“The impact of corporate social responsibility on the cost of equity: an analysis of Vietnamese listed companies”

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THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON THE COST OF EQUITY: AN ANALYSIS OF VIETNAMESE LISTED COMPANIES

Abstract

A number of studies in environmental disclosure have suggested that corporates accountable for environmental responsibility practice have lower cost of capital. However, this relationship has not yet been discovered in Vietnam. The purpose of this study is to examine the relationship between environmental disclosure and the equity cost of 115 non-financial companies listed on Vietnamese stock market from 2014 to 2017 with 460 observations. This study uses the panel data regression model (the fixed effects model (FEM) and the random effects model (REM)) to assess the impact of environmental disclosure on the equity cost of listed companies in Vietnam. Content analysis method according to GRI guidelines is used to measure the level of the environmental responsibility practice and Easton's model (2004) is used to estimate firms' ex ante cost of equity. The research results show that the level of environmental information disclosure of listed companies in Vietnam is not high and there is a negative relationship with statistical significance between the environmental disclosure and cost of equity of listed companies in Vietnam. The findings suggest that environmental practice can be profitable and beneficial to Vietnamese listed companies. Therefore, companies in Vietnam need to change their awareness of social and environmental responsibility practices. This study also shows that the suitable model for listed companies in Vietnam is the FEM.

Keywords environmental disclosure, cost of equity, impact, FEM, REM, regression

JEL Classification M14, M40, G3, Q3

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INTRODUCTION

Sustainable development is an indispensable development trend of modern society, because sustainable development not only meets the needs of the present, but also ensures the needs of the future. Green economy has become a business trend in many developed countries and is spreading to developing countries. Under the pressure of all stakeholders, companies have implemented production and business activities, which are more and more responsible. However, environmental pollution is a global concern, so social responsibility in general and environmental responsibility in particular receive a lot of attention not only from researchers, but also of the whole society. The situation of environmental pollution in Vietnam has become more and more complex and the pressure from public tends to increase over time. Under this situation, the Ministry of Finance issued Circular 155/2015/TT-BTC guiding the listed companies that they have to be environmental and social disclosure (non-financial information). The regulation on environmental and social disclosure in Circular 155 marks an important step forward for Vietnam towards a sustainable

financial market. Appendix 4 of this Circular stated that, on environmental issues, companies need to exchange information related to the management of raw materials, energy consumption and water consumption during the year, from which to divide share initiatives to save energy.

According to Gray et al. (1995), social and environmental disclosure is considered as a mechanism that organizations use to enhance their status, provide information to stakeholders and implement social contract between organizations and related stakeholders. Thus, environmental disclosure is considered as a tool to provide information about policies, strategies, goals, costs, environmental liabilities, etc. to the stakeholders in voluntarily or compulsorily to support decision making. At the same time, environmental disclosure also reflects the company's interest in environmental and social issues, which is reflected in the annual report or sustainable development report.

There are many empirical studies, which were conducted in developed economies, emerging economies, as well as developing economies, including Vietnam recently, on the benefits of environmental disclosure and the effects of environmental disclosure on financial performance, capital expenditures, cash flow, risk, etc. of the company. Most of these studies suggest that environmental and social disclosure will help companies save cost of equity, increase revenue, improve the image and reputation of the company, reduce risks and increase corporate value (Plumlee et al., 2015; Clarkson et al., 2013; Bich et al., 2015; El Ghoul et al., 2011; Dhaliwal et al., 2011). However, studies on the level of environmental disclosure, as well as assessing the relationship between environmental disclosure and cost of equity, are still limited in Vietnam. This study was conducted to review and assess the level of environmental disclosure, determine the impact of environmental disclosure on the cost of equity of listed companies on the Vietnamese stock market.

The structure of this study is as follows: first is introduction, which talks about the definition of environmental disclosure, the role of environmental disclosure and the need to conduct research on the relationship between the environmental disclosure and cost of equity. Section 1 discusses the literature review and develops the research hypothesis. In this section, we examine the relationship between environmental disclosure and equity cost, and then we develop a hypothesis to test the relationship between the practical environmental disclosure and cost of equity. Section 2 is the research method in which we describe the sample and build the regression model. In section 3, we present the research results and discuss the main findings of this article. Finally, last section is the conclusion.

1. LITERATURE REVIEW

According to Clarkson et al. (2008), environmental accounting is often studied in three directions: the first research direction is to study the factors that influence the decision of managers when disclosure of potential environmental debts. This was reflected in the research of Patten (1992), Aerts et al. (2006), and so on. These studies showed that there are some crucial factors affecting managers' decisions on compulsory environmental disclosure, especially when the information is given freely. The second research direction explored the relationship between environmental disclosure and performance, including environmental performance and financial performance. For example, there are many studies of Ingram and Frazier (1980), Wiseman (1982), Patten (2002), Al-Tuwaijri et al. (2004), etc. The third research direction to check the usefulness of environmental disclosure to cost of equity by using the diverse models (Ohlson, 1995) in different contexts for stakeholders, especially investors. For instance, there are some studies of Richardson and Welker (2001), Clarkson et al. (2013), and Plumlee et al. (2015).

The initial studies examining the relationship between environmental disclosure and cost of equity focused on the relationship between specific environment issues or events and stock prices or stock price changes (Plumlee et al., 2015). The study which was conducted by Barth and McNichols (1994) suggested that the market has assessed superfund debt in excess of the amount published by

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companies which "undone" environmental debts. The research of Blacconiere and Patten (1994) provided evidence of benefits of improving environmental information disclosure. Specifically, while chemical companies were facing a drop in stock prices after a serious chemical leak (Union carbide Bhopal leak), stock prices have started to rise slightly for companies with better environmental disclosure. These studies provided evidence of the relationship between environmental disclosure and cost of equity, although their focuses are the relationship between compulsory environmental disclosure and environmental events, environmental debts.

In a study examining voluntary social and environmental disclosures, Richardson and Welker (2001), and Déjean and Martinez (2009) both claimed an unexpected positive relationship between social and environmental disclosure and cost of equity. According to these authors, three reasons can justify such an effect: (i) some companies disclosure social and environmental information, but they did not really comply to responsible approaches to society and environment (it means that there is a discrepancy between the company's social behavior and communication on the issue); (ii) on the other hand, if companies are making socially and environmentally responsible investments, those transactions can bring negative present value and serve to increase the total risk that the company can suffer; and (iii) the lack of trust in the environmental report, according to Rivière-Giordano (2007), can also explain the higher cost of equity.

In contrast to Richardson and Welker (2001), Aerts et al. (2008), Chava (2010), Clarkson et al. (2013), and Plumlee et al. (2015), Aerts et al. (2008) provided evidence that the improvement of environmental disclosure related to a lower cost of equity.

Experimental studies are summarized in Table 1.

In summary, previous studies provided mixed results on the impact of environmental disclosure and cost of equity. The findings in these studies showed that the impact level of environmental disclosure on cost of equity varies depending on the type of information disclosure (voluntary or compulsory), the way to measure environmental disclosure index and cost of equity, research space, and sample size. In terms of research space, these studies were conducted in many countries, focusing mainly on developed countries (USA, Canada, Australia), and emerging economies recently, especially China. The sample size is also diverse, being the whole market or focusing on the most environmentally sensitive industry group. In terms of variable measurement, for independent variables (environmental disclosure index), developed countries used indices like Toxics Release Inventory (TRI); Kinder index, Lydenberg, and Domini index (KLD); Global initiative reporting index (GRI), etc. and content analysis methods in developing countries. The dependent variable

Table 1. Summary of empirical studies

Author	Nation	Sample	The empirical results	The environmental disclosure measurement	The equity cost measurement
Richarson and Welker (2001)	Canada	87 companies in 9 industries with 324 observations, from 1990 to 1992	(+ sig)	SMAC/UQAM index	Stock price
Aerts et al. (2008)	USA	267 European companies, 206 Canadian companies, and 419 American companies in 2002	(– sig)	Content analysis	The increase rate of earning per share EPS
Déjean and Martinez (2009)	France	119 companies listed on the stock market SBF 120, 1995–2005	(+ sig)	KLD index	CAPM model
Chava (2010)	USA	Companies listed on S&P 500, period 1991–2008	(– sig)	KLD index	Stock price
Clarkson et al. (2013)	USA	195 observations (92 companies in 2003 and 103 companies in 2006 in the 5 most polluting industries	(no sig)	Content analysis	Stock price, expected cash flow
Xu et al. (2014)	China	831 observations (271 companies in 2009, 269 companies in 2010 and 291 companies in 2011)	(– sig)	KLD and GRI indices	Stock price
Plumlee et al. (2015)	USA	474 companies in 5 industries, 2000–2005	(– sig)	GRI index	Stock price, future cash flow

(cost of equity) is estimated through the CAPM model or the dividend capital model, which was used by Ohlson (1995), the PEG model of Easton (2004), in which the dividend capital model is used more commonly, because it reduces the inconsistence of research results (Reverte, 2012). The difference in the measurement of variables such as the indices of environmental disclosure and cost of equity is one of the main reasons for the conflict of research results (Ullmann, 1985; McWilliams & Siegel, 2001).

In Vietnam, research related to environmental disclosure often focuses on two directions: the first direction is to study the factors affecting the environmental disclosure with typical research of Trinh Hiep Thien (2010), Hoang Thuy Dieu Linh (2013), Linh (2017). Research by Hoang Thuy Dieu Linh (2013) found out that companies with environmental disclosure are companies operating in areas with environmental impacts such as tourism, construction, aquatic product, chemical production. The companies operating in the field of less impact on the environment do not publish this information. According to the author, the reasons that corporate administrators do not support environmental disclosure are the fear of losing credibility and costly (Linh, 2017). The second direction is research studying about the impact of environmental disclosure on financial performance. Typical studies of this direction are Tien et al. (2017) and La and Dung (2019). Both studies found the positive impact of environmental disclosure on financial performance.

It is clear that the research on environmental disclosure has been implemented in Vietnam relatively limited and these studies focused on analyzing the factors affecting the environmental disclosure and the impact of environmental disclosure on financial performance. Most of these studies suggested that good implementation of environmental responsibilities will bring many benefits for firms, especially increasing revenue, improving financial performance. However, the limitations of these studies are not considering the impact of environmental disclosure on capital cost, especially the cost of equity.

Based on synthesizing domestic and foreign studies related to environmental disclosure, the authors hypothesize that: "Environmental disclosure has a negative impact on cost of equity of listed companies on the Vietnamese stock market".

2. RESEARCH METHOD

2.1. Research sample

In this paper, the authors collected sample in two steps. The initial sample measured the independent variables. The authors applied the random sample method. We chose the companies which have a Vietnamese annual report (including financial statements) of a listed non-financial companies with sufficient information on the indicators which need to be collected. As a result, there were 48 companies in 2014, 69 companies in 2015, 116 companies in 2016, and 420 companies in 2017. Combining with the sampling criteria of the authors (choosing companies which are not in the sectors of banking, finance, insurance, available data – it means that these companies have to have full information disclosure on the annual report). The final sample was 115 listed companies for each year (from 2014 to 2017).

Table 2. Sample used in the study

No.	Industry sector	The quantity of companies
1	Energy	14
2	Building materials	8
3	Construction investment	3
4	Steel	9
5	Mineral	4
6	Rubber	5
7	Aquatic product	22
8	Oil	6
9	Food	26
10	Medicine	8
11	Household appliances	10

2.2. Variable measurement

2.2.1. Independent variable measurement

Previous studies related to environmental disclosure had little consistence on the measurement of environmental disclosure. However, with data limitations, content analysis method is more commonly used in developing countries to extract information about environmental initiatives.

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Consistent with previous studies, with each environmental information which is published in the annual report of the company, the point received is 1. In contrast, the point is 0 (Bich et al., 2015; Tien et al., 2017).

$$Environmental\ disclosure\ index_i\left(CED\right) = \frac{\sum_{i=1}^{t} mt_{ij}}{n_{ij}}, \quad (1)$$

where mt_{ij} – equals 1 if the i company has j environmental disclosure and equals 0 otherwise, n_{ij} – the number of expected questions about j environmental disclosure for the i company.

2.2.2. Dependent variable measurement

Cost of equity is the profit that a company requires to decide whether an investment meets the capital reimbursement requirement (Reverte, 2012). Cost of equity can be measured by capital asset pricing model (CAPM model) or dividend capital model. With such advantages, the dividend capital model is increasingly used. With restrictions on data sources, cost of equity is estimated according to the PEG model (Easton, 2004), which is adjusted as follows:

$$COE_i = \frac{FEPS_{i,t+1}}{P_{it}}, \quad (2)$$

where $FEPS_{i,t+1}$ – predictive EPS (earnings per share) of year $(t+1)^{th}$, P_i – annual average share price of the company i after the date publishing the annual report or annually sustainable development report of year t. Specifically, for state-owned companies (the percentage of state ownership greater than 50%) is after January 31 annually, and other owned companies are after March 31 annually.

2.2.3. Control variables measurement

Company size is an important control variable, which affects the relationship between environmental disclosure and the cost of equity (El Ghoul et al., 2011). Hillman and Keim (2001) argued that large-sized companies have higher levels of environmental disclosure than small and medium-sized companies, due to limited resources to maintain corporate social and environmental responsibility activities compared to larger companies with more infrastructure and higher cash flow. In this study, company size is measured by logarithm of total assets and it is denoted by SIZE.

2.2.3.1. Financial leverage

According to Brammer et al. (2006), companies with the low level of financial leverage often fiel less pressure by stakeholders (creditors). Companies with the low level of financial leverage and the good financial situation will invest more in social and environmental activities than companies with the high level of financial leverage (Crisóstomo et al., 2011). In addition, companies with the high level of financial leverage will get higher bankruptcy risk; therefore, they are active in social and environmental disclosure to reduce agency cost. Financial leverage is measured by liability on total assets. Financial leverage is denoted by LEV.

2.2.3.2. Business line

According to Deegan and Gordon (1996), the business characteristics can strongly influence the relationship between social and environmental disclosure cost of equity. For example, some companies in manufacturing sector in Japan have a clearly higher level of environmental disclosure compared to non-manufacturing companies (Cooke, 1992). In this study, the business line is measured by the rate of increase in earnings per share – denoted by EPS.

2.2.3.3. Liquidity

In order to issue more shares or sell stocks from the option contracts of the company, it is required that companies have to increase the liquidity of stocks by disclosing information to stakeholders (Dhaliwal et al., 2011). However, the research results of Dhaliwal et al. (2011) and Xu et al. (2014) suggested that improving liquidity will increase cost of equity of companies. The liquidity of stocks is denoted by LIQUID.

2.2.3.4. Ownership structure

Xu et al. (2014) argued that state-owned companies perform better social and environmental re-

sponsibilities and they also have the lower cost of equity compared to other companies, but the effect of implementing social and environmental responsibility in reducing cost of equity of state-owned companies is inferior. In addition, with the globalization of the economy, some researchers are also interested in the factors of foreign investors such as Cheng et al. (2015), Dowell et al. (2000). Therefore, the foreign ownership variable in this study is measured by the percentage of foreign ownership in the total number of shares of the company; and state ownership variable is measured by the percentage of state ownership at the company. The ownership structure variable is denoted by SOE and FOR.

2.2.3.5. *Beta*

Lambert (2009) argued that the estimated cost of equity is affected by the fluctuation of beta over time (Reverte, 2012). In this study, beta is measured according to the CAMP model, by regressing the adjusted closing stocks price and closing prices of the entire market (VN-INDEX);

In summary, the control variables are presented in Table 3.

2.3. Regression model

The research uses panel data regression model to assess the impact of environmental disclosure to cost of equity of non-financial companies listed on Vietnamese stock market. The research model proposed is as follows:

$$COE = \beta_0 + \beta_1 CED_{it} + SIZE_{it} + LEV_{it} + \\ + LTG_{it} + LIQUID_{it} + SOE_{it} + FOR_{it} + \\ + BETA_{it} + \varepsilon_{it}, \quad (3)$$

where $i = 1,2,3,...,115$ (i is the company in 115 selected companies in this research), t is the study period from 2014 to 2017.

3. RESEARCH RESULTS

3.1. Descriptive statistics

The descriptive statistics for research variables are presented in Table 4.

The descriptive statistics in Table 4 shows that the measurement of cost of equity (COE) of list-

Table 3. List of control variables and measurement methods

No	Variable	Denotation	Measurement	Sources
1	Company size	SIZE	Logarithm of total assets	Hillman and Keim (2001)
2	Financial leverage	LEV	Liabilities on total assets	Brammer et al. (2006)
3	Business line	LTG	The rate of increase in earnings per share (EPS)	Deegan and Gordon (1996)
4	Liquidity	LIQUID	Short-term assets on short-term debt	Dhaliwal et al. (2011), Xu et al. (2014)
5	State ownership	SOE	Percentage of state ownership	Xu et al. (2014)
6	Foreign ownership	FOR	Percentage of foreign ownership	Cheng et al. (2015), Dowell et al. (2000)
7	Beta	BETA	CAPM model	Razali et al. (2017)

Table 4. Descriptive statistics

Variable	Mean	Maximum	Minimum	Std. dev.
COE	135.4621	1015.335	–414.145	147.5362
CED	0.2404762	1.000000	0.000000	0.2647584
SIZE	12.04348	13.53992	11.10985	0.5335899
LEV	0.4255965	0.966925	0.006119	0.2324288
LTG	–12.9103	752.3837	–2475.23	218.5256
LIQUID	2.61852	26.04	0.019790	3.232946
SOE	0.2698539	0.995400	0.000000	0.305616
FOR	0.1765942	1.846230	0.000000	0.3141296
BETA	0.479765	1.8456491	–0.729	1.84623

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ed companies in Vietnamese stock market in four years 2014, 2015, 2016, and 2017 according to the PEG model of Easton (2004) gives an average value of 135.4621, the maximum value is 1015.335, the minimum value is –414.1450. The environmental disclosure index (CED) of listed companies in Vietnam is still not high with the average value of 0.2404762, the highest value is 1, the minimum value is 0. The main results found out about environmental disclosure through the review of the annual report of companies showed that the number of listed companies on Vietnamese stock market is increasing during the research period. In 2014, there were 38 companies had environmental disclosure; and in 2017, increased to 115 companies had environmental disclosure and some of them performed a very well environmental disclosure such as Vinamilk, Hau Giang pharmacy. More and more companies are aware of the importance of non-financial information disclosure. The information of environment policies, materials and energy is the most commonly publication. These are the environmental information required companies must publish in accordance with Circular 155/TT-BTC.

3.2. Correlation analysis

The table of Pearson correlation coefficients matrix (Table 5) shows that there are 8 variables affecting the equity cost at 10% significance level. In particular, the independent variable – environmental disclosure index (CED) negatively affects cost of equity. Control variables including company size, business line, liquidity, state ownership, foreign ownership have negative effects to the dependent variable – cost of equity. The control variables of financial leverage and beta have positive impacts on cost of equity.

3.3. Analyzing the impact of environmental disclosure on cost of equity of listed companies in Vietnam

Table 6. Regression analysis results

Variable	REM	FEM
C	496.2292 (1.33)	3631.592** (1.92)
CED	–62.48579** (–1.66)	–45.17118 (–1.16)
SIZE	–43.8071 (–1.40)	–315.6285** (–1.98)
LEV	328.2283*** (4.30)	562.1737*** (2.76)
LTG	0.1009296 (0.25)	0.0173611 (0.37)
LIQUID	7.105211 (1.61)	8.22399 (1.61)
SOE	–17.24091 (–0.36)	43.31329 (0.55)
FOR	22.71255 (0.44)	116.8396 (0.55)
BETA	20.75352** (2.05)	48.39977 (1.62)
R-squared	0.2640	0.1322
P-value	0.0004***	0.0775**
Hausman test		
Chi-Sq. statistic	21.703614	–
Prob	0.0055	–
Wald test	–	–
Prob	–	0.0000

Notes: (*) 10% significance level, (**) 5% significance level, and (***) 1% significance level.

The results of the regression analysis show a mixed relationship about the impact of environmental disclosure on cost of equity of listed companies on the Vietnamese stock market. Specifically, the REM model shows a positive and statistically significant correlation between the environmental disclosure and cost of equity at 10% significance level and reconfirms the effect in Table 6, similar to the research of Aerts et al. (2008), Plumlee et al. (2015). On the contrary, the results of the FEM model shows that

Table 5. Correlation coefficients

Variable	COE	CED	SIZE	LEV	LTG	LIQUID	SOE	FOR	BETA
COE	1	–	–	–	–	–	–	–	–
CED	–0.1885***	1	–	–	–	–	–	–	–
SIZE	–0.0402	0.0478	1	–	–	–	–	–	–
LEV	0.4074***	–0.0303	0.1940**	1	–	–	–	–	–
LTG	–0.0627	0.0619	–0.0217	–0.0017	1	–	–	–	–
LIQUID	–0.1563*	0.2336***	–0.2389*	–0.5513***	0.0184	1	–	–	–
SOE	–0.1354	0.0471	0.1248	0.0114	–0.0566	0.0765	1	–	–
FOR	–0.1010	0.1166	0.0859	–0.1550**	0.0510	–0.0257	0.1637	1	–
BETA	0.2810***	–0.1119	0.2216***	0.1766**	–0.1062	–0.1192	–0.1266	–0.1633**	1

the environmental disclosure does not affect the cost of equity of listed companies, similar to the study of Clarkson et al. (2013). However, Hausman test, which is used to select the suitable model between FEM and REM, claims that FEM is the suitable one. Since *p*-value (Chi-squared) = 0.0055 < 0.05, the model suitable for listed companies on Vietnam stock market is FEM. Therefore, testing of model defects will be conducted for the FEM model.

For heteroscedasticity, the authors used Wald test. Test results in Table 6 show that there is heteroscedasticity phenomenon ($p < 0.05$).

3.4. XTSCC

The results overcome the defect of heteroscedasticity in this research model (Table 6).

Table 7. Regression model FEM

Variable	FEM
C	3631.592** (1.86)
CED	−45.17118*** (−6.93)
SIZE	−315.6285** (−1.86)
LEV	562.1737*** (2.76)
LTG	0.0173611 (0.60)
LIQUID	8.22399*** (2.74)
SOE	43.31329*** (3.31)
FOR	116.8396*** (5.11)
BETA	48.39977*** (2.66)
R-squared	0.1322
P-value	0.000***

Notes: (*) 10% significance level, (**) 5% significance level and (***) 1% significance level.

Regression results show that environmental disclosure has a negative impact on cost of equity at 1% significance level. Therefore, the research hypothesis is accepted.

$R^2 = 0.1322$ implies that the independent variables in the model explain 13.22% of the variation of cost of equity of a company.

There are six control variables which affect cost of equity including company size (SIZE), financial leverage (LEV), liquidity (LIQUID), state ownership (SOE), foreign ownership (FOR), and beta (BETA). The company size has a negative impact on this relationship, similar to the research of El Ghoul et al. (2011), Xu et al. (2014), Plumlee et al. (2015). This means that large-size companies will not publish much environmental information to save cost of equity. There is a negative and significant correlation between environmental disclosure and LEV. It is showed that the low levels of environmental disclosure are reported by companies with high LEV and the high LEV companies cannot spend much money on environmental disclosure. This is consistent with the studies of Dhaliwal et al. (2011), Xu et al. (2014), Plumlee and et al. (2015). The ownership structure has a positive impact on environmental disclosure, as well as on this relationship. It means that state-owned and foreign companies have lower environmental disclosure and higher cost of equity capital than other companies, because state-owned companies can be protected by the state. This result is consistent with results from the studies of Li and Zhang (2010).

CONCLUSION AND POLICY IMPLICATIONS

Based on many previous studies and the theoretical framework on the relationship between environmental disclosure and cost of equity, this study has analyzed and evaluated the impact of environmental disclosure on equity cost of listed companies on the Vietnamese stock market.

This research has contributed significantly to providing more empirical evidence for the negative impact of environmental disclosure and equity cost of listed companies on the Vietnamese stock market. This study result is consistent with many previous studies that we found a statistically significantly negative impact between environmental disclosure and cost of equity.

The results in the article are meaningful to not only managers and investors, but also the government and other regulatory agencies in helping them to issue policies related to implementation of

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environmental responsibility. This contributes to saving capital cost, improving value for listed companies and investors.

Any studies will exist some certain limitations and our study is the same. First, the sample size is small (n = 115) and is not highly representative of the whole market. Secondly, this study only considers the relationship between environmental disclosure and cost of equity of non-financial companies. Finally, this study uses GRI guidelines (G4) to measure the environmental information disclosure index so there are some criteria that are not suitable for the Vietnamese context. Therefore, further studies can be established on environmental disclosure index based on Circular 155/TT-BTC to build this index to suit the Vietnamese context.

Based on the empirical results, this study proposes several policy implications to improve the environmental responsibility practice in Vietnam for both the government and business organizations. The state needs to supplement and complete the current legal system in Vietnam to create a solid legal basis for the practice of environmental responsibility. Besides, the state also needs to strengthen propaganda to raise awareness of environmental responsibility and adopt policies to encourage and support companies to practice environmental responsibility. On the side of companies, there exists a need to change their awareness of environmental responsibility practice through short-term training courses, agendas, seminars, technology transfer.

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