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# Does Corporate Environmental Disclosure Affect the Cost of Capital? Evidence from Tunisian Companies

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**Abstract-** We examine the effect of corporate environmental disclosure on the cost of equity capital for a sample of Tunisian firms over the period 2003-2011. Using an approach based on increasing dividends to estimate firms' cost of equity, we find that firms with better environmental disclosure scores exhibit cheaper equity financing. In particular, our findings suggest that investment in practices corporate environmental disclosure contributes substantially to reducing firms' cost of equity. Our paper contributes to the literature by adding evidence on effects of corporate environmental disclosure voluntary on long term economic forecasts of the cost of equity and on the financial value of firms.

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1. DOES CORPORATE ENVIRONMENTAL DISCLOSURE AFFECT THE COST OF CAPITAL? EVIDENCE FROM TUNISIAN COMPANIES

*Strictly as per the compliance and regulations of:*



# Does Corporate Environmental Disclosure Affect the Cost of Capital?

## Evidence from Tunisian Companies

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**Abstract-** We examine the effect of corporate environmental disclosure on the cost of equity capital for a sample of Tunisian firms over the period 2003-2011. Using an approach based on increasing dividends to estimate firms' cost of equity, we find that firms with better environmental disclosure scores exhibit cheaper equity financing. In particular, our findings suggest that investment in practices corporate environmental disclosure contributes substantially to reducing firms' cost of equity. Our paper contributes to the literature by adding evidence on effects of corporate environmental disclosure voluntary on long term economic forecasts of the cost of equity and on the financial value of firms.

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### 1. INTRODUCTION

The association between the environmental corporate disclosure quality and the cost of equity capital is a significant theme in economic theory and practice. Therefore, the objective confirmation and the extensive observation of its role between practitioners propose that environmental disclosure strategy is somehow related to a company's costs of equity funding. In addition, academic study also sustain the positive effect of superior environmental voluntary disclosure to decreasing cost of equity capital by emphasizing its consequence on stock market liquidity and assessment risk. Though, little experiential evidence exists on the precise nature of this correlation, particularly when it comes to so-called regulations law countries member to a "stakeholder" practice of company governance.

The pressure of voluntary disclosure measures on the cost of independence funding has forever been a motivating theme in the financial-accounting research, which can be ranked to academic and empirical. From a theoretical point of vision, an adverse relationship between quality of disclosure Company and cost of equity financing is confirmed, particularly accentuate on

communication ability to power stock market liquidity and evaluation risk. Empirical maintain for the recommended association is also offered by a rising body of studies, trying to measure the correlation between cost of equity capital and quality of environmental corporate disclosures.

This research founded on previous and simultaneous study that present inconsistent results contradictory the relation between corporate social responsibility and corporate environmental disclosure and the cost of equity capital. Richardson and Welker (2001) support a significant positive relationship between social disclosure and the cost of equity capital. In this context, Tsang and Yang (2010) expose confirmation consistent with an opposite relation, while Clarkson, Fang, Li, and Richardson (2010) not succeed to bring a important relation after instruct for firms relative environmental performance. Conclusion in Connors and Silva-Gao (2009) and Sharfman and Fernando (2008) imply that relative environmental performance catch a measurement of firm danger that matters to investors and eventually affects the cost of equity.

Our study is associated to but also impede from the research of Plumlee et al. (2008) and Richardson and Welker (2001). Plumlee et al. (2008) analyses the effect pact of voluntary environmental disclosure on firm value. We examine a broader concept of corporate social responsibility (CSR), which incorporated environmental protection, community development, corporate governance practices, employee relations, multiplicity practices, individual rights, and merchandise quality. In addition, we use a measure of CSR that is diverse from Plumlee et al. (2008). These researchers employ a self-constructed index to measure firms' environmental disclosure quality.

Indeed, to the insufficiency of empirical study on the relation between environmental corporate disclosure and the cost of capital, our attention in firms' equity financing costs is stimulated by the next thoughtfulness. Firstly, the cost of equity capital is the inside price of return so as to the market indented to a firm's potential cash flows to establish its current market value. Accordingly, it is the necessary rate of efficiency specified the market's observation of a company's

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riskiness. If environmental corporate disclosure influences the estimation riskiness of a firm, as we discuss afterward, subsequently socially responsible firms must avail from reduced equity financing costs. Next, correlated research recommends that successful corporate governance, and in particular stricter reporting standards, abase firms' cost of equity capital means of a decrease in agency and information asymmetry problems (Chen et al., 2009).

As we discuss in the following, information asymmetry is considered among technical through which environmental corporate disclosure affects the cost of equity capital. According to the third idea research, the cost of equity correspond to investors' necessary rate of return on corporate investments and consequently is a solution input in firms' long-term investment choice. Exploratory the relation between environmental corporate disclosure and the cost of equity must then assist managers appreciate the result and therefore have significant repercussion for strategic planning. Furthermore, the cost of capital possibly will be the intermediary through which capital markets promote firms to become more socially responsible (Heinkel et al., 2001).

Based on the theoretical study of Merton (1987) and Heinkel et al. (2001), we examine the following hypothesis, environmental corporate disclosure have decrease cost of equity capital than low corporate environmental reporting justification to poor corporate environmental disclosure being related through a modest investor foundation and elevated perceived risks. To calculate firms' cost of equity capital, we will rely an important number of studies in accounting (Hail and Leuz, 2006; Chen et al., 2009) and employ the ex ante cost of equity indirect in analyst earnings forecasts and stock prices. This accounting supports approach present two major advantages. Primary, contrasting usual measures of firm value (Tobin's Q), it permit one to organize for dissimilarity in development rates and predictable future cash flows when approximation firms' cost of equity (Hail and Leuz, 2006). Next, it avoids the use of noisy appreciated returns and the deterioration of traditional asset pricing models to introduce precise approximation of firm-level cost of equity capital (Pástor et al., 2008).

Our studies add to the literature in some level. Indeed, as preceding studies examine whether environmental corporate disclosure influence firm value, this is the first study to our knowledge to use a large panel of Tunisian firms to study the consequence of corporate environmental disclosure on the cost of equity capital.

Our analysis is incite by prior research propose that a significant instrument through which corporate environment disclosure concern firm value is its effects on firm risk (McGuire et al., 1988; Starks, 2009). Our empirical results propose supportive evidence.

The remainder of the paper is organized as follows. In section 2 we review the relevant literature and develop hypotheses. Section 3 provides details of research design, variable measurement, and sample selection, and presents descriptive statistics of the sample. We present our empirical results in section 4 and conclude in section 5.

## II. LITERATURE REVIEW

Financial and environmental information disclosure represents an essential function in decrease information asymmetry among firms and investors. Revelation practices harmonize the role performed by accounting numbers in producing more accurate pictures of firms' economic positions. We can classify communication practices in two axis: (a) obligatory and (b) not required and voluntary or firm-specific. Obligatory disclosure practices are necessary by laws, policy, and widely used company practices. In this class, we can organize all practices that are common to all firms submerged in the same environment. Essential and obligatory disclosure practices complement official disclosure and depend on firms' encouragement to improve enquire external user.

According to Ullmann (1985), the association between corporate environmental disclosure and financial performance is compound and the subsistence of any correlation between these two variables is unexpected. The study to Barnett and Salomon (2006), this correlation is nonlinear. The majority of the empirical research reveals a significant relationship between corporate environmental disclosure and financial performance and no significant relationship with the cost of capital (Botosan and Plumlee, 2002; Graham et al., 2005). This affirmation attracts more the concentration of financial analysts as it provide them specific information which facilitate them to reduce the cost of collecting and treating the information and hence reduce the firm information asymmetry. In this context, the results of Cormier et al. (2009) illustrate information disclosure about the environmental disclosure of Canadian companies decrease information asymmetry. Welker et al. (2001) analysis the relationship between the cost of equity and social and environmental disclosure for a sample of Canadian firms. However, they corroborate a significant positive relationship between the quality of environmental disclosure and the cost of equity. They involve their result to the problem of endogeneity between disclosure and firm characteristics which wasn't taken into consideration.

Required and voluntary disclosure practices can be complements or substitutes. Some firms can round of general regulations by providing information about especial aspects off their business that are not necessary by the measure and standard. Accordingly, a general improvement in the mandatory disclosure level may replacement for disclosure practices that were

earlier voluntarily announced by some firms. Consequently, we suppose voluntary disclosure practices to be slightly more important in countries where the general disclosure environment is poor. We also anticipate discovering advanced cross-sectional difference among firms in that environment. Some firms may have inducement to furnish disclosure levels superior to the normal, while others do not thus generate a larger deviation in disclosure levels than those observed in countries where the general disclosure environment is lofty.

First research exploratory the relationship between environmental reporting and firm value focus on the correlation linking specific environmental concern or actions and stock price or stock price changes. In this context, Barth and McNichols (1994) study that the market evaluates environmental liabilities in excess of that declared by firms reliable with them having an unrealized environmental liability, while Blacconiere and Patten (1994) and Blacconiere and Northcutt (1997) present confirmation of the profit of enhanced environmental reporting.

In another study that analyzed disclosures absent specific actions or liabilities, Richardson, and Welker (2001) explore the association between social disclosures include on annual reports (which contained environmental and social disclosures) and the cost of capital for a illustration of Canadian firms.

They find a surprising positive relation between environmental disclosures and cost of capital and explore whether that relation is due to partiality in social disclosures. While their conclusion propose that enhanced social disclosures amplify cost of capital, which would decrease firm value, the authors confirmed that this does not involve that environmental disclosure has an in general negative effect on the firm and advocate that additional research discuss other favorable effects of environmental disclosures.

Voluntary environmental corporate disclosures possibly will take various profits (Dedman et al., 2008). For example, Dedman et al. (2007) confirmed that corporate from the elevated R&D biotechnology segment advantage as of liberate voluntary disclosures on medicine improvement statement. Prior study has commonly found a negative association between voluntary environmental corporate disclosure and the cost of capital. Hypothetically, Diamond and Verrecchia (1991) conceive that superior environmental corporate disclosure decrease adverse selection cost suitable to information asymmetry, thus improve market liquidity and diminish the cost of capital.

In a similar context, Barry and Brown (1985) established that better environmental corporate disclosures may diminish the evaluation risk that is related with the cost of capital. Indeed, Welker (1995) illustrate that environmental corporate disclosure levels are negatively connected with information asymmetry.

Botosan (1997) arouse a negative dependence between environmental corporate disclosure level and the cost of equity capital for firms with a low analyst subsequent. Additional, Mensah et al. (2003) explain that better corporate environmental corporate disclosure is linked with reduced analyst estimate mistake and dispersions.

This works of research analyze the incidence of environmental corporate disclosure level on the cost of capital and suppose a unique sense association between environmental corporate disclosure and the cost of capital. Nevertheless, we cannot detect a straightforward negative relationship between environmental corporate disclosures and the cost of capital because under some situation, disclosures will amplify investor ambiguity and information asymmetry.

In the same line, Kothari et al. (2009) conceive that the information signaling of environmental disclosure effects the cost of capital and they recommend a strong link between environmental corporate disclosure and the cost of capital (i.e., positive environmental corporate disclosures decrease investors' improbability and the cost of capital while adverse environmental corporate disclosures increase investors' uncertainty and the cost of capital). They content analyze environmental corporate disclosures from management, market analyst, and business press. Nevertheless, they discover that the estimated directional relationship between environmental corporate disclosure and the cost of capital only be present for credible business press environment corporate disclosures and that the market be inclined to reduction environment corporate disclosures from management. In testing environmental corporate disclosures by management, Kothari et al. (2009) center of attention on directive environmental corporate disclosures such as 10-K and 10-Q documents. Though, little attention in the literature has been committed to exploratory the directional effect of voluntary environmental corporate disclosure on the cost of capital.

### III. HYPOTHESES DEVELOPMENT AND METHODOLOGY

#### a) *Hypotheses Development*

Further, the signaling theory speculates the solution choice would encourage managers to offer more voluntary environmental corporate disclosures when information asymmetry is elevated (Verrecchia, 1983). Reliable with signaling theory, Mak (1996) notes that Initial Public Offering (IPO) firms are more tending to environmental corporate disclose management forecasts when they have higher deviation of returns. Verrecchia (1983) suggests that managers are encouraged to environmental corporate disclose good news forecasts to collect a higher firm valuation from investors. Likewise, Trueman (1986) posits that goods news release can translate into a higher market value by



generous investors a more optimistic measurement of managers' talent. Management profits forecasts can affect firm values in two approaches. First, communication of profits forecasts might result in an adjustment in predictable future earnings. Second, management forecasts may enhance the percentage of investors holding the company's securities, thus decrease necessary rates of return. In general, good news forecasts may diminish the adverse-selection component of information asymmetry. Basing on all above arguments, we predict that:

$H_7$ : There is a positive relationship between the expected cost of equity capital and the quality of corporate environment disclosure

#### b) Methodology

##### i. Data description

Companies in our study are characterized by a low level of environmental disclosure. Tunisia appears principally adequate for such type of examination, since Tunisian companies have significant disclosure discretion and approved level of revelation is notably low. The just obligation for companies to be listed on the local exchange is compliance with Tunisia Financial Market Council, which authorized firms with important autonomy in deciding their voluntary disclosure policy. Moreover, a number of prior studies also focus on Tunisian, or comprise it in a supplementary international sample. Consequently, this specific research should make the subtle influence of amplified environmental disclosures voluntary on firms' cost of equity capital more simply measurable.

Overall, there are 32 companies listed on the Tunisian Stock Exchange. The type of firms includes greatest capitalized Tunisian companies, along with some small publicly held companies, trading on the local exchange. This sample of firms involve that a significant bias in a potential environmental disclosure score may exist, because environmental disclosure quality is positively correlated with company's market value (Lang and Lundholm, 1993). Corporate environmental disclosure is negatively related with the firm size and large companies are generally assumed to have a richer environmental disclosure in terms of media and analyst coverage. Though, if there is an adequate cross-sectional variation in the score of environmental corporate disclosure, this should not cause problems for the empirical research.

##### ii. Independent Variable- Cost of equity capital

Cost of equity capital is calculated of the rates of returns implied by current prices and future cash flows, and thus is not straight observable. Prior research affords some approaches to approximation the cost of equity capital (Ohlson and Juettner-Nauroth, 2005; Easton, 2004). The fundamental theory in all methods is

to use analyst forecast data to procure the cost of equity capital by associate the existing stock price to a series of predictable future and abnormal cash flows. Thus, Botosan and Plumlee (2005) evaluate these choice approaches by exploratory the dependence between cost of capital estimates and firm-specific risk (i.e., market risk, leverage, information risk, firm size, and growth). They appraise that the target price technique utilized by Botosan and Plumlee (2002), and the PEG ratio (price/earnings to growth ratio) method explained by Easton (2004) are more consistent as opposed to new methods. The Easton model approximate the cost of capital has been extensively utilized in the literature (Francis et al., 2005).

##### iii. Corporate Environmental Disclosure

To examine the method by which the environmental performance or environmental information is communicated between (2003-2011) by Tunisian companies listed at Tunis Stock Exchange Securities in the first, second and third level (Environmental Reporting) we composed an index publication (PI) on all of the following information:

$$\text{EnvRepPI} = \frac{\sum_{i=1}^n p_i}{m}$$

Where,

n: number of element disclosed, n=3

m: number of possible elements to disclose, m=3

pi: group of elements disclosed

- $[p_1]$  Non-financial information concerning the environmental objectives, the management, the policy and other appearances that can broadcast environment performance in non-financial information. This measure can procreate a value "1" if the company disseminates this information or category "0" if the companies no account information.
- $[p_2]$  Performance indicators have a significant impact on the environment (water, air, soil). These indicators are defined by the Global Reporting Initiative, and other organizations. The indicator is "0" if the company does not disclose such information, "1" if the company reports communicate these indicators, although these indicators are not associated with the indicators set out in international guidelines and recommendations.
- $[p_3]$  Financial indicators (investments and acquisitions of environmental assets, costs, provisions). These indicators expose in monetary terms the behavior of firms regarding environmental reporting. Values can be "0" if the company does not advertise this information or "1" if the company indicates such information.

This way of quantifying environmental information allows the incorporation of all kinds of information in single figure comparable companies and is not very subjective and based, as it is not a review qualitative analysis. According to researchers is not always the same with the point of view of the investor in terms of environmental reporting importance and transparency.

Indeed to test empirically the association between Environmental Corporate disclosure score and the cost of equity ( $r$ ), we estimate the following model:

Where  $r$  = cost of equity capital

$$r_{i,t} = D_{i,t+1}/V_{i,t} + g$$

Where:

$r_{i,t}$ : the cost of equity of the firm  $i$  in  $t$ .

$D_{i,t+1}$ : the dividend paid by the firm  $i$  in  $t + 1$ .

$V_{i,t}$ : the market value of the share of the firm  $i$  in  $t$ .

$g$ : the growth rate of the dividend yield predictable as the dividend growth over the previous year.

#### iv. Control Variables

In order to control the effect of additional determinants of the cost of capital, we utilize firm characteristics variables such as market capitalization, leverage, and market to-book ratio.

As the research work of Kothari et al. (2009), these three measures are important determinants of the cost of capital. Because we examine the evolution in cost of capital as a replacement for of examining its level, these intervening effects are expected to be less significant in the models. Though, to be reliable with prior studies, we employ these control variables.

Little firms are riskier than big firms, thus, we anticipate a negative coefficient on market capitalization (Rogers et al., 2009). Extremely levered firms are correlated with higher risks, so we predict a positive coefficient on leverage. Furthermore, prior studies use development opportunity (i.e., the market to book ratio) as a proxy for proprietary cost (Ajinkya et al., 2005). Growth opportunities show the availability of beneficial projects. Bushman and Smith (2001) argue that environmental corporate disclosure is a mechanism through which a firm can lower its cost of capital to back growth opportunities. We consequently contain market-to book ratio in our regressions, and we anticipate a negative coefficient on growth opportunity.

Therefore, hypothesis one is tested by taking all variables into consideration and using the following regression model:

$$\text{Cost of Capital}_{i,t} (r_{i,t}) = \alpha + \beta_1 (PI) + \beta_2 MC + \beta_3 MB + \beta_4 LEV + \varepsilon_i$$

Where:

$r_{i,t}$ : the cost of equity of the firm  $i$  in  $t$ .

PI: index publication of corporate environmental disclosure.

MC: represents log of the market capitalization estimated by total number of outstanding common shares multiplied by stock price at the beginning of the year.

MB: is log of market-to-book ratio at the beginning of the year.

LEV: is long-term debt at the beginning of the year deflated by total assets at the beginning of the year.

## IV. RESULTAS AND DISCUSSION

In this study, the method used is panel data because we have data for 23 companies and 8 years, which gives us 168 observations. The variables of this study can be classified into three types: dependent variable, independent variables and control variables.

The data are consolidated over time or eight years examined 2003-2011 inclusive. Panel data are better able to absorb and measure effects that are just downright not visible in pure transverse or pure time series data.

#### a) Descriptive Analysis

Descriptive statistics are tested for each Corporate governance systems and firms specificities. The results of the descriptive statistics are shown in Table 1.

Table 1: Descriptive Statistics

Variables	Mean	SD	Max	Min
$r_i$	0.082	0.212	0.326	0.041
PI	1.494	0.823	3	0
MC	0.762	0.017	1.820	0.173
MB	0.185	0.161	1.483	0.092
LEV	0.406	0.292	1.468	0.064

Table 1 also analyzes the descriptive statistics related to our cost of equity capital approximated and control variables. To determine the descriptive statistics, we use 168 sample observations. We compute the descriptive statistics of the cost of capital employing all observations across the years 2003–2011. The mean (median) estimates of the cost of capital and corporate environmental disclosure are 9.2% and 1.494, respectively. On the other hand, the median MC is 0.762, while mean (median) LEV is 0.432. When we measure MB, we took the natural log of market-to-book ratio to control for the outliers. However, the majority of the sample companies are in debt. There seems to be a wide variation between the minimum values among the society and maximum attributes. This result is expected due to the consideration of a wide range of companies of different sizes, degrees of environmental sensitivity and different levels of profitability, debt, as well as various positions on the list.

### b) Correlation Analysis and Examination of Multicollinearity

Concerning the most information from of corporate environmental disclosure, it is also significant positive relationship between board independence and the disclosure quantity of each environmental issue related to environmental policy changes, products, environmental auditing and sustainability. There is a negative significant correlation between the role of leverage and the cost of equity. Index publication of corporate environmental disclosure significantly and positively associated with cost of equity.

Results exhibit a significant positive identically dependence between the cost of equity and companies specificity, including firm size (market capitalization), and ratio of market-to-book. No significant relationship was found between cost of equity and each log-term debt (LEV) measure.

In an exclusive way the coefficient of correlation between the two independent variables, measuring the financial value of company, more particularly, there is little multicollinearity between market capitalization and ratio market-to-book, where Pearson and Spearman coefficients dependency are 0.781 and 0.792 correspondingly. We confirm this result given that are two measures that getting close and gathered to determine the value of the firm. Furthermore, as such multicollinearity is simply somewhat higher than the ideal limit, results signify that multicollinearity is improbable to be a powerful problem.

The likely existence of multicollinearity is also considered by the explanation of the variance inflation factor (VIF). Table 2 analyzes the variance inflation factor

(VIF) and tolerance coefficients of each illustrative variable. The table illustrates that the maximum VIF is 3.53, in addition, the smallest tolerance coefficient is 0.28. Finally, the results of VIF and tolerance coefficients discover that there is no intolerable degree of multicollinearity between the variables in our study dealing with Tunisian firms, ensures that there is no require to worry about the correlation between the illustrative variables.

**Table 2 :** Variance inflation factor (vif) of corporate environmental disclosure and corporate characteristics

Variable	VIF	Tolerance 1/VIF
PI	1.78	0.56
MC	3.53	0.28
MB	2.91	0.34
LEV	2.41	0.41

The results of the tests show the absence of a multivariate multicollinearity problem. The Hausman test results indicate that the random effect is preferred.

### c) Regression Analysis

Multiple regression examination by Ordinary Least Squares (OLS) longitudinal panel regression with robust standard error is engaged to test the developed research hypotheses. Such multivariate study supposes to analyze the association between cost of equity and corporate environmental disclosure and control variables measuring the financial value of company and debts.

Empirical results of the Ordinary Least Squares (OLS) regression of cost of equity and corporate environmental disclosure quantity are exposed in Table 3.

**Table 3 :** OLS Longitudinal Panel Regression with Robust Standard Error of Cost of Equity ( $r_{it}$ )

Variable	Cost of Equity ( $r_{it}$ )	
	Coeff.	p-value
<i>Intercept</i>	4.38	0.341
<i>PI</i>	0.28**	0.001
<i>MC</i>	0.31**	0.024
<i>MK</i>	12.76**	0.058
<i>LEV</i>	-0.72**	0.081
<i>Adjusted R<sup>2</sup> (%)</i>	27.96	

*PI: Index Corporate Environmental Disclosure, MC: Market Capitalization, MK: Market-to Book, LEV: Leverage; \*\*\* $p \leq 0.01$ , \*\* $p \leq 0.05$ , and \* $p \leq 0.10$ .*

Table 3 analyses the results of Ordinary Least Squares (OLS) longitudinal panel regression with robust standard error cost of equity.

Correlation coefficients of the cost of equity ( $r_{it}$ ) variable with the control variables show a statistically significant correlation with corporate environmental disclosure, market capitalization, ratio of market-to book and % leverage. These results are consistent with the descriptive analysis in Table 3, supporting the relationship between cost of equity and corporate environmental disclosure voluntary.

In this context, we find that, the results show a significant positive association between cost of equity and total corporate environmental disclosure ( $p \leq 0.01$ ). Results also indicate a strong significant positive association of cost of equity total with each of market capitalization ( $p \leq 0.05$ ), market-to book ratio ( $p \leq 0.1$ ). The adjusted R square of the model is 27.96% which indicates that 27.96% in the changes in cost of equity are explained by changes in the examined determinants. Results also expose an important negative relationship between cost of equity and corporate specifics including

company leverage ( $\rho \leq 0.1$ ); the insignificant relationship of debt to cost equity is confirmed for most of the disclosure categories.

## V. IMPLICATIONS AND CONCLUDING REMARKS

The focus of this study is to examine the effects of corporate environmental disclosure on the cost of equity capital. Specifically, we posit that good news of environmental disclosure contain different information content and therefore have asymmetric impacts on the cost of equity capital. Using a sample spanning from 2003 to 2011, we find that environmental disclosure voluntary a significant increases in the cost of equity capital.

This paper extends the previous literature by directly examining the effects of corporate environmental disclosure voluntary on the cost of equity capital. Our study also contributes to a better understanding of the costs and benefits of voluntary disclosure. However, our results recommend that there is an asymmetric function of good news of corporate environmental disclosure versus bad news on the cost of equity capital. As a matter a fact, not all types of voluntary disclosures decrease investors' uncertainty about future cash flows. This finding suggests that policy makers emphasize the credibility of corporate environmental disclosure voluntary to fully achieve the target of reducing the cost of capital.

This research has some limits, based little company size and short horizon. It has considered the environmental information disclosed only in management annual reports, while other reporting media are used by companies such as websites and the press. Other variables that can explain the societal process of the company could be used as well as other methods of calculating the future cost of equity.

Our study uses environmental disclosure as a proxy for voluntary disclosures. However, a firm's cost of equity capital can be affected by other types of voluntary disclosures (e.g., voluntary disclosures of future cash flow and corporate research, development, corporate social reporting, reports of sustainable development). In addition, there are other technical and strategy to estimating underlying market uncertainties related to firm valuation.

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