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ENVIRONMENTAL MANAGEMENT SYSTEM AND TOOLS OF MALAYSIAN LISTED FIRMS AND ITS FINANCIAL PERFORMANCE

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Abstract

Using the sample of 30 public listed companies in Malaysia for the period of 2010 to 2014, we examine their environmental management system and tools and its financial performance. Our preliminary analysis show that the profitability trend movement of financial performance is inconclusive, yet most profitability measurement tabled positive results. Surprisingly, we found positive significant correlation to the most of the financial variables such as ROE, ROI and ROA whenever the firm being asked about their environmental management system and tools. Additionally, the implementation of environmental management system and tools in their company is found to move in tandem with their financial performance.

Keywords: *Environmental management, financial performance.*

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Introduction

It is believed that the risk of environmental impact towards community is lessen if firms incorporate proactive environmental management system into the culture of their company. As for Malaysia, the collapse of Highland Towers in 1993 had a tremendous changes on how environmental management system should be incorporated to the company business and operations. This can be achieved for example by having a well written environmental policy, carry out external audit environment, place an environmental training programs for their employees, etc.

This paper is organized as follows: first, the background and literature review will be in the next section; second, the measurement of financial variables and environmental management system and tools will be presented. Then, the results and discussion of the findings are described in the third section. Finally, conclusions were drawn.

Background

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During the last decade, an increasing number of listed companies in Malaysia have been engaged themselves in incorporating and even institutionalizing environmental reporting into their database such as annual report, corporate website, circular and some goes beyond into their routine operations. This is to respond to society's growing expectations of accountability, safety, environmental and health performance. Recognizing that a company has obligation with various stakeholder surrounding them, it is essentially instrumental to obtain an understanding of the relationship between environmental reporting and financial performance. An intuitive explanation is that stakeholders would put high expectations to the firms, and limited resources inferred that firms must evaluate the cost and benefits efficiently. However, sustainability reporting is a kind of voluntarily reporting with the main purpose of:

1) to analyze the state of firm's economic and environmental contribution to the society
2) to communicate a firm's efforts and sustainability contribution to their stakeholder (Dala-Clayton and Bass 2002; Hamann, 2003)

The current study examines the issues of environmental management system and tools of public listed companies in Malaysia and their financial performance over the period of five years from 2010 to 2014. This study attempt to look and relate the firm-level environmental to the firm's financial performance. Prior studies suggested that pollution precedes poor financial performance by one or more years (Hart & Ahuja, 1996). When it comes to finance literature, few studies has been conducted in investigating the market returns of portfolios of environmentally friendly firms. Cohen et. al (1995) applied several measures of environmental performance derived from U.S. EPA databases to construct two industry-balanced portfolios of firms. They claimed of no penalty associated with investment in the green portfolio and a positive return to green investing. Furthermore, Kiernan (1998) argued that market players and analyst, for instance is increasingly gather environmental performance data as an indicator for future capital market returns.

In the earlier 1970s, Bragdon and Marlin (1972) and Spicer (1978) conducted a series of studies on a sample of pulp and paper firms demonstrated significant correlation between expenditures on pollution control and financial performance. Meanwhile, Russo and Fouts (1997) revealed a significant positive correlation between various financial returns and an index of environmental performance developed by the Council on Economic Priorities. In regards to the market valuation of the firms, firms whom adopt a single, stringent environmental standard worldwide have higher market valuation (Tobin's Q) as compared to those firms whom do not adopt such standards (Dowell et al., 2000).

In assessing the financial performance of the firm, environmental management is said to have an important role. It is also suggested that higher production cost of environmental management initiatives will leads towards higher profitability, while others provide evidence of decreased profitability. Klassen and McLaughlin (1996) tested empirically the link of environmental performance and financial performance. They found significant positive returns for strong environmental management and significant negative returns for weak environmental management as indicated by environmental crisis.

Manufacturers whom demonstrate initiatives to minimize environmental hazard into their product and process and establish environmental management system are able to expand their market and displace competitors as compared to those whom fail to demonstrate

environmental performance. At the same time, environmental certification obtained will mark the firm as being consumer oriented and may able to preserve some market segment within the community for the longer term. Therefore, this study try to provide an insight whether the same principles hold true whether environmental management system and tools linked to the financial performance or simply provides an indicator of firms that have high financial performance.

Measure of Environmental Management System and Tools

In this study, we obtained survey responses from 30 public listed companies, and most of them are located in peninsular Malaysia. Research questionnaire were given to the respective firms in answering few question in regards to environmental issues. However for the purpose of this study, our attention leads us to the issues of environmental management and tools only and its impact to their financial performance. Hence, we develop a structured questionnaire as in Table 3 (selected). Firms in our survey sample are engaged in the production of goods and services in pollution-intensive industries including construction, industrial product, consumer, plantations and trading services. Table below depicts sector from which the firm is belong to.

Table 1: No. of Firm according to the Sector of Activities

Sector	No. of firms	Percentage (%)
Industrial Product	12	40.0
Construction	5	16.7
Consumer	1	3.30
Plantation	5	16.7
Trading/ Services	7	23.3
Total	**30**	**100%**

It appears that 40% of the survey firm belongs to industrial product, followed by 16.7% (Construction and Plantation) and 23.3% (Trading/Services). The low percentage of the firm belongs to the Consumer sector which only represent 1 firm out of 30 surveyed firm.

Methodology

Measures of Financial Performance

According to Palepu et al. (1996), firm value is the function of growth and profitability. In this study, we adopt few financial variables that is used to assess corporate financial performance by the investment community.

i) Profitability Measurement

Return on equity (ROE) is probably the most widely reported profitability measure (Hawkins, 1998) and is the measure of great interest to shareholders (Berstein and Wild, 1998). ROE can be split into few sub element of Return on Sales (ROS), Asset Turnover and Financial Leverage. Again Palepu et al. (1996) stressed that any movement in ROE indicate changes in profit margin, for instance ROS. In this case, the study also choose ROS as a profitability

measure because of its sensitivity as an overall indicator of profitability and because it is not subject to the criticisms. ROE is associated with net income before tax for the term divided by stockholders' equity. ROE is the mathematically calculated as follows:

$$Return\ on\ Equity\ (ROE) = \frac{Net\ income\ before\ taxes}{Stakeholder's\ Equity}$$

(Equation 1)

ROS meanwhile is defined as net income before tax for the term divided by total sales for the period.

$$Return\ on\ Sales\ (ROS) = \frac{Net\ income\ before\ taxes}{Total\ Sales}$$

(Equation 2)

The third financial variable, Return on Investment (ROI) is measured by income before tax / total investment. This variable is a proxy to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. Next Return on Invested Capital (ROIC) measured the profitability variable which give a sense and exact pictures on how efficiently the firms are in utilizing its capital and to answer the questions of whether or not its competitive positioning allows it to generate returns from that capital. The mathematical equation for ROIC is as follows:

$$Return\ on\ Invested\ Capital\ (ROIC) = \frac{Net\ income\ after\ taxes - Dividend}{Total\ Capital}$$

(Equation 3)

ii) Asset Utilization Measurement

Return on Asset (ROA) reflect the asset utilization of the firm. The calculations of this variable is similar to those in (Equation 1), yet it is measured by net income before tax / total assets. According to Stickney (1990: p. 161), it has been suggested that return on assets takes the particular set of environmental factors and strategic choices made by a firm as given and focuses on the profitability of operations relative to the investments (assets) in place. An essential gist of this financial variables is that it separates financing activities from both operating and investing activities. Under asset utilization, this study also adopt Capital Intensity measurement as part of the analysis. This measurement indicates how much assets the firm needs to generate a Ringgit in sales. Capital Intensity is then computed as follow:

$$Capital\ Intensity = \frac{Total\ Assets}{Total\ Sales}$$

(Equation 4)

Higher ratio of capital intensity inferred more utilization of assets (machine intensive) as compared to those with lower ratio (labor intensive) to generate sales in equal amount.

iii) Growth Measurement

Growth in sales is used due to the importance that sales and sales forecast play a vital role in developing firm valuation models. Hence, growth in sales is defined by the percent change in sales from one period to another period. Hence, the growth in sales are computed as follows:

Growth in Sales = $LNSales_t$ - $LNSales_{t-1}$ (Equation 5)

Where;
$LNSales_t$ = Natural logarithm of total sales at time *t* for each firm
$LNSales_{t-1}$ = Natural logarithm of total sales at time *t-1* for each firm
t = time period

iv) Market Measurement

Tobin's Q measures the market valuation of a firm relative to the replacement costs of tangible assets. In addition, it depicts what cash flows the market thinks a firm will provide per Ringgit invested in assets. Tobin's Q, is computed as the ratio of the market value of a firm's assets (as measured by the market value of its outstanding stock and debt) to the replacement cost of the firm's assets (Tobin 1969).

$$Tobin's\ Q = \frac{Total\ Market\ Value\ of\ Firm}{Total\ Assets\ Value}$$

$$= \frac{total\ debt + (stock\ prices\ x\ the\ number\ of\ stocks)}{Total\ Assets\ Value}$$

(Equation 6)

v) Other Measurement

Prior research by Graves and Waddock, (1994) argued that clear differences in the levels of Research and Development (R&D) investment exist among different industries, which finally contribute to their level of financial performance. In this paper, R&D is measured as the size of R&D expenses incurred by each firm for the period of 2010 to 2014. It calculated as a natural logarithm of R&D, LN (R&D).

Results and Discussion

Financial Performance

Table 2 below list down the descriptive statistic of all of the selected financial variables used in the sample of 30 public listed companies in Malaysia. For ease of listing, the financial variables have been splitted into 5 categories: profitability (4 measures), asset utilization (2 measures), and growth, market and other with one measurement only. The descriptive statistic results will address the questions of what will be the trend of financial performance of those 30 listed firm in Malaysia. Data for the current study was taken from the DataStream for the period of 2010 to 2014. According to the table 2, it shows that the descriptive mean of

profitability which indicated by ROE is decreasing. However, the mean for ROS showed downward trend until year 2013. Surprisingly, in year 2014, the ROS of these 30 public companies revealed positive tremendous performances in their profitability measurement.

Nevertheless, the movement of return indicated by ROI, ROIC and ROA fluctuate and tabled inconsistent and mix of results. Somehow, the shareholders still able to earn positive return with the exception of ROIC which showed negative results in year 2013 and 2014. ROIC is of course important to any prospective investor whom is considering investing in a company. Yet, ROIC becomes more informative especially for firms with large capital investment for example oil and gas industries. Nevertheless, both the ROI and ROA depicts that those 30 companies still able to compete in the global market with positive results except for ROIC in year 2013 and 2014.

Table 2: Descriptive Statistic of Financial Measurement of 30 Listed Companies in Malaysia for the Year 2010 - 2014

Financial Variables	Year	Mean	Median	Standard Deviation
Profitability				
	2010	8.8490	8.0879	9.8664
	2011	5.4512	8.6557	13.8173
ROE	**2012**	3.0891	6.5236	13.3079
	2013	3.8134	3.8968	9.5090
	2014	2.8155	4.0315	9.8112
	2010	9.4391	9.5285	10.2305
	2011	9.1837	11.5576	18.4442
ROS	**2012**	5.3012	7.9490	15.8629
	2013	3.0944	8.4946	13.0449
	2014	61.4939	6.8719	19.5545
	2010	5.7882	5.6096	7.1824
	2011	5.2975	7.8529	11.7656
ROI	**2012**	2.2428	4.4086	11.2088
	2013	3.7608	3.1691	7.6027
	2014	3.1897	2.7996	10.6772
	2010	3.8436	2.9419	4.9964
	2011	2.5031	4.2332	10.1675
ROIC	**2012**	0.0654	3.7822	9.2530
	2013	-2.1197	2.0669	17.4662
	2014	-2.2261	1.6445	16.7847
Asset Utilization				
	2010	4.5373	4.6398	4.5762
	2011	3.6039	7.0179	9.0132
ROA	**2012**	1.8591	3.9934	8.8452
	2013	2.6458	2.8708	5.6006
	2014	2.0663	2.6023	6.5404
CAPINT	**2010**	110.7117	77.3416	80.0245
	2011	95.3770	82.1201	60.1544

	2012	89.6864	76.1114	54.9500
	2013	100.9452	81.2691	75.5510
	2014	91.3608	68.7942	83.9269
Growth				
	2010	18.6058	8.1267	49.8376
	2011	9.0193	6.1550	31.4861
GROWTH IN SALES	**2012**	8.0664	7.3455	19.6723
	2013	6.6908	9.3482	32.3044
	2014	-17.1876	-1.1723	50.8103
Market				
	2010	0.8453	0.7859	0.3915
	2011	0.9551	0.8240	0.4612
LNTOBINS'Q	**2012**	0.9892	0.8607	0.5046
	2013	1.1113	0.7411	1.0183
	2014	1.3942	0.7502	2.4884
Other				
	2010	0	0	0
	2011	0	0	0
LN R&D	**2012**	0	0	0
	2013	0	0	0
	2014	0	0	0

Notes:
Return on Equity (ROE), Return on Asset (ROA), Return on Investment (ROI), Return on invested Capital (ROIC), Capital Intensity (CAPINT), Return on Sales (ROS), Natural logarithm of Tobin's Q (LNTONINS'Q), and Natural logarithm of Research & Development (R&D)

The mean to measure the capital intensity ratio meanwhile shows rapid decrease from 2010 to 2012. This inferred a lower utilization of the firm's asset and high labor intensive over the three years period. Yet, their dependent on machines towards their production seems to be higher again in the year 2013. Furthermore, the growth sales of the company which is measured by the changes in their size of the sales reflect poor performances over the 5 years of investigation especially in the year 2014 with negative result.

Next, the Tobin's Q ratio revealed the undervalued of the companies' stock over the period of three years (mean < 1). Somehow, the stock's value in the year 2013 and 2014 looks slightly better with the ratio of more than 1. Expenditure towards R&D activities in Malaysia still considered scarce as compared to the well developed country such as United States, Korean, Japan, etc. Hence, the mean of zero from the table uphold this study. The limitation of this study is the inability to gather R&D financial data of those 30 firms.

Environmental Management System and Tools

Table 3 presents descriptive statistic of the 30 public listed companies in Malaysia on matters relate to the firm's environmental management system and tools. When the firms being asked about the consideration of purchasing or marketing of goods and services, 56.7 percent of the firm agreed to have environmental performance assessment towards their suppliers. In

addition, 60 percent shows good responds which demand their suppliers to undertake environmental measures. However, whenever the firms being required to inform their customers or buyers on how to reduce environmental impacts as a result of using their product, it infer that only 30 percent of the firms marginally agreed to do so. An intuitive explanation is perhaps due to sustaining and maintaining the company's image from being perceived bad by the community.

Table 3: Descriptive Statistic of Environmental Management System and Tools

	Frequency	**Percent (%)**
Consideration Measure of Purchasing/Marketing Goods and Services		
Assessing Environmental Performance towards suppliers	17	56.7
Require suppliers to undertake Environmental Measure	18	60.0
Informing customers/buyers on how to Reduce Environmental Impact	9	30.0
Practices Implemented on Environmental Management		
Compliance with written environmental policy	25	83.3
Environmental criteria used in the evaluation and/or compensation of employees	14	46.7
Environmental training program in place for employees	21	70.0
Carry out external environmental audits	17	56.7
Carry out internal environmental audits	24	80.0
Benchmark environmental performance	14	46.7
Environmental accounting	9	30.0
Public environmental report	8	26.7
Environmental performance indicators / goals	18	60.0

In regards to the practices that they have established to implement environmental management system, a more positive findings revealed that 83.3 percent conduct their business and operation in compliance with the written environmental report. Besides, 70 percent of firms motivated to have environmental training program in place for their employees. Furthermore, to ensure fair and just assessment, 56.7 percent and 80 percent have carried out external and internal environmental audit respectively. Surprisingly, again firms unwilling to engage in public environmental reporting with only 26.7 percent commitment.

Correlation

Table 4 provides the correlation matrices for the key variables between environmental management system and tools and financial variables for the period of 2010 - 2014. Statistic shows when the firm being address the consideration of purchasing or marketing of goods and services, all ROE, ROI, ROIC and ROA depicts significantly positively low correlation with SUEM.

Table 4: Correlation of Environmental Management System and Tools – Financial Variables

	ROE	ROS	ROI	ROIC	ROA	CAPINT	GROWTH IN SALES	TONINSQ
Consideration Measure of Purchasing/Marketing Goods and Services								
AEP	0.056	0.156	0.131	-0.038	0.098	0.244	-0.138	0.166
SUEM	0.481**	0.267	0.457*	0.506**	0.452*	0.259	0.310	0.184
IEI	0.341	0.331	0.341	0.028	0.324	0.198	-0.081	0.270
Practices Implemented on Environmental Management								
CWEP	0.298	-0.242	0.379*	0.222	0.387*	0.157	-0.008	0.143
EC	0.223	0.279	0.233	0.031	0.205	0.031	-0.117	0.129
ET	0.591**	-0.048	0.498**	0.291	0.550**	0.175	0.207	0.170
EEA	0.472**	0.252	0.489**	0.263	0.548**	0.029	0.145	-0.036
IEA	0.584**	0.310	0.484**	0.327	0.560**	0.155	0.191	0.148
BEP	0.144	0.278	0.078	0.308	0.130	-0.124	-0.121	0.063
EA	0.067	0.382*	0.113	0.197	0.071	0.008	-0.296	0.171
PER	0.276	0.095	0.388*	0.305	0.361	-0.007	0.037	0.312
EPI	0.207	0.252	0.272	0.378*	0.263	0.043	0.005	0.115

Notes:

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

In regards to the type of practices that they have established in their facility in order to implemented environmental management, all three measure of financial performance (ROE, ROI and ROA) is found to be significant positively correlated with all of the environmental management system and tools of (ET, EEA & IEA). On a more interesting finding, the results indicate CWEP as having significant positive correlation with both ROI and ROA. Yet interestingly, PER and EPI shows significant correlation only towards to the financial performance of ROI and ROIC respectively.

Conclusion

This paper sought to understand the linked between environmental management system and tools and its financial performance or simply provides an indicator of firms that have high financial performance. On a preliminary descriptive findings indicate that public listed companies in Malaysia are aware and increasingly interested in adopting environmental management system, seeking to make the firms become more competitive and at the same time be more environmental responsible. It is observed that firms do also appreciate and concern about environmental issues. Results indicate that all of the 30 listed companies provide mix and inconclusive results in regards to their profitability trend analysis from the year 2010-2014. However, the firms still manage to earn positive returns with the exception of ROIC. In terms of market assessment, financial measurement of Tobin's Q meanwhile showed a marginally a ratio below than 1 in year 2010 - 2012 which inferred of less market value of the company as compared to the recorded value of their assets. Generally, it suggest that the market value may be undervaluing the company. Additionally, the firms recorded poor performance of their growth in sales particularly in year 2014.

Nevertheless, the correlation between environmental management system and tools and financial performance seems to be encouraging. When the firm being required to demand their suppliers to undertake environmental measure, ROE, ROI, ROIC and ROA showed positive significant correlated. Besides, it appears that when firm are asked about the type of practices that they have established in their facility in order to implemented environmental management, most of all of the financial variables is positively correlated with all of the environmental management system and tools of (ET, EEA & IEA). On the other hand, CWEP has also responded positively towards the ROI and ROA. In a nutshell, the degree of significant correlation between the financial measurement and some of the environmental management system and tools is considered low. Yet, the common finding is the implementation of environmental management system and tools in their company is moving in tandem with their financial performance.

The preliminary findings provided by the data thus far may not be indicative to represent the general trend of financial performance of public listed companies in Malaysia. Nevertheless, the result from this study contribute to the principles knowledge in providing the insight as well as in upholding the linkages between environmental management system and its financial performance. Thus, the opportunity to dig into future research still available to be explore once we have more data so that robust and rigorous result can be presented.

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Appendix

List of Abbreviations

AEP	: Assessing Environmental Performance
SUEM	: Requiring to Undertake Environmental Measure
IEI	: Informing How to Reduce Environmental Impact
CWEP	: Written environmental policy
EC	: Environmental criteria used in the evaluation and/or compensation of employees
ET	: Environmental training program in place for employees
EEA	: Carry out external environmental audits
IEA	: Carry out internal environmental audits
BEP	: Benchmark environmental performance
EA	: Environmental accounting
PER	: Public environmental report
EPI	: Environmental performance indicators / goals