



Impact of Environmental Management Accounting Practices on Financial Performance of Listed Manufacturing Companies in Sri Lanka

Chandrasegaran Larojan^a and Janaki Samuel Thevaruban^b

^a*Faculty of Business Studies, Vavuniya Campus of the University of Jaffna, Sri Lanka.*

^b*Faculty of Business Studies, Vavuniya Campus of the University of Jaffna, Sri Lanka.*

Abstract

The aim of this research paper is to examine the Environmental Management Accounting (EMA) practices in achieving financial performances in listed manufacturing companies in Colombo Stock Exchange (CSE). This is an exploratory study based on analyzing primary and secondary data to answer the research problem of how does the application of EMA relate with financial performance in the listed manufacturing companies in Sri Lanka. Literatures bordering on the areas of EMA practices were reviewed. A well designed structured questionnaire was used to collect the primary data. EMA application is employed as independent variable and parameters were used to measure the independent variables such as environmental information, environmental evaluation, environmental cost savings and environmental laws where as financial performance is the dependent variable profitability and revenue growth were used to measure the dependent variable. Top level, middle level and lower level of managers of the 39 manufacturing companies which are listed in CSE have been sampled. Correlations and multiple regression analysis have been used to analyze the data. Results reveal that there is a statistically significant positive relationship between practices of EMA and financial performance. The results of this study provide directions towards building a strong knowledge base for future EMA development. The results suggest that government should establish legal and regulatory framework for environmental issues. This research paper makes an original contribution to the growing body of empirical studies on practices of EMA in Sri Lanka.

Keywords: *Colombo stock exchange; environmental management accounting; financial performance; listed manufacturing companies*

1. Introduction

Business organizations trust that environmental costs are not significant to their functions. It does not incur to the organizations that some production costs have an environmental component. For an example, the purchase price of raw materials, the unused part that is emitted in a waste is not generally considered an environmental cost. These costs tend to be much higher than initial estimates and must be minimized by the introduction of effective cleaner production initiatives. EMA can be used for sound product, process and decision making.

According to IFAC's (International Federation of Accountants, 2005) Statement Management Accounting Concepts, EMA is "the management of environmental and economic performance through the development and implementation of appropriate environmental accounting practices. While this may include reporting and auditing in some companies, environmental management accounting typically involves life-cycle costing, full-cost accounting, benefits assessment, and strategic planning for environmental management". The major areas for EMA application include; assessment of annual environmental costs, budgeting,

product pricing, investment appraisal, computing costs, and savings of environmental projects. EMA systems have the dual purpose of managing and improving the financial and environmental performance 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 (UNSD, 2003).

In the context of Sri Lankan organizational view, research on of EMA is still at its initial stage. In view of the fact that little is known about the application, practices and the role of EMA in determining corporate performance, more concentration to the practice of EMA application and its impacts on organizations' corporate performances will be important to the organizations. This study examines the EMA practices on the financial performance in listed manufacturing companies in Sri Lanka.

2. Review of Literature

Xiaomei (2004) defined EMA as It is a new branch of accounting which is under the direction of sustainable economic development goal, using the basic accounting theory and method to recognize measure and report the environmental management system and the environmental impact of economic activities of a business.

Schaltegger, Burritt and Peterson (2003) explained that Companies are gradually more concluding that maximization of profits at any cost is no longer the most favorable manner to run their business and improve their competitive advantage Environmental litigation have been developed in some countries, and a rising number and range of stakeholders have been demanding greater responsibility for the environment in business. Inadequacy of awareness, of the environment and the resultant damage are dramatically altering stakeholders' opinions of companies and can lead to loss of business. Companies who do pro-actively demonstrate environmental aspects, and build environmental factors into their overall business strategy, can win favour with stakeholders and gain other advantages, like goodwill and rival, assistance from financial institutions, good and strengthened business relationships and supply chain Participation.

Jasch (2003) defined EMA as EMA, Environmental management accounting represents a combined approach which provides for the transition of data from financial accounting, cost accounting and material flow balances to increase material efficiency, reduce environmental impact and risk and reduce costs of environmental protection.

Long term, costs can be minimized as more efficient energy practices are implemented, deductions are completed in the exercise and waste of other resources and more efficient removal and removal of waste production is established, as explained by. Babakri, Bennett, Raos and Franchetti (2004), present further evidence of advantages of recycling practices following implementation of environmental management systems and practices such as savings from recycling product materials and packaging.

Burritt, Bennet, Richardsson and Schaltegger (2003) found EMA is becoming gradually important not only for environmental management decisions, but also for all routine managerial activities, such as environmental reporting, cost allocation and control, performance appraisal

Research problem

The main role of EMA in enlarging the exploitation of management accounting for the management of environmental performance is drawing increased recognition. This has shifted the center of conventional management accounting from financial information provision to the reduction of resource consumption and more efficient use of natural resources (IFAC 2005). There is a lack of awareness and understanding of the level of the environmental costs being generated by firms, and several opportunities for cost savings through good environmental management are lost (Deegan, 2001).

This lack has led to the conduct of this research, which attempts to fill the gap by adding to the existing body of knowledge on the potential of EMA to be used for the management of environmental performance by manufacturing companies particularly.

This study is an attempt to extend the practices of EMA which directs attention towards manufacturing companies. Further, the influence of factors arising from the manufacturing environment on EMA adoption

has not yet been examined within the context of Sri Lanka. The environmental impacts caused by their operations should be reduced and associated environmental costs need to be managed.

Following research questions have been made with in the context of the research problem.

1. Does the existing management accounting system generate sufficient information to assist the manufacturing companies in decision making pertaining to environmental factors?
2. At what levels of the EMA practices are in the listed manufacturing companies in Sri Lanka?
3. How does EMA practices relate with financial performance in the listed manufacturing companies in Sri Lanka?

Objectives of the Study

- To examine the levels of EMA practices in the listed manufacturing companies in Sri Lanka.
- To analyze the impact of EMA practices on financial performance in the listed manufacturing companies in Sri Lanka.
- To find out the relationship between EMA practices and financial performance in the listed manufacturing companies in Sri Lanka.

3. Methods

As on 31st March, 2013, there are 288 companies which represents 20 various industry sector have been listed in CSE. 37 Manufacturing companies are sampled in this study. Based on the review of literature, objectives of the study, the following conceptual model has been developed.

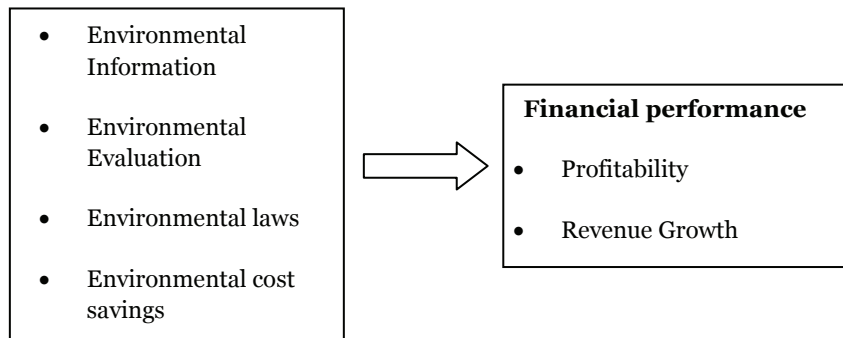


Figure 1: Conceptual model

Table 1: Sample

Levels of managers	Number of Respondents
Top level	60
Middle level	25
Lower level	20

Source: figures as provided by the managers

Data collection

Primary data was obtained from the all three levels of management. Questionnaires were mailed among the managers and in this questionnaire, listed manufacturing companies were asked about their practices of EMA measures which are commonly practices or adoption by these listed manufacturing companies, Secondary data was obtained from printed materials generated by management of the particular listed manufacturing companies in Sri Lanka and other sources.

Measurement of variables

EMA practices were measured by questions that were answered based on a 5-point Likert scale. EMA practices was measured by the degree to which environmental information is produced and disseminated in the listed manufacturing companies in Sri Lanka ,degree of carrying out environmental evaluation, degree of compliance of environmental laws and the detail of environmental costs. In order to analyze the financial performance, questions were asked to probe direction in growth in terms of profitability and revenues listed manufacturing companies in Sri Lanka. In order to analyze the environmental information, questions were asked to probe aspects of producing environmental information which is positive for the manufacturing companies. Compliance of environmental laws were probed by establishing whether there has been cases of penalties for breach of legislation and the environmental safety measures in place. Environmental evaluation was probed by establishing the accuracy of the analysis by which the manufacturing companies investment sensitivity to the environmental costs has been carried out. Environmental cost savings were probed by establishing whether management pursues environmental quality management through the development of environmental management systems to environmental costs for cost savings.

4. Data Analysis

Data was collected, coded, edited and input in a Statistical Package for Social Science (SPSS). Frequency distribution tables and descriptive statistics where used to examine the levels of EMA application and perceived financial performance levels in the listed manufacturing companies in Sri Lanka. Inferential statistics using Spearman's Correlation Coefficient to measure the degree of relationship between EMA application and perceived financial performance was determined. Multiple regressions were used to predict perceived financial performance in the listed manufacturing companies in Sri Lanka.

Table 2: Descriptive statistics

	Environmental Information	Environmental Evaluation	Environmental Costs	Environmental Laws	Financial Performance
Mean	3.86	4.02	3.94	4.27	3.98
Median	4.00	4.00	4.00	4.00	4.00
Mode	4.00	4.00	4.00	4.00	4.00
Std. Deviation	0.74	0.64	0.73	0.61	0.62
Variance	0.55	0.40	0.54	0.37	0.38

According to the above discriptive analysis table, mean values foe environmental information, environmental evaluation, environmental costs and environmental laws are are 3.86,4.02,3.94 and 4.27 respectively. The frequency distribution table was used to analyze the level of independent variables in the listed manufacturing companies in Sri Lanka. EMA Application composed of environmental information, environmental evaluation, compliance of environmental laws, and tracking of environmental cost savings. Around 78% of the respondents indicated that there was adequate, timely, accurate, reliable and concise environmental information. 18% were not sure and only 5% were not satisfied with the environmental information. Around 92% of the respondents had a positive perception that the environmental evaluation of the company is good, only 11% were not sure of the environmental evaluation and only 2% were not satisfied with the environmental evaluation. Around 96% of the respondents had a positive view on the compliance of environmental laws, and only 3% had a negative perception. Around 81% of the respondents had a positive perception that there was good environmental cost savings, 22% were not sure and only 3% had a negative perception. Around 81% of the respondents had a positive perception on the financial performance of the listed manufacturing companies in Sri Lanka, 18% were not sure and only 1% had a negative perception.

The research objective of this analysis seeks to establish the relationship between the environmental management practices and the financial performance in the listed manufacturing companies in Sri Lanka. To achieve this, correlation tests were carried out to predict the degree to which financial performance of the

manufacturing companies is dependent on the EMA application. Spearman's Rank correlation Coefficient was used to determine the degree of relationship between EMA application and financial performance in the listed manufacturing companies in Sri Lanka.

Table 3: Correlations analysis

	r
Environmental Information	0.875
Environmental Evaluation	0.904
Environmental Cost Savings	0.909
Environmental Laws	0.875

There is a statistically significant positive relationship between environmental information and financial performance ($r = 0.875$, $sig < 0.01$). This interprets that good environmental information improved on the financial performance of the listed manufacturing companies in Sri Lanka. There is a statistically significant positive relationship between environmental evaluation and financial performance ($r = 0.904$, $sig < 0.01$). This interprets that environmental evaluation positively affected the financial performance of the listed manufacturing companies in Sri Lanka.

There is a statistically significant positive relationship between tracking of environmental cost savings and financial performance ($r = 0.909$, $sig < 0.01$). This interprets that good tracking of environmental cost savings improved on financial performance of the listed manufacturing companies in Sri Lanka. There is a statistically significant positive relationship between compliance of environmental laws and financial performance ($r = 0.875$, $sig < 0.01$). This interprets that compliance of environmental laws improved on the financial performance of the listed manufacturing companies in Sri Lanka.

EMA application significantly and positively affected the financial performance of the listed manufacturing companies in Sri Lanka ($r = 0.945$). 89.4% of the financial performance is explained by the four independent variables.

Table 4: Multiple regression analysis

Model	Unstandardized β	Coefficients Std. Error	Standardized Coefficients	t	Sig.
(Constant)	0.811	0.160		5.080	0.000
Environmental Information	0.069	0.070	0.083	0.983	0.328
Environmental Evaluation	0.462	0.070	0.473	6.574	0.000
Environmental Costs savings	0.413	0.073	0.487	5.631	0.000
Environmental Laws	-0.136	0.038	-0.133	-3.536	0.001

The regression model predicts the outcome variable significantly well. Here, $sig = 0.000$, which is less than 0.05, and indicates that, overall, the model applied can statistically significantly predict the financial performance of the listed companies in Sri Lanka. The F -ratio in the ANOVA tests whether the overall regression model is a good fit for the data. The independent variables statistically significantly predict the dependent variable, $F(4, 100) = 210.189$, $sig = 0.000$ (i.e. the regression model is a good fit of the data)

Multiple regression analysis has been used to predict the financial performance of the listed manufacturing companies in Sri Lanka and determine the direction of the relationship between the dependent variables and the independent variables.

Table 4 shows that environmental evaluation and environmental cost savings predicted 48% of financial performance. environmental cost savings ($\beta = 0.487$) explained more of financial performance than environmental evaluation ($\beta = 0.473$).

5. Discussion

According to the data analysis it can be revealed that EMA application correlates positively with the financial performance in the listed manufacturing companies in Sri Lanka. Environmental information, environmental evaluation, environmental cost savings and environmental laws had a positive relationship on financial performance of the listed manufacturing companies in Sri Lanka.

A statistically significant strong positive correlation exists between environmental information and financial performance of the listed manufacturing companies in Sri Lanka. It refers that the financial performance of the listed manufacturing companies in Sri Lanka can be improved with a good environmental information,

A statistically significant strong positive correlation exists between environmental evaluation and financial performance of the listed manufacturing companies in Sri Lanka. It refers that environmental evaluation positively affected the financial performance of the listed manufacturing companies in Sri Lanka. Nowadays, while the peoples in industries are, technically speaking, too toxic to be placed in landfills, it is time to find out a way to eliminate the poisons, a number of actions and consequences which energizes business industries, which stimulates innovation, conserves employment, and restores the environment.

A statistically significant strong positive correlation exists between the environmental cost savings and financial performance of the listed manufacturing companies in Sri Lanka. It refers that good environmental cost savings improved on the financial performance of the listed manufacturing companies in Sri Lanka.

Finally, statistically significant strong positive correlation exists between all the variables which composing determinants of EMA application and financial performance. A statistically significant strong positive correlation exists between environmental laws and financial performance in the listed manufacturing companies in Sri Lanka. It refers that environmental laws improved on the financial performance of the listed manufacturing companies in Sri Lanka. Present economic arena should be redesigned so that what is good for business industries is better for the global economic environment and the human future. If we want a decent future, we must make choices in the present to protect the future, for ourselves, our children, and the larger global environment. According to Richard (2003), the listed manufacturing companies in Sri Lanka is aware of environmental issues and the activities offer the benchmark for environmental laws.

In order to direct these choices, government puts in place laws and regulations to protect the future in which the listed manufacturing companies in Sri Lanka has to comply. By complying with the environmental laws, punishments such as penalties, environmental curative costs, closure of businesses have been avoided, and financial performance of the listed manufacturing companies in Sri Lanka improved.

6. Conclusions

EMA is a new tool in the discipline of environmental management. Recently, it has been a steep increase in all environmental costs, including energy and water prices. Environmental costs are no longer a minor cost item which can be pooled together with other costs; the use of EMA saves money and improves control. Many companies want external help in creating or improving the EMA, as those skills are not widespread and rarely available internally. EMA has to be tailored to the special needs of the company rather than be applied as a generic system. The costs and advantages of building such a system has to be considered and the scope of the EMA properly selected. Building the EMA incrementally is a general implementation strategy among the companies. According to the analysis, it can be found that adoption of EMA practices is a transformation in companies decision-making, and organizations are realizing the important role which performance can play in terms of profitability and growth in sales.

According to the analysis it can be concluded that; there are statistically positive relationships between the variables of study. Items of EMA practices (environmental information, environmental evaluation, environmental cost savings and environmental laws) are statistically and significantly positively related to financial performance, environmental information significantly positively relate to the financial performance, environmental information disclosure is an essential component of improved financial performance. Envi-

ronmental evaluation significantly positively relate to financial performance. Continuous environmental evaluation handled in an acceptable way garners sales and therefore improved incomes. Environmental laws also significantly positively relate to financial performance. Environmental cost savings significantly positively relate to the financial performance of the listed manufacturing companies in Sri Lanka. Integrating cost into pricing is a pathway to innovation and an efficient means to lower costs. Environmental laws, punishments by the regulatory authorities are avoided and improving the financial performance of the listed manufacturing companies in Sri Lanka.

References

- Allen Blewitt, (2006), Accounting for a Sustainable Built Environment. Discussion Paper at the International Consortium on Governmental Financial management, Miami, USA.
- Anderson S.W. (2007), "Managing costs and cost structure throughout the value chain: Research on strategic cost management, Handbook of Management Accounting Research, Elsevier, 481-506.
- Bennett M., Bouma J. J. and Wolters T, Environmental Management Accounting: Informational and Institutional Developments. Selected papers from EMAN-Europe conferences, 1999 and 2000. Dordrecht, Netherlands: Kluwer Academic Publishers.
- Bennett M., Rikhardsson. P and Schaltegger.S (2002) Environmental Management Accounting: Purpose and Progress. Selected papers from EMAN-Europe conference, Dordrecht, Netherlands: Kluwer Academic Publishers, 2003.
- Burritt, and James (2002) "Towards a Comprehensive Framework for Environmental Management Accounting Links Between Business Actors and Environmental Management Accounting Tools." Australian Accounting Review,
- Clarencia Reyes (2002), Environmental Management Accounting: A Tool for Decision Makers. Environmental Management Capacity Building for the Philippines - Project, Astoria Plaza, Pasid City.
- Deegan, C. (2001). "An Analysis of Environmental Disclosures by Firms Prosecuted Successfully by the Environmental Protection Authority", Accounting, Auditing and Accountability Journal, Vol. 9, No. 2, 50-67.
- International Federation of Accountants (IFAC) (2005), International Guidance Document, Environmental Management Accounting, International Federation of Accountants.
- International Federation of Accountants (IFAC) <http://www.ifac.org/PAIB> .
- Jasch C. (2003), The use of environmental management accounting (EMA) for identifying environmental costs. Journal of Cleaner Production, Vol. 11.
- Lange, Hassan. G, and Alferi A. (2004), Using Environmental Accounts to promote Sustainable Development: Experience in Southern Africa. Natural Resource Forum 27 p.19-31.
- United Nations Division for Sustainable Development, UNDSO (2003), Improving Government's Role in the Promotion of Environmental Managerial Accounting. United Nations, New York, p. 39.
- Xiaomei, L. (2004) "Theory and practice of environmental management accounting: Experience of implementation in China", International Journal of Technology Management and Sustainable Development, 3(1), 47-57.