

Impact of Corporate ESG Performance on Equity Returns

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Abstract. In the context of sustainable development, ESG is no longer a theoretical concept, but is gradually put into practice. Corporate decision makers, market investors and regulators are all attach more and more attention to ESG information. Whether the efforts made by companies in ESG can bring the companies due returns? Whether excellent ESG performance attracts investors and brings them excess returns? Whether ESG information can help regulators to promote a stable and growing market? This paper uses Bloomberg ESG data and a sample of 242 companies from 2011 to 2020, to answer these questions. This study finds that ESG performance does not generate positive returns for firms and investors. Furthermore, for state-owned enterprises and heavily polluting firms, the sacrifices made in ESG performance are greater. This study theoretically analyses the reasons for the negative correlation between the two research subjects. It alerts the tripartite participants to look at ESG disclosure information in a critical way.

Keywords: ESG Performance; Equity Returns; negative correlation.

1. Introduction

ESG is a broad and profound concept that reveals a new investment philosophy and criteria that encompasses environmental, social and governance aspects, forming an important link in the green financial system and sustainable development. In October 2015, China put forward the new development concept of "Innovation, Coordination, Green, Openness and Sharing", and green development has become a development strategy for China's 13th Five-Year Plan and beyond. ESG plays an increasingly important role in corporate decision makers' pursuit of green and sustainable operations, market investors' venture of high-yield and low-risk investment opportunities, and regulators' exploration of efficient and uniform regulatory indicators and measurement standards.

Although China has continued to focus on ESG in recent years and has seen an exponential growth in ESG research, there are still huge gaps to be filled in ESG-related research in China due to its relatively later start compared to other countries and the lack of a mature system. In addition, Chinese investors face many difficulties and obstacles when they are gradually becoming more aware and concerned about ESG investment. Therefore, this study holds a critical attitude, focusing on the perspective of corporate decision makers, to explore the impact of ESG performance on the future development of companies.

The contributions of this paper are: Firstly, it uses ESG scores for the study, avoiding the use of ESG ratings and thus the treatment of artificially assigned scores, which leads to the elimination of subtle differences between firms by uniform ratings. Secondly, it adopts a positive and negative competing hypothesis to examine the impact between ESG performance and stock returns in a neutral manner. Thirdly, it explores the impact of ESG performance on firms not only in terms of overall ESG performance, but also based on the separate aspects of E, S and G to analyse firms' decision preferences. Fourth, it further explores two different influence factors that would have differential impact of ESG performance and return on firms.

2. Literature review

As the ESG concept continues to be incorporated into practical decision-making and development strategies by the three parties of corporate decision-makers, market investors and regulators, many researchers have focused on ESG and have done a lot of research on its internal and external value to companies around its influencing factors, degree of influence and scope of influence.

There has been considerable international research on decision planning by corporate decision makers, but the existing research to date does not provide a consistent answer to the discussion on whether corporate ESG performance helps corporate development. Does a good ESG rating or score reflects in the stock returns of a company? Is a good ESG performance able to gain the favour of market investors? Can well efforts in ESG be over-compensated by the market? Research in this direction has been divided into three broad perspectives: positive, negative and non-correlated.

Based on a study of 417 A-share listed companies in the three years from 2015 to 2017, Zhang and Zhao conclude that ESG performance has a significant positive correlation with corporate value [1]. Ma concluded that there is a positive effect between a firm's ESG performance and that firm's stock return, and that this positive relationship varies slightly with changes in industry, firm size, and firm value [2]. Yin, Zhang, Zeng, and Hamdi et al. found that there is a positive correlation between a firm's ESG performance and firm value [3-6]. In contrast to the findings of the above scholars, Filbeck et al. empirically demonstrated that a positive environmental regulatory climate exhibits a negative relationship with corporate financial returns [7]. Patten DM found that after controlling for firm size and industry nature, the performance of firms exhibited a negative relationship with environmental disclosure [8]. In addition, Qiu et al. found no relationship between environmental disclosure and firm profitability [9]. Halbritter et al. confirmed that different levels of ESG performance do not have a significant impact on ESG portfolios and high ESG performance does not lead to abnormal excess returns [10].

Although most studies agree that corporate ESG efforts can help increase their value and attractiveness to investors, some empirical studies have concluded that the corporate ESG efforts are negatively correlated or even uncorrelated with the reward. In addition, ESG in China is in its early stages of development and its application has not yet gained clearly large number of results. This study therefore takes a cautious attitude by selecting data from 242 companies listed on A-shares from 2011-2020 to examine what impact corporate ESG performance actually has on stock returns, while then separately examining E, S and G sub-performances and comparing the combined ESG performance to examine the differences and judge the strategic choices of companies. Further, the impact of the nature of firm ownership and industry between firm ESG performance and stock returns is discussed.

3. Theoretical analysis and research hypothesis

3.1. The impact of the combined performance of corporate ESG on equity returns

The positive feedback from corporate ESG performance is reflected in corporate stock returns in two ways: Firstly, there are more opportunities to raise capital to break free from financing constraints. Financing is an essential part of building a business that requires sufficient cash flow. However, there are problems in the market due to market failures such as information asymmetry, monopolies and negative externalities, which undoubtedly make it more difficult for companies to raise capital. In order to match companies and investors with each other, it is necessary to reduce the information gap between companies and investors and make information transparent. Disclosure of ESG-related information can help to achieve this. Zhou et al. found that institutional investors would pay attention to the ESG responsibility performance of enterprises and prefer to invest in those enterprises with good ESG performance [11]. The disclosure of ESG information complements the imperfect information on companies in the market, enabling information users to gain a deeper understanding of companies and helping investors to target their investments. At the same time, the market provides incentives for companies to make efforts in ESG. A good ESG performance helps companies to build a good corporate image, which allows them to have more opportunities to be invested in and receive more financial support, thus breaking down the financing barriers. Secondly, it helps to enhance the long-term value of a company. In the long run, enterprises must consider how to achieve long-term stable development in the context of the current "Double Carbon" and "Sustainable Development". Hu et al. demonstrate that ESG ratings can significantly contribute to the green transformation of

companies by alleviating financing constraints and agency problems [12]. For society, the green transformation of enterprises can significantly reduce the cost of environmental management and the difficulty of supervision and regulation, thus stabilizing social development and improving social welfare. Accordingly, there are rewards and incentives for companies that incorporate ESG into their development strategies. At the macro level, companies have a clearer development trend and a stable development environment, reducing uncertainty of macroeconomic fluctuations and unintended losses. At the micro level, the company has a stable user base and reduces internal conflicts of interest between stakeholders and agents while alleviating financing constraints and internal risk. When companies make efforts in ESG, investment in technology research and development increase, which will not only gain incentives from the government and the market, but also help them build the cornerstones of long-term development and pave the way for future growth.

Corporate ESG performance also has negative feedback on a company's stock returns: First, higher input costs. With market investors generally favouring companies with superior ESG scores or ratings, companies often have to pay a high cost to meet investors' expectations. From voluntary disclosure to the introduction of policies mandating disclosure, this change in decision-making criteria signifies that companies have to take on social and environmental responsibility and pay a certain amount of cost and sacrifice for it. When companies focus more on results in ESG, they tend to incur more costs in terms of human, material and financial resources, thus increasing their operating expenses and leading to the detriment of revenue and value. Brammer et al. studied 451 listed companies in the UK and found that companies with higher social performance scores were instead rewarded with lower returns and concluded that support for a particular social activity by a company largely undermines corporate value [13]. Secondly, the development of ESG in China is still immature at this stage. Although ESG is gradually becoming mainstream in China, the relevant research and application of ESG in China is still in its infancy and there are many problems. Firstly, compared to the information disclosure requirements in European and American area, China does not have a unified standard for ESG information disclosure, resulting in incomplete and less credible quality of disclosure informations and reports from listed companies, even the possibility of false "greenwashing" in the reports. Inaccurate or missing information not only leads to large discrepancies in ratings and scores by rating agencies, but also leads to loss for investors who choose it. Secondly, the ESG rating agencies in China, such as SynTao Green Finance, Wind, RKS and Huazheng, do not have a high correlation between different rating agencies and cannot draw on or compare with each other. Besides the evaluation system has a weak foundation, so the rating scores of each agency are relatively primary and cannot accurately provide effective assistance to investors, or even destroy the overall value of investors' portfolios after considering ESG performance.

Therefore, this study proposes the competing hypothesis that:

H1a: Firms ESG performance is positively correlated with their stock returns.

H1b: Corporate ESG performance is negatively correlated with its stock returns.

3.2. Heterogeneous differences in ESG performance in influencing corporate value

When examining the direct impact of ESG performance on firm value, the ESG performance of firms also varies depending on the nature of their ownership and the nature of the industry.

Firstly, nature of business ownership. The different nature of ownership can lead to different preferences. State-owned enterprises are inherently supported by state policies and funding, and therefore have a greater responsibility and obligation to fulfil their responsibilities than other private or foreign enterprises. Moreover, when faced with the dilemma of choosing between the overall interests of the country and their own interests, SOEs will prefer the former at the expense of their own self-interest. At the same time, SOEs are subject to greater scrutiny, which requires them to disclose, and report correct and valid ESG information as much as possible. In order not to damage their own corporate image and existing interests, SOEs will seek a relatively good ESG level to avoid the "poor but necessary disclosure" situation. For non-SOEs, the returns are generally less stable than for SOEs, and investors have the potential to reap high returns but also face the risk of large losses

when invest in non-SOEs. Therefore, when the ESG performance of a firm becomes better, investors will pay more attention to those more volatile firm to see whether it will have a higher probability of higher returns or a lower probability of lower losses. This paper therefore proposes the second hypothesis:

H2: Compared to non-SOEs, SOEs reduce the positive impact of ESG performance on firm value or increase the negative impact of ESG performance on firm value.

Secondly, the nature of the industry. ESG is an important indicator of green sustainability and has a different status in different industries. Non-heavy polluting industries may not be sensitive to this indicator, as these companies do not have to pay much attention and worry about the pollution they bring to the environment. In contrast, heavily polluting industries are by their nature required to fulfil more environmental responsibilities and help build a green and environmentally friendly natural ecology. As a result, they are under greater pressure to protect the environment and are subject to the attention and supervision of the government, society and the public. This paper thus proposes the third hypothesis:

H3: Compared to non-heavily polluting firms, the enterprise value of heavily polluting firms will be more sensitive to ESG performance, reflecting a greater positive impact or a smaller negative impact.

4. Study design

4.1. Sample selection and data sources

With the continuous development of ESG in China in recent years, the ESG rating systems established by third-party institutions such as Wind have begun to take effect but considering that the development of these institutions is still in its initial stage, and it is difficult to cross-reference and compare among different institutions, due to no uniform judging standard among the systems of various institutions. Therefore, this study uses the earliest Bloomberg ESG scores, from which ESG scores of Chinese A-share listings for the ten-year period 2011-2020 were selected. The rest of the data are obtained from the CSMAR database, in which ST and *ST listed companies and companies of financial and insurance are excluded from the sample to ensure the reliability and validity of the data. Besides, samples with missing key variables were also excluded, eventually collecting a total of 2,420 data for 242 companies.

4.2. Definition and description of variables

The explanatory variable is the annual stock return (Return), which represents the return that an investor would receive if they purchased the stock. The core explanatory variable is the overall ESG performance, which is derived from the Bloomberg ESG Disclosure Score by weighting the E (Environment), S (Society) and G (Government) sub-scores. The higher the score, the better the company's ESG performance and the more effective it is in practising environmental responsibility, social responsibility and corporate governance. On the contrary, the worse the score, the less effective it is. As for the control variables, the logarithm of the total annual share market capitalization of the company (Size) is chosen to measure the size of the company. In general, the larger the size of the company, it has the greater potential and ability to conduct ESG management. The year of observation minus the year the company went public (Age) is chosen to measure the age of the company. Generally, the older the company is, the more stable the business conditions within the company and the greater the potential to implement ESG strategies. The asset-liability ratio (Leverage) and return on equity (ROE) are respectively selected to measure the solvency and profitability of a company. The shareholding ratio of the top ten shareholders (Top10) is selected to measure equity concentration. The distribution structure of equity is closely related to corporate business governance, which in turn has an impact on stock returns. The nature of shareholding (SOE) is used as a dummy variable, with a value of 1 if the company is state-controlled and 0 if the company is non-state-controlled. The degree of pollution (Pollution) is used as a dummy variable. According to the "Environmental

protection verification industry classification management directory of listed companies” and the "Guideline for Environmental Information Disclosure of Listed Companies" formulated by the Ministry of Environment and Environmental Protection in 2008, 16 categories of industries such as thermal power, iron and steel, cement and coal are classified as heavily polluting industries. Therefore when an enterprise is classified in one of these 16 categories, Pollution is given value of 1 indicates a heavily polluting enterprise, while the opposite is 0, indicating a non-heavily polluting enterprise. The names, codes and definitions of the main variables are shown in Table 1.

Table 1. Variable selection and definitions.

Variable type	Variable name	Variable Code	Variable definition	Data source
Explained variables	Annual Return on Stocks	Return	=Annual individual share returns considering reinvestment of cash dividends	CSMAR
Explanatory variables	ESG performance	ESG	Total corporate ESG score	Bloomberg
	Environmental responsibility	E	Corporate Environmental Responsibility Score	
	Social responsibility	S	Corporate Social Responsibility Score	
	Corporate Governance	G	Corporate Governance Score	
Control variables	Business size	Size	=Total market capitalisation of individual shares in the year taken as a logarithm	CSMAR
	Age of business	Age	=Current year - Year of launch	
	Asset-liability ratio	Leverage	=Total liabilities / Total assets	
	Return on equity	ROE	=net profit / shareholders' equity balance	
	Concentration of shareholding	Top10	Shareholding of top ten shareholders	
	The nature of shareholding	SOE	Dummy variable for the nature of ownership, 1 if the corporate is state-controlled, 0 otherwise	
	Pollution level	Pollution	Dummy variable for heavily polluting enterprises, 1 if a heavily polluting enterprise, 0 otherwise	
	Nature of industry	Industry	Industry dummy variables	
	Year	Year	Year dummy variables	
	Companies	Firm	Corporate dummy variables	

4.3. Model setting

In order to investigate the relationship between the aggregate ESG performance of firms and stock returns, this study constructs the following fixed benefit regression model:

$$\begin{aligned}
 \text{Return} = & \beta_0 + \beta_1 \text{ESG}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Age}_{i,t} + \\
 & \beta_4 \text{Leverage}_{i,t} + \beta_5 \text{ROE}_{i,t} + \beta_6 \text{Top10}_{i,t} + \\
 & \text{Firm}_i + \text{Year}_t + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

Further, to explore the impact of the E, S and G sub-scores on stock returns, construct the following equations with a similar structure to model (1):

$$\begin{aligned}
 \text{Return} = & \beta_0 + \beta_1 \text{E}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Age}_{i,t} + \\
 & \beta_4 \text{Leverage}_{i,t} + \beta_5 \text{ROE}_{i,t} + \beta_6 \text{Top10}_{i,t} + \\
 & \text{Firm}_i + \text{Year}_t + \varepsilon_{i,t}
 \end{aligned} \tag{2}$$

$$\begin{aligned} \text{Return} = & \beta_0 + \beta_1 S_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Age}_{i,t} + \\ & \beta_4 \text{Leverage}_{i,t} + \beta_5 \text{ROE}_{i,t} + \beta_6 \text{Top10}_{i,t} + \\ & \text{Firm}_i + \text{Year}_t + \varepsilon_{i,t} \end{aligned} \quad (3)$$

$$\begin{aligned} \text{Return} = & \beta_0 + \beta_1 G_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Age}_{i,t} + \\ & \beta_4 \text{Leverage}_{i,t} + \beta_5 \text{ROE}_{i,t} + \beta_6 \text{Top10}_{i,t} + \\ & \text{Firm}_i + \text{Year}_t + \varepsilon_{i,t} \end{aligned} \quad (4)$$

Where Firm and Year in (1)-(4) are respectively individual dummy variable and time dummy variable. β_0 Is the interception. $\varepsilon_{i,t}$ Is the random perturbation term.

5. Empirical testing

5.1. Descriptive statistics

The results of the descriptive statistics for the key variables are shown in Table 2: the mean value of Return is positive, indicating that individual stocks have positive returns after taking into account the reinvestment of cash dividends and the sample performed well over the sample period. Together, the extreme difference of E, S, G and the overall ESG score indicates that different enterprises fulfill their environmental and social responsibilities to different degrees and the degree of social responsibility undertaken by each enterprise is significantly different. Meanwhile smaller extreme difference of G indicates a consistent preference towards corporate governance efforts. Among the control variables, the minimum value of ROE is -0.062, which indicates that the profitability of individual companies is not optimistic. The standard deviations of both Leverage and Top10 are small, indicating that the companies in the sample have a good solvency and a similar organizational structure. The mean value of Enterprise Size is 16.508. As the size data is processed by taking the logarithm of the market value, the difference in size of different enterprises in the sample is actually significant. The minimum value of Age is 0 and the maximum value is 29, indicating that there are significant differences in internal operations indirectly reflected by the age of companies.

Table 2. Descriptive statistics of the variables.

Variables	N	Mean	SD	Min	Max
Return	2420	0.103	0.414	-0.733	2.633
ESG	2420	23.614	6.985	10.744	60.744
E	2420	12.401	8.871	1.550	55.814
S	2420	27.156	10.038	7.018	77.193
G	2420	46.401	5.174	28.571	64.286
ROE	2420	0.104	0.069	-0.062	0.493
Leverage	2420	0.477	0.193	0.034	0.865
Size	2420	16.508	1.159	13.917	21.644
Age	2420	13.521	6.196	0.000	29.000
Top10	2420	0.605	0.158	0.127	0.986

5.2. Regression results

This study uses a multiple regression model with fixed benefits for the analysis. The regression results of equations (1)-(4) are shown in Table 3. As shown in Table 3, column 2 presents the results of the empirical evidence on the combined ESG performance and stock return. The regression coefficient between Return and ESG is -0.0045, which is significantly negative at 1% level of significance. Reasons for this result may be that, on the one hand, the pursuit of a good ESG score may cause the firm to divert capital into ESG construction by sacrificing potential earnings from other important businesses, thus increasing the investment cost of ESG, resulting in the diminishment of

return. On the other hand, due to the immature scoring system and standard in China, the authenticity and validity of corporate information disclosure should be considered. "Rubbish in and rubbish out" may lead to distortion of ESG scores, so investors may not get the desired return after considering ESG factors.

The regression results for equations (2)-(4) presented in Table 3 are sequentially represented the outcome of E, S and G performance with Return. Firstly, the regression coefficients for E, S and G are all negative, meaning that a firm's stock return is negatively correlated with the firm's performance in E, S and G, indicating that whichever aspects the firm invests in, the firm's value will decrease. Secondly, the coefficient of the E term (-0.0024) in equation (2) is not significantly different from that of the ESG term (-0.0045), indicating that sustainable development has become a general consensus and decision makers generally choose to incorporate environment into their corporate development plans and make continuous efforts in environmental aspects with fairly stable achievements. Furthermore, compared to Environment, Government and ESG, there is a non-significant relationship between corporate social responsibility performance and stock returns, suggesting that investors are not sensitive to the fulfilment of corporate social responsibility. The possible reason for this is that corporate social responsibility is regulated by the government, the public and the relevant authorities, and is perceived by the public as a general consensus, so when corporate social performance becomes better, investors will take it for granted and will not reflect this change too much. Finally, the coefficient on the G term of equation (4) (-0.0106) is significantly smaller than the coefficient on the ESG term (-0.0045), suggesting that it is not a good option for corporate decision makers to concentrate on internal corporate governance. As opposed to putting efforts into ESG in combination, focusing on corporate governance alone does not lead to a good corporate performance in the current context of green development.

Table 3. Empirical results for corporate stock returns and performance of E, S and G subscales.

Variables	Return			
	(1)	(2)	(3)	(4)
ESG/E/S/G	-0.0045*** (0.0013)	-0.0024** (0.0010)	-0.0014 (0.0009)	-0.0106*** (0.0017)
ROE	0.3800*** (0.1282)	0.4056*** (0.1280)	0.4268*** (0.1276)	0.3114** (0.1279)
Leverage	-0.0997** (0.0429)	-0.1074** (0.0428)	-0.1046** (0.0429)	-0.0724* (0.0430)
Size	0.0965*** (0.0087)	0.0923*** (0.0086)	0.0891*** (0.0085)	0.0962*** (0.0082)
Age	-0.0019 (0.0014)	-0.0020 (0.0014)	-0.0023* (0.0014)	-0.00077 (0.0014)
Top10	-0.2352*** (0.0570)	-0.2461*** (0.0569)	-0.2555*** (0.0567)	-0.1924*** (0.0573)
Interception	-1.208*** (0.1233)	-1.205*** (0.1269)	-1.1393*** (0.1218)	-0.8648*** (0.1250)
Industry	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes

The superscripts nnn, nn, and n indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

5.3. Heterogeneity analysis

Two factors affecting the ESG performance of enterprises are proposed in the previous paper. One is the nature of enterprise ownership and the other is the nature of the industry. In this paper, the sample enterprises are divided into state-owned and non-state-owned enterprises, and heavily

polluting and non-heavily polluting enterprises. The state-owned and heavily polluting enterprises are assigned a value of 1, and the non-state-owned and non-heavily polluting enterprises are assigned a value of 0. The regression results are shown in Table 4.

First look at the two columns in Table 4 where SOEs are located. The ESG coefficient under SOEs is -0.0053, which is twice as high as -0.0027 for non-SOEs. This indicates that the ESG performance of SOEs reduces the value of the enterprise more compared to non-SOEs. The reason for this differentiation may be that the ESG performance of SOEs is more of a requirement and a standard that matches the political expectations of the state rather than the investment expectations of the market, and the nature of their equity requires SOEs to take on more environmental and social responsibility. In contrast, private companies and Sino-foreign joint ventures are market-oriented and focus on maximizing shareholder interests. As a result, decision makers in SOEs invest more effort in pursuing superior ESG indicators in order to meet political requirements, thus sacrificing some of the value of the company. On the other hand, investors develop a certain sense of rejection of SOEs prioritizing responsibility over shareholder rights, thereby increasing the damage to corporate earnings and value, hence hypothesis H2 is accepted.

Look again at the last two columns in Table 4 where Pollution is located. For heavily polluting firms, the coefficient on ESG performance is close to zero, which is smaller in absolute value than for non-heavily polluting firms. This suggests that the negative impact of ESG performance on firm value is close to zero for heavily polluting firms, while the negative impact on firm value is more significant for non-heavily polluting firms. The reason for this may be that since the 20th century, ecological and environmental problems have become increasingly prominent, and the consequences of "development before treatment" have continued to hinder China's high-quality economic development. Then China has begun to change from its previous extensive economy and has increased regulations and restrictions on a large number of heavily polluting enterprises, forcing such heavily polluting enterprises to make a green transformation. As a result, market investors will see it as deserved when heavy polluters take on environmental and social responsibility to improve their ESG performance, while for other non-heavily polluting companies, investors will be relatively more sensitive.

Table 4. Empirical results on the combined ESG performance and the nature of ownerships and industries.

Variables	Return			
	SOE		Pollution	
	SOE=1	SOE=0	Pollution=1	Pollution=0
ESG	-0.0053*** (0.0017)	-0.0027 (0.0022)	-0.0008 (0.0020)	-0.0060*** (0.0018)
ROE	0.3450672** (0.1704)	0.2345 (0.2016)	0.9722*** (0.2143)	-0.0232 (0.1638)
Leverage	-0.0458 (0.0546)	-0.1557** (0.0741)	-0.0439 (0.0715)	-0.1122** (0.0544)
Size	0.0864*** (0.0105)	0.1423*** (0.0166)	0.0521*** (0.0147)	0.1264*** (0.0111)
Age	0.0022 (0.0019)	-0.0065*** (0.0024)	-0.0014 (0.0024)	-0.0018 (0.0017)
Top10	-0.2047*** (0.0745)	-0.1901** (0.0945)	-0.2365** (0.1036)	-0.1763** (0.0698)
Interception	-1.1334*** (0.1511)	-1.9113*** (0.2436)	-0.6619*** (0.1950)	-1.6485*** (0.1645)
Industry	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes

The superscripts nnn, nn, and n indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

5.4. Endogeneity test

In order to test the correctness of the above regression data, this paper uses three methods to test the stability of the model used. Table 5 shows the regression results of these three methods.

5.4.1. Adding control variables.

Considering that macroeconomic conditions have impact on microeconomics, the macroeconomic variable of regional GDP is used as a control variable in this study. The coefficient of ESG performance before and after adding regional GDP is -0.0045016 and -0.0044875. The difference between them is small. Besides, the significance level and variance are basically unchanged. Meanwhile, the regression results of the other control variables do not change significantly, indicating that the results mentioned above are robust.

5.4.2. Replacing explained variables.

Tobin Q (TobinQ) is chosen to replace the explanatory variable stock return (Return) to test the robustness of the model. TobinQ is an important indicator of enterprise value, which is calculated as $\text{TobinQ} = \text{market value} / \text{total assets}$. The larger the enterprise value, the larger TobinQ is and the more favored by investors. Its measure is in the same perspective as stock return. The coefficient between TobinQ and ESG shows a negative correlation at the 5% significance level, thus hypothesis H1a can still be rejected and hypothesis H1b be accepted. The conclusion that the ESG performance of enterprises has a negative impact on their value is obtained.

5.4.3. ESG lagged by one year

Considering that ESG efforts usually require a certain period of time before there is practical feedback, this study lags ESG scores by one period in order to reduce the endogeneity problem caused by ESG scores. As shown in Table 5, the coefficient of ESG lagged by one period is still negatively correlated with stock return at 1% significance level, which is consistent with the previous findings. And the effect of this lagged period is even larger than that of the unlagged period, indicating that investors are more sensitive to the ESG performance of companies in the previous period.

Table 5. The regression results to test the stability of the model.

Variable	Add control variable	Replace explained variable	ESG lagged by a year
ESG	-0.0045*** (0.0013)	-	-
TobinQ	-	-0.0072** (0.0034)	-
ESG_t-1	-	-	-0.0056*** (0.0014)
ROE	0.3791*** (0.1280)	1.3893*** (0.2962)	0.7665*** (0.1386)
Leverage	-0.1035** (0.0428)	-0.8963*** (0.1585)	-0.0632 (0.0451)
Size	0.0959*** (0.0087)	0.7662*** (0.0286)	0.0824*** (0.0091)
Age	-0.0023* (0.0014)	-0.0519*** (0.0048)	-0.0066*** (0.0015)
Top10	-0.2348*** (0.0569)	-1.365*** (0.2052)	-0.2651*** (0.0598)
GDP	0.0323*** (0.0126)	-	-
Interception	-1.5253*** (0.1746)	-8.9030*** (0.4532)	-0.8860*** (0.1302)
Industry	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes

6. Conclusion

This study examines the relationship between corporate ESG performance and corporate stock returns using the fixed-effects multiple regression model with 242 non-financial, non-ST listed companies listed on A-shares from 2011 to 2020. The preliminary finding shows that higher ESG performance will, on the contrary, lower stock returns, with a negative correlation between the two. The endogeneity test confirms that the empirical data and process are valid and credible. Further, this paper compares the difference between aggregate ESG performance and the performance of the E, S and G separately, finding that the more companies focus on improving their G performance, the greater the damage to corporate value. More specifically, this study analyses two impact factors that would make a difference to the study subjects. The results show that state-owned enterprises mitigate the negative impact of ESG performance on stock returns and heavily polluting enterprises aggravate this negative impact.

The conclusions of this paper have important practical implications for all three parties: corporate decision-makers, market investors and regulators. Firstly, the conclusion of a negative correlation in this paper is contrary to the mainstream findings of current research. Most of the relevant studies in China have confirmed that take effort in ESG can bring positive feedback to enterprises in terms of increased corporate value, increased revenue or reduced risk. While the negative correlation is more often found in the early stage when the ESG concept was first introduced into China. The most important feature of this paper is therefore to sound the alarm about the prevailing belief that ESG performance will lead to positive feedback. Secondly, for corporate decision-makers, it is necessary to plan ESG according to the nature of their own companies and development conditions, setting reasonable targets instead of blindly sacrificing potential opportunities in pursuit of a high on-table score. For market investors, a good ESG score does not necessarily indicate that it is an investment that will bring high returns. Investors should be more cautious about ESG indicators and should use them as a reference tool rather than a judgment tool for making yes or no decisions. For regulators, the regulation of ESG information disclosure should be strengthened and uniform standards should be set. Regulators should narrow the information gap, improve the accuracy and effectiveness of information disclosure, borrowing the experience of international institutions to promote the establishment of a complete ESG system. There is still a long, long way to go in the development of ESG in China.

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