WHO CARES ABOUT YOUR GREEN REPUTATION? EVIDENCE FROM "FINANCIAL WATCHDOGS"

DANH TIẾNG XANH VÀ PHẢN ỨNG TỪ CÁC ĐƠN VỊ GIÁM SÁT TÀI CHÍNH

Hoang Duong Viet Anh, Dang Huu Man*, Nguyen Thanh Khanh Quynh

The University of Danang - University of Economics, Vietnam

*Corresponding author: man.dang@due.edu.vn

(Received: March 19, 2024; Revised: May 04, 2024; Accepted: May 06, 2024)

Abstract - This study investigates the importance of firm-level green reputation on client-side financial watchdogs' reactions characterized by audit fees and credit ratings. Using a comprehensive sample of US-listed firms over 2007-2020, we find that firms with high environmental reputation risk (ERR) are positively associated with higher audit fees, and they also tend to receive lower credit ratings. We further document that corporate governance emerges as a significant factor moderating the effect of ERR on the responses of financial watchdogs. This highlights the importance of strong governance practices in mitigating the adverse impacts of ERR on audit fees and credit ratings. Overall, our study contributes insights into the importance of green reputation for corporate decision-making from the lens of financial watchdogs.

Key words - Green reputation; financial watchdogs; audit fees; credit ratings; governance environment.

Tóm tắt - Nghiên cứu này xem xét tầm quan trọng của danh tiếng xanh đối với phản ứng của các đơn vị giám sát tài chính từ phía khách hàng, được đặc trưng bởi phí kiểm toán và xếp hạng tín dụng. Sử dụng mẫu gồm các công ty niêm yết tại Hoa Kỳ trong giai đoạn 2007-2020, nghiên cứu nhận thấy các công ty có rủi ro danh tiếng môi trường (ERR) cao có mối quan hệ cùng chiều với phí kiểm toán và có xu hướng nhận xếp hạng tín dụng thấp. Nghiên cứu cũng nhận thấy quản trị công ty là một yếu tố quan trọng điều chỉnh tác động của ERR đến phản ứng của các cơ quan giám sát tài chính. Điều này nhấn mạnh tầm quan trọng của các cơ chế quản trị mạnh trong việc giảm thiểu tác động bất lợi của ERR đối với phí kiểm toán và xếp hạng tín dụng. Nhìn chung, nghiên cứu này bổ sung thêm bằng chứng về tầm quan trọng của danh tiếng xanh đối với việc ra quyết định của công ty từ góc nhìn của các đơn vị giám sát tài chính.

Từ khóa - Danh tiếng xanh; đơn vị giám sát tài chính phía khách hàng; phí kiểm toán; xếp hạng tín dụng; môi trường quản trị.

1. Introduction

Traditionally, credit rating agencies (CRAs) and auditors have primarily focused on firms' financial health, assessing corporate performance in terms of liquidity, leverage, profitability, and cash flow. However, with increasing environmental concerns and rising stakeholder expectations, a new measure, environmental reputation risk (ERR), is gaining significant traction. Put differently, integrating green reputation into corporate evaluations alongside traditional financial measures is becoming crucial in today's growing business landscape [1].

Further, environmental issues are no longer peripheral concerns. Climate change, resource depletion, and pollution pose significant threats to businesses and society at large. Dimitropoulos and Koronios [2] highlight the confluence of regulatory pressures and industry expectations that compel companies to address environmental reputation risk. A tarnished environmental reputation can lead to financial losses through fines, boycotts, and operational disruptions [3]. On the other hand, a strong green reputation can enhance brand image, attract responsible investors, and unlock new market opportunities [4].

In response to these developments, CRAs and auditors, acting as important checks within the financial system and contributing to transparency and accountability, are expanding their scope to encompass environmental considerations. This aligns with the broader trend of stakeholders demanding greater corporate accountability on environmental issues. For instance, the International Accounting Standards Board (IASB) now requires auditors to assess the effects of climate risks on a firm's financial performance [5]. Similarly, previous studies show that higher audit quality, which includes consideration of environmental factors, facilitates smoother capital-raising processes [6].

CRAs and auditors may not have the same regulatory authority as government agencies, but they can be considered financial watchdogs in a broader sense. Since their primary roles are to oversee and assess the financial aspects of companies, they fulfill a watchdog role in monitoring financial health and stability.

Notably, numerous studies have focused on a range of factors, such as corporate risk disclosure, firm size, compliance with regulations, corporate governance, firm performance, earnings management, profitability, revenues, and debt levels [7-14]. However, little attention has been paid to how these factors influence the reactions of financial watchdogs regarding green reputation, as evidenced by audit fees and credit ratings. This research aims to uncover these relationships. Understanding them can help firms make well-informed decisions that balance environmental responsibility with long-term financial viability. Therefore, our research contributes to the existing literature in two important ways:

First, we extend prior research on the green reputation-audit fees relationship by considering the impact of additional variables that may influence this relationship, such as audit firm tenure, business segment, and seasoned equity offerings. We also provide stronger evidence of a negative association between green reputation and credit ratings, as measured by S&P debt ratings, and conduct

robustness tests to enhance the reliability of our findings.

Second, our results offer new insights into how environmental reputation risk affects firms' audit fees and credit ratings. We also show that a stronger governance environment characterized by better board independence can moderate the influence of ERR on financial watchdogs' responses.

2. Literature review and hypothesis development

Reputation can be defined as the perceptual representation of a firm's past actions and future prospects, describing the firm's overall appeal to its stakeholders when compared to other leading competitors [15]. The role of ethics and social activities has recently increased and is considered as crucial as economic performance. Environmental, Social, and Governance (ESG) standards have become an important corporate governance model. External factors, such as government regulations or peer pressure, can motivate firms to pursue a green reputation. A company's ERR reflects its environmental responsibility and can be closely related to its values and priorities.

Qian et al. [16] look at the effect of the green credit policy using a difference-in-differences (DID) model. They find that auditors can identify the environmental risks associated with this policy, resulting in higher audit fees. Similarly, Yang et al. [17], Tan et al. [18], and Yao et al. [19] also suggest that companies with higher potential environmental risks tend to face significant audit fees.

According to Simunic [20], Francis [21] audit fees are determined based on the expenses associated with audit procedures and the risk of audit failures. Firms with a higher level of green reputation risk often face more complex audit requirements. Auditors may need to conduct additional procedures to assess the company's compliance with environmental regulations and sustainability practices. This expanded scope of work can contribute to higher audit fees [22].

Further, firms with a significant green reputation risk often attract even greater public and regulatory inspection. Auditors may need to dedicate more resources to address these specific risks and ensure compliance with evolving environmental standards. The increased regulatory environment can lead to increased audit complexity and associated costs [19], [23]. Also, lower environmental responsibility practices could pose risks to a firm's reputation and financial stability. Auditors may perceive higher inherent risk in auditing such firms, which could result in increased audit fees to compensate for the elevated risk exposure and potential consequences of audit failures [1].

Therefore, we posit that when firms face with the environmental risks, auditors tend to perform more audit actions and tolerate the higher risk of audit failure, leading to the higher audit fees. Our first hypothesis is as follows:

H1. *Firms with higher green reputation risk experience greater audit fees.*

Credit ratings play a significant role in assessing a company's ability to repay debt, influencing its access to capital markets, cost of capital, and finally, its likelihood of default [24]. Dehaan [25] notes that CRA collect information about a company's senior management and assess how companies handle their financial and business risks.

Branco & Rodrigues [3] find that ERR can lead to financial losses through fines, boycotts, and operational disruptions. Similarly, Wang et al. [1] suggest that firms with higher environmental issues could pose risks to a firm's reputation and financial stability. Therefore, firms with greater environmental responsibility risk potentially result in lower credit ratings from credit rating agencies.

Other studies, such as Kothari et al. [26], suggest that innovative companies often undertake on more risk. Dang et al. [27] emphasize that CRAs, similar to auditors, closely consider a company's business strategies along with quantitative characteristics. Following these arguments, we can infer that firms with high-risk business strategies are likely more prone to default, resulting lower credit ratings from CRAs. Conversely, companies with conservative and sustainable business strategies aligned with ESG standards tend to exhibit lower risk profiles, reducing likelihood of default and leading to higher credit ratings.

In summary, we posit that firms with higher green reputation risk are more likely to experience lower credit ratings due to perceived financial risks, reputation concerns, and the alignment of business strategies with sustainability and risk management practices. Therefore, besides facing increased audit fees, higher green reputation risks also negatively impact credit ratings. The hypothesis is as follows:

H2. *Firms with higher green reputation risk experience lower credit ratings*.

Previous research highlights the positive impact of good corporate governance (CG) on reducing agency costs, curbing overinvestment, and enhancing firm performance [28]. Whereas, weak CG can undermine a firm's financial stability, increasing the risk of default and creditor losses [29]. Alali et al. [30] also demonstrate that firms with robust CG often receive higher bond ratings due to enhanced monitoring by large shareholders and increased transparency, which effectively mitigates agency conflicts and creditor risks. In other words, strong CG enables firms to reduce information asymmetry and promote transparency, thereby enhancing their ability to manage agency conflicts and mitigate creditor risks.

It is likely that firms with a higher degree level of environmental risk tend to exhibit higher information asymmetry and less environmental information transparency. This increased asymmetry often leads to higher audit fees since auditors must take more actions and face a higher risk of audit failure. Moreover, information asymmetry and less transparency enhance creditor risks. As a result, we argue that the adverse effects of green reputation risk on financial watchdogs' responses are amplified in firms with weaker corporate governance environments. Therefore, we propose the following hypothesis:

H3. *The negative relationship between green reputation risk and financial watchdogs is more pronounced in a weaker governance environment.*

3. Research design

3.1. Sample

Our study focuses on publicly listed firms on US stock exchanges by using data from the RepRisk and Audit Analytics databases spanning the period from 2007 to 2020. The year 2007 signifies the initial availability of ERR data for a significant number of U.S. firms within the RepRisk database.

To ensure data quality and consistency, we first identified firms with at least two years of data in the Compustat database. Subsequently, we excluded firms lacking audit fee data in the Audit Analytics database. This rigorous process resulted in a final dataset comprising 15,371 firm-year observations.

Table 1 presents the descriptive statistics for our research variables. The average ERR score of 1.8417 indicates a moderate level of ERR across the dataset. However, the median ERR value of 0.00 suggests a skewed distribution, with a remarkable portion of firms exhibiting very low or zero ERR, indicating that firms with minimal environmental reputation risks are prevalent in the dataset. Despite this, the high standard deviation with the value of 4.27 highlights significant heterogeneity among firms regarding environmental reputation risks.

Table 1. *Descriptive statistics of firm characteristics*

Variables	Mean	Median	25%	75%	SD
ERR	1.8417	0.0000	0.0000	0.0000	4.2720
AUDFEE	10.9890	11.0314	10.1754	11.7514	1.1036
S&P24	18.4100	18.0000	16.0000	20.0000	2.8104
S&P22	12.2500	12.0000	10.0000	15.0000	3.3510
S&P17	9.3301	9.0000	6.0000	9.0000	1.4005
SIZE	7.5630	7.5752	6.3759	8.7220	1.8295
NONAFEE	10.9127	12.4841	10.8390	13.6820	4.2435
LOSS	0.2258	0.0000	0.0000	0.0000	0.4181
BUSY	0.8464	1.0000	1.0000	1.0000	0.3606
ROA	0.0217	0.0414	0.0073	0.0811	0.1604
AUOP	0.0952	0.0000	0.0000	0.0000	0.2935
BIG4	0.8678	1.0000	1.0000	1.0000	0.3387
GEOSEGMENT	1.6827	1.4142	1.0000	2.0000	0.6580
BUSSEGMENT	2.5998	2.4495	1.7321	3.4641	0.8523
FORSALES	0.0033	0.0005	0.0002	0.0019	0.0089
SPECIAL	0.7665	1.0000	1.0000	1.0000	0.4231
LEV	0.2594	0.2321	0.0813	0.3797	0.2222

Table 1 also provides descriptive statistics for credit ratings using three different S&P credit rating scales: S&P 24-point (S&P24), S&P 22-point (S&P22), and S&P 17-point (S&P17). These scales assign ordinal values, with higher values indicating better credit quality. The mean credit ratings are 18.41 for S&P24, 12.25 for S&P22, and 9.33 for S&P17, suggesting relatively high credit quality among the firms in our sample. These findings align with previous research by [4], [31], and [32].

3.2. Model

To explore the relationship between firm-level environmental reputation risk and audit fees, we use the specification model for panel data as shown in Equation (1):

$$AUDFEE_{i,t} = \alpha + \beta_1 ERR_{i,t-1} + \Sigma_c \beta_c Control_{c,i,t-1} + \Sigma_k \gamma_k Year_k + \Sigma_d \gamma_d Industry_d + \varepsilon_{i,t} \quad (1)$$

In this equation: $AUDFEE_{i,t}$ represents the audit fees for firm i in year t. $ERR_{i,t-1}$ is the environmental reputation risk (*ERR*) of firm *i* in the previous year (*t-1*). For control variables, we use one year lagged variables, including firm size (*SIZE*), financial ratios (*MB, LEV*), fees (*NONAFEE*), performance (*ROA*), industry (*LITIGATION*), audit characteristics (*BIG4, BUSY, AUOP, AUCHANGE*), and firm complexity (M&A, *GEOSEGMENT, BUSSEGMENT, FORSALES, SPECIAL, SEO, SQRTEMPL, LOSS*).

To investigate the impact of environmental reputation risk at the firm level on credit ratings, we employ Equation (2):

$$RATINGS_{i,t} = \alpha + \beta_1 ERR_{i,t-1} + \Sigma_c \beta_c Control_{c,i,t-1} + \Sigma_k \gamma_k Year_k + \Sigma_d \gamma_d Industry_d + \varepsilon_{i,t} \quad (2)$$

In this equation: $RATINGS_{i,t}$ represents the credit ratings for firm *i* in year *t*, using a numeric conversion of S&P debt ratings on 24, 22, or 17 point scale, where higher values indicate better creditworthiness (e.g., AAA = highest, D = lowest). This approach aligns with previous research [25], [31], [32]. Specifically, we converted these letter ratings into ordinal values using three scales: the S&P 24-point scale (S&P24), the S&P 22-point scale (S&P22), and the S&P 17-point scale (S&P17). These scales assign the highest to lowest credit quality values for each rating, ranging from 24 to 1 for S&P24, 22 to 1 for S&P22, and 17 to 1 for S&P17. For control variable, we use one-year lagged variables, including firm size (*SIZE*), leverage (*LEV*), operating performance (*ROA*), market valuation (*MB*), operational performance (*LOSS, TANG*), financial health (*INTCOV*), riskiness (*SDRET*), and ownership structure (*IO*).

Also, industry and year effects are included in both equations to control for fixed effects that may influence the relationship between the independent and dependent variables. Specifically, firms operating within the same industry may face similar environmental risks, regulatory environments, and stakeholder expectations. Controlling for industry effects allows us to account for any systematic differences in firms across different sectors, Besides, economic conditions, regulatory changes, and market trends can all vary from year to year. Controlling for year effects helps us isolate the impact of these fixed factors the relationship between ERR and audit fees or credit ratings variables.

4. Empirical results

Table 2 presents the results for the regression of audit fees on firm-level environmental reputation risk. After controlling for industry and year effects, the coefficient estimates for ERR variable is 0.0043 (t-stat=2.19) in column (1). When we further control for firm-level characteristics, the coefficient for ERR variable remains positive and increases to 0.0061 (t-stat=3.21) in column (2). These results indicate that firm-level environmental reputation risk is significantly and positively associated with audit fees. Therefore, this finding supports our first research hypothesis, suggesting that firms facing higher environmental reputation risk tend to incur higher audit fees.

Table 2. *The impact of environmental reputation risk on audit fees*

Variables	*(1)*	*(2)*
ERR	**0.0043**	**0.0061**
	(2.19)**	**(3.21)*****
SIZE		0.3588
		(37.54)***
NONAFEE		0.0237
		(9.68)***
LOSS		0.0829
		(4.24)***
BUSY		0.0651
		(2.25)**
ROA		-0.1519
		(-3.04)***
AUOP		0.1307
		(2.10)**
BIG4		0.3274
		(10.14)***
GEOSEGMENT		0.0841
		(4.16)***
BUSSEGMENT		0.1176
		(7.11)***
FORSALES		0.0998
		(0.10)
SPECIAL		0.1512
		(9.28)***
LEV		0.0571
		(1.37)
AUCHANGE		0.1184
		(0.55)
MB		0.0263
		(2.19)**
LITIGATION		0.0156
		(0.72)
INHERENT		0.2422
		(3.50)***
M&A		0.157
		(9.93)***
SEO		0.0204
		(1.05)
SQRTEMPL		0.0572
		(8.74)***
Constant	Yes	Yes
Industry and Year effects	Yes	Yes
Adj R^2	0.7617	0.7936
Nobs	15,371	15,371

*The t statistics are reported in parentheses. Superscripts *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively.*

To further examine the impact of the ERR variable on credit ratings, we conduct regressions of the ERR variable on S&P24, S&P22, and S&P17, with results reported in Table 3. We find that the ERR coefficients are statistically significant and negatively correlated with S&P letter ratings across the three S&P debt rating scales, S&P24, S&P22, and S&P17 in columns (1), (2), and (3). Moreover, the coefficients for the ERR variable still achieve a solid statistical significance level of 1%, suggesting a robust relationship between ERR and credit ratings. These results again strongly support our second hypothesis that firms with higher green reputation risk experience lower credit ratings.

Table 3. *The impact of environmental reputation risk on firm debt ratings*

Variables	S&P24 (1)	S&P22 (2)	S&P17 (3)
ERR	**-0.2408**	**-0.2193**	**-0.1652**
	(-11.52)***	**(-10.48)*****	**(-9.54)*****
SIZE	0.8525	0.8416	0.7742
	(25.67)***	(24.82)***	(22.61)***
LEV	-1.1808	-1.0963	-1.4425
	(-18.85)***	(-17.45)***	(-15.08)***
ROA	1.9539	1.8225	0.7428
	(6.42)***	(6.11)***	(4.34)***
MB	-0.0019	-0.0011	-0.0002
	(-0.86)	(-0.69)	(-0.42)
LOSS	-0.8856	-0.8107	-0.6020
	(-14.11)***	(-13.85)***	(-11.24)***
TANG	0.3564	0.3417	0.2241
	(9.81)***	(9.15)***	(8.32)***
INTCOV	0.0010	0.0010	0.0000
	(2.25)**	(2.21)**	(1.85)*
SDRET	-2.8552	-2.5361	-2.1634
	(-29.67)***	(-27.14)***	(-22.44)***
IO	1.1905	1.0854	0.8416
	(11.42)***	(10.32)***	(9.17)***
Constant	9.3144	9.0741	8.3664
	(26.24)***	(22.34)***	(20.18)***
Industry and Year effects	Yes	Yes	Yes
Adj R^2	0.5926	0.5833	0.5024
Nobs	15,371	15,371	15,371

*The t statistics are reported in parentheses. Superscripts *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively.*

To address the potential for reverse causality and endogeneity concerns in our analysis, we conduct robustness tests for the relationship between audit fees (credit ratings) and green reputation risk. Table 4 and Table 5 report the panel regression results of auditor fees (credit ratings) on environmental reputation risk with respect to (i) controlling for firm and year fixed effects (Panel A), (ii) using a subsample of financially distressed firms (Panel B), and (iii) using the alternative independent variable approach (Panel C), specially, we use ENVCOST measured as the total direct and indirect environmental cost as an alternative independent variable for ERR.

Table 4 shows that the ERR coefficients remain positive and statistically significant in all models across Panels A, B, and C. These results again confirm our first hypothesis that firms facing higher environmental reputation risk tend to incur higher audit fees.

Table 5 also suggests that firms with higher green reputation risk experience lower credit ratings as the ERR coefficients for all of the regressions in the table are negative and highly significant. These results further support our second hypothesis.

Table 4. *Robustness tests for the relationship between audit fees on green reputation*

Variables	Panel A: Firm fixed effects	
	(1)	*(2)*
ERR	**0.0021**	**0.0043**
	(2.18)**	**(2.94)*****
Constant	Yes	Yes
Control variables	No	Yes
Firm and Year effects	Yes	Yes
Adj R^2	0.8906	0.9430
Nobs	15,371	15,371
	Panel B: Financially distressed firms	
ERR	**0.0086**	**0.0132**
	(4.12)***	**(7.63)*****
Constant	Yes	Yes
Control variables	No	Yes
Industry and Year effects	Yes	Yes
Adj R^2	0.7517	0.7849
Nobs	6,806	6,847
	Panel C: Alternative independent variable	
ENVCOST	**0.0827**	**0.0981**
	(2.36)**	**(2.77)*****
Constant	Yes	Yes
Control variables	No	Yes
Industry and Year effects	Yes	Yes
Adj R^2	0.7548	0.7935
Nobs	15,371	15,371

*The t statistics are reported in parentheses. Superscripts *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively.*

Table 5. *Robustness tests for the relationship between credit ratings on green reputation*

Variables	S&P24 (1)	S&P22 (2)	S&P17 (3)
	Panel A: Firm fixed effects		
ERR	**-0.2198**	**-0.1964**	**-0.1417**
	(-11.24)***	**(-9.82)*****	**(-7.52)*****
Constant	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
Firm and Year effects	Yes	Yes	Yes
Adj R^2	0.4285	0.4221	0.4016
Nobs	15,371	15,371	15,371
	Panel B: Financially distressed firms		
ERR	**-0.2547**	**-0.2271**	**-0.1508**
	(-12.63)***	**(-10.42)*****	**(-7.96)*****
Constant	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
Firm and Year effects	Yes	Yes	Yes
Adj R^2	0.4965	0.4417	0.4184
Nobs	6,528	6,528	6,528
	Panel C: Alternative independent variable		
ENVCOST	**-0.0752**	**-0.0684**	**-0.0247**
	(-4.16)***	**(-3.47)*****	**(-2.18)****
Constant	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
Firm and Year effects	Yes	Yes	Yes
Adj R^2	0.4168	0.4032	0.3526
Nobs	15,371	15,371	15,371

*The t statistics are reported in parentheses. Superscripts *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively.*

Table 6 presents the results examining how the corporate governance environment influences the relationship between environmental reputation risk and financial watchdogs, specifically audit fees (Panel A) and credit ratings (Panel B). We use Board Independence (BI) as the proxy to measure corporate governance. Firms in our sample are divided into two groups based on those with high board independence and those with low board independence. We then conduct separate regressions for each group and report the outcomes in Table 6.

Table 6. *The role of governance environment*

Variables	*AUDFEE*	
	High-BI	*Low-BI*
ERR	**0.0016**	**0.0079**
	(2.19)**	**(4.82)*****
Constant	Yes	Yes
Control variables	Yes	Yes
Industry and Year effects	Yes	Yes
Adj R^2	0.7455	0.8085
Different in Coefficient	0.0063	
χ^2	[11.57]***	
Nobs	4,374	5,041

	RATINGS (S&P24)	
	High-BI	*Low-BI*
ERR	**-0.2187**	**-0.2753**
	(-10.63)***	**(-14.35)*****
Constant	Yes	Yes
Control variables	Yes	Yes
Industry and Year effects	Yes	Yes
Adj R^2	0.4065	0.4986
Different in Coefficient	-0.0566	
χ^2	[14.21]***	
Nobs	5,125	7,244

*The t statistics are reported in parentheses. Superscripts *, **, and *** denote significance levels of 10%, 5%, and 1%, respectively.*

Our findings indicate that environmental reputation risk is positively associated with audit fees and negatively associated with credit ratings for firms in both high and low board independence groups. Importantly, the coefficients are larger in the low board independence group, suggesting that more robust governance practices moderate the negative impact of environmental reputation risk on financial watchdogs.

These results support our hypothesis, confirming that the adverse effects of green reputation risk on financial watchdogs' reactions (e.g., increased audit fees and decreased in credit ratings) are more pronounced in firms with weaker corporate governance environments. This highlights the importance of strong governance in mitigating the negative impacts of environmental reputation risk on audit fees and credit ratings.

Overall, our findings reveal a negative association between environmental reputation risk at the firm level and financial watchdogs. Firms with higher environmental reputation risk tend to experience higher audit fees and receive lower credit ratings. This is because auditors face more audit actions and tolerate a higher risk of audit

failure, while credit rating agencies are concerned with the firm's reputation, financial stability, and increased likelihood of default.

5. Conclusion

Our study provides new insights into the impact of firm-level environmental reputation risk on the responses of financial watchdogs. We find that firms exposed to higher levels of environmental reputation risk are more likely to pay higher audit fees for more accurate financial reporting and undergo more extensive auditing. Also, these firms receive lower credit ratings from credit rating agencies, as they are concerning about the firm's reputation, financial stability, and increased likelihood of default. These results are robust to a variety of robustness checks.

We also find that corporate governance plays an important role in mediating the effect of environmental reputation risk on the responses of financial watchdogs. Specifically, the adverse effects of green reputation risk on financial watchdogs' responses (e.g., increased audit fees and decreased in credit ratings) are more pronounced in firms with weaker corporate governance environments. This finding indicates the importance of strong governance in mitigating the negative impacts of environmental reputation risk on audit fees and credit ratings.

The findings of this study have several important implications for corporate managers and financial watchdogs. Managers of firms facing high environmental reputation risk need to actively manage this risk. They should closely monitor environmental developments, comply with environmental regulations, and implement measures to mitigate the impact of environmental risks on their operations. This is an area for future research.

For financial watchdogs, firms with high environmental reputation risk may face financial distress and be warned for having non-green policies and decisions, as environmental, governance, and social events can significantly affect their performance. Therefore, financial watchdogs should conduct careful due diligence before rating a firm, to ensure they are comfortable with the level of environmental risk.

Acknowledgement: This research is funded by Funds for Science and Technology Development of the University of Danang under project number B2023-DN04-10.

REFERENCES

[1] J. Wang, H. Zhong, and M. Li, "The effect of environmental credit rating on audit fees: A quasi-natural experiment from China", *Heliyon*, vol 10, no. 4, pp. e26670, 2024.

[2] P. Dimitropoulos, and K. Koronios, *Corporate Environmental Responsibility, Accounting and Corporate Finance in the EU*. Springer, 2021.

[3] M.C. Branco, and L.L. Rodrigues, "Corporate social responsibility and resource-based perspectives", *Journal of Business Ethics*, vol. 69, pp. 111–132, 2006.

[4] D. Griffin, O. Guedhami, K. Li, and G. Lu, "National Culture and the Value Implications of Corporate Environmental and Social Performance", *Journal of Corporate Finance*, vol 71, pp.102123, 2021.

[5] S. Zhou, "Reporting and assurance of climate-related and other sustainability information: a review of research and practice", *Australian Accounting Review*, vol. 32 no. 3, pp. 315–333, 2022.

[6] X. Chang, S. Dasgupta, and G. Hilary, "The effect of auditor quality on financing decisions", *The Accounting Review*, vol 84, pp. 1085–1117, 2009.

[7] R. Yang, Y. Yu, M. Liu, and K. Wu, "Corporate risk disclosure and audit fee: A text mining approach", *European Accounting Review*, vol. 27, no. 3, pp. 583–594, 2018.

[8] [A. Lyubimov, "How do audit fees change? Effects of firm size and section 404 (b) compliance", *Managerial Auditing Journal*, vol. 34, no. 4, pp. 393–437, 2019.

[9] A.A. Gull, M. Atif, A. Issa, M. Usman, and M.A. Siddique, "Female CEO succession and audit fees: Evidence from China", *Managerial Auditing Journal*, vol. 36, no. 3, pp. 485–509, 2021.

[10] M. Salehi, H. Tarighi, and S. Safdari, "The relation between corporate governance mechanisms, executive compensation and audit fees: evidence from Iran", *Management Research Review*, vol. 41, no. 8, pp. 939–967, 2018.

[11] A. Choi, E.Y. Lee, S. Park, and B.C. Sohn, "The differential effect of accrual-based and real earnings management on audit fees: International evidence", *Accounting and Business Research*, vol. 52, no. 3, 254–290, 2022.

[12] T. Horvat, U. Travner, H. Skoko, and V. Bobek, "The influence of profit, revenues and debt on audit prices in large companies: insights from Slovenia", *Economic Research-Ekonomska Istra˙zivanja*, vol. 35, no. 1, 778–798, 2022.

[13] M. Parkash, R. Singhal, and Y. Zhu, "The impact of loan covenants on audit delays and audit fees", *Journal of Corporate Accounting & Finance*, vol. 33, no. 4, pp. 39–51, 2022.

[14] A. Barua, M.S. Hossain, and D.V. Rama, "Financial versus operating liability leverage and audit fees", *Int. J. Audit*, vol. 23, no. 2, 231–244, 2019.

[15] C. J. Fombrun, *Reputation: Realizing value from the corporate image*. Harvard Business School Press, 1996.

[16] Z. Qian, S. Wang, H. Li, and J. Wu, "Does the green credit policy improve audit fees? evidence from Chinese firms", *Journal of Environmental Planning and Management*, vol. 67, no. 5, pp. 943-966, 2022.

[17] C. Xin, X. Hao, and L. Cheng, "Do environmental administrative penalties affect audit fees? Results from multiple econometric models", *Sustainability*, vol. 14, no. 7, pp. 4268, 2022.

[18] J. Tan, K.C. Chan, S. Chang, and B. Wang, "Effects of carbon emissions on audit fees", *Managerial Auditing Journal*, vol. 38, no. 7, pp. 1112–1140, 2023.

[19] S. Yao, S. Wei, and L. Chen, "Do clients' environmental risks affect audit pricing? Evidence from environmental violations in China", *Managerial Auditing Journal*, vol. 38, no. 5, pp. 634–658, 2023.

[20] D.A. Simunic, "The pricing of audit services: theory and evidence", *Journal of Accounting Research*, vol. 18, no. 1, pp. 161–190, 1980.

[21] J. R. Francis, "A framework for understanding and researching audit quality. *Auditing: A Journal of Practice & Theory*, vol. 30, no. 2, pp. 125–152, 2011.

[22] D.S. Sharma, V.D. Sharma, and B.A. Litt, "Environmental responsibility, external assurance, and firm valuation", *Auditing: A Journal of Practice & Theory*, vol. 37, no. 4, pp. 207–233, 2018.

[23] X. Yang, L. Wei, R. Deng, J. Cao, and C. Huang, "Can climate-related risks increase audit fees? – Evidence from China", *Finance research letter*, vol. 57, pp. 104194, 2023.

[24] G. Manso, "Feedback effects of credit ratings", *Journal of Financial Economics*, vol. 109, pp. 535–548, 2013

[25] E. Dehaan, "The financial crisis and corporate credit ratings", *The Accounting Review*, vol. 92, pp.161–189, 2017.

[26] S. Kothari, T.E. Laguerre, A.J. Leone, "Capitalization versus expensing: evidence on the uncertainty of future earnings from capital expenditures versus R&D outlays", *Review of Accounting Studies*, vol. 7, pp. 355–382, 2002.

[27] M. Dang, P. Puwanenthiren, E. Jones, T.Q. Nguyen, X.V. Vo, and S. Nadarajah, "Strategic archetypes, credit ratings, and cost of debt", *Economic Modelling*, vol. 114, pp. 105917. 2022.

[28] C.X. Chen, H. Lu, and T. Sougiannis, "The agency problem, corporate governance, and the asymmetrical behavior of selling, general, and administrative costs", *Contemporary Accounting Research*, vol. 29, pp. 252–282, 2012.

[29] K. P. Olson, *Evaluating Corporate Governance: The Bondholders' Perspective Credit policy special report*, New York, 2005.

[30] F. Alali, A. Anandarajan, W. Jiang, "The effect of corporate governance on firm's credit ratings: further evidence using governance score in the United States", *Accounting and Finance,* vol. 52, pp. 291–312, 2012.

[31] K. J. Cornaggia, G. V. Krishnan, C. Wang, "Managerial ability and credit ratings", *Contemporary Accounting Research*, vol. 34, pp. 2094–2122, 2017.

[32] H. Ashbaugh-Skaife, D.W. Collins, R. Lafond, "The effects of corporate governance on firms' credit ratings. J. Account", *Journal of Accounting and Economics,* vol. 42, no. 1, pp. 203–243, 2006.

APPENDIX - DESCRIPTION AND CONSTRUCTION OF VARIABLES

Variables	Acronym	Description	Data sources
1. Dependent variables			
Audit fees	*AUDFEE*	Logarithm of adjusted audit fee as at the balance sheet date in year t.	Audit Analytics
S&P Credit Ratings	*S&P24*	The S&P 24-point scale takes an ordinal value of 24 (1) for better (worse) letter ratings (e.g., AAA = 24,…. SD = 1).	Compustat
	S&P22	The S&P 22-point scale takes an ordinal value of 22 (0) for better (worse) letter ratings (e.g., AAA = 22,…. D or SD = 1).	Compustat
	S&P17	The S&P 17-point scale takes an ordinal value of 17 (1) for better (worse) letter ratings (e.g., AAA = 17,…. CCC+ and lower grades = 1).	Compustat
2. Independent variables			
Environmental reputation risk	*ERR*	Environmental Reputation Risk (ERR) is calculated as the environmental percentage multiplied by the current level of reputational risk exposure.	RepRisk
Environmental cost	*ENVCOST*	The natural logarithm of total direct and indirect environmental costs.	Trucost
3. Control variables			
Firm size	*SIZE*	Logarithm of total assets.	Compustat
Market to book	*MB*	Market to book ratio of firm's equity.	
Leverage	*LEV*	Total debt to total assets. We measure leverage as long-term debt (#9 dltt) plus debt in current liabilities (#34 dlc) divided by book assets (#6).	Compustat
Non-audit fees	*NONAFEE*	Logarithm of non-audit fee as at the balance sheet date.	Audit Analytics
Loss firms	*LOSS*	An indicator variable, which equals one if a firm's average ROA during the period t-1, t and t+1 is negative, and zero otherwise in year t.	Compustat
Firm with reporting date in the period Dec-Mar	*BUSY*	An indicator variable, which equals one for a firm with reporting date in the period Dec-Mar, and 0 otherwise.	Compustat
Operating performance	*ROA*	The ratio of net income before extraordinary items to total assets (IB/AT).	Compustat
Audit opinion	*AUOP*	An indicator variable, which equals one for a modified audit opinion and zero for others (Item 149).	Audit Analytics
Audit quality	*BIG4*	An indicator variable, which equals one for a Big 4 audit firm and zero for other firms, in year t	Audit Analytics
Geographic segments	*GEOSEGMENT*	The square root of the number of geographic segments.	Osiris
Business segments	*BUSSEGMENT*	The square root of the number of business segments.	Osiris
Foreign sales	*FORSALES*	An indicator variable equal to one if a firm reports foreign sales, and zero otherwise.	Compustat
Firm reports special items	*SPECIAL*	An indicator variable that equals one if the firm reports special items (COMPUSTAT SPI), and zero otherwise.	Compustat
Leverage	*LEV*	The ratio of total debt to total assets in year t. Total debt = Long term debt (Item 220) + Debt in current liabilities Item (Item 213).	Compustat
Auditor change	*AUCHANGE*	An indicator variable, which equals one if there is a change in the auditor, and zero otherwise.	Audit Analytics
Litigation industry	*LITIGATION*	Following Hogan et al. (1999) we label the following two-digit SIC codes as belonging to a high litigation industry: 28 (Chemicals and allied products), 35 (Industrial machinery and equipment), 36 (Electronic and other electric equipment), 38 (Instruments and other related products), 60 (Depository institutions), 67 (Holding and other investment offices) and 73 (Business services), and zero otherwise.	Compustat
Inherent risk	*INHERENT*	This is the sum of receivables and inventory, scaled by total assets ((RECT + INVT)/AT), in year t	Compustat
Acquisition activity	*M&A*	An indicator variable, which equals one if the firm is engaged in a merger or acquisition, and zero otherwise.	Compustat
Seasoned equity offerings	*SEO*	An indicator variable which equals one if the number of shares outstanding (CSHO) increased by 10 percent or more, and zero otherwise.	Compustat
Employees	*SQRTEMP*	The square root of the number of employees in year t	Compustat
Institutional ownership	*IO*	The average ownership proportion of institutional investors over the four quarters of the firm's financial in year t.	13F
Analyst coverage	*ANALYST*	The number of analysts following for year t.	I/B/E/S
Board independence	*BI*	The percentage of outside directors on the board in year t. We first use BoardEX database to obtain this variable. We use institutional shareholder services (ISS) database to obtain missing values for BI.	ISS
Tangibility	*TANG*	Tangibility, defined as the ratio of gross property, plant, and equipment scaled by total assets.	Compustat
Interest coverage	*INTCOV*	Interest coverage, defined as the ratio of operating income before depreciation divided by interest expense.	Compustat
Stock return volatility	*SDRET*	Stock return volatility, defined as the annualized standard deviation of monthly stock returns in year t-1.	CRSP