The Impact of Corporate ESG Activities on Firm's Risk - China Listed Companies from 2013 to 2022

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Abstract. The impact of corporate social activities on corporate financial performance has become a popular topic in recent decades. Using data from 102 companies listed in the Shanghai and Shenzhen stock exchange markets from 2013 to 2022, this paper examines the correlation between corporate performance, evaluated through three aspects, environmental, social responsibility, and governance ("ESG"), and the firm risk. We obtain data from the China Securities ESG Index System and CSMAR database. The OLS two-way fixed effect regression model is utilized in this study after the Hausman test to examine the association between corporate ESG activity development and company risk. Our empirical results show that ESG and business risk have a negative relationship, and this relation is significant. This paper conducts a robustness test, and we find that the results are still robust after considering more firm characteristics as control variables. Based on this result, this paper also discusses the implications for stakeholders, such as employees, business managers, and financial analysts. Further research prospects are also provided based on the limitations of this research.

Keywords: ESG; firm risk; OLS two-way fixed effect regression; China.

1. Introduction

1.1. Background

In the past few decades, corporate social responsibility (CSR) has been pivotal in guiding investment decisions and risk management strategies for investors and other stakeholders. Traditionally, companies primarily focused on financial metrics to evaluate their performance. However, in today's interconnected and environmentally conscious world, CSR factors play a critical role in assessing a business's holistic performance and resilience. Consequently, companies have initiated diverse CSR initiatives. The combined metric of environmental responsibility (ENV), social responsibility (SOR), and corporate governance (GOV) - known as ESG ratings - offers a valuable gauge to assess the efficacy of these CSR endeavours. How a firm handles ESG variables can reduce or increase its business risks. A proactive environmental plan, for instance, can position a business as a pioneer in sustainable practices, bringing up new markets or clientele. On the other hand, ignoring social obligations can result in reputational damage, which influences brand value and profitability. This study explores the relationship between business risk on the Chinese stock market and Covid-19, an ESG grade that serves as a proxy for CSR efforts.

1.2. Related Research

Research on ESG has gained significant traction among scholars and industry professionals. Numerous investigations underscore the positive impact of ESG in markets. For instance, ESG initiatives have been shown to boost a company's operational efficiency and elevate its reputation [1, 2]. Such initiatives also heighten transparency for financiers and market analysts and fortify a firm's ties with its community and stakeholders [3, 4]. However, ESG may also have detrimental effects, such as being linked to future corporate missteps and ties to financial manipulation [5, 6].

The rewards from ESG participation may arise from multiple avenues such as enhanced shareholder value through insurance-like safeguards, refined risk management, strategic appeal to consumers, heightened transparency, and facilitated access to the financial market. Any combination of these elements might potentially diminish the risk for firms in contentious sectors. Company risk

generally comprises systematic and unsystematic risk. Systematic risks, affecting a vast array of assets, are commonly referred to as market risks. Conversely, unsystematic risks, which impact a limited set of assets, are often termed as firm-specific or unique risks [7]. Sharfman and Fernando analyse 267 U.S. firms and they find that better environment risk management leads to a reduced cost of capital, which means that reducing social or environmental crisis could reduce firm risk [8]. This potential decrease in capital costs might be attributed to a decline in risk, thus enhancing our understanding of the benefits of strategically enhancing risk management [9]. Some argue that managers motivated by ethics use ESG to boost transparency, strategic approaches, and chariTable efforts, in turn, lowering the risk for the organization [10]. Timothy et al. suggest that the idea of managerial discretion portrays managers as moral agents, obligated to direct their efforts toward beneficial societal outcomes [11]. Managers with a strong ethical foundation may see ESG activities as strategic investments [12]. Firms actively participating in ESG tend to communicate their ESG actions more [11], which enhances corporate transparency. This increased clarity can narrow the knowledge disparity between firms and their investors, consequently diminishing the firm's perceived risk [13].

Many studies have pointed out the impact of ESG activities on corporate information disclosure. However, there is few literatures directly analyze the relationship between corporate ESG activities and business risk. This study investigates the relation between Chinese listed firm's engagement and firm risk in China. Based on the above literature, we propose the following hypothesis.

H1: Firm's ESG activities development has a negative impact on firm's risk.

The remainder of this essay is organized as follows. The data, variables, and technique are displayed in Section 2. The Table, results, and robustness test are discussed in Section 3. Section 4 conducts more analysis, wraps up the study, and offers additional implications.

2. Data and Variables Description

It is anticipated that the data of A-share listed businesses in Shanghai and Shenzhen from 2013 to 2022 are picked as the data needed for this study in order to verify the aforementioned research. Specifically, regarding the selection of samples, this paper also considers the following factors. First of all, the sample of this paper is selected from the industries of CSRC in 2012, and other industries except the financial industry are selected as the research industries. The reason is that the particularity and virtuality of the financial industry and its accounting calculation are also different, so the sample selected after excluding the financial industry is more reference. Secondly, the sample selected in this paper also excludes ST-type companies, which are selected from non-ST stock companies because the financial situation of ST-type companies is often abnormal and extreme, so it has nothing to do with empirical research. Excluding this type of company is extremely important for the scientific nature of empirical research. Finally, this research acquires pertinent panel data and chooses 102 associated listed businesses in Shanghai and Shenzhen A-shares as selected samples.

Table 1. Variable description

Variable type	variable symbol	variable declaration	data source
ESG	Xit	Quantitative score of ESG rating of listed company i in the t year	China Securities ESG Index System
business risk	Yit	Variance of stock return rate of listed company i in the t year	CSMAR
Return on Asset (ROA)	roa	Ratio of return on assets of listed companies	CSMAR
company size	size	Total assets of listed companies after taking natural logarithm	CSMAR
Leverage	lever	Comprehensive leverage of listed companies	CSMAR
capital structure	z		CSMAR

Five indicators are used in this paper to measure the five variables required for the investigation, as indicated in Table 1. The quantitative ESG rating score of listed firms in each year is chosen as the unit of measurement in this study to illustrate the ESG performance of varied organizations. The index chosen for this explanatory variable, in particular, comes from the independent ESG rating company Huazheng Index. At the moment, the China Securities Index is a well-established and approved ESG grading mechanism. In order to quantitatively measure the ESG performance of sample firms chosen by Shanghai and Shenzhen A-shares, this article employs its three-level index system. The ESG performance of companies is specifically broken down into nine grades by China Securities, namely C.CC.CCC.B.BB.BBB.A.AA.AAA, and these grades are allocated to 1-9, correspondingly. The ESG rating increases as the score does.

3. Results Analysis

3.1. Descriptive Statistics

Table 2. Descriptive statistics

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
y	824	2.890	7.509	0.00149	111.2
x	824	72.04	6.730	41.19	90.93
size	824	22.63	2.331	3.076	28.29
roa	824	0.166	3.190	-6.476	90.71
lever	824	1.259	0.249	0.793	1.882

According to the Table 2, the sample size of this paper is 824. For the five variables, firstly, the enterprise risk is explained, with an average of 2.89 and a standard deviation of 7.509. It can be seen that there is a big difference in business risk between enterprises, and the financial performance between enterprises is unsTable considering internal and external factors. Secondly, as for the ESG performance of enterprises that explain the variable, the descriptive statistical results in the above Table show that the standard deviation of the variable is 6.730, the minimum value is 41.19, and the maximum value is 90.93, which shows that the ESG performance varies from company to company and from year to year. For each control variable, the standard deviations of size, roa and lever are smaller than those of independent variables and dependent variables, which shows that the differences between these variables are small.

3.2. Correlation Analysis

Table 3. Correlation analysis

	y	x	size	roa	lever
y	1	_	_	_	_
x	-0.0337* 0	1	_	_	_
size	-0.0261* 0	0.0167 (0.6324)	1	_	_
roa	-0.0097 （0.7805）	0.0076 (0.8278)	0.0247 (0.4786)	1	_
lever	-0.0751* (0.0315)	0.1133* (0.0011)	-0.1099* (0.0016)	0.0496 (0.1549)	1

(*** p<0.01, ** p<0.05, * p<0.1)

The correlation coefficient between independent factors and dependent variables is -0.0337 in 824 samples, as shown in Table 3, and the analysis results are significant at the level of 10%, according to the results. By analysing the correlation between the four controlled variables and the dependent variables in this paper, we can see that size and y are negatively correlated at the level of 10%, while the correlation between lever and y is not significant.

3.3. Hausman Test

The fixed effect model and the random effect model, which are more appropriate for this regression, are compared using the Houseman test. The random effect model is preferred above the fixed effect model, as indicated in Table 4, which was the original hypothesis. The final p value is 0.0000, which rejects the original hypothesis of choosing random effect model, so the test conclusion shows the V_b-V_B shown in Table 5 is positive definite and choosing fixed effect model is better than random effect model, so the next step is to carry out OLS bidirectional fixed effect.

Table 4. P-value among different ways

	way	P
Choose mixed regression model or fixed effect model?	F test	0.3054
Choose mixed regression model or random model?	BP test	0.9022
Choose fixed effect model or random effect model?	Houseman test	0.0000

Table 5. Hausman test

	(b)	(B)	(b-B)	sqrt(diag (V_b-V_B))
	fe	re	Difference	S.E.
x	.0442519	.0091194	.0351325	.0404829
size	-.1132721	-.1155842	.0023121	.0850328
roa	-.0040852	-.0042512	.000166	.0213575
lever	-.343661	-1.972391	1.62873	1.488297

3.4. OLS Two-way Fixed Effect

After descriptive statistics, this paper passes the judgment of houseman and other test models, and then uses this model for empirical analysis, that is, regression analysis of related variables. Finally, we get (1) a model containing only the control variables and dependent variables and (2) a regression model containing the dependent variables, independent variables, and control variables.

Table 6. Regression result

	(1)	(2)
VARIABLES	y	y
x		-0.027*
		(-0.66)
size	-0.111*	-0.109
	(-1.67)	(-1.62)
roa	-0.012**	-0.012**
	(-2.47)	(-2.44)
lever	-2.370***	-2.282***
	(-2.88)	(-2.59)
Constant	8.388***	10.190***
	(3.79)	(3.69)
Observations	821	821
R-squared	0.007	0.007
Ftest	9.52e-06	5.37e-06
r2_a	0.00319	0.00256
F	8.802	7.579

(t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1)

By analysing the results of each model shown in Table 6, it is found that in the second regression model with three control variables, the dependent variable and the three control variables have a significant negative impact, and it is known that the enterprise risk will be reduced accordingly with each increase of one unit of the three control variables.

Finally, the model (3) shows that the ESG performance of the explanatory variable enterprise has a significant negative impact on it at the level of 10%, and the regression coefficient is -0.027, which shows that when the ESG performance of the explanatory variable enterprise changes by one unit, the risk of the explained variable enterprise will decrease by 0.027 unit, which shows that the influence of the ESG performance of the enterprise on the enterprise risk is negatively significant.

3.5. Robustness Test

In order to avoid the potential reverse causal problems in the model and consider the emergence of endogenous problems such as explanatory variables related to residual terms and affecting regression estimation, this paper conducts robustness tests. Another control variable used for this study is the largest shareholder's shareholding ratio.

Table 7. Robustness test

	(1)	(2)	(3)
VARIABLES	basic y	first- x	second- y
x	-0.027*		-1.123*
	(-0.70)		(-0.97)
size	-0.109	0.073	-0.024
	(-0.96)	(0.72)	(-0.13)
roa	-0.012	0.009	-0.009
	(-0.14)	(0.13)	(-0.08)
lever	-2.282**	3.283***	1.248
	(-2.14)	(3.46)	(0.31)
z		2.093	
		(1.35)	
Constant	10.190**	65.538***	82.747
	(2.56)	(23.82)	(1.08)
Observations	821	821	821
R-squared	0.007	0.016	

(t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1)

As shown in Table 7, the results show that model (1) is the regression result of the first stage, in which the shareholding ratio of the largest shareholder is selected as another control variable for OLS regression. In this stage of regression, the coefficient of tool variable Z is not significant.

Model (2) is the result of the second stage of regression. In this stage, the exogenous part of the explanatory variables obtained by the first stage of regression replaces the endogenous variables in the basic model, and finally OLS regression is carried out. The results show that the exogenous part of the explanatory variable (X) has a significant influence on the explained variable (Y) at the level of 10%, and it has the same influence as the basic regression, both of which are negative. It can be seen that the robust result is significant and robust, so this empirical analysis is of research significance.

4. Implications and Suggestions

The primary aim of this paper is to analytically examine the effect of ESG involvement on the risk of firms listed on the A-share markets in Shanghai and Shenzhen. To achieve this, we utilize the ESG

rating from the China Securities ESG Index, given its extensive coverage and popularity among researchers in the fields of accounting, economics, finance, and management.

First, we do a two-way fixed effect OLS regression analysis to determine how ESG engagement and other firm factors affect firm risk. According to the findings, which support the original hypothesis, after accounting for business factors such firm size, return on assets, leverage, and capital structure, ESG participation is significantly and adversely correlated with overall risk as evaluated by variance of stock return rate. After adding the largest shareholder's shareholding ratio as additional control variable, we discovered that our findings are still solid.

The results are beneficial to business leaders and executives by helping them understand the advantages of ESG can help them strategize and integrate ESG initiatives in company's strategy and daily operations. Investors and shareholders can gain insights into which companies prioritize ESG initiatives, potentially indicating more sustainable and responsible investments with long-term returns. Besides, employees who pay special attention to corporate's social and environmental responsibility can know that a company takes ESG seriously can be a deciding factor for many when choosing their employer. In addition, for financial analysts and advisors can use research to advise clients on investing in companies that prioritize ESG, potentially offering better long-term returns and reduced risks.

5. Limitation and Prospects

This study comprehensively examines the connection between ESG activities and firm risk through both theoretical and empirical lenses. However, it does present some constraints. Notably, the research focuses solely on companies listed in Shanghai and Shenzhen, China, which might limit the generalizability of our conclusions. Future research should delve deeper into the micro-level effects of specific ESG actions of companies on firm risk. For instance, a sophisticated investigation could concentrate on the effects of specific problems or advantages, like as layoffs or profit-sharing, on business risk, organizational culture, morale, and worker productivity. A different approach may be to research how significant emission or pollution control projects affect corporate risk. A particularly pressing challenge for upcoming studies would be to analyse if a firm's ESG choices affect environmental sustainability or tackle environmental justice concerns. Exploring the ESG initiatives would also be insightful. The complex relationship between ESG and firm risk can be clarified by understanding the causes and effects of ESG operations in controversial sectors around the world, especially for businesses whose goods might be harmful to the environment, humanity, or society at large. Additionally, investigations into the interwoven dynamics of corporate image, reputation, company risk, and value, both theoretical and empirical, promise to be fruitful.

6. Conclusion

The engagement of firms in ESG has garnered significant attention in recent times, resonating with shareholders, regulators, and academic circles. In this study, we delve into the tangible effects of ESG participation on the risk profiles of a broad set of Chinese companies listed in Shanghai and Shenzhen between 2013 and 2022. Our findings indicate a negative correlation between ESG engagement and firm risk, even after accounting for multiple firm attributes. This consistent negative linkage might stem from heightened information transparency, enhanced risk management, added market appeal, or facilitated access to financial resources, aligning with our initial propositions. Furthermore, we elucidate the ramifications of our discoveries for various stakeholders, including executives, financial consultants, and employees. Our research enriches the ESG discourse by offering initial empirical insights into the dampening influence of ESG involvement on the risk quotient of Chinese enterprises.

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