



THE ADOPTION OF ENVIRONMENTAL MANAGEMENT ACCOUNTING PRACTICES AMONG MANUFACTURING COMPANIES IN SRI LANKA

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Abstract

This study examined the factors influencing environmental management accounting adoption among manufacturing companies in Sri Lanka. This is an explanatory study based on analyzing primary data to answer the research problem of what are the factors influencing the adoption of environmental management accounting practices among manufacturing companies in Sri Lanka. Influencing factors for environmental management accounting practices adoption is employed as independent variable and parameter was used to measure independent variables such as firm size, firm age, regulatory compliance, financial performance, environmental strategy and level of manufacturing technology whereas the level of adoption environmental management accounting practices among manufacturing companies is the dependent variable. A convenient sampling method was used to collect data and select 36 manufacturing companies which are listed in Colombo Stock Exchange have been sampled. The study revealed that firm size, firm age, regulatory compliance, financial performance, environmental strategy and level of manufacturing technology significantly positive influenced manufacturing company's intention to adopt environmental management accounting practices. To achieve these result six hypotheses were formulated. This study has made useful contributions to current knowledge by providing more explanations for environmental management accounting adoption in an unexplored context. To conclude, this study has provided important insights into the factors that influence the acceptance and adoption of environmental management accounting in general, and specifically in Sri Lanka. More importantly, this study has opened up possibilities for further research into environmental management accounting adoption in Sri Lanka.

Key Words: Environmental Management Accounting, Compliance, Financial performance, Environmental strategy.

01.Introduction

The world population increase day by day but limited resources do not increase to meet the population need therefore protecting environment represent one of the most important problems in the community. By implementing Environmental Management Accounting (EMA) will multiply the benefits gained from environmental resources. According to the Ansari et al. (1997) Environmental Accounting (EA) is “the process of identification, measurement and allocation of environmental cost and their integration into business decision”. The major areas for EMA application include assessment of annual environmental costs, budgeting, product pricing and investment appraisal, computing costs and saving of environmental projects. EMA systems have the dual purpose of managing and improving the financial and environmental performances of an entity. Application of EMA which integrates two of the main principles of sustainable development in terms of environment and economics can help to significantly improve corporate decision making UNDS (2001).

Most of previous studies have been done based on the developed capital markets. EMA is a very important concept achieving better goals and objectives in the manufacturing companies. But in the context of Sri Lankan organizational view, researches on EMA are still at the initial stage. In view of the fact that little is known about the application, practices and the role of EMA in determining corporate performances, the importance of EMA practices should be identified. As only few research works were done in Sri Lanka, these are not enough for Sri Lankan context when comparing the other countries in the world. Many researches investigate the impact of EMA practices on financial performances. (Larajana, 2014) have investigate that there is a strong positive relationship between practices of EMA and financial performances of listed manufacturing companies and EMA practices record keeping is essential for decision making which invariably affects performances of manufacturing companies. (Perera et al , 2015) have investigate that there is a listed manufacturing companies performances strongly depend on EMA practices and also there is a positive association relationship between the EMA practices and financial performances of listed manufacturing companies.

Researcher unable to find out relevant to the factors influencing the adoption of EMA practices among manufacturing companies in Sri Lanka. As mentioned above, this domain has not been touched thoroughly. As a developing country investigates about this area is more important. Various industries have been included in EMA related research and case studies, But more concentration to

the practices of EMA application and it is impacting on the organizational corporate performance will be important to the organizations. Considering these researches understand the gap between factors influencing the adoption of EMA and organization successful in Sri Lankan context. Therefore, this study attempt to fill the gap in the literature as well as find out what are the factors influencing the adoption of EMA practices among manufacturing companies in Sri Lanka.

02.Literature Review

EMA is the subset of environmental accounting, which is the “accounting systems and techniques that provide decision makers and management with financial and nonfinancial information about the firm or organization and its environment” Bouma & Correlj (2003) and (Birkin, 1996) indicated that “EMA is a straightforward development of management accountancy”. Everett & Neu (2000) and IFAC (2005) indicated that management accountants can apply their expertise and skills to improve the quality of environment related information in decision making on investment appraisal, capital budgeting and strategic management. MA integrates two of the main principle of sustainable development, such as environment and economics. It helps to significant improve corporate decision making. The UNDS (2001) suggested that EMA “is simply doing a better, more comprehensive management accounting while wearing an environment hat that opens the eyes for hidden costs”. (Staniskis & Stasiskiene 2006) and (European Commission, 1992) suggested that EMA support the internal management decision making process through various techniques of cost allocation, performances measurement and business analysis.

In order to understand EMA practices, it is important to consider management accounting practices in general management accounting is concerned with the delivery of accounting information to management to assist them in making decisions (Drury, 2008). In the case of EMA practices, manufacturing firms are more likely to adopt them because of the impact their production activities have on the ecosystem. This is not easy that non-manufacturing entities do not adopt EMA practices. (Chang, 2013) found that the level of EMA implementation within universities in Taiwan. This researcher finding showed that universities used EMA simply to identify environmental costs and also researcher found that the levels of implementation of EMA were very low.

Hart, (1997) investigated that the management, natural resources through the application of EMA may result in pollution prevention and may assist manufacturing corporations in saving energy consumption costs, material costs and waste disposal costs through recycling and cleaner production

process. Hence an organization is able to produce and deliver goods and services while using simultaneously reducing their ecological impact and resource utilization. This double effect is known as Eco efficiency. According to Barrutia,(1996) limitation faced by local entities tend to increase proportionally as their size decreases. Several authors (Emilsson & Hjelm, 2002) and (Zutshi et al. 2008)have stated that smaller local entities tend to lack the financial, human and knowledge resources needed to develop and implement EMA practices. Therefore, it could be said that larger local entities are more likely to develop EMA practices.

Rothenber & Zylidopoulos, (2003) used a questionnaire survey for collecting data. Conducted the primary concern is with the various EMA practices adoption within the U.S. printing industry. This research is investigating that the impacts the external and internal factors (firm size, environmental regulation, productive technologies, dynamism, environmental technology and munificence) determining the adoption of EMA practices and innovations by firms. The study used correlation and coefficient measures and evaluated independent and dependent variables. The major finding is that firm in highly dynamic environments, as well as firms that have adopted productive innovation are more likely to adopt a greater number of environmental innovations.

According to have a more empirical review about the EMA practices in manufacturing companies. Most of the researches have been done based on the developed capital markets. Further, have several empirical reviews on EMA practices and adoption level of EMA among manufacturing companies in international context. EMA is a very important concept achieving better goals and objectives in the manufacturing companies. But in the context of Sri Lankan organizational view research on of EMA is still at the initial stage. Some amount of research works was done in Sri Lankan context, such as (Perera & Meepagama, 2015), (Larोजना & Thevaruban, 2014) and (Gunarathna, 2014) But these are not enough for Sri Lankan context comparing other countries in the world, and manufacturing companies in Sri Lanka. Therefore, low empirical review has EMA practices and adoption level of EMA among manufacturing companies in Sri Lanka. In view of the fact that little is known about the application, practices and the role of EMA in determining corporate performances. Therefore, that creates a need to carry out a study on the factors influencing the adoption of EMA practices among manufacturing companies in Sri Lanka. As well as this study focus fill the gap in literature. Further, find out of factors influencing the adoption of EMA practices among manufacturing companies in Sri Lanka.

03.Methodology

The study determines the factors that influence the levels of adoption of EMA practices among manufacturing companies. According to the previous studies Firm age, Firm size, Regulatory compliance, Environmental strategy, financial performance and Level of manufacturing technology were considered as independent variables and the level of EMA practices adoption was dependent variable. Researcher developed following hypothesis based on the above independent and dependent variables.

- H1:** There is a significant relationship between environmental strategies employed by manufacturing companies and the level of adoption of EMA practices.
- H2:** There is a significant relationship between financial performance and the level of adoption of EMA practices.
- H3:** There is a significant relationship between the age of manufacturing companies and the level of adoption of EMA practices.
- H4:** There is a significant relationship between the levels the costs of compliance to environmental regulations and the level of adoption of EMA practices.
- H5:** There is a significant relationship between the size of the manufacturing companies and the level of adoption of EMA practices.
- H6:** There is a significant relationship between advanced production technology of a manufacturing companies and the level of adoption of EMA practices.

The population of this study consists of the companies listed on the CSE or the purpose of selecting respondents to the sample from population, a researcher has selected simple random sampling method. This study selected sample based on convenient sampling techniques and sample size of the research is 40 manufacturing companies listed in CSE. As four companies are not adopting EMA practices, hence only 36 companies were considered for this study. The first part of the questionnaire was used to collect data about demographic information and second part was used to collect data about independent and dependent variables. The questionnaire consists multiple questions, dichotomous questions and Likert Scale“ questions. Likert scale questions included one to five points. One represents lowest level and five represents highest level. The questionnaires were analyzed through SPSS software and employed descriptive, correlations and regression analysis to derive accurate findings.

04.Result and Discussion

The study collected primary data to analyse research hence study employed validity test and reliability test at the initial stage. The estimate values of the items were greater than 0.7, and the lowest value was 0.713. It indicated that an item explains more than 70% variation of its respective dimension. KMO values of all dimensions were greater than 0.5. Accordingly, both estimate and KMO values were above the standard level (Estimate 0.7 and KMO 0.5) of convergent validity of the test (Hair, 1998). According to reliability test, the Cronbach's Alpha value of each item to variables was greater than 0.7. That indicates all respective items are internally consistent to the respective variable. Later, study tested overall reliability of variables; it also was at the accepted level. According to the correlation analysis Firm age and EMA Practices significant at 0.003 and it was less than 0.05. This relationship was statistically significant. It means firm age of the manufacturing company's influence of the level of adoption EMA practices among listed manufacturing companies in Sri Lanka. Hence this variable was relatively high and this F value was 5.619 as the value is more than the three, there was a strong positive relationship between firm age and EMA adoption among manufacturing companies in Sri Lanka. Firm size and EMA Practices significant at 0.007 and is less than 0.05. This relationship is statistically significant. Hence this variable is relatively high and this F value is 5.869 as the value is more than the three, there is a strong positive relationship between firm size and EMA adoption among manufacturing companies in Sri Lanka.

The person correlation value for EMA practice adoption and regulatory compliance was 0.431 and it was the moderate positive relationship between above variables. According to the analysis significant value is 0.009. Therefore, it can be statistically say that there was significant and moderate positive relationship between EMA practice adoption and regulatory compliance. EMA practice adoption and financial performance was 0.421 and significant at 0.011 which reflects moderate positive significant relationship between EMA practice adoption and financial performance. EMA practice adoption and environmental strategy was 0.531 and it was a strong positive significant relationship between these two variables.

Table 01. Model summary of Independent variables and dependent variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.731 ^a	0.535	0.439	0.539

According to the regression analysis R value shows the simple correlation and it is 0.731. The R² value indicates how much of the total variation in the dependent variable can be explained by the independent variable. According to the above result 73.1%, level of EMA practices adoption among manufacturing companies were described by the variable taken under the model 1. Also, this indicates that the remaining 26.9% of EMA practice adoption is described by the other factors. Coefficient table show the intercept (constant) and predictor variable in multiple regression equation which is, $EMAP = (3.679) + (0.079)b_1 + 0.306b_2 + (0.462)b_3 + 0.447b_4 + 1.290b_5 + 0.598b_6$. According to the coefficient analysis without the influence of the identified factors, the level of adoption of EMA practices would decrease by 3.68%. The analysis result reflects Firm age, Environmental strategy and Regulatory compliance positively and significantly affect to EMA adaption but Level of manufacturing technology positively and insignificantly affect to EMA adoption ,firm size and financial performance insignificantly and negatively impact on EMA adoption

Table 02 Coefficients Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.679	1.624		-2.266	0.031
	Firm size	-0.079	0.139	-0.076	-0.568	0.574
	Firm age	0.306	0.108	0.411	2.840	0.008
	Financial performance	-0.462	0.525	-0.465	-0.880	0.386
	Environmental strategy	0.447	0.142	0.494	3.154	0.004
	Regulatory compliance	1.290	0.401	0.512	3.218	0.003
	Level of manufacturing technology	0.589	0.549	0.549	1.088	0.286

05. Conclusion

The study was analysed factors that influence the levels of adoption of EMA practices among manufacturing companies. According to the findings approximately 90% of the manufacturing companies that participated in this study have adopted EMA practices to some extent. The results indicate that most manufacturing companies separately account for identify environmental costs. EMA is a new tool in the discipline of EA. Recently, it has been a steep increase in all environmental costs, including energy and water prices. According to the analysis, it can be found that adoption of EMA practices is a transformation in company's decision making, and organizations are realizing the important role which performance can play in terms of costing decision product pricing decision. Correlation and linear regression methods have been exercised to analyze the data which was collected through the questionnaire based on the randomly selected sample of 40 manufacturing companies in Sri Lanka. One of the specific objectives is to establish the factors influence the levels of adoption of EMA practices among manufacturing companies in Sri Lanka. According to the analysis it can be concluded that, there were statistically positive relationships between the variables of study. Items of EMA practices (firm size, firm age ,regulatory compliance, level of manufacturing technology financial performance and environmental strategy) were statistically and significantly positively related to the factors influencing the adoption of EMA practices among manufacturing companies in Sri Lanka. Based on the finding researchers' can represent the following conclusion about the study. EMA adoption among listed manufacturing companies in Sri Lanka strongly depend on the firm size, firm age regulatory compliance, level of manufacturing technology financial performance and environmental strategy. As well as above variable significantly and positively effect on the EMA adoption among listed manufacturing companies in Sri Lanka. According to the finding, researcher can some issue regarding EMA adoption among manufacturing companies in Sri Lanka. Such as Lack of professional guidelines for EMA practice reporting and EMA practice adoption, lack of knowledge and training of adoption EMA practices, negative attitude about EMA adoption within the manufacturing companies, shortage of qualified staff employee to carry out EMA adoption and lack of local and international standard about EMA practice hence government and relevant parties can improve knowledge regarding EMA and provide better guidance to practice EMA within organization.

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