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Environmental Management Accounting Practices: A Survey of ISO 14001 Certified Malaysian Organizations

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Abstract

In order to react to the demand of environmentally conscious society, organizations must incorporate environmental agenda in their corporate strategy. The adoption of environmental management accounting practices would help organizations to realize significant cost saving, enhance competitiveness and improve performance. However, some studies revealed organizations which implemented environmental management accounting practices were unable to realize the benefits. Due to the inconsistency of the previous studies' results, this study aims to shed light on the environmental management accounting practices, competitive advantage and organizational performances in ISO 14001 certified Malaysian organizations. An online survey was utilized for the collection of data, in which the views of top management and relevant key personnel involved in environmental management in these organizations were sought. Environmental management accounting activities and environmental management system were used as the proxy for environmental management practices. The theory of resource-based view had been employed to provide the premise to explore the variables. The findings from this study showed that ISO 14001 certified organizations are actively asserting their role as responsible social players and the perceived environmental concerns has become an integral part of their routine operations, which clearly revealed organizations' continuous commitment towards environmental responsibility. Further to that, the findings from this study revealed that environmental management accounting practices enabled organizations to achieve competitive advantage and improve their performances.

Keywords: environmental management accounting practices, environmental management accounting activities, environmental management system, organizational performance, survey

1. Introduction

1.1 Background of the Study

This paper reports on a survey on the extent of environmental management accounting practices and the competitive advantage and performances of ISO14001 certified Malaysian organizations. ISO 14001 (International Organization for Standardization) primarily focuses on environmental management system and it is designed to introduce environmental improvement on the entire organization's operations as well as assists in organizing a suitable approach in managing environmental issues. For this study, the work carried out by Ann et al. (2006) was extended to include environmental management accounting activities besides environmental management system as a proxy for environmental management accounting practices. This research was also influenced by resource-based view theory that posits resources as sources of competitive advantage (Barney 1991). The findings from this study revealed that environmental management accounting practices enabled organizations to achieve competitive advantage and improved their performances.

The increasing demand for environmental protection has forced organizations to become environmentally responsible (Sulaiman & Mokhtar, 2010). In order to proactively engage in environmental management, significant costs need to be incurred (Bansal & Bogner, 2002). However, these additional costs could possibly give negative impact to an organization's bottom line. This is because being environmentally responsible is viewed as only a mean for fulfilling social demand and not for profit maximization (Watson, Kilngenberg, Polito & Geurts, 2004). Thus, with the introduction of environmental management accounting practices, organizations can become environmentally responsible without compromising their bottom line (Ann, Zailani & Abd Wahid, 2006). The implementation of environmental management accounting practices not only enhances an organization's performance, but would also improve its competitiveness (Leonidou, Leonidou, Fotiadis & Zeriti, 2013). However, a review of the literature showed that there are still inconclusive results obtained on environmental management accounting practices and organization's ability to realize the benefits from its implementation.

Environmental issues have become a main concern in today's society. Human activities such as deforestation and energy consumption have caused climate change, which includes the melting of polar ice caps and the increasing sea levels. As a result, the Non Governmental Organizations (NGOs) have voiced their concern for environmental protection. Since business organizations are considered to be the main source of environmental problems, they are subjected to pressures from various parties inside and outside the country in which they operate, to produce environmentally friendly products (Eltayeb, Zailani & Jayaraman 2010). The pressures that these organizations faced have forced top management to implement environmental management accounting. Social structural and organizational contextual were the two main forces that encouraged the development of environmental management accounting in local government (Qian, Burritt & Monroe 2011). Examples of these motivations were pressures from different environmental regulatory bodies, environmental expectations from society, and pressures from peer councils. These circumstances reflected the situational needs in the organizational contexts, which comprises of comprehensive waste operations and services designs, changes and uncertainties in disposal management, and the council's strategic position for waste management.

1.2 Research Problem

Energy can be identified as one of the causes of climate change, as it is the main factor of greenhouse gas emissions. In 2010, it was reported in the United States that 87% of greenhouse gas emissions came from energy-related gas (EIA 2011). Therefore, with increasing projection of energy consumption, environmental catastrophes such as earthquakes, tsunamis, hurricanes, droughts, and floods might occur frequently, which will negatively impact present and future generations (Hubpages 2011). In other words, the emergence of environmental issues which have increased the awareness for environmental protection among society, have pushed organizations to become environmentally responsible (Schaarsmith, 2005). Organizations which overlook this matter may not be able to sustain its position in the market in the long run as this issue has become a threat to business survival (Sulaiman & Mokhtar, 2010). One way to address environmental issue is to practice environmental management accounting.

Environmental management accounting practices were implemented in order to overcome the limitation in conventional management accounting which cannot provide sufficient information relating to environmental management (Sulaiman & Mokhtar, 2010; Swamy, 2010). Ranganathan and Ditz (1996) pointed out that hidden costs for environment-related activities cannot be revealed with the use of conventional management accounting. Thus, the revelation of environment-related hidden costs would be beneficial to organizations in improving organizational performance (Sirisom & Sonthiprasat, 2011). Besides the reduction of negative impacts on the environment (Link & Naveh, 2006), organizations can gain benefits from the adoption of environmental management accounting practices. These benefits include an improvement in corporate decision-making (Gibson & Martin, 2004), cost reduction (Molina-Azorin et al., 2009), stimulation of innovation (Frondel, Horbach & Rennings, 2010), and enhancement of organizational competitiveness (Leonidou, Leonidou, Fotiadis & Zeriti, 2013), which will eventually lead to an improvement in the organization's bottom line (Sirisom & Sonthiprasat, 2011). However, a review of prior studies showed that organizations sometimes were unable to improve their performances (e.g., Vries, Bayramoglu & Wiele, 2012). This was because, in order to implement environmental management accounting practices, high level of costs need to be incurred (Bansal & Bogner, 2002). Due to this downside, some managers will question the benefits of being environmentally responsible, as to whether or not the benefits gain can outweigh the costs of implementing it (Goh & Wahid 2010).

Hence, increasing environmental issues and the gaps discussed above provided an opportunity for this study to be carried out. Therefore, the objectives of this study are as follows:

1. To explore the environmental management accounting practices, competitive advantage and organizational performance within ISO 14001 certified Malaysian organizations
2. To examine the relationships between environmental management accounting practices, and competitive advantage and organizational performance within ISO 14001 certified Malaysian organizations

The remaining of this paper consists of five sections. Firstly, a review of the literature on environmental management accounting practices, competitive advantage, organization performance and the chosen theory are provided. Secondly, an explanation on the research method adopted. Thirdly, the survey results are presented. Fourthly, a discussion of the results is given. Finally, the implications and limitation of this study, and future research are put forward.

2. Literature Review

2.1 Environmental Management Accounting Practices

Jaipiem, Ussahawanitchakit, and Muenthaisong (2012, p. 4) defined environmental management accounting practices as "accounting practices related to recognize, identify, collect and analyze data, including disclosure, reporting and auditing activities". Based on the given definition of environmental management accounting practices, it is known that environmental management accounting practices consist of environmental management accounting and environmental management system.

2.1.1 Environmental Management Accounting

According to Setthasakko (2010, p. 317), environmental management accounting is "a business tool that provides essential data for corporate environmental management ranging from simple to comprehensive methods that link physical and monetary information for decision making". Physical information is the information relating to the usage and flow of water, energy and material including wastage, whilst monetary information with regard to environmental management is relating to costs, earnings and savings" (Sulain & Mokhtar, 2010). Deployment of strategic environmental management accounting would certainly help organizations to overcome the limitations that exist in conventional accounting system in relation to environmental matters (Setthasakko, 2010). The ability to capture both physical and monetary environmental related information would surely be beneficial to an organization. The revelation of hidden environmental costs such as the labor cost of maintaining environmental-related equipments, which is usually not charged as environmental costs (Kitzman 2001), would promote organizations with better decision-making (Ferreira, Moulang & Hendro 2010). This is where organizations can identify which activities negatively impact the environment either directly or indirectly, and charge the explicit and embed environmental costs to its respective root caused activity (Kitzman 2001). Gibson and Martin (2004) emphasized that the allocation of environmental costs to the right activity or product would certainly help in improving product pricing decision, as compared to conventional management accounting, which pool the environmental costs in overhead accounts (Ranganathan & Ditz 1996) and allocate to each product line, which eventually leads to the overpricing of products (Kitzman, 2001).

With the integration of environmental management accounting into the current accounting system, organization performance would be enhanced. Most of the previous literatures found that there were a significantly positive relationship between environmental management accounting and organizational performance (Molina-Azorin, Claver-cortes, Pereira-moliner, and Jose Tari, 2009; Sirisom and Sonthiprasat, 2011). This is because environmental management accounting would help organizations in making better decisions (Gibson and Martin, 2004). Further to that, Pereira-moliner et al. (2012) also reported that by implementing environmental management accounting, organizations are able to enhance organizational performance due to the fact that they were able to attract more customers, as customers nowadays are more environmentally cautious and would choose organizations that uphold environmental protection practices. This can be reflected by the adoption of ISO 14001 Environmental Management System standard, which prescribes the good practice of environmental management system (Ann et al., 2006). Relying solely on environmental management accounting tools is not sufficient in order to generate the optimal benefits of being environmentally responsible (Sulaiman and Mokhtar, 2010). Hence, the adoption of ISO 14001 certification would help organizations, as it prescribes the framework and guidelines in implementing environmental initiatives (Lefebvre and Lefebvre, 2003). This is consistent with the findings from the study done by Sirisom and Sonthiprasat (2011), which revealed that environmental management accounting has a significantly positive relationship with environmental management system.

2.1.2 Environmental Management System

Relying only on environmental management accounting as a tool itself would not be a good way to realize the optimal value of being environmentally proactive. It must be integrated with an effective environmental management system (Sulaiman & Mokhtar, 2010), which would assist in organizing environmental initiatives (Lefebvre & Lefebvre, 2003). This is because environmental management system provides managerial framework and guidelines to be integrated in the overall business operation so that the adverse effect on environment can be mitigated (Cassells et al., 2011). Environmental management system can be defined as "a structured approach to address environmental bottom line that improve environmental management which enable organizations to equally access to a growing "green" market place" (Ann et al., 2006, p. 75). In order to effectively manage the impact of an organization's activities towards the environment, the International Organization for Standardization issued a worldwide environmental management standard which is ISO 14001, which prescribes the environmental management system framework to demonstrate a sound environmental management (Ann et al., 2006). This standard is designed to help organizations take a more proactive approach by introducing environmental improvement in every aspect of their business operations, with intention to reduce the negative impact of business activities towards the environment (Link & Naveh, 2006).

To implement environmental management system effectively, five main elements as prescribed in ISO 14001

must be outlined to organizations. The five elements are environmental policy, planning, implementation and operation, checking, and management review (Cassells et al., 2011). Bansal and Bogner (2002) identified five steps to further explainabout environmental management system. Firstly, in setting up the environmental management system, an organization must identify the activities that give adverse impact towards the environment and environmental regulations in which the organization operates. Secondly, organizations are required to develop a plan to mitigate the negative environmental impact by developing environmental policy, setting environmental objectives and targets, delegating tasks to handle environmental management system, setting up documentation processes, and modifying the organization structures and systems. This should be done in order for them to be in line with the environmental policy and to successfully meet their objectives and targets. With the environmental policy, objectives, and targets in place, the third step, organizations are required to implement environmental management based on the set policy and work towards achieving those objectives and targets. In this stage, the implementation of environmental management must be well communicated to employees, employees must be well trained and empowered, and procedures must be documented. Fourthly, once implementation is completed, the actual result of environmental management must be checked and any variance with the goals must be addressed. Finally, organizations must review and re-evaluate its environmental policy, systems and structure, as well as its goals, and change where deemed necessary.

Since this standard is a global standard, it can be generalized that the requirements stipulated in this standard is more flexible and less stringent (Bansal & Bogner, 2002). It means that this standard is flexible enough in such a way that it can be implemented in different types of industries and different sizes of organizations (Ann et al., 2006). It is also deemed less stringent since employees who are directly involved in the implementation of the environmental management system can use their own discretion and not merely focus on the requirements of the standard itself (Link & Naveh, 2006).

Adopting an efficient environmental management system would also help organizations boost their performances. For example, a study conducted on Malaysian organizations that are ISO 14001 certified revealed that ISO 14001 certified organizations were able to enhance their environmental performance, customer perceived satisfaction and economic performance (Ann et al., 2006). In a literature review conducted by Vries, Bayramoglu, and Wiele (2012), it was found that 30 out of 34 previous studies on ISO 14001 certified organizations reported that these organizations were able to improve their bottom line. It can be generalized that the organizations which implemented environmental management system characterized by adoption of ISO 14001 certification are able to realize similar benefits as what they would gain from the implementation of environmental management accounting activities, such as cost reduction (Ann et al., 2006; Cassells et al., 2011) and ease of entering the global market (Bansal and Bogner, 2002). These benefits would then help organizations to improve their bottom line. It was apparent that environmental management accounting activities such as identification of environmental related costs and allocation of environmental related costs to the production process are part and parcel of the environmental management system. Therefore, in order to implement good environmental management accounting practices, environmental management accounting tools should be integrated with this system (Sulaiman and Mokhtar, 2010).

2.2 Competitive Advantage

Competitive advantage exists when an organization is able to produce a product at a lower cost compared to its competitors and by delivering the same benefit or produce a product that offer superior benefit relative to its competing product (Wang et al., 2011). This can be achieved when existing or potential competitors do not simultaneously implement an organization value creating strategy (O'shannassy, 2008). Organizations' value creating strategy is where organizations are able to create value for their customers that exceed the costs of creating it, such as offering high quality products at low costs (O'shannassy, 2008). Barney (1991) stated that competitive advantage can be achieved by exploiting their own strategies and overcoming its internal weaknesses as well as responding positively to externalities. Having an advantage over competitors would surely help an organization to generate strong financial performance (O'shannassy, 2008).

Implementation of good environmental management accounting practices will also lead to competitive advantage (Leonidou et al., 2013; Lopez-Gamero, Molina-Azorın, and Claver-Cortes, 2009). This is because most organizations that implement effective environmental management accounting practices are able to gain cost saving advantage as consequent of improvement in process efficiency, reduced usage of raw materials and wastage disposal, and low cost of production (Lopez-Gamero et al., 2009). Besides that, implementation of environmental management accounting practices also give advantage for organizations to differentiate their products or services by producing eco-friendly products and providing their customers with a high quality product (Wang et al., 2011). Apart from that, due to the infancy of environmental management and the increase

in demand for environmental protection, organizations that implement environmental management characterized by the adoption of environmental management accounting practices will be able to enhance its reputation (Chiou et al., 2011).

2.3 Organizational Performance

Organizational performance can be defined as the actual results generated by an organization as measured against the organization's stated goals and objectives (Wikipedia, 2012). It can be served as an indicator to measure the effectiveness of an organization in running its daily operations (Richard, Devinney, Yip & Johnson, 2009). This will determine whether organizations are able to survive in the market or not. Based on Richard et al. (2009), organizational performance encompasses three specific areas which comprises of financial performance, market performance and shareholders return.

2.3.1 Financial Performance

Financial performance is the change of the financial state of an organization as the consequence of the implementation of managerial decision made by the players in an organization (Carton, 2004). It provides feedback on the success of pursuing organizational objectives (Drury, 2007). This can be measured by looking at organizational profitability and efficiency such as operating profit, return on investment and return on assets; and organizational size which is measured by sales level and cash flows (Carton, 2004).

One of the main objectives for the existence of an organization is to create and maximize shareholders' value or shareholders return (Jensen, 2001). Shareholders are people who invest their money in an organization in order to obtain a required return on investment. Shukla (2009) stated that organizational profitability, growth and free cash flow are the fundamental determinants in creating shareholders value. She further added that revenue enhancement, low production costs, operational efficiency, and better utilization of resources are the main drivers for shareholders' value creation. Based on the determinants and drivers of shareholders value creation stated above, it can be concluded that shareholders return is part and parcel of financial performance indicator.

Implementation of environmental management accounting practices would improve organizational financial performance (Ann et al., 2006). This is because the implementation of environmental management accounting practices could help to improve corporate decision making by keeping track of environmental related information, in which the conventional management accounting are unable to reveal (Sulaiman & Mokhtar, 2010). Revelation of environmental related information and improvement in decision making helps organizations to identify new opportunities (Ferreira etal., 2010), such as reduction in operational costs (Sulaiman & Mokhtar, 2010). As a result, an organization's bottom line will also be improved.

2.3.2 Market Performance

Relying on financial performance itself is not sufficient enough in determining the effectiveness of an organization since the performance is measured based on historical data (Drury, 2007). Therefore, non-financial performance such as market performance should also need to be considered in order to complement financial performance in measuring organizational performance. Market performance can be referred to as the ability of an organization to satisfy, develop and retain customers by offering products or services and other attributes that are able to fulfill the needs of their customers (Leonidou, Leonidou, Fotiadis & Zeriti, 2013). By referring to the customer's perspective, organizations might be able to acquire new customers, retain their existing customers, encourage for repeat purchase, build up loyalty among customers, and enhance organizational reputation (Leonidou et al., 2013). This non-financial performance which concentrates on the current activities will become an indicator for organizations' future financial performance (Hilton & Platt, 2011).

Adoption of environmental management accounting practices would enhance organizational performance (Vries et al., 2012). This is because environmental management accounting practices would be able to neutralize the threat to business survival, which was characterized by the changes in customers' preferences who demand for organizations to be environmentally responsible (Bansal & Bogner, 2002). Therefore, organizations that are able to portray themselves as being environmentally responsible are able to have their reputations improved (Gibson & Martin, 2004). The improvement of corporate reputation will then help organizations to serve in the new market characterized by new customer preferences, which demand for environment friendly products or services. The organization's ability to fulfill the demand of environmentally conscious customers by offering good quality products or services will lead to customer satisfaction (Bloemer, Ruyter, & Wetzels, 1998). The perceived quality of products or services and customer satisfaction are two main drivers in building customer loyalty (Bloemer et al., 1998). A loyal customer may repurchase the products or services offered by the organization. As a result, it will lead to improvement in the organization's sales level, which in turn would enhance the organization's financial performance.

2.4 Resource-Based View Theory

Resource-based view evolves from the concept of competitive advantage. A comprehensive framework of resource-based view had been developed by Jay Barney, which proposed resources as a source of sustainable competitive advantage (Barney, 1991). Barney (1991, p. 101) defined resources as "all assets, capabilities, organizational processes, firm attributes, information, knowledge and other resources controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness". Based on resource-based view, environmental management accounting practices can be viewed as capabilities by mixing up organization resources. The resources in this case are environmental management accounting tools or activities, environmental management systems, physical and monetary environmental-related information, water, energy and raw materials, environmental management staffs and plant and equipment used in environmental related activities. By binding up these individual resources, organizations are able to produce superior value. The values that environmental management accounting practices can deliver include improvement in decision making (Ferreira et al., 2010; Ranganathan and Ditz, 1996) and cost reduction (Ann, Zailani, & Abd Wahid, 2006; Sulaiman & Mokhtar, 2010). It would also help organizations to increase its efficiency and productivity (Chiou, Chan, Lettice, & Chung, 2011) and thus, can be translated into improvement in organizational performance (Ann et al., 2006; Vries et al., 2012).

3. Survey Method

In this study, the survey method was used in the collection of data that covers Malaysian organizations certified with ISO14001. The survey method is most appropriate to be conducted when the information to be gathered comes from the object of the study (Powell & Hermann 2000). According to Mitchell and Jolley (2007), employing survey method is an easy way to collect a lot of information. This method also allows the researcher to reach a wider geographical area and larger proportion of the group (Sekaran & Bougie 2009). However, it is subjected to low responses and bias information due to the unwillingness of respondents in providing information (MSG 2008).

3.1 Onine Questionnaire

Online questionnaire was administered to achieve the objective of this study. This is because online questionnaires can reach respondents globally, with little to no cost needed to be incurred and is a fast way of delivery besides ensuring anonymity of respondents (Sekaran & Bougie 2009). On the other hand, several limitations of using online questionnaires include low response rate achieved (Sekaran & Bougie, 2009) and the responses gathered may not reflect the true answer. Apart from that, the usage of questionnaires will not allow the researcher to clarify any doubt that is faced by the respondent in answering the given questions (Sekaran & Bougie, 2009), which in turn, might result in misinterpretation of questions (Milne, 1999). Nevertheless, since most of the previous studies related to environmental management also uses the survey method for data collection (e.g., Leonidou et al., 2013; Lopez-Gamero et al., 2009) and its its advantages, thus, this further justifies the selection of survey method for this present study.

3.2 Questionnaire Design

The questionnaire is made up of four sections. Section A covers the demographic information of respondents, while environmental management practices and competitive advantage were the focus in Section B and Section C, respectively. Section D aims to determine the competitive advantage of the organization relative to their competitors. Section A was intended to gather information relating to the background of the respondents (job title, length of service, proportion of time involved in environmental management accounting, and type of industry). This information is considered important since it determines the reliability and quality of the overall response to the questionnaire (Ferreira et al., 2010). On the other hand, Section B was designed to explore the environmental management practices in Malaysian organizations in relation to environmental management accounting activities and environmental management systems. Environmental management accounting activities reflect the activities that identify, collect, and assess environmental related physical and monetary information. The question was adopted from Ferreira et al.'s (2010) as it considers both physical and monetary information. In order for environmental management accounting practices to be effective, it must be supported by environmental management system which represents the managerial procedures of an organization in the process of achieving environmental goals (Lefebvre & Lefebvre, 2003). For environmental management system, the question was adopted from Lefebvre and Lefebvre (2003). Respondents were asked to "indicate the extent to which your organization has done each of the following in the past three years" on 12 items of environmental management activities and 10 items of environmental management systems based on a 5-point Likert scale that ranged from 1 (has not done at all) to 5 (has done to a great extent).

Section C was designed to determine the competitive advantage of the organization relative to their competitors. Competitive advantage exists when an organization is able to produce a product at a lower cost as compared to its competitors, and by delivering the same benefit or produce a product that offers superior benefits relative to its competing product (Wang, Lin, and Chu, 2011). In order to measure the competitiveness level of an organization, questions relating to competitive advantage was adopted from Leonidou et al. (2013). Therefore, to determine the level of competitiveness of an organization, six items were used to measure the level of competitiveness and the anchors of the scale ranged from 1 (strongly disagree) to 2 (strongly agree). The objective of Section D was to determine the level of performance in an organization. Organizational performances comprised of market performance and financial performance. Market performance can be referred to as the ability of an organization to satisfy, develop and retain customers by offering products or services and other attributes that are able to fulfill the needs of their customers (Leonidou et al., 2013). Whereas, financial performance refers to the changes of the financial state of an organization as a consequent of the implementation of managerial decision made by the players in an organization (Carton, 2004). For market and financial performances, the measurements developed by Leonidou et al. (2013) were adopted, since their study employed perceptual performance measurement to determine the level of organizational performance. The measurement for organizational performance was based on seven items of market performance and five items of financial performance. Respondents were required to rate their organization's performance against the initial expectation in the past three years based on a 5-point Likert scale ranging from 1 (unsatisfactory) to 5 (outstanding).

3.3 Pre-test of Questionnaire

The online questionnaire was pre-tested on students, lecturers, auditors and accountants to determine the quality of the survey instrument (Iraossi 2006). The pre-test of the questionnaire resulted into 20 responses were received, however only 12 responses were usable. Based on the reliability test, the internal consistency of 0.986 and 0.978 respectively, was achieved for environmental management accounting practices and competitive advantage. From the comments received, only minor changes were made such as rephrasing of sentences to ease respondents' understanding of the questions.

3.4 Sampling Selection

This study only focuses on organizations that are registered with the Federation of Malaysian Manufacturers (FMM). Based on FMM's directory for 2012, there are 430 Malaysian organizations that are certified with ISO 14001. The entire population was used as the sample of this study. The selection of ISO 14001 certified Malaysian organizations as the population for the study was due to the benefits obtain by these organizations. Organizations which obtained ISO 14001 certification were most likely to be able to reduce the negative impact of their activities on the environment since this certification prescribes the environmental management system framework, which demonstrates a sound environmental management (Ann et al., 2006). Therefore, it can be generalized that Malaysian organizations that are ISO 14001 certified are seen being actively involved in environmental activities, hence justifies the selection of these organizations. The sample selection was in line with Goh and Wahid (2010) who also conducted a study on ISO 14001 certified small and medium enterprises in Malaysia. They found that the certification has positively enhanced business performance.

3.5 Target Respondents

Chief executive officers, managing directors, finance managers or other key personnel related to environmental management were identified as the most suitable participants to respond to the questionnaire. The selection of the chief executive directors and managing directors as respondents seemed to be appropriate since they possess the overall knowledge of the organization's operation and make strategic decision making for the survival of the organization (Lefebvre & Lefebvre, 2003). In terms of environmental management, Cassells et al. (2011) found that top management involvement and commitments are ranked as the highest success factor for the implementation of environmental management accounting system. Meanwhile, finance managers and key personnel related to environmental management such as environmental management representatives, also were considered as suitable respondents since they are involved in the day-to-day financial and operational activities (Ferreira et al., 2010) as well as being directly involved in the environmental management of the organization.

3.6 Survey returns

The online survey was administered using Survey Monkey web-based survey tool, via the following link https://www.surveymonkey.com/s/CXB6SY5. After three follow-ups, 52 responses were obtained, however only 36 were usable. Therefore, the useable response rate achieved in this study was 8.37% (36/430) as shown in Table 1 below.

Table 1: Summary of the Survey Returns

		Responses	Usable Responses
Deployed	11 March 2013 to 23 March 2013	0	0
Follow-up 1	8 April 2013 to 16 April 2013	29	17
Follow-up 2	23 April 2013 to 26 April 2013	23	19
TOTAL		52	36 (8.37%)

Similar low number of responses from online survey were reported in the studies carried out by Ramli (2010) and Park and Chen (2007). There were only nine responses out of 119 in the study conducted by Ramli (2010), and only eight responses out of 823 in the study done by Park and Chen (2007). Nevertheless, there were minimal problems of multiple responses from any respondent or organization, as the survey itself was designed to restrict respondents from answering twice when using the same computer, and the respondents were unable to change their answers after the completion of the survey.

3.7 Data Analysis

Data collected were descriptively analyzed using Statistical Packages for Social Science (SPSS) version 21. Reliability and normality tests were performed in this study. Reliability test was conducted to examine the internal consistency of each measurement of the variables. On the other hand, normality test was carried out to determine whether data were normally distributed or not. Nonetheless, the assumptions to reliability and normality were addressed. Further to that, correlation analysis was used to examine the relationship among each variable.

4. Results

This section presents the results from the descriptive and correlation analyses of the data gathered from the survey of ISO 14001 certified Malaysian organizations.

4.1 Background of Respondents

Respondents' background were categorized into job position held, length of service, proportion of time spent on environmental management, and type of industry which respondents' organization belong to. The results are presented in the following sub-sections.

4.1.1 Job Positions

Table 2 shows the different job positions of respondents in the survey.

Table 2: Job Positions

	Frequency	Percent	Valid Percent	Cumulative percent
Finance Officers and Accountants	3	8.3	8.3	8.3
Human Resources and Adiminstrative Officers	7	19.4	19.4	27.8
Health, Safety and Environmental Officers	19	52.8	52.8	80.6
Quality Assurance Officers	7	19.4	19.4	100.0
Total	36	100.0	100.0	

Just above half (52.8%) of the respondents were health, safety and environmental officers. This was followed equally by respondents who are quality assurance officers as well as human resources and, administrative officers each with 19.4% of the sample. While, only 8.3 % of the respondents were finance staffs and accountants. The result indicates that personnel from other departments were also to a certain extent involved in environmental management in their organizations.

4.1.2 Length of Service

Table 3 presents the results of respondents' job experience with their current organization.

Table 3: Length of Service

Frequency	Percent	Valid Percent	Cumulative Percent
Less than one year	13.9	13.9	13.9
One to two years	11.1	11.1	25.0
Three to four years	8.3	8.3	33.3
Five years and above	66.7	66.7	100.0
Total	100.0	100.0	

It was apparent that two-thirds or 66.7% of the respondents have served their current organization for a minimum of five years or more. The result revealed that a majority of the respondents have vast experience and knowledge on their current organization's operations.

4.1.3 Time Spent on Environmental Management

The results of respondents' degree of involvement in environmental management, which were categorized into four bands ranging from 1% to 29% (very little) to 70% to 100% (to a very great extent) are shown in Table 4.

Table 4: Involvement in Environmental Management

	Frequency	Percent	Valid Percent	Cumulative Percent
1%-29% (very little)	8	22.2	22.2	22.2
30%-49% (to some extent)	9	25.0	25.0	47.2
50%-69% (to a great extent)	9	25.0	25.0	72.2
70%-100% (to a very great extent)	10	27.8	27.8	100.0
Total	36	100.0	100.0	

The results revealed that respondents' extent of involvement in environmental management varies from extensive involvement to very little involvement. Approximately, 27.8% of respondents were extensively involved in environmental management, while 22.2% of them have very little involvement in this activity. Nonetheless, there were little differences in the distribution across organizations in the survey in terms of their degree of involvement in environmental management.

4.1.4 Type of Industry

Table 5 shows the distribution of ISO 14001 certified organizations across the four industries.

Table 5: Type of Industry

	Frequency	Percent	Valid Percent	Cumulative Percent
Plantation	1	2.8	2.8	2.8
Services	3	8.3	8.3	11.1
Manufacturing	32	88.9	88.9	100.0
Total	36	100.0	100.0	

The result indicates that 88.9% of the organizations belong to the manufacturing industry. This was followed by services industry and plantation industry respectively, with 8.3% and 2.8%. It was apparent that a large majority of ISO14001 certified organizations in the survey were involved in manufacturing activities.

4.2 Environmental Management Accounting Practices

In this study, environmental management accounting practices comprised of environmental management accounting activities and environmental management system. Table 6 presents the descriptive statistic on the overall environmental management accounting practices among ISO14001 certified Malaysian organizations.

Table 6: Overall Environmental Management Accounting Practices

	N	Minimum	Maximum	Mean	Std. Deviation
Overall Average for Environmental Management Accounting Practices	36	2.64	4.91	3.64	.676

In summary, Malaysian ISO 14001 certified organizations had implemented environmental management accounting practices to a great extent (M = 3.64, SD = .676). This was further supported by the results of the descriptive analysis on environmental management accounting activities and environmental management system which are presented in the following sub-sections.

4.2.1 Environmental Management Accounting Activities

Table 7 presents the results of the descriptive analysis on environmental management accounting activities in Malaysian ISO 14001 certified organizations registered with FMM.

Table 7: Environmental Management Accounting Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Identification of environmental related cost	**36**	**2**	**5**	**3.67**	**.828**
Estimation of environmental related contingent liabilities (e.g. fines and penalties related to pollution)	36	1	5	2.75	1.228
Classification of environmental related costs	36	1	5	3.56	.877
Allocation of environmental related costs to production processes	**36**	**2**	**5**	**3.69**	**.710**
Allocation of environmental related costs to product	36	1	5	3.64	.961
Introduction or improvement to environmental related cost management	36	2	5	3.61	.838
Creation and use of environmental related cost accounting	36	1	5	3.19	1.091
Develop and use of environmental related key performance indicators (KPIs)	36	1	5	3.64	.931
Product life cycle cost assessment	36	1	5	2.92	1.204
Product inventory analysis (i.e. the specification of the types and quantities of material and enegry required and the amount residue released to the environment)	36	1	5	3.11	1.090
Product impact analysis (i.e. assessment of the environmental effect of competing product designs)	36	1	5	3.47	1.028
Product improvement analysis (i.e. identification of opportunities for reduction of environmental impact)	**36**	**1**	**5**	**3.67**	**.894**
Overall Average for Environmental Management Activities	**36**	**2.08**	**4.83**	**3.41**	**.715**

The results revealed that to some extent, the respondents perceived their organizations had conducted appropriate environmental management accounting activities as reflected by the overall mean value of 3.41 (SD = .715). In addition, the results indicated that most of the environmental management activities were rated with mean values between 3.11 and 3.69 (standard deviation: .710 - 1.091). It was apparent that "allocation of environmental

related costs to production processes" activity was ranked highest suggesting a common activity within Malaysian ISO 14001 certified organizations (*M* = 3.69, *SD* = .710). This was followed by both "identification of environmental related costs" (*M* = 3.67, *SD* = .828) and "product improvement analysis" (*M* = 3.67, *SD* = .894). Identification and allocation of environmental related costs to production processes are needed in order to overcome the limitation of conventional management accounting which is unable to detect hidden environmental related costs that spread around business operations (Ranganathan & Ditz 1996). Meanwhile, for product improvement analysis, it is performed in order to uncover new opportunity within organizations (Gibson & Martin 2004). The results also revealed that "estimation of the environmental related contingent liabilities" with mean value of 2.75 (*SD* = 1.228) and "product life cycle costs assessment" with mean value of 2.92 (*SD* = 1.204) were two environmental management activities least implemented by Malaysian ISO 14001 certified organizations.

4.2.2 Environmental Management Accounting System

Table 8 shows the descriptive statistics for environmental management system implemented to monitor and improve environmental performance in the past three years in Malaysian ISO 14001 certified organizations registered with FMM.

Table 8: Environmental Management System

	N	Minimum	Maximum	Mean	Std. Deviation
Written and detailed environmental policy	36	2	5	4.03	.845
Proactive environmental policy beyond compliance to legislative requirements	36	3	5	4.00	.793
Establishment of quantifiable environmental objectives	36	3	5	3.97	.774
Monitoring environmental costs and benefits	36	2	5	3.92	.906
Establishment of roles and responsibilities with respect to environmental programmes	**36**	**3**	**5**	**4.11**	**.708**
Documented procedures for environmental management system	**36**	**3**	**5**	**4.17**	**.737**
Appropriate training for employees	36	2	5	3.89	.785
Environmental audit on regular basis	**36**	**2**	**5**	**4.08**	**.770**
Reassessment of environmental management system on regular basis	36	2	5	3.92	.874
Employees remuneration and promotion based on environmental objectives	36	1	5	3.14	1.099
Overall Average for Environmental Management System	**36**	**2.60**	**5.00**	**3.92**	**.703**

The results revealed that about half (50%) of the items had been introduced and implemented to a great extent with mean values between 4.00 and 4.17 (SD =.708 - .845). Meanwhile, the remaining items had been introduced and implemented to some extent with mean values that ranged from 3.14 to 3.97 (SD = .774 to 1.099). The item "documented procedures for environmental management system" was ranked highest (M = 4.17, SD = .737) suggesting that most of the Malaysian ISO 14001 certified organizations had properly documented its environmental management system. This was followed by "establishment of roles and responsibilities with respect to environmental programmes" (M = 4.11, SD = .708) and "environmental audit on regular basis" (M = 4.08, SD = .770). The lowest environmental management system rated was "employees remuneration and promotion based on environmental objectives" (M = 3.14, SD = 1.099). Overall, the results provided evidence that the Malaysian ISO 14001 certified organizations registered with FMM to a great extent had introduced and

implemented the environmental management system to monitor and improve environmental performance in the past three years (M = 3.92, SD = .703).

4.3 Competitive Advantage

Table 9 presents the results of respondents' level of agreement on the competitive advantage of their organizations relative to their competitors.

Table 9: Competitive Advantage

	N	Minimum	Maximum	Mean	Std. Deviation
Being environmentally conscious can lead to substantial cost advantage for our organization	**36**	**3**	**5**	**3.89**	**.667**
Our organization has realized significant cost saving by improving the environmental quality of our products or services	**36**	**3**	**5**	**3.94**	**.583**
By regularly investing in new eco-friendly technologies, processes and strategies, our organization can be a leader in the market	36	2	5	3.56	.773
Our orgnaization can enter lucrative new market by adopting environmental strategies	36	2	5	3.64	.639
Our organization can increase service quality by making its current processes more environmentally friendly	36	3	5	3.72	.566
Reducing the negative environmental impact of our organization's activities will lead to a quality improvement in our products or services	**36**	**2**	**5**	**3.81**	**.710**
Overall Average for Competitive Advantage	**36**	**2.67**	**5.00**	**3.76**	**.544**

Overall, respondents agreed (*M* = 3.76, *SD* = .544) that their organization were more competitive as compared to their competitors. In fact, all the dimensions in competitive advantage had a mean value between 3.56 and 3.94. The results also revealed that the dimension "Our organization has realized significant cost saving by improving the environmental quality of our products or services" has the highest mean value (*M* = 3.94, *SD* = .583), suggesting that realization of significant cost saving was commonly achieved by improving the environmental quality of organization's products or services. This was followed by the dimensions "Being environmentally conscious can lead to substantial cost advantage for our organization" (*M* = 3.89, *SD* = .667) and "Reducing the negative environmental impact of our organization's activities will lead to a quality improvement in our products or services" (*M* = 3.81, *SD* = .710). The lowest dimension was "By regularly investing in new eco-friendly technologies, processes and strategies, our organization can be a leader in the market" (*M* = 3.56, *SD* = .773). In general, to a certain extent, the results showed that organizations with ISO 14001 certification could achieve a competitive advantage over rival companies. This is because they are able to realize significant cost saving, which may lead to a substantial cost advantage and an increase in quality level through practicing environmental management accounting.

4.4 Organisational Performance

Table 10 shows the descriptive statistics for organizational performances, which comprised of market performance and financial performance.

Table 10: Organizational Performance

	N	Minimum	Maximum	Mean	Std. Deviation
Overall Average for Organizational Performance	36	2.50	5.00	3.35	.577

In general, respondents rated Malaysian ISO 14001 certified organizations current performances as satisfactory as compared to their initial expectation in the past three years (M = 3.35, SD = .577). This can be further supported with the results of both market and financial performances in the next sub-section.

4.4.1 Market Performance

Table 11 presents the descriptive statistics on market performance within Malaysian ISO 14001 certified organizations registered under FMM.

Table 11: Market Performance

	N	Minimum	Maximum	Mean	Std. Deviation
Rate of acquiring new customers	36	1	5	3.11	.747
Rate of retaining existing customers	36	2	5	3.44	.695
Rate of increasing sales from existing customers	36	2	5	3.36	.798
Customer satisfaction	36	3	5	3.50	.655
Customer loyalty	36	2	5	3.58	.770
Reputation among customers	**36**	**3**	**5**	**3.75**	**.692**
Service quality offered to customers	**36**	**3**	**5**	**3.69**	**.710**
Overall Average for Market Performance	36	2.86	5.00	3.49	.593

The result for overall market performance revealed that most of the organizations' current market performances were rated to some extent as satisfactory (M = 3.49, SD = .593). The results also indicated that "reputation among customers" (M = 3.75, SD = .692) was ranked highest and this was followed by "Service quality offered to customers" (M = 3.69, SD = .710). The lowest mean value was "rate of acquiring of new customers" (M = 3.11, SD = .747).

4.4.2 Financial Performance

Table 12 shows the descriptive statistics for financial performances within Malaysian ISO 14001 certified organizations registered under FMM.

Table 12: Financial Performance

	N	Minimum	Maximum	Mean	Std. Deviation
Revenue	**36**	**2**	**5**	**3.17**	**.609**
Operating profit	36	2	5	3.08	.692
Return on investment	**36**	**2**	**5**	**3.19**	**.668**
Return on assets	36	1	5	3.11	.785
Cash flow	**36**	**1**	**5**	**3.17**	**.737**
Overall Average for Financial Performance	36	2.00	5.00	3.35	.577

Overall, respondents were satisfied with their organizations' current financial performance as compared to their initial expectation over the past three years (M = 3.35, SD = .577). This can be seen where the mean value for all

the dimensions of financial performance were between 3.08 and 3.19, in which "return on investment" was ranked highest (M = 3.19, SD = .668), followed by both dimensions "revenue" (M = 3.17, SD = .609) and "cash flow" (M = 3.17, SD = .737). Meanwhile, both "return on assets" (M = 3.11, SD = .737) and "operating profit" (M = 3.08, SD = .692) were rated low.

4.5 Results from Correlation Analysis

Table 13 presents the results from the correlations analysis of the variables; environmental management accounting practices (EMAP), competitive advantage (CAD) and organizational performance (FP) in which, EMAP represents the overall average of environmental management practices which comprised of environmental management activities and environmental management system. CAD represents overall average of competitive advantage, while FP represents organization performance (market performance and financial performance).

Table 13: Results of Correlations Analysis

		EMAP	**CAD**	**FP**
EMAP	Pearson Correlation	1	.615**	.378*
	Sig. (2-tailed)		.000	.023
	N	36	36	36
CAD	Pearson Correlation		1	.617**
	Sig. (2-tailed)			.000
	N		36	36
FP	Pearson Correlation			1
	Sig. (2-tailed)			
	N			36

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

It can be seen that environmental management accounting practices (EMAP) has a significant moderate positive relationship with competitive advantage (CAD) at r (34) = .615, p < .001. This means that as environmental management practices implementation increase, the competitive advantage of the organization also might increase. The results also revealed that environmental management accounting practices has a significant weak positive relationship with organizational performance (FP) at r (34) = .378, p = .023. This indicates that when implementation of environmental management accounting practices increase, organizational performance also increases. Further to that, competitive advantage has a significant moderate positive relationship with organizational performance at r (34) = .617, p < .001 too, which suggests that when an organization becomes more competitive, its organizational performances are expected to improve as well.

5. Discussion of Results

This study was conducted to explore the environmental management accounting practices within Malaysian ISO 14001 certified organizations. This study also looks at the relationships between environmental management accounting practices and competitive advantage and organizational performance within Malaysian ISO 14001 certified organizations.

With regards to respondents' demographic information, it was revealed that a majority of the respondents hold the health, safety and environmental position. This indicates that specific task related to environmental management was mostly performed by officer from this position. The result also suggests that, to a certain extent, environmental management tasks were performed by accountants, finance officers, human resource and administrative officers and quality assurance offices. This might be due to the unavailability of resources of an organization in employing staff that specifically performs environmental management. Further to that, it was apparent that most of the respondents have served their current organizations for a minimum of five years or more, which suggests that they may have an extensive knowledge and experience with the current organizations' operations. The survey finding also revealed that the distribution of the extent of respondents' involvement in environmental management in their respective organizations was about the same across the different range from "a little extent" to "a very great extent". Further to that, the finding also indicates that environmental management accounting practices were mostly adopted by manufacturing companies. This is because, it was

anticipated that the operation from this industry adversely impacts the environment and organizations that fall under this industry are typically high users of natural resources (Ferreira et al., 2010).

It was also discovered that in general, most of the respondents agreed that Malaysian ISO 14001 certified organizations have extensively implemented environmental management accounting practices. In other words, these organizations had extensively implemented both environmental management accounting activities and environmental management system. In addition, most of the respondents agreed that their organizations were able to achieve competitive advantage over rival companies, as well as remain satisfied with their current organizational performances as compared to their initial expectations. For example, the findings showed that competitive advantage was achieved when these companies realized significant cost savings by improving the enivironmental quality of products or services and being environmentally conscious. Additionally, the survey findings showed that generally, organizations were able to improve their market performances, specifically in terms of higher service quality offered to customers and higher reputation among customers. Meanwhile, their financial performances were enhanced too through increased revenue, cash flow, and return on investment. Similar findings were reported in Leonidou et al. (2013) and Cassells et al (2011) studies. They also discovered that through environmental management accounting practices, organizations were able to sustain their competive advantage and enhance their performances. It was also discovered that environmental management accounting practices has a significant positive relationship with competitive advantage. This means that when organizations practice environmental management accounting, it was possible to achieve competitive advantage over their competitors. Further to that, the survey finding also revealed that environmental management accounting practices also has a significant positive relationship with organizational performances which is consistent with the findings from Molina-Azorinet al., (2009)'s study. In essence, environmental management accounting practices would enable organizations to improve their performances. In addition, the present study's finding also showed that competitive advantage has a significant moderate positive relationship with organizational performance. Consistent with the findings from Lenidou et al., (2013)'s study, this study's finding indicates that when organizations become more competitive, their organizational performances are expected to improve as well.

6. Conclusion

It can be concluded that ISO 14001 certified organizations in Malaysia had extentsively implemented environmental management accounting practices. In other words, to a certain extent the implementation of environmental management system has facilitated environmental management accounting activities to be carried out extensively within Malaysian ISO 14001 certified organizations. It can also be concluded that there is an awareness among key players in implementing environmental practices into organizations' operation might be beneficial to them in order to overcome the problem of traditional management accounting which fails to incorporate environmental hidden costs (Swamy, 2010). Its introduction also would help organizations to introduce newness or modification to their products or services as well as, their processes (Wagner, 2008). Besides that, organizations would also be able to improve their competitiveness (Leonidou et al., 2013) and their bottom line (Vries st al., 2012). Organizations could achieve competitive advantage over their rivals since these organizations were able to realize significant costs saving which lead to substantial costs advantage and an increased in quality level through the adoption of environmental management accounting (Leonidou et al., 2013). The result also indicated that organizations' current performances as compared to the initial expectation were at a satisfactory level. Further to that, significant positive relationship between environmental management accounting practices and competitive advantage and, organizational performance was discovered in this study. This indicates that implementation of environmental management accounting practices would enhance organizational competitiveness as well as organizational performance. This is where the identification and allocation of environmental related costs would help organizations to overcome the limitation of conventional management accounting system and thus would significantly reduce operational costs. The reduction in operational costs would then lead to a substantial cost saving advantage. Besides cost saving advantage (Lopez-Gamero, Molina-Azorın, and Claver-Cortes, 2009), improvement in corporate reputation (Chiou, Chan, Lettice, and Chung, 2011), and differentiation advantage (Leonidou et al., 2013) might also be attained by organization which implemented environmentally friendly strategy. This is line with the study by Leonidou et al. (2013), who also found that competitive advantage had a significant positive relationship with organizational performance. This indicates that competitive advantages gained from being environmentally responsible such as cost saving advantage, enhance in reputation, and differentiation advantage would improve organization performance.

This study contributes to a better understanding of environmental management accounting practices, competitive advantage and organizational performance. Firstly, this study gave an insight into organizations that have yet to implement environmental management accounting practices to become more environmentally friendly so that

the ecosystem especially in Malaysia can be preserved and the threat to business survival due to pressure from environmentally conscious society can be eliminated. It was apparent that the implementation of environmental management accounting practices did not harm organizational performances and was also able to enhance organizational competitive advantage. Secondly, the findings from this study would be able to motivate organizations to incorporate environmental agenda into their corporate strategy as the results showed evidence that organizations' competitiveness could be enhanced by being environmentally friendly, which ultimately could also improve organizational performance. Finally, the result of this study also would give an insight to policy makers relating to environmental protection. An initiative that could be undertaken by policy makers in order to promote organizations about the importance environmental management is by giving training or information relating to environmental protection to organizations in Malaysia. This initiative could at least reassure organizations that environmental management accounting practices do not impair organization bottom line. Furthermore, in a medium-term and long-term period, it would yield valuable environmental improvement especially to the country.

Besides the normal limitations such as non-response bias inherent in a survey method, there were other limitations present in this study such as the low response rate achieved despite several follow-ups. The lack of sample size in this study may not represent the whole population which may impact the statistical power of the analysis conducted. Thus, the findings reported must be interpreted with more care due to the low response rate achieved. Some of the respondents may have limited experience in environmental management accounting practices (characterized by little involvement in environmental management and length of service below three years), thus they might be unable to response to the questionnaire accurately, which in turn affect the overall results of this study.

The present study has provided a better understanding of the environmental management accounting practices, competitive advantage and organizational performance within ISO 14001 certified Malaysian organizations. As mentioned earlier, this study had several limitations. The findings can be relied upon if only the issues are further investigated to shed more light on them. Hence, it is recommended that firstly the sample of the study should be improved so that the findings can be generalized to the population of ISO 14001 certified organizations in Malaysia. Secondly, in order to clearly see the benefit of environmental management accounting practices, an investigation into the effects it has as well as other variable such as innovation on organizations' competitive advantage and performance would be an interesting area too.

Environmental protections are important for both present and future generations. It had been argued that businesses are the main sources of environmental problems and are subjected to pressures from various parties who demand for organizations to be environmentally responsible. In order to face with this challenge, it is imperative that organizations incorporate environmental agenda into their corporate strategy. This can be done through adoption of environmental management accounting practices. Skeptics of environmental management accounting practices argued that organizations are unable to realize the full benefits of being environmentally responsible. However, the findings from this study showed that ISO 14001 certified organizations are actively asserting their role as responsible social players and the perceived environmental concerns has become an integral part of their routine operations, which clearly revealed organizations' continuous commitment towards environmental responsibility. Therefore, by being environmentally responsible, not only can the environment be preserved for the sake of present and future generations, but it also helps organizations to realize the benefits in order to sustain their position in the market for longer period.

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