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O CUSTO AMBIENTAL AFETA A PERFORMANCE DAS EMPRESAS JAPONESAS?

DOES ENVIRONMENTAL COST AFFECT JAPANESE FIRMS' PERFORMANCE?

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ABSTRACT

Purpose: This article aims to examine the effect of environmental cost to financial performances, measured by profitability and firm value in Japanese chemical industry during 2012-2015. Examining about this matter in Japan case is suitable since the government has settled guidelines that assist the companies to record and report their activities in environmental preservation. This study focuses on chemical industry in Japan because the industry has been potential to create hazardous wastes along with its daily businesses. In Japan, the companies are involved in Japan Chemical Industry Association (JCIA) that initiates international environmental programs called Responsible Care. **Design/methodology/approach:** This study uses 27 chemical companies listing in Japan Exchange Group (JPX) first section during 2013-2015 periods or 81 company-year. Environmental data is taken from the websites of the each company. Independent variable of this study is environmental cost, measured by the amount of environmental costs spent by the companies as stated in their annual sustainability reports. There are five dependent variables, i.e. Return on Asset (ROA), Return on Equity (ROE), Net Profit Margin (NPM), Price to Earnings Ratio (PER), and Tobin's Q. The author then runs five times regression analysis to examine whether environmental costs affect five dependent variables. **Findings:** The results show that: 1) environmental cost is negatively affecting ROA; 2) environmental cost has no effect on ROE; 3) environmental cost is negatively affecting NPM; 4) environmental cost has no effect on PER; 5) environmental cost is influencing Tobin's Q negatively. **Research/practical implications:** This study helps to determine whether the company could take benefit from financing environmental activities. Managers should acknowledge that if the companies spend greater costs on environmental programs, it might deteriorate the profitability measured by ROA and NPM. The costs could decline Tobin's Q, the proxy for firm value, as well. **Originality/value:** The results allow readers to grasp that environmental financing affects profitability measured by ROA and NPM, instead of ROE. This study fills the gap of profitability and firm value indicators which are significantly affected by firms' strategies on environmental programs.

Keywords: Environmental cost; Japan; Environmental Accounting Guidelines; Profitability; Firm value

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INTRODUCTION

In Japan, the government has initiated practices on environmental accounting. The Ministry of the Environment (MOE), through the Environment Agency Japan (EAJ) has encouraged Japanese corporations to adhere ISO14001. In 2000, MOE published Guideline for Introducing an Environmental Accounting System that contains environmental accounting system, conservation cost, and conservation and economic effects. Meanwhile, the Ministry of Economy, Trade and Industry (METI) established a committee for environmental accounting that focuses on research and development of environmental management accounting tools. Both projects are complementary to each other corresponding to the needs of Japanese companies. These schemes show that the government has an essential role in environmental preservation and sustainability (Kokubu & Kurasaka, 2002).

Environmental accounting allows managers reappraise the relative significance of social, environmental, and economic benefits and risks in the conventional corporate accounting system. The branch is developed to complement the conventional one, to provide prudent information for evaluating corporate activities which have ecological impacts, and then to handle externalities. It becomes a system by which a company can collect and analyze the costs and effectiveness of environmental protection in business activities from qualitative perspective. For the public, the information illustrates efforts of the firm to engage in environmental protection initiatives while also achieving the businesses' goal. Therefore, understanding the impact of environmental cost to financial performances is important to determine to what extent the companies could

take benefits from financing environmental activities. This article examines the influences of environmental costs on Return on Asset (ROA), Return on Equity (ROE), Net Profit Margin (NPM), Price to Earnings Ratio (PER), and Tobin's Q. While the first three represent profitability measurements, the rest two denote for firm value measurements.

Environmental Accounting in Japan

The study examines the first section chemical companies listed in Japan Exchange Group that have reported and published environmental cost in their annual corporate social responsibility or corporate sustainability reports. The companies are implementing environmental accounting standards so-called as Environmental Accounting Guidelines 2005 issued by the Ministry of Environment Japan. By applying environmental accounting, the company is able to maintain a favorable relationship with the community and to conduct environmental conservation activities (Environmental Accounting Guidelines, 2005). The Guideline also discusses the concept, function, role and benefits of environmental accounting for the companies.

According to the Guideline, there are two functions of environmental accounting, i.e. internal functions and external functions. Internally, it helps the company identifying the costs of environmental conservation and analyzing environmental activities. The points of the analysis are to answer whether the monetary benefits are higher than the cost incurred, and whether the costs are able to improve the effectiveness and efficiency of environmental conservation activities through appropriate decision-making. Externally, the guideline functions as an instrument to convince wide stakeholders such as buyers, business partners,

investors, and local communities that the company has improved their environmental management. After the release, Kokubu & Kurasaka (2002) created a survey and found that the guideline has several benefits for the company, i.e.: 1) improve corporate image and increase environmental awareness within the company, 2) reduce environmental load, 3) reduce environmental costs, and 4) develop environmentally friendly products and improve decisions.

Environmental Accounting Guidelines infers environmental costs as environmental conservation costs that include expenditures aimed to invest on assets for improving the quality of environment and costs allocated for prevention, mitigation and define methods for reducing environmental impacts, such as disaster recovery, environmental restoration, and other activities. Therefore, total environmental conservation cost is the sum of expenses incurred for environmental conservation purposes. Total cost includes the cost of depreciation of the asset. The guideline classifies environmental conservation costs into seven categories based on its business activities, i.e. business area costs, upstream/downstream costs, administration costs, research & development costs, social activity costs, environmental remediation and other costs.

Environmental Cost and Profitability

Scholars have examined environmental costs and investments within corporate social responsibility framework (Nakamura, 2011). Business activities in environmental areas is one part of the efforts to deal with social problems, aside from the corporate's main focus to maximize the wealth of shareholders. The environmental activities are recognized as one of important corporate strategies to improve the

economic performance. According to Kokubu & Kurasaka (2002), applying environmental accounting is beneficial since it supports decision making in specific purposes, such as investment decision, price setting, and performance evaluation.

This study assumes that companies voluntarily disclose their effort to preserve environmental aspects voluntarily. Clarkson et al. (2008) suggest that this kind of companies is having proactive environmental strategy by which allowing them to disclose more environmental information to their stakeholders, including investors. This group of companies is superior that poor environmental performers cannot easily imitate the actions. Nakamura (2011) suggests the impact of environmental investment on both short- and long-term period. When a company deals with environmental problems, it can enhance the corporate image and then increase the stock price and profitability.

Hypotheses

Following the explanation above, the author sets the hypotheses.

- H1 : Environmental cost influences ROA
- H2 : Environmental cost influences ROE
- H3 : Environmental cost influences NPM
- H4 : Environmental cost influences PER
- H5 : Environmental cost influences Tobin's Q

Methods

This study follows the Ministry of Environment Japan's definition of environmental

cost. As stated in the Environmental Accounting Guideline 2005, environmental conservation cost contains the monetary value of investments and costs, allocated to prevent, reduce, and/ or to avoid the environmental impact, to remove such impact, to restore damages after the occurrence of a disaster, and other activities. This study uses 27 chemical companies listing in Japan Exchange Group (JPX) first section during 2013-2015 periods. Using three years of analysis, total companies-years analysis is 81. The author obtained environmental data from the websites of the each company. This study applies four criteria in determining samples that the companies must: 1) listed consecutively in the JPX during 2013-2015, 2) published their annual reports and social responsibility reports in English version, and 3) did not experience loss during the period of analysis.

Independent variable of this study is environmental cost, measured by the amount of environmental costs spent by the companies as stated in their annual sustainability reports. This study applies five dependent variables, that are Return on Asset (ROA), Return on Equity (ROE), Net Profit Margin (NPM), Price to Earnings Ratio (PER), and Tobin's Q. The author then runs five times univariate regression analysis to examine whether environmental costs affect five dependent variables. The following is the regression formula for each dependent variable.

Results and Discussion

Results of statistical analysis

Results from univariate regressions for five independent variables and Environmental Cost as the dependent variable are described in the Table 2 below.

	Models				
	1	2	3	4	5
Dependent variables	ROA	ROE	NPM	PER	Tobin's Q
B Coefficients	-0.094	-0.017	-0.156	0.014	-0.080
Constants	3.619	2.287	4.985	2.454	1.692
R Square	0.080	0.003	0.177	0.003	0.119
t	-2.627*	-0.519	-4.124*	0.471	-3.260*
Sig.	0.010	0.604	0.000	0.639	0.002

Table 1 - Results of regression analysis
Source: Processed data (2017)

Table above shows that, in Model 1, if the dependent variable is ROA and the independent variable is environmental cost, regression coefficient for environmental cost is -0.094. The regression formulas of those five models are as follows.

Model 1

$$ROA = 3.619 - 0.094 \cdot EnvironmentalCost$$

Model 2

$$ROE = 2.287 - 0.017 \cdot EnvironmentalCost$$

Model 3

$$NPM = 4.985 - 0.156 \cdot EnvironmentalCost$$

Model 4

$$PER = 2.454 + 0.014 \cdot EnvironmentalCost$$

Model 5

$$Tobin's\ Q = 1.692 - 0.080 \cdot Environmental\ Cost$$

Negative coefficients indicate that environmental cost influences ROA, ROE, NPM, and Tobin's Q inversely, meaning that adding one value of environmental cost would cause ROA decreases 9.4%, others are constant, and soon. The influence of environmental cost to ROA is low 8%, showing that other variables that are not examined in this study have more valuable contribution to determine ROA. With the same interpretations applies for other variables, the results show that environmental cost influences ROE, NPM and Tobin's Q negatively while it has positive influence only for PER. Further, t-students show that environmental cost significantly affects dependent variables only in Model I, III, and V. These results suggest the author to reject null hypotheses for Model 1, Model 3 and Model 5, and to conclude that Environmental Costs are affecting ROA, NPM, and Tobin's Q significantly.

The influence of environmental cost to profitability

Results of regression analysis show that environmental cost has significant and negative influence on profitability, measured by ROA and NPM. The environmental cost does not significantly affect ROE. This study is somewhat different with results of previous studies such as Cortez & Penacerrada (2010), Cortez & Cudia (2010), Chiang, et al. (2015). The previous researchers examined relationship between environmental costs with various indicators of firms' financial performance and suggested that the higher cost for environmental activities will cause financial performance increases. Probably, different sectors as the object of studies cause

the results differ. For example, the three studies above conducted their researches in electronic and automotive sectors in Japan.

This study has similar findings with the finding of Yamaguchi (2009). Using static and dynamic panel data, he examined that environmental conservation cost had relationships with firms' financial performance measured by ROA, while it did not affect ROE. Environmental cost is the expenses incurred to prevent the occurrence of or to repair environmental damage resulting from business activities undertaken by the company. The higher expenditures it will reduce the company's profits. This current study confirms the negative relationships, that the higher environmental cost spent by Japanese companies, the lesser ROA and NPM.

Nonetheless, according to Yamaguchi (2009), environmental conservation cost could affect the profits either in positive or negative ways. Positive influence is occurred when the company is able to save the energy that could be higher if the company does not spend the costs, for example, to fund the maintenance and prevent the possible environmental damage. The cost could affect the profits negatively from the increasing of the cost itself, mainly if the company is unable to take monetary advantages of environmental expenditures. Japanese companies allocated environmental costs to develop energy-saving equipment. Therefore, the cost-saving effect would not occur soon after the expenditures consumed instead it appears gradually. Curcio and Worf (1996) acknowledge that the Japanese companies also recycled residual raw materials employed in their daily business process. The activity can reduce production and disposal costs.

Apparently, the enactment of environmental accounting by the Japanese Ministry of

Environment has caused transformation in the company level. Companies must have good environmental and management strategies to be environmentally responsible and not make environmental responsibility a burden. The companies must develop strategies for reducing the costs for environmental-related business activities. Good strategies would lead to better implementation of environmental accounting management, measured by the gradual reduction of costs to maintain various material emissions and to save energies. This current study support Yamaguchi's (2009) statement that in short term, environmental conservation cost cause a negative effect for management in terms of profitability. Therefore, the strategies are important to assist the companies managing the costs so that it would contribute to attain sustainable business. Environmental cost can also impact the profitability of the company negatively because sometimes the environmental cost incurred during a period will not necessarily be directly felt directly in that period. This influence will be realized in the next year, perhaps even in some later periods.

The influence of environmental cost to firms value

Results of regression analysis show that environmental cost is not significantly influencing firm values measured by PER. However, if the indicator for firm value is Tobin's Q, the influence is proven significant. Further, similar with other significant variables, the influence is negative, meaning that the higher environmental cost would lessen the value of Tobin's Q. This finding is different with results of Spicer's (1978) and Yamaguchi's (2009) research. Yamaguchi (2009) studied the influence of environmental conservation cost toward ROA,

profitability, and Tobin's Q in Japanese companies. The study found that static and dynamic environmental costs did not affect ROA and Tobin's Q, but the cost had negative effect on the firms' profitability.

The finding that the environmental cost is significant to determine Tobin's Q but not for PER is supporting previous research completed by Lasmin & Nuzula (2012). The study suggests that when the Japanese companies released information about environmental expenses, the capital markets and firm values were not affected. The higher environmental expenses were not determining positive responses shown by the Japanese capital markets. Investors are interested in social information, including safety and quality of products as well as environmental activities illustrated by the managements in the annual reports. The companies disclose these additional information as signals for investors to attract them investing in the companies' stocks. Higher demand on the stocks would lead to raise the price and firm value. Some scholars use this rationalization for explaining the existence of consistent and mutual relationship between the firm social performances with the financial performance (Spicer, 1978; de Villiers & van Staden, 2010).

However, previous studies also found that social performances might not have influence on financial performance of the firm (Hassel, Nilsson & Nyquist, 2005; Lasmin & Nuzula, 2012). This may occur because investors would not perceive the social performance as a worthy achievement of the company. Investors may infer that noteworthy social and environmental performance requires considerable related costs. For them, this expenditure would create negative value since it may lessen expected earnings.

Disclosing firms' performance on environmental activities will increase transparency for various stakeholders. Issuing information such as the amount of environmental costs allows stakeholders improving trust on the companies. Since transparent data helps refining the reliability of the reports, investors will respond it through the rise of stock prices and the firms' value. Therefore, good implementation of environmental management accounting is a necessity to develop the quality of the disclosure.

According to Lasmin dan Nuzula (2012:23), there are some reasons why environmental expenditures would not influence firm value. Firstly, the market would see that the businessman and companies in Japan were actively participating in environmental activities because it has been compelled by environmental related acts issued by the Japanese Ministry of Environment. Secondly, the benefits taken from the environmental activity projects are not certain. It causes the companies are facing difficulties to determine to what extent they would gain earnings from doing current environmental related plans.

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Conclusion

This study results that environmental cost is influencing profitability, measured by return on assets (ROA) and net profit margins (NPM) of the Japanese chemical firms negatively for 2013-2015 period. The higher is environmental cost, the lesser is ROA and NPM. This finding suggests that expenditures on environment activities would not provide monetary feedback in short terms. The cost could be taken as current expenses, not expenditures that would generate returns years after and not only for the same year when the expenses were occurred. As expenses, the increasing amount of yen used to fund the environmental activities could cause the profits lessen. In addition, this study also reveals that the occurrence of environmental costs is affecting Tobin's Q, not for Price to Earnings (PER), indicating that capital market is somehow considering to what extent the company allocates their money on environmental activities. This study suggests further research to conduct an analysis whether expenditures recorded in one year (t), would cause improving returns in one year after (t-1).

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