

ENVIRONMENTAL DISCLOSURE, INVESTORS' INVESTMENT DECISIONS AND THEIR PERCEPTIONS OF THE CREDIBILITY OF MANAGEMENT

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ABSTRACT

A majority of studies use archival files to examine the effect of environmental disclosure on the stock markets and may thus lead to inconsistent findings. This paper adopts an experimental method to examine the effects of environmental disclosure on investors' investment decisions and further examines their perceptions of the credibility of management in the setting of Taiwan. Particularly, environmental disclosure with different extent is examined. The results show that environmental disclosure has positive effects on investors' stock purchase decisions and their perceptions of the credibility of management no matter the extent of environmental disclosure is. The findings have essential policy implications for security regulators and encourage firms in emerging countries to implement environmental management well and enhance environmental disclosure transparency.

JEL: G11, M10, M14

KEYWORDS: Environmental Disclosure, Investment Decisions, Credibility

INTRODUCTION

Although technological change brings prosperity day by day, it also brings increasingly negative effect such as the pollutions on ecology environment. In developed countries, people are aware increasing ecology pollutions and thus care about the protection for ecology environment. When people buy products and invest stocks of particular firms, they would often consider whether the firms have environmental protection consciousness. Their major reference source is corporate environmental disclosure.

In developed countries, as everyone is getting more and more interested in the issues on environmental protection and ecology, environmental disclosure becomes important information. Environmental disclosure is vital to firm stakeholders (Deegan and Rankin, 1997). Particularly, environmental disclosure has become a key indicator for investors to select stocks. Many studies have examined the effects of environmental disclosure on the stock markets in developed countries (Halme and Niskanen, 2001; A1-Tuwaijri et al., 2004; Cho and Patten, 2007). The findings are mixed. Some findings indicate that environmental disclosure can increase stock prices (Dasgupta et al., 2001; A1-Tuwaijri et al., 2004) whereas some findings show that environmental disclosure leads to the decline of stock prices (Walley and Whitehead, 1994). Using archival files to examine the above association is likely to be one of major reasons to result in inconsistent results.

Compared to developed countries, Taiwan is a developing country and thus has less rigorous regulations for environmental protection and has lower environmental consciousness. However, considering the benefits of environmental disclosure, it is likely that environmental disclosure still has positive effects on

investors' investment decisions in Taiwan. Different from previous environmental disclosure studies using archival files to examine the reactions of environmental disclosure to the stock markets, this paper adopts an experimental method to examine whether environmental disclosure positively affects investors' stock purchase decisions in the context of Taiwan. Furthermore, legitimacy theory is often used to depict why firms are willing to disclose environmental information (Hooghiemstra, 2000; O'Donovan, 2002; Mousa and Hassan, 2015). It is suggested that environmental disclosure can be used as an important way to build firm reputation. Hence, this paper also examines whether environmental disclosure positively affects investor perceptions of the credibility of management.

Environmental disclosure literature suggests that it is important to take the disclosure extent into account when investigating the impact of environmental disclosure (Deegan and Gordon 1996; Cormier and Magnan 2003). In this study, environmental disclosure is examined via investigating qualitative environmental disclosure and complete environmental disclosure (including both qualitative environmental information and quantitative environmental information) to differentiate the extent of environmental disclosure. The findings show that environmental disclosure positively influences investors' stock purchase decisions and their perceptions of the credibility of management no matter whether qualitative environmental information or complete environmental information is reported. This paper contributes to adopt an experimental method to support that investors would purchase the stocks of the firm disclosing environmental information and have high perceptions of the credibility of management. The findings have essential policy implications for security regulators and encourage firms in developing countries to implement environmental management well and strengthen environmental disclosure transparency.

The remainder of this paper is as follows. Section 2 presents the literature review and hypothesis development. Section 3 provides the experimental design and experimental procedure. Section 4 presents the results. Finally, conclusions, research limitations and future research directions are reported in Section 5.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Environmental Disclosure, Investors' Investment Decisions and Their Perceptions of the Credibility of Management

Recently, environmental disclosure has begun to receive more and more concerns in corporate disclosure literature due to increasing environmental consciousness. Some environmental disclosure studies examine the effects of environmental disclosure on economic performance and financial performance (Clarkson et al. 2008; Al-Tuwaijri et al. 2004). Some literature turns the attention toward the examination on the linkage of environmental disclosure to firm legitimacy (Patten, 2002; Cho and Patten, 2007) and corporate governance (Rupley et al. 2012). Environmental disclosure literature examining economic performance and financial performance generally focuses on the impact of environmental disclosure to stock prices. These studies often employ archival files to provide empirical evidence about the effects of environmental disclosure on the stock markets (Halme and Niskanen, 2001; Al-Tuwaijri et al. 2004; Lyon and Shimshack, 2015; Qiu et al. 2016). However, the findings are inconclusive. The mixed results may be mainly attributed to the adoption of archival files to examine the above relationship. On the one hand, prior findings indicate that the stock markets have positive reactions to environmental disclosure (Al-Tuwaijri et al. 2004; Xu et al. 2014). Al-Tuwaijri et al. (2004) examine American firms to investigate the relationship among economic performance, environmental performance, and environmental disclosure. They find that the stock markets have positive reactions to environmental disclosure with good environmental performance. Lyon and Shimshack (2015) adopt the event study methodology to examine whether Newsweek's 2009 ranking of the 500 largest U.S. firms is related to environmental information disclosure. Their findings indicate that firms with high rankings are associated with abnormal stock returns when environmental disclosure is reported, showing that the rankings have significant effects on shareholder value. Conversely, some

findings show that environmental disclosure has negative effects on the stock markets (Halme and Niskanen 2001). Halme and Niskanen (2001) use data from the Finnish forest industry to examine share price effects of environmental investments. Their results indicate that the stock market reactions are negative. Xu et al. (2014) adopt web crawler technology to examine the effect of environmental violation on shareholders' wealth by using a perspective from media coverage in China. Their results indicate that the media coverage would affect the market values of firms announcing environmental violation events and the firms receiving much attention from the media would bear more losses in their shareholders' wealth. It is widely recognized that firms can benefit from disclosing environmental information despite that environmental disclosure also can bring cost. For investors, they can know more firm prospects via environmental information disclosure so as to make investment decisions accurately. Based on the above, this paper suggests that environmental disclosure has positive effects on investors' investment decisions. Consequently, this paper proposes H1.

H1: Environmental disclosure is positively related to investors' stock purchase decisions.

Legitimacy theory is often used to illustrate why firms are willing to disclose environmental information. Legitimacy theory asserts that managers disclose environmental information to affect stakeholders' perceptions. Environmental disclosure is an essential way to increase firm legitimacy and represents a response to the expectations from the society and thus can enhance firm reputation (Hooghiemstra, 2000; O'Donovan, 2002; Aldrugi & Abdo, 2014; Mousa and Hassan, 2015). Hooghiemstra (2000) provides the theoretical framework related to firm social reporting. He asserts that legitimacy theory is generally used to explain the reason why firms make environmental disclosure and suggests that environmental disclosure can be adopted as the responses to induce the pressure from the public and increasing attention from the media discussing social events regarding the issues on environmental protection. O'Donovan (2002) adopts the quasi-experimental method accompanying semi-structured interviews with senior personnel in three large Australian public companies. Their findings are consistent with legitimacy theory, which is generally regarded as a major reason of environmental disclosure. Aldrugi and Abdo (2014) explain the motives or reasons that make firms in Libya to report environmental information in the annual report by focusing on the environmental disclosure practices of oil and gas firms in Libya via questionnaire investigation. They collect 115 questionnaires from 43 local and foreign firms in the Libyan oil and gas sector. Their findings suggest the motives of environmental disclosure made by firms include the factors such reputation, legal requirements and the public pressures. Mousa and Hassan (2015) provide a further examination on using the legitimacy theory to explain corporate environmental disclosure. They also assert that firms prefer to disclose environmental information so as to maintain, acquire and strengthen firm legitimacy. According to legitimacy theory (O'Donovan, 2002; Mousa and Hassan, 2015), this paper regards that investors would have high perceptions of the credibility of management when environmental information is reported. Consequently, this paper proposes H2.

H2: Environmental disclosure is positively related to investor perceptions of the credibility of management.

METHODOLOGY

Experimental Process

The experiment includes one control group: non-environmental disclosure (only presenting financial information) and two experimental groups (presenting both financial information and environmental information). One of the experimental groups: qualitative environmental disclosure presents qualitative environmental information and the other experimental group: complete environmental disclosure presents both qualitative environmental information and quantitative environmental information. The control group has 32 persons and each experimental group has 33 persons. In the control group, the experiment only presented financial information, including the backgrounds of the fictitious company and particular financial information: one-year financial indicators for the firm and the industry average, including EPS,

ROE and ROA. All financial indicators of the firm are higher than those of the industry average. In the control group, we implement manipulation checks on financial information, including three items related to financial indicators: EPS, ROE and ROA. The manipulation checks on financial information are designed to check whether the subjects understand the presented financial information. The item on EPS is “I regard that EPS of the firm is higher than that of the industry average”. The item on ROE is “I regard that ROE of the firm is lower than that of the industry average”. The item on ROA is “I regard that ROA of the industry average is higher than that of the firm”. Then, we required the subjects to answer the following items: Investment and Credibility. The item on Investment is “I would purchase the stocks of the firm”. The item on Credibility is “I regard that the management is credibility”. All items adopt a Likert seven-point scale, ranging from 1 = very disagree to 7 = very agree. Finally, we asked the subjects to answer personal profiles.

In the experimental groups, the experiment presented financial information and environmental information with different extent. Initially, the presented financial information and the manipulation checks on financial information are the same with the control group. Next, qualitative environmental information or complete environmental information (including both qualitative environmental information and quantitative environmental information) was presented to different subjects. Qualitative environmental information is environmental information related to qualitative issues (e.g., the firm adopts environmental management systems). Quantitative environmental information is environmental information related to quantitative issues (e.g., environmental expenditure and the amount of pollution release). Further, we implement manipulation checks on environmental information to assure that the subjects understand the presented environmental information, including three items: ENVC1, ENVC2 and ENVC3. The items adopt a Likert seven-point scale, ranging from 1 = very disagree to 7 = very agree. The item on ENVC1 (qualitative environmental information) is “the firm adopts environmental management systems”. The other two items on ENVC2 and ENVC3 are quantitative environmental information. The item on ENVC2 is “the firm discloses environmental expenditure” and the item on ENVC3 is “the firm discloses the amount of pollution release”. Next, the subjects were required to rate items on Investment and Credibility. Finally, the subjects were asked to answer personal profiles.

Subjects

The experimental process was implemented by randomly assigning questionnaires in a sealed envelope to people who work in Hsinchu Science Park or Tainan Science Park in the experiment in the early of 2016. All of the experimental subjects have investment experience. The questionnaire items include three parts: manipulation checks, hypotheses and personal data. There are three items on manipulations checks for financial indicators: EPS, ROE and ROA and three items on manipulation checks for environmental disclosure: ENVC1, ENVC2 and ENVC3. There are two items on hypotheses: Investment and Credibility. Three items are related to personal profiles, including age, education and sex. There were 99 assigned questionnaires. However, one questionnaire in the controlled group was invalidated and was deleted due to several omitted questionnaire items. As all the subjects have the willingness to participate in the experiment, total response rate is high (99%). The total number of investors is 98. Of the subjects, 78.6% were male, and 21.4% were female. About half of them were in the 30–39 age group (38.8 %) and had a bachelor’s degree (54.1 %).

RESULTS

Manipulation Checks

The results of manipulation checks on financial information are as follows. The presented financial information shows that financial indicators of the fictitious company are higher than those of the industry average. Hence, as expected, the results show that the average score on EPS is high (4.60) whereas the average scores on ROE (2.05) and ROA (2.28) are low. Our results indicate that the manipulations on financial information are successful. In addition, this paper uses independent-sample t-test to compare the

mean level of each item in the group of qualitative environmental disclosure and that in the group of complete environmental disclosure, shown in Table 1.

The group of qualitative environmental disclosure only reports qualitative environmental information whereas the group of quantitative environmental disclosure reports qualitative environmental information and quantitative environmental information. The item on ENVC1 depicts qualitative environment information. Hence, our results show that the average score on ENVC1 in the group of qualitative environmental disclosure is not significantly different from that in the group of complete environmental disclosure ($T = 1.417, p > 0.1$). Besides, the items on ENVC2 and ENVC3 depict quantitative environmental information. Therefore, as expected, the results indicate that the average scores on ENVC2 and ENVC3 in the group of qualitative environmental disclosure are both significantly lower than those in the group of complete environmental disclosure ($T = 7.328, p < 0.01$; $T = 2.934, p < 0.01$). Our results reveal that the manipulations on environmental information are successful.

Table 1: Manipulations Checks on Environmental Disclosure

Item	Qualitative Environmental Disclosure (N=33)	Complete Environmental Disclosure (N=33)	Differences
	Mean	Mean	Mean (T-value)
ENVC1	5.52	5.61	1.417
ENVC2	2.09	5.24	7.328***
ENVC3	2.52	6.24	2.934***

*Asterisks *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively. All analysis adopts one-tailed testing. This table reports descriptive statistics for the three items: ENVC1, ENVC2 and ENVC3 with using independent-sample t-test. We compare the mean level of each item in the group of qualitative environmental disclosure and that in the group of complete environmental disclosure. The item on ENVC1 is “the firm adopts environmental management systems”. The item ENVC2 is “the firm discloses environmental expenditure”. The item on ENVC3 is “the firm discloses the amount of pollution release”.*

Descriptive Statistics and MANOVA Results

Table 2 provides the descriptive statistics for the items on Investment and Credibility with adopting independent-sample t-test. Panel A of Table 2 reports the mean level of each item in the group of qualitative environmental disclosure and that in the group of non-environmental disclosure. Panel B of Table 2 reports the mean level of each item in the group of complete environmental disclosure and that in the group of non-environmental disclosure. The results show that the average scores on the items: Investment ($F=2.359; p < 0.05$) and Credibility ($F=2.779; p < 0.01$) in the group of qualitative environmental disclosure are significantly higher than those in the group of non-environmental disclosure. Besides, the results show that the average scores on the items: Investment ($F=6.290; p < 0.01$) and Credibility ($F=5.928; p < 0.01$) in the group of complete environmental disclosure are also significantly higher than those in the group of non-environmental disclosure. Therefore, hypothesis 1 and hypothesis 2 appear to be supported. Investors are likely to purchase the stocks of the firm disclosing either qualitative environmental information or complete environmental information and regard that the management is credibility.

Next, this paper adopts multivariate analysis of variance (MANOVA) to test the hypotheses. This paper creates two dummy variables: Qualitative and Complete. Qualitative is a dummy variable that equals to 1 if qualitative environmental information is reported and 0 if non-environmental disclosure is reported. Complete is a dummy variable that equals to 1 if complete environmental information is reported and 0 if non-environmental information is reported. On the one hand, panel A of Table 3 reports the MANOVA results for the effects of qualitative environmental disclosure on investors’ decisions to purchase stocks and their perceptions of the credibility on management. The findings show that compared to firms not disclosing environmental information, investors tend to purchase more stocks of the firm disclosing qualitative

environmental disclosure ($F=5.482$; $p < 0.05$) and have higher perceptions of the credibility of management ($F=7.722$; $p < 0.01$).

Table 2: Descriptive Statistics

Panel A				
Items	Qualitative Environmental Disclosure (N=33) Mean	Non-Environmental Disclosure (N=32) Mean	Differences Mean (T-value)	
Investment	5.33	4.91	2.359**	
Credibility	5.27	4.78	2.779***	

Panel B				
Items	Complete Environmental Disclosure (N=33) Mean	Non-Environmental Disclosure (N=32) Mean	Differences Mean (T-value)	
Investment	5.76	4.91	6.290***	
Credibility	5.64	4.78	5.928***	

Asterisks *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively. All analysis adopts one-tailed testing. This table reports descriptive statistics for the items on Investment and Credibility with using independent-sample t- test to compare means in two groups. In panel A, we compare the mean level of the group of qualitative environmental disclosure and that of the group of non-environmental disclosure in Investment and Credibility, respectively. In panel B, we compare the mean level of the group of complete environmental disclosure and that of the group of non-environmental disclosure in Investment and Credibility, respectively. The item on Investment is “I would purchase the stocks of the firm”. The item on Credibility is “I regard that the management is credibility”.

On the other hand, panel B of Table 3 displays the MANOVA results for the effects of complete environmental disclosure on investors’ stock purchase decisions and their perceptions of the credibility of management. The findings show that compared to firms not disclosing environmental information, investors tend to purchase more stocks of the firm disclosing complete environmental disclosure ($F=39.500$; $p < 0.01$) and have higher perceptions of the credibility of management ($F=35.461$; $p < 0.01$). These results support H1 and H2. The findings show that environmental disclosure has positive effects on investors’ stock purchase decisions and their perceptions of the credibility of the management regardless of the extent of environmental disclosure is in the setting of Taiwan. The findings are consistent with prior literature revealing that environmental disclosure has positive effects on stock prices and can enhance firm legitimacy (Cho et al. 2007; A1-Tuwajjri et al. 2004).

Table 3: Environmental Disclosure, Investors’ Investment Decisions and Their Perceptions of the Credibility of Management

Panel A				
Qualitative (N=65)				
Variable	Type III sum of squares	Df	Mean square	F-value
Investment	2.963	1	2.963	5.482**
Credibility	3.924	1	3.924	7.722***
Wilk’s Lambda = 0.667				4.328**

Panel B				
Complete (N=65)				
Variable	Type III sum of squares	Df	Mean square	F-value
Investment	11.774	1	11.774	39.500***
Credibility	11.880	1	11.880	35.461***
Wilk’s Lambda = 0.474				34.410***

Asterisks *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively. All analysis adopts one-tailed testing. This table adopts multivariate analysis of variance (MANOVA) to test hypotheses. Qualitative is a dummy variable that equals to 1 if qualitative environmental information is reported and 0 if non-environmental information is reported. Complete is a dummy variable that equals to 1 if complete environmental information is reported and 0 if non- environmental information is reported. The item on Investment is “I would purchase the stocks of the firm”. The item on Credibility is “I regard that the management is credibility”.

In order to further confirm the hypotheses, this paper examines the hypotheses without distinguishing the extent of environmental disclosure and creates a dummy variable: Environmental. Environmental is a dummy variable that equals to 1 if any environmental information is reported and 0 if non-environmental information is reported. In Table 4, the results of MANOVA indicate that environmental disclosure is significantly positive related to investors’ investment decisions ($F=17.954$; $p < 0.01$) and their perceptions of the credibility of management ($F=22.420$; $p < 0.01$). Therefore, H1 and H2 receive further support. In sum, the findings are consistent with prior studies that show environmental disclosure is important information to investors (Deegan and Rankin 1997).

Table 4: Further Examinations on Environmental Disclosure, Investors’ Investment Decisions and Their Perceptions of the Credibility of Management

Environmental (N=98)				
Variable	Type III sum of squares	df	Mean square	F-value
Investment	8.805	1	8.805	17.954***
Credibility	9.770	1	9.770	22.420***
Wilk’s Lambda = 0.772				14.057***

Asterisks *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively. All analysis adopts one-tailed testing. This table adopts multivariate analysis of variance (MANOVA) to test hypotheses. Environmental is a dummy variable that equals to 1 if any environmental information (without distinguishing the extent of environmental disclosure) is reported and 0 if no environmental information is reported. The item on Investment is “I would purchase the stocks of the firm”. The item on Credibility is “I regard that the management is credibility”.

CONCLUSION

The environmental protection issues have become more and more important all around the world. Investors in developed countries such as America have recognized the importance of environmental disclosure and thus regard that environmental disclosure is an essential indicator when selecting stocks (Al-Tuwajri et al., 2004; Aerts et al., 2008; Qiu et al., 2016). It is likely that Taiwanese investors would also consider environmental disclosure when making investment decisions. This paper aims to examine investor perceptions of environmental disclosure in the setting of Taiwan, including investors’ investment decisions of purchasing stocks and their perceptions of credibility of the management. This paper adopts an experimental method. The experiment was implemented by assigning questionnaires in a sealed envelope to the investors.

The experiment includes one control group and two experimental groups. In both the control group and the experimental groups, the experimental process begins with the presentation of the backgrounds of a fictitious company, including the financial indicators and those of industry average. The subjects were asked to rate the items on their investment decisions and the perceptions of credibility of the management based on the above information. In the experimental groups, environmental information is next presented. Then, the subjects were asked to rate the items on their investment decisions and the perceptions of credibility of the management. Finally, the subjects were asked to rate the items on their personal profiles. Environmental disclosure literature indicates the importance to examine the extent of environmental disclosure (Deegan and Gordon, 1996; Cormier and Magnan, 2003).

Hence, in this paper, environmental disclosure with different extent is considered: quantitative environmental disclosure and complete environmental disclosure (including qualitative environmental disclosure and quantitative environmental disclosure). As the findings of prior literature (Deegan and Gordon, 1996; Cormier and Magnan, 2003), the results show that environmental disclosure positively influences investors’ investment decisions and their perceptions of the credibility of management no matter the extent of environmental disclosure is. The research limitation of this paper is as follows. This paper

focuses on the perceptions of investors in Taiwan, which is a developing country. Hence, the differences in culture and investment preferences of investors between developing countries and developed countries may lead to different perceptions of the investors. It is likely that the findings in this paper cannot be duplicated to developed countries. Future research can further examine how environmental disclosure affects other perceptions of investors and the perceptions of other stakeholders such as creditors.

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