accounting Practices of ISO 14000 Firms in Thailand (Continued)

Consequences of Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
15. Firm has the operational performance achieved its goals consistent with the current situation.					
16. Firm is able to retain an old customer and add new customers continuously.					
Firm Survival 17. Firm is able to survive under the fierce competition in both the present and future.					
18. Firm has the reputation and build credibility to those involved continuously.					
19. Firm received an award on good management about recognizing social responsibility continuously.					
20. Firm has outstanding management to can more growth and expansion in the past, present, and future.					

Section 5: Opinions on Internal Environmental operation of ISO 14000 Firms in Thailand

Internal Factor on Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
Social Responsibility Vision 1. Firm believes that the policy that focus on social responsibility and the good environment will enables firm to succeed in the competition.					
2. Firm supports the guideline for social responsibility concretely which enhance management efficiency.					
3. Firm focuses on the integration knowledge of social expectations as a guideline for good management will promotes the success of the management both the present and future.					

Section 5: Opinions on Internal Environmental operation of ISO 14000 Firms in Thailand (Continued)

Internal Factor on Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
4. Firm emphasizes on analyze and predict the society needs systematically which provides the good information for the operational planning.					
Strategic Management Accounting System 5. Firm believes that good management accounting system will facilitates firm to apply the information in management more efficiency.					
6. Firm recognizes the importance of ongoing development the management accounting system will enhance good information for develop and improve the business operations.					
7. Firm encourages the application of new techniques and methods in management accounting regularly will promotes the business management more successful.					
8. Firm promotes on linking of management accounting system and other management systems together which enable firm to apply the information more efficiently and effectively.					
Market Culture 9. Firm believes that the operation that focuses on marketing and related issues will allow the management success both in the present and future.					
10. Firm focused on the analysis of the changing needs of customers regularly will promote the development of products and services.					
11. Firm emphasizes on creating consciousness in the good services consistently which helps to response the customer needs as well.					

Section 5: Opinions on Internal Environmental operation of ISO 14000 Firms in Thailand (Continued)

Internal Factor on Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
12. Firm recognizes the importance of the continuous learning of customer requirement which enable the operational planning more efficiently.					
13. Firm always recognizes that great ability to respond the customer needs in order to success in business operations.					
Business Ethics 14. Firms believes that the operation that always adhering to ethical principles will help the operation more successful.					
15. Firm encourage staff to continuously learn and understand the moral principles and the laws related to the business operations in order to achieve the business goal.					
16. Firm emphasizes on adherence ethics in their business operations which makes its operations to be recognized from those involved continuously.					
17. Firm supports the implementation of standards of conduct that is socially acceptable standard which makes the firm achieve the operational goals both in the present and in future.					

Section 6: Opinions on External Environmental operation of ISO 14000 Firms in Thailand

External Factor on Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
Stakeholder Force Dynamism 1. The needs of stakeholders continuously changing which cause firms focus on the development the capacity and ability in the operation continuously.					

Section 6: Opinions on External Environmental operation of ISO 14000 Firms in Thailand (Continued)

External Factor on Environmental Management Accounting Capability	Levels of Agreement				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
2. Customer needs increasingly diverse which cause firms focus on the development products and services in order to better respond the customer needs.					
3. Competitors are increasing in the present which cause firms need to continuously develop the potential of the firm.					
4. Competition is more violence at the present which cause firms focus on the development of the operational strategy more efficiently.					
5. Rules and regulations are increasing which cause firms intend to study and understand in order to take advantage of it.					

Section 7: Recommendations and suggestions regarding environmental management accounting of ISO 14000 Firms in Thailand

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Thank you for your participation

APPENDIX H

Letters to the Experts

บันทึกข้อความ

หน่วยงาน คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม โทรศัพท์ 043-754333 ต่อ 3431
ที่ ศธ.0530.10/ **วันที่** 5 มิถุนายน 2559
เรื่อง ขอเรียนเชิญเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัย

เรียน อาจารย์ ดร.ศรัญญา รักสงฆ์

ด้วย นางสาววรพรรณ รัตนทรงธรรม นิสิตระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการบัญชี (ปร.ด.) คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม กำลังศึกษาวิทยานิพนธ์ เรื่อง "ศักยภาพการบัญชีบริหารสิ่งแวดล้อมและความอยู่รอดของบริษัท : หลักฐานเชิงประจักษ์จากบริษัทที่ได้รับรองมาตรฐาน ISO 14000 ในประเทศไทย" ซึ่งเป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิต ดังนั้น เพื่อให้การดำเนินการเป็นไปด้วยความเรียบร้อยและบรรลุตามวัตถุประสงค์ คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม จึงใคร่ขอความอนุเคราะห์จากท่านเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัย และข้อเสนอแนะเพื่อนำข้อมูลที่ได้ไปดำเนินการทำวิทยานิพนธ์ต่อไปตามเอกสารแนบท้าย

จึงเรียนมาเพื่อโปรดพิจารณา

(รองศาสตราจารย์ ดร.ปพฤกษ์บารมี อุตสาหะวาณิชกิจ)
คณบดีคณะการบัญชีและการจัดการ

บันทึกข้อความ

หน่วยงาน คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม โทรศัพท์ 043-754333 ต่อ 3431
ที่ ศธ.0530.10/ **วันที่** 5 มิถุนายน 2559
เรื่อง ขอเรียนเชิญเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัย

เรียน ผู้ช่วยศาสตราจารย์ ดร.เกสินี หมื่นไธสง

ด้วย นางสาววรพรรณ รัตนทรงธรรม นิสิตระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการบัญชี (ปร.ด.) คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม กำลังศึกษาวิทยานิพนธ์ เรื่อง "ศักยภาพการบัญชีบริหารสิ่งแวดล้อมและความอยู่รอดของบริษัท : หลักฐานเชิงประจักษ์จากบริษัทที่ได้รับรองมาตรฐาน ISO 14000 ในประเทศไทย" ซึ่งเป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิต ดังนั้น เพื่อให้การดำเนินการเป็นไปด้วยความเรียบร้อยและบรรลุตามวัตถุประสงค์ คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม จึงใคร่ขอความอนุเคราะห์จากท่านเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัย และข้อเสนอแนะเพื่อนำข้อมูลที่ได้ไปดำเนินการทำวิทยานิพนธ์ต่อไปตามเอกสารแนบท้าย

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RESEARCH

2015	Ratanasongtham, W. and Ussahawanitchakit, P. (2015). Strategic audit planning and audit quality: an empirical research of CPAs in Thailand. *The Business and Management Review*, 7(1), 384-394.