Relationship between Corporate Social Responsibility Performance and Systematic Risk—A Case Study of A-share Listed Chinese Companies

Chih-Yi Hsiao[1*], Xue Lin[1], Ke-Ke Cen[1] and Wan-Ping Zheng[1]

[1]*Xiamen University Tan Kah Kee College, Zhangzhou, China.*

Authors' contributions:

This work was carried out in collaboration between all authors. Author C-YH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author XL managed the analyses of the study. Authors K-KC and W-PZ managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Taking the A-share listed companies in the 2018-2019 Environment, Social and Governance (ESG) rating by the China Alliance of Social Value Investment (CASVI) as samples, we analyze the impact of Corporate Social Responsibility (CSR) performance on the current systematic risk and its deferred effect. By using quantile regression and the ordinary least squares (OLS) for cross-comparison, we find that 1) for high-risk companies, the current performance of CSR can help reduce systematic risks, and 2) for low-risk companies, the more progress they make in CSR performance but do not disclose social responsibility information according to the global reporting initiative (GRI) guideline, the more systematic risks they will encounter; if they proactively disclose such reports, however, they may reduce systematic risks. Based on our findings, we propose the following measures: 1) the government should properly guide economic development; 2) companies should actively disclose CSR reports so as to achieve a win-win result for both the companies and their stakeholders; 3) investors should consult social responsibility information to make rigorous investment plans, before making investment decisions.

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Corresponding author: E-mail: cyhsiao@xujc.com;

1. INTRODUCTION

The operating environment of enterprises is fraught with risks, especially after the outbreak of COVID-19, which is a typical public health emergency. COVID-19 correlates with the core concepts of ESG, with, for example, the consumption of some wild animals. From the dimension of ESG, the pandemic involves "E" and "S". Specifically, the suppliers of wild animals defy the regulators and disregard the harm of relevant transactions to society. Their customers are, therefore, faced with the risk of viral infection, which threatens the lives and health of many social individuals. The risk of unexpected events itself should be considered in the scope of enterprise operation [1]. If the enterprise has corresponding risk aversion measures in advance, then in the face of the epidemic, it can respond in time, lead its competitors, and even the crisis itself may become a turning point for it. In particular, as an important social organization, if the listed companies can take the lead in strictly requiring themselves as indicated by the relevant dimensions of ESG, do their utmost to standardize their internal governance, and assume their CSR, they can bring positive impact to the capital market and make it more standardized and orderly. From the moral point of view, CSR is an obligation, but in terms of business objectives, does social responsibility help enterprises? This issue has been probed by many scholars. Some suggest that undertaking the cost of CSR will deprive enterprises of their profits [2]; others argue that CSR is a long-term investment.

Against the backdrop of COVID-19, we ponder over whether the performance of CSR is associated with a corporate's resistance to external risks or it is an improper way to implement CSR. We therefore carry out an empirical study to explore the relationship between ESG and the systematic risk and to test the deferred effect and the impact of progress on CSR. We hope to explore the correlation between ESG indicators and systematic risk, so as to emphasize the concept value and role of ESG. We expect that our research can provide a reference for enterprises, increase their methods for risk assessment, and encourage them to reflect on and practice their CSR. We also expect to help investors' awareness of relevant information about their investment objects before making decisions.

1.1 Literature Review

1.1.1 Application and development of ESG in China and around the world

In recent years, the concept of responsible investment has risen. According to the Global Sustainable Investment Alliance (GSIA) data, since 2016, global social responsibility investment has increased by over 34%, and the total assets managed in early 2018 exceeded $30trillion, which proves the significant growth of ESG. According to the EUROSIF, it is conspicuous that over the past 20 years, socially responsible investment (SRI) has become an integral part of European fund management, while ESG integration, which remains a preferred strategy to date, has increased by 60 percent. In addition, ESG equity mutual funds have in recent years attracted record-high net flows. Europe had the most concentrated ESG assets in the world, with a total amount of $14.1 trillion in 2018, followed by the United States of America, of $12 trillion; the latter was 38 percent higher than in 2016. Japan was the third-largest sustainable investment market after Europe and the United States, with management assets rising from 3% to 18% over the same period. Canada in the same two-year period also witnessed an increase of 42 percent in SRI, accounting for half of the country's total managed assets. Australia also had a high share of total assets under management [3].

In 2006, the Principles for Responsible Investment (PRI) was created as a spin-off from the UNEP Financial Initiative and the UN Global Compact, which marked the formal proposal of three concepts of ESG investment. As the most influential ESG investment initiative in the world, PRI has covered more than 50 countries with over 1,700 institutional signatories; the total assets under its management amounted to $63 trillion.

Although ESG investment in China is in the ascendant, there are still many deficiencies compared with that in foreign countries. At present, the problems of ESG in China are all basic ones, and we need to do the basic work of responsible investment. There are three main problems. First, the investment industry still pays little or insufficient attention to ESG. With China's growing role in the international arena, China needs to pay more attention to responsible investment, invest more energy, and view ESG investment based on better understanding.

Second, because ESG is not formally included in company assessment, relevant data rely on voluntary disclosure; yet the effective data of ESG from Chinese enterprises are still seriously inadequate. Third, China still lacks authoritative evaluation systems for responsible investment. The changes in evaluation methods and contents make it more difficult to invest in and research on ESG.

1.1.2 Definition and characteristics of systematic risk

Systematic risk, also known as "unavoidable risk" or "non-diversifiable risk", refers to the possible change of investment income caused by some global common factor, which affects all securities returns in the same way. The risks usually arise from the formulation and implementation of relevant laws, inflation in the market, high interest rates, changes in an economic policy, etc., all of which may affect the overall securities market. The main characteristics of systematic risk are: 1) it is caused by the same factors, 2) it will ultimately affect the return of all stocks in the stock market, and 3) such risks cannot usually be eliminated by diversifying stock securities. Hence, to effectively evaluate the total risk, we must pay attention to all types of risks inherent in holding specific types of assets and liabilities when considering systematic risks. Beaver et al. [4] first proposed the research on the relationship between corporate accounting information and corporate systematic risk, and found that the beta coefficient, assets size, dividend payment rate, and profit change rate are significantly related to corporate systematic risk. Subsequent scholars have also successively published relevant studies to further explore the correlation between systematic risk and other accounting information.

1.1.3 Literature on ESG and systematic risk

At present, most of the literature on the relationship between social responsibility and systematic risk tends to discuss social responsibility, which can effectively reduce the systematic risk.

Krueger [5] finds that most empirical studies fail to differentiate the correlation and causal relationship accurately. When studying the correlation between ESG and financial indicators, most of the conclusions are as follows: ESG is the cause of financial indicators or the latter are the results of the former, but this conclusion can also be drawn reversely. Generally speaking,

companies with higher ESG scores know more about how to control risks and get higher valuations. If a company has a higher valuation, however, it is relatively financially capable, allowing it to invest more in ESG and in turn bringing higher scores to ESG. According to Li [6], in general, ESG enterprises with higher evaluation also make better business performance. And more and more enterprises adopt ESG as a pivotal reference in formulating corporate strategy. The ESG criteria focus more on corporate governance, especially in the face of financial fraud, on the relationship between strategy and performance, and on the intensity of R & D investment. In terms of environment, the ESG indicators pay more attention to the performance of environmental indicators and green business. In the aspect of social governance, ESG indicators attach more importance to the quality of disclosure of social responsibility information. Generally speaking, the companies with high ESG scores have a common character, that is, they are more able to control the risk than the average in regard to company management and supply chain management. Second, owing to higher risk control capabilities, companies with higher ESG scores are less susceptible to the adverse effects of negative news [7]. Third, the risk of the company's stock price will be reduced because of the decreased probability of risk events. Park et al. [8] examines the moderating role of a restaurant firm's geographical diversification. Geographical diversification significantly moderates the relationship between CSR and risk. Farah et al. [9] found that the relationship between corporate social responsibility and systematic risk is nonlinear; it shows an inverted U-shaped distribution. That is, the initial risk increases with the increase of corporate social responsibility, but after reaching a critical value, the higher the level of corporate social responsibility, the lower the risk. The relationship between corporate social responsibility and risk is regulated by some country specific factors, namely the sustainability of national corporate social responsibility and legal environment. According to Flammer and Luo [10], they find that companies react to increased risk of adverse behavior by strategically increasing their investment in employee related CSR (e.g., work life balance benefits, health and safety policies). Therefore, they propose that corporate social responsibility managements have important managerial implications. Albuquerque et al. [11] find that corporate social responsibility decreases systematic risk and increases firm

value; especially for the firms with high product differentiation, these effects are stronger. First, the companies with a high score of ESG can effectively reduce their own harm when facing the impact of the market, and also show that they have lower systematic risk. Take the commodities of a company for example. High-efficiency commodities are less vulnerable than inefficient ones to the impacts of changes in commodity prices, so the former bear less systematic risks. Secondly, beta, a very important function in the capital asset pricing model, is a major factor to measure the systematic risk of a company. The lower the beta is, the lower the systematic risk will be. Second, it can convert the returns required by investors in the stock. The return rate required by investors is positively related to the systematic risk. Low returns required by investors indicate that the company has low systematic risk, which reduces the capital cost of the company. Third, companies with lower capital costs are more likely to have higher valuations. The finding of Giese et al.[12] shows that the ESG information of a firm is transmitted to its valuation and performance through its system risk status, i.e. lower capital cost and higher valuation, and special risk status, i.e. higher profitability and lower tail risk exposure. This also means that the change of ESG characteristics of a firm may be a useful financial indicator. Therefore, ESG ratings may also be suitable for inclusion in policy benchmarks and financial analysis.

Some scholars hold the different view. Filbeck et al. [2] show that although the company's efforts in environmental protection can promote social or environmental performance, the benefits of environmental protection investment are insufficient to make up for the internal resources the enterprises tapped. To fulfill social responsibility means that the excess expenditure will cause waste of resources and costs and make enterprises lose. Thus, it has a negative impact on the profitability of the enterprise. The study of Benlemlih et al. [13] examined the link between a firm's environmental (E) and social (S) disclosures and evaluation of its risk including total, systematic, and specific risk. However, it does not find any impact of a firm's E and S disclosures on its systematic risk, while a negative and significant effect between these disclosures and a firm's total and specific risk.

1.1.4 GRI and ESG information disclosure

China is promoting the strategy of sustainable development. To this end, the performance of

CSR needs to be disclosed to the public specifically. A universally recognized way is to disclose the non-financial information of enterprises and improve the quality of sustainable development, in accordance with the sustainable development reporting guidelines provided by GRI. This approach can be regarded as one of the important strategies to enhance the competitiveness of enterprises to publish their economic, environmental, and social performance through sustainable development reports. The guidance framework may fall into four parts, in which the guide to sustainable development reports is the basis of all other documents and applies to all kinds of organizations. In addition, the guide can be customized to each particular industry. This guide attempts to require enterprises or organizations to disclose what they are doing to their stakeholders in a common framework, that is, to focus on the content of the report, so as to improve corporate transparency. As for the quality of the results they have done, the readers must judge by themselves [14]. The finding from Truant et al. [15] shows that "experienced" sustainable reporters provide a significant volume of disclosure, and that disclosure quality on risk is positively influenced by their international presence and reporting experience. Bradford et al. [16] explored whether stakeholders are interested in sustainable reporting information in the GRI framework. It found that stakeholders pay the most attention to the dimensions of risk, compliance and social justice, while they pay less attention to the economic dimension. Korphaibool et al. [17] took Thailand listed companies as the samples to evaluate the sufficiency economy performance through annual report and sustainable development report. The results show that there is a significant negative relationship between sustainable development report and firm-specific risk. Disclosing ESG information in compliance with GRI standards will constitute a driving force for enterprises themselves and show their soft power to stakeholders, thus helping them grow rapidly. For corporate stakeholders, disclosure of GRI to ESG information is also conducive to their own rights and interests.

It is noteworthy, however, that the ESG information disclosure by Chinese enterprises still encounters the following main problems: first, Chinese enterprises have yet to form a unified system of disclosure standards. Such an embarrassment forces enterprises to choose their own evaluation system, resulting in the low

comparability of ESG reports among enterprises. Second, Chinese enterprises are unenthusiastic about such information disclosure. In the stage of economic transformation and upgrading, they still prefer to rely on the existing extensive development mode at the expense of the environment. Third, they are unwilling to disclose their shortcomings in social and environmental responsibility performance and corporate governance; this leads to the distrust and disappointment of the stakeholders to the enterprise, so the stakeholders cannot understand the enterprise objectively and comprehensively. [14].

2. METHODS

After summarizing the previous research results, we establish the hypothesis that CSR performance can help companies reduce systematic risk. We use quantile regression and ordinary least squares to explore the relationship between CSR and systematic risk.

Considering that the implementation of CSR may have the impact of deferred effect, we add a deferred effect test. The variable design includes the active disclosure of CSR reports, the progress of CSR compared with the previous year, and the interaction between the explanatory variables. The samples are selected from the listed companies of Shanghai and Shenzhen stock exchanges with ESG ratings by the China Alliance of Social Value Investment (CASVI) from 2018 to 2019. CASVI is the first international public welfare platform focusing on promoting financing for sustainable development in China. It is initiated by 50 prominent institutions led by YouChange Entrepreneur Foundation for Poverty Alleviation, China Association for Research and Investment in Social Governance, Jifu Investment, and Mingde Public Welfare Research Institute of Qinghua University. The ESG rating results of the sample companies are obtained from Wind Database, and the financial data from Wind Database and CSMAR Database respectively. After downloading all the samples, we select the companies included in CASVI ratings in both 2018 and 2019; delete the incomplete data samples and remove the extreme values. The number of samples in 2018 and 2019 is 167 and 169 respectively.

Considering the different development stages and objective operating conditions of enterprises, we adopt quantile regression and "least squares" method for cross-comparison to analyze the impact of current CSR performance on current systematic risk; the quantile regression is divided into 25%, 50%, and 75% according to the low, medium and high degrees of systematic risk. The regression model is designed as follows: i represent the sample order; t, the year of 2019; and t-1, the year of 2018. The models of quantile regression and "least squares" method are as follows:

$$SR_{it} = \alpha_0 + \alpha_1 ESG_{it} + \alpha_2 GRI_{it} + \alpha_3 ESG * GRI_{it} + \alpha_4 IND_{it} + \alpha_5 SCALE_{it} + \alpha_6 ROA_{it} + \alpha_7 LIAB_{it} + +\alpha_8 STATE_{it} + +\alpha_9 AGE_{it} + \alpha_{10} GROWTH_{it} + \varepsilon_{it} \quad (1)$$

$$SR_{it} = \alpha_0 + \alpha_1 ESG_{it-1} + \alpha_2 PROGS_{it} + \alpha_3 PROG_{it} + \alpha_4 GRI_{it} + \alpha_5 PROGS * GRI_{it} + \alpha_6 PROG * GRI_{it} + \alpha_7 IND_{it-1} + \alpha_8 SCALE_{it-1} + \alpha_9 ROA_{it-1} + \alpha_{10} LIAB_{it-1} + +\alpha_{11} STATE_{it-1} + +\alpha_{12} AGE_{it-1} + \alpha_{13} GROWTH_{it-1} + \varepsilon_{it} \quad (2)$$

The variables are described as follows:

Explained variable

Systematic risk (SR): β value is a value of 1, which means that the security price changes with the market price β. When the value is higher than 1, the securities price is more volatile than the average market β; when the value is lower than 1 (greater than 0), the volatility of the securities price is lower than the average fluctuation of the market. The data is directly downloaded from CSMAR Database, and the calculation formula is as follows:

$$\beta_a = \frac{\text{cov}(r_a, r_m)}{\sigma_m^2}$$

Explanatory variables

ESG rating: the CASVI rating standard is divided into AAA, AA, a, BBB, BB, B, CCC, CC, C, and D. In each level of B to AA, we use the "plus" and "-" for fine adjustment, with a total of 20 small levels. We take the grades from low to high score as the alternative variable for grades 1 to 28.

Progress score (PROGS): The increase or decrease of corresponding scores of ESG rating results from 2018 to 2019.

Progress (PROG): expressed in virtual variables. The improved rating results from 2018 to 2019 are set to "1"; otherwise "0".

Whether the CSR is disclosed actively according to the guidelines of the GRI sustainable development report, expressed in virtual variable mode; companies that do so are set as "1", otherwise as "0".

Social responsibility performance and active disclosure of intersection (ESG * GRI): ESG and GRI cross multiplication, namely, the two variables are multiplied after decentralization.

Progressive score and active disclosure intersection (PROGS * GRI): PROGS and GRI cross multiplication, that is, the two variables are multiplied after decentralization.

Whether PROG * GRI is improved or not: PROG and GRI cross multiplication terms, that is, the two variables are multiplied after decentralization.

Control variables: including industry type, company scale, total asset return rate, debt ratio, property right nature, company age, and operating income growth rate.

Industry (ind): because the sample companies are diversified, the industry characteristics of the information technology industry fluctuate relatively considerably in financial performance compared with other industries. We therefore set the industry category with virtual variables as "1", and non-information technology industry society as "0".

Scale: the total assets are the alternative variables of the company size. Because the amount is too large compared with other variables, we take the natural logarithm of the total assets to reduce the absolute value of the data without changing the nature and correlation of the data.

Total asset return (ROA): the total asset return rate measures the ability of an enterprise, regardless of the source of funds, to create value for shareholders and creditors. The higher the return rate of the company's total assets, the better the operation efficiency and the profitability. Thus, the indicator considerably impacts the business risk of the enterprise; as a result, we take the total asset return rate of the company as one of the control variables.

Liability ratio (liab): considering that the debt ratio of the company represents the solvency of the company and that a high debt ratio will affect the company's ability to resist the operational risk, we also include the liability ratio as one of the control variables.

Property right nature (state): expressed in virtual variable mode. the state-owned enterprise is set as "1"; otherwise it is set as "0".

Age: the number of years from the date of incorporation to the year of testing.

Growth rate of operating income (growth): calculated by the company's operating income compared with the growth rate of the previous year.

3. RESULTS AND DISCUSSION

Firstly, we carry out descriptive statistics analysis to check whether all samples are abnormal.

Table 1. Descriptive statistics of the year 2018 (N=167)

Variable	Min.	Max.	Ave.	Std.
SR	0.16	1.74	1.06	0.33
ESG	1.00	25.00	17.63	6.79
PROGS	-3.00	23.00	1.81	5.84
PROG	0.00	1.00	0.68	0.47
GRI	0.00	1.00	0.50	0.50
PROGS*GRI	-8.05	10.66	0.21	2.90
PROG*GRI	-0.34	0.34	0.02	0.23
IND	0.00	1.00	0.12	0.33
SCALE	13.34	21.57	16.62	1.76
ROA	-6.47	25.69	5.01	5.91
LIAB	0.07	0.93	0.60	0.22
STATE	0.00	1.00	0.28	0.45
AGE	9.96	35.19	21.35	5.81
GROWTH	-0.29	0.70	0.11	0.18

Note：for definition of these variables, see 3.2.

By reviewing the sample distribution in Tables 1 and 2, we find that in the performance of ESG rating results, the minimum value is only 1, and the maximum value is 25. This indicates markedly different ESG performance among the sample companies, and passive disclosures of social responsibility by about half of them. We also find a big gap among the control variables, including financial performance, growth, and company establishment time. Therefore, considering the differences in various operating conditions of the sample companies, we use the quantile regression method to analyze the data, which can enhance the practical value of the research results.

In addition, since most of the variables in the sample do not show normal distribution, we delete extreme values via winsorization. We first judge the rationality of the linear regression model according to the collinearity and F value, and then list the empirical results of quantile regression and OLS method in Table 5 to table 6.

Tables 3 and 4 are the empirical results of the "least squares" method, from which we can first examine whether the design of the regression model is reasonable. First of all, "collinearity" refers to whether there is obvious homogeneity among the variables in the regression equation. The upper limit defined in the general academic literature is 10, and a more rigorous standard is to set the upper limit to 5. If it exceeds this number, it means that the variable has serious homogeneity with another variable, which will distort the design of the regression equation, and therefore the result is meaningless. These two tables show that the maximum collinearity of regression results of model 1 and model 2 does not exceed 3.83, indicating that the choice of each variable has its own representative

significance and that there is no obvious homogeneity. Another value is the F value, an indicator to judge whether the linear regression model has a predictive ability. From Tables 3 and 4, we know that F values are 10.297 and 9.611 respectively; these are significant results that can explain the rationality of the regression equation. Next, Tables 5 and 6 compare and analyze empirical results of quantile regression and ordinary least squares (OLS).

Table 5 shows the empirical results between CSR performance and systematic risk in 2019. From the table, we can observe that there is no significant correlation between CSR performance and systematic risk in the OLS and most levels of quantile regression; only in high-risk companies, those with good social responsibility performance can effectively reduce systematic risk.

Table 6 shows the impact of CSR performance on systematic risk deferral within one year. The results of OLS show that the more "progress" scores and the more companies that actively disclose social responsibility reports, the more effectively they can resist the impact of systematic risk. The results of quantile regression reveal that in the low-risk samples, the more "progress" scores a company gets, the higher the systematic risk it will take.

Based on the results of Tables 5 and 6, we can conclude that the companies only perform well in social responsibility but fail to disclose relevant information. For the high-risk samples, CSR can reduce systematic risk temporarily, but CSR performance has no deferred effect. But if the "progress" score gets higher and they disclose their CSR performance report to their stakeholders, CSR will reduce the systematic risk

Table 2. Descriptive statistics of the year 2019 (N=169)

Variable	Min.	Max.	Ave.	Std.
SR	0.16	1.74	1.06	0.33
ESG	1.00	25.00	19.41	4.10
GRI	0.00	1.00	0.41	0.49
ESG*GRI	-10.90	3.31	0.44	2.04
IND	0.00	1.00	0.12	0.33
SCALE	13.54	21.66	16.71	1.77
ROA	-15.27	22.23	4.61	5.64
LIAB	0.06	0.92	0.60	0.22
STATE	0.00	1.00	0.48	0.50
AGE	10.96	36.19	22.34	5.82
GROWTH	-0.60	1.19	0.15	0.23

Note：For definition of the variables, see 3.2.

Table 3. The OLS empirical results of model (1)

Variable	t value	p value	VIF
CON_	9.36	0.00	
ESG	-1.16	0.25	1.51
GRI	0.33	0.75	1.46
ESGGRI	1.25	0.21	1.30
IND	3.63	0.00	1.19
SCALE	-5.88	0.00	3.12
ROA	-0.86	0.39	1.83
LIAB	4.34	0.00	3.53
STATE	-0.92	0.36	1.19
AGE	-0.17	0.86	1.22
GROWTH	3.14	0.00	1.27
Adj-R^2	0.356		
F value	10.297	p value ***	

*Note 1：p<=0.01 is ***， 0.01<p<=0.05 is **， 0.05<p<=0.1 is *; Note 2：For definition of the variables, see 3.2.*

Table 4. The OLS empirical results of model (2)

Variable	t value	p value	VIF
CON_	9.71	0.00	
ESG	-0.12	0.90	3.65
PROGS	0.86	0.39	3.83
PROG	-0.77	0.44	1.30
GRI	-1.08	0.28	1.33
PROGSGRI	-2.28	0.02	1.40
PROGGRI	-0.66	0.51	1.26
IND	4.22	0.00	1.16
SCALE	-6.74	0.00	2.85
ROA	0.68	0.50	2.22
LIAB	5.68	0.00	3.49
STATE	0.79	0.43	1.06
AGE	-0.32	0.75	1.13
GROWTH	-3.73	0.00	1.26
Adj-R^2	0.403		
F value	9.611	p value***	

*Note 1：p<=0.01 is ***， 0.01<p<=0.05 is **， 0.05<p<=0.1 is *; Note 2：for definition of variables, see 3.2.*

Table 5. The quantile and OLS empirical results of model (1)

Variable	25%	50%	75%	OLS
CON_	2.57***	3.17***	2.98***	2.72***
ESG	0.01	-0.01	-0.02**	-0.01
GRI	0.09	0.09	-0.06	0.02
ESGGRI	-0.01	0.02	0.01	0.01
IND	0.30***	0.21	0.24***	0.25***
SCALE	-0.13***	-0.15***	-0.11***	-0.12***
ROA	-0.01	0.00	0.00	0.00
LIAB	0.65***	0.85***	0.83***	0.78***
STATE	-0.08	0.03	-0.01	-0.04
AGE	0.00	0.00	0.00	0.00
GROWTH	0.25*	0.23***	0.27**	0.32***
Adj-R^2	0.25	0.23	0.29	0.36

*Note 1：p<=0.01 is ***， 0.01<p<=0.05 is **， 0.05<p<=0.1 is *; Note 2：For definition of the variables, see 3.2.*

Table 6. The quantile and OLS empirical results of model (2)

Variable	25%	50%	75%	OLS
CON_	2.60***	3.05***	2.99***	2.69***
ESG	0.00	0.01	-0.01	0.00
PROGS	0.02**	0.01	-0.01	0.01
PROG	-0.08	-0.02	0.02	-0.04
GRI	0.01	0.01	-0.02	-0.05
PROGSGRI	-0.03***	-0.03**	-0.02***	-0.02**
PROGGRI	-0.04	0.07	-0.03	-0.06
IND	0.35***	0.23***	0.25***	0.28***
SCALE	-0.13***	-0.16***	-0.14***	-0.13***
ROA	0.00	0.00	0.00	0.00
LIAB	0.73***	0.98***	1.08***	0.99***
STATE	0.05	0.12**	0.12**	0.04
AGE	0.00	0.00	0.00	0.00
GROWTH	-0.23	-0.50***	-0.72***	-0.46***
Adj-R^2	0.29	0.30	0.35	0.40

*Note 1：p<=0.01 is ***，0.01<p<=0.05 is **，0.05<p<=0.1 is *; Note 2：For definition of variables, see 3.2.*

for them. For the low-risk samples, if only in terms of social responsibility progress, CSR will increase the systematic risk. This also reflects the previous view that social responsibility behavior will increase the cost outside the normal business, which is unfavorable to the business operation. Our empirical results, however, also find the importance of CSR report disclosure, and confirm that CSR performance can improve the interaction between the enterprise and the external environment, thereby reducing business risk.

4. CONCLUSION

4.1 Findings

In this paper, we have empirically explored how ESG performance of listed companies and disclosure of ESG information impact systematic risk, by taking the A-share listed companies with ESG rating from 2018 to 2019 as samples. Our findings demonstrate the importance of both social responsibility performance and its information disclosure and prove the necessity for CSR performance to make as much progress as possible. The combination of these three elements can give full play to the best function of resisting systematic risk. The findings are as follow:

For high-risk companies, the current performance of CSR helps to reduce systematic risk.

For low-risk companies, progress in CSR performance and an increasing number of

companies that do not disclose social responsibility information will increase the systematic risk.

Better CSR performance and activeness to disclose social responsibility report will help to reduce systematic risk.

4.2 Suggestions

Based on the above three research findings, we put forward the following suggestions in practical operation.

The government and regulators should establish and improve the ESG information disclosure system and strengthen policy support for ESG investing. There are two reasons for this suggestion. First, since ESG investing conforms to the trend of sustainable development and the goal of green development, implementing ESG investment philosophy is conducive to economic restructuring and the transformation of development mode. Such implementation alone will not suffice to achieve the above goals, though. Second, our research shows that despite the critical importance of ESG information disclosure, most of the enterprises have not yet realized it, and voluntary disclosure by listed companies is still the main approach. Based on the above two reasons, therefore, we recommend that the government and relevant departments should play their guiding role in improving the ESG information disclosure system, give full play to the role of market mechanisms, and supervise the ESG information disclosure. We also propose to gradually unify the ESG

evaluation standards, strengthen the unity of relevant departments, improve shared databases, and provide effective data support for investors.

Enterprises should pay attention to relevant regulations, assume CSR, and complete ESG information disclosure as required. Out of the principle of "voluntariness" has arisen a problem of "quantity over quality"—most companies lack knowledge of what information to disclose and only disclose positive information, thus misguiding investors. We contend that enterprises should fully understand the requirements of ESG investment philosophy and disclose their ESG information punctually and factually. In addition, enterprises can avoid individual risks by improving the overall performance of ESG, so as to increase their value.

Investors can choose the enterprises that perform well in ESG information disclosure to reduce their investment risk. These enterprises have higher market value and can bring higher investment income for investors, especially in the long run. If investors consider ESG information before making investment decisions, they can better avoid investment losses. They should, therefore, be encouraged to pay special attention to the ESG performance of the enterprise when making investment decisions.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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