Transactions on Social Science, Education and Humanities Research
ISSN: 2960-1770, eISSN: 2960-2262 | Volume 9
SSMI 2024

Corporate ESG Performance and Corporate Value

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Abstract. In the context of China's green development transformation and high-quality development, it is of great significance to actively promote enterprises to practice the concept of ESG development. In order to study the impact of ESG on enterprise value, this paper empirically examines the impact of ESG performance on enterprise value and its mechanism of action, taking listed companies of enterprises from 2013 to 2023 as the research sample. The research results show that ESG performance can significantly increase enterprise value. The study of the mechanism of action shows that corporate ESG enhances corporate value through digital transformation, promoting corporate innovation, and enhancing financial asset allocation. Heterogeneity analyses find that the positive effect of ESG on firm value shows differences among different types of firms, especially among state-owned enterprises and high-tech firms, where the positive effect of ESG performance on firm value is more significant. The research in this paper enriches the impact of ESG on enterprise value, which is of theoretical and practical significance for enterprises, investors and government to complete.

Keywords: Corporate ESG performance; corporate value; digital transformation; innovation capability; corporate asset allocation.

1. Introduction

The report of the 20th CPC National Congress pointed out that Chinese-style modernisation is a modernisation in which human beings coexist harmoniously with nature, and that we must adhere to sustainable development to achieve the sustainable development of the Chinese nation. ESG performance is a comprehensive assessment of the sustainable development of corporate operations from three dimensions: environmental (E), social (S) and corporate governance (G), and is a green development concept that organically combines social and economic values. In China, the implementation of ESG practices is of great strategic significance because not only is it in line with the high-quality development of the economy, in line with the spirit of the 20th CPC National Congress, and closely related to issues such as the dual-carbon target, ecological civilisation, poverty alleviation, and common prosperity, but it is also a powerful tool for enhancing corporate value and realising high-quality development of the economy. How to view how ESG performance affects corporate sustainability and high-quality development is a current issue that needs to be verified. Therefore, on the basis of the core question of whether ESG performance affects enterprise value, this paper further studies its specific impact mechanism, explores the mechanism by which ESG performance affects enterprise value and the moderating role of enterprise heterogeneity on the value effect of ESG performance, which is crucial to help enterprises implement the concept of green development and promote the sustainable development of the real economy.

Based on the above background, this paper uses A-share family-owned companies listed in Shanghai and Shenzhen from 2014 to 2024 as a sample to examine the impact of ESG performance on enterprise value. The empirical results of this paper find that ESG performance can effectively promote enterprise value, and this promotion effect is more significant when belonging to state-owned enterprises and high-tech enterprises. Further analysis of its mechanism of action finds that corporate ESG enhances corporate value through digital transformation, promoting corporate innovation, and enhancing financial asset allocation.

The contributions of this paper are: 1. Based on the fact that there are still relatively few in-depth studies on how ESG performance affects corporate value, and the research in this field still needs to be further deepened, this paper conducts an empirical study on the relationship between ESG performance and corporate value. 2. An empirical study of the relationship between ESG performance and firm value explores the interactions between the two and the mechanisms by which they work, providing a useful addition to the existing literature on the impact of ESG performance on economic outcomes. ESG performance-digital transformation", "ESG performance-innovation capability-corporate value", "ESG performance-financial asset allocation-corporate value", and "ESG performance-innovation capability-corporate value". ESG performance - digital transformation - enterprise value", "ESG performance - innovation capability - enterprise value" and "ESG performance - financial asset allocation - enterprise value", which enriches the research on the mechanism of the impact of ESG performance on enterprise value. 3. In order to more comprehensively study the relationship between ESG performance and enterprise value, this paper further explores and tests the impact of ESG on enterprise value of state-owned enterprises (SOEs) and high-tech enterprises (HTEs), in terms of heterogeneity of property rights and types of enterprises. 4. In order to more comprehensively study the relationship between ESG performance and enterprise value, this paper further explores the impact of ESG on enterprise value of state-owned enterprises and high-tech enterprises from the perspective of ownership type and enterprise type heterogeneity, and conducts a test to make the research of this paper richer.

The rest of this paper is arranged as follows: the second part is the literature review, the third part is the research hypothesis, the fourth part is the research design, the fifth part is the empirical analysis, and the sixth part is the conclusions and insights.

2. Literature Review and Research Hypothesis

2.1. ESG performance and enterprise value

Currently, academics have conducted a large number of studies on the impact of ESG on corporate value, and scholars have come to different conclusions about the relationship between ESG and corporate value. In these studies, the vast majority of scholars ESG can enhance the value of the company; some scholars believe that ESG will reduce the value of the company.

On the one hand, ESG performance can promote firm value. Existing studies suggest that ESG enhances firm value in all three dimensions of environmental (E) social (S) and corporate governance (G). The environmental dimension focuses on a firm's efficiency in the use of natural resources, the control of pollution emissions, and the protection of ecosystems. Investments in environmental management can lead to cost savings and efficiency improvements, which in turn increase corporate value. Enterprises' assumption of environmental responsibility improves their corporate image, which in turn increases their market value (Chen Hong and Zhang Lingxiao, 2024). Under the corporate social dimension, good social performance enhances corporate brand image and consumer loyalty, which in turn increases market share and revenue (Zhu et al., 2016). In addition, corporate investment in social responsibility can attract and retain talent and increase employee satisfaction and productivity. With regard to the corporate governance dimension, good corporate governance can reduce agency costs and improve the quality of decision-making and risk management ability of firms. Taking domestic A-share listed enterprises in 2011-2016 as a research sample, Zhang Ju (2019) analysed and found that the higher the level of corporate governance, the stronger the profitability of the enterprise.

On the other hand, some scholars believe that ESG performance has a negative effect on firms. In the short term, ESG performance may have a negative impact on firms' financial returns in the short term (Coelho et al., 2023). An empirical study by Giannopoulos et al. (2022) states that ESG actions may negatively affect firms' return on assets. In the long run, Rojo-Suarez and Alonso-Conde's (2023) study, on the other hand, suggests that ESG performance may be negatively correlated with corporate returns. These findings suggest that ESG investments are not always positively associated with corporate financial performance.

Although scholars' findings are inconsistent, most of the studies believe that ESG performance can promote enterprise value (Lou Zouchao, 2021), which means that the idea that ESG performance can promote enterprise value is more reasonable. Therefore, this paper proposes hypothesis 1.

Hypothesis 1: ESG performance can promote enterprise value.

2.2. The role of digital transformation in ESG affecting firm value

There is little literature on ESG enhancing firm value through digital transformation. However, there is existing literature that examines the impact of ESG on digital transformation, and there is also literature that examines the impact of digital transformation on firm value. These two studies provide a reference for us to study ESG's enhancement of firm value through digital transformation.

Wang, Dan and Zhang, Ding (2023) show that based on signaling theory and principal-agent theory, digital transformation facilitates the interconnection of information and effective regulation between principals and agents by improving information transparency and transmission efficiency, and enhances the willingness of firms to disclose ESG information. At the same time, enterprises are able to continuously update ESG information to the capital market through multiple platforms, expanding the influence of the media and institutional investors, enriching external regulatory channels, helping to avoid moral hazard caused by information asymmetry, and promoting the transparency of business processes and the quality of internal control. Further the information transfer effect of ESG disclosure can be enhanced by the advancement of digital technology. Yu Hao and Zhao Sweet (2023) found that enterprises in the process of digital transformation, through active disclosure of ESG information, enhanced stakeholder information, which helps to improve the reputation and visibility of the enterprise and thus enhance corporate performance, reduce corporate risk for digital transformation to bring significant synergistic effects, access to achieve a multi-faceted empowerment. Li Jinglin et al. (2021) argued that digital transformation provides a way for companies to enhance dynamic capabilities, optimise cost control, and improve resource efficiency, while also laying the foundation for corporate ESG performance. Chen et al. (2023) found that ESG performance helps to strengthen the role of digital transformation in promoting corporate innovation. In terms of the relationship between digital transformation and enterprise value, according to the signalling theory, enterprises' proactive fulfilment of social responsibility can reduce the information asymmetry between enterprises and stakeholders such as shareholders, and enable enterprises to increase enterprise value more effectively by advancing the digitalisation process (Ming Yuzhuo, 2024). Zhang Miao (2024) digital transformation can improve enterprise value from three aspects: improving corporate governance, easing financing constraints, and enhancing the ability of corporate innovation. Based on the above analyses, this paper proposes hypothesis H2.

Hypothesis 2: ESG performance improves corporate value by improving digital transformation.

2.3. The role of innovation capability in ESG affecting firm value

There is little research in the literature on ESG increasing firm value by promoting firm innovation. However, there is literature on the impact of ESG on corporate innovation and also on the impact of corporate innovation on firm value. The two studies provide a reference for us to study that ESG increases firm value by promoting firm innovation.

In terms of the relationship between ESG and innovation capability, corporate innovation is a key element of an enterprise's development as it constantly creates and innovates according to the market development trend, and it also provides an important support for the transformation and upgrading of the enterprise in terms of technology. Wang Ni (2022) found that excellent ESG performance can provide valuable information resources for corporate management, support the optimisation of corporate resource allocation and governance structure, and thus promote corporate innovation investment decisions including innovation level and innovation structure. ESG can enhance the ability and motivation to innovate in the three dimensions of corporate environmental performance, corporate social responsibility, and corporate governance, all at the same time, thus contributing to the improvement of corporate transformation and upgrading. ESG performance has a positive effect on the sustained innovation ability of enterprises (Liu, Huihong et al., 2023).

In terms of the relationship between innovation capacity and enterprise value, innovation is the core driving force for enterprises to gain competitive advantage and achieve long-term development (Gao Jieying et al., 2021). Enterprises increase their R&D investments to achieve more innovative outputs, and transforming innovations into commercial applications or integrating them into daily production operations can reduce multiple costs and establish unique competitive advantages, which in turn improves their profitability and business performance (Peng Manru et al., 2023). The adoption of ESG practices by firms tends to motivate them to proactively enhance their innovation capabilities. In order to meet environmental standards and market demands, firms usually take the initiative to increase their R&D investment and actively fulfil their environmental responsibilities by improving their technology or developing environmentally friendly and innovative products. Based on the above analysis, this paper proposes hypothesis H3.

Hypothesis 3: ESG performance increases firm value by promoting firm innovation.

2.4. The role of asset allocation in ESG's impact on firm value

There is little literature on ESG increasing firm value through financial asset allocation. However, there is literature on the impact of ESG on financial assets and also on the impact of financial asset allocation on firm value. The two studies provide a reference for us to study ESG to increase firm value through financial asset allocation.

In terms of the relationship between ESG and financial asset allocation, the improvement of overall ESG performance can enhance corporate reputation (Sun Hui et al., 2023), win the trust of stakeholders, and provide financial support for corporate allocation of financial assets. Gu Leilei et al. (2020) found that there is a "financialisation" effect of social responsibility, and although external quality resources flow into companies with good social responsibility performance, they cannot inhibit the tendency of management to invest in financial assets, i.e., the positive social responsibility of enterprises increases the degree of financialisation of enterprises. Corporate ESG performance may also contribute to financial asset allocation behaviour for financial gain.

In terms of the relationship between financial asset allocation and firm value, Yang Zing et al. (2017), by empirically analysing the trading financial assets of China's A-share firms, found that they can effectively reduce the firm's financing constraints and thus improve the sustainability of R&D investment. Denis and Sibilkov's (2010) analysis shows that a firm's increased degree of financial asset allocation is conducive to solving its financing difficulties and increase the level of capital owned by the company, which in turn promotes the development of the field of industrial investment. Financial assets have become an important asset allocation option due to their high liquidity and fast liquidity, which in turn can be used as a "reservoir" to help companies cope with possible financing constraints and financial difficulties (Liu Guanchun, 2018).

As a result, ESG improves the credibility and market image of enterprises, making it easier for enterprises to obtain funds, thus reducing the need to cope with financing constraints through financial asset allocation. ESG can influence the financial asset allocation decisions of enterprises by improving their credibility and reducing financing costs, thus promoting the enhancement of enterprise value. In addition, the main purpose of holding financial assets is to pursue profits (Wang et al., 2022), so the governance effect of ESG ratings can reduce the financial asset allocation of enterprises for the motive of "investment substitution". Inhibiting the financialisation of enterprises can help them return to their main business, reduce risk, improve capital efficiency and transparency, promote long-term sustainable development, and thus increase enterprise value.

Hypothesis 4: ESG performance increases corporate value through financial asset allocation.

3. Research Design

3.1. Sample Selection and Data Source

This paper selects the listed companies of family-owned enterprises in Shanghai and Shenzhen A-shares from 2013-2023 as the research samples, and the data mainly come from CSMAR database, and do the following treatments: ① delete the samples of listed companies in the financial industry; ② exclude the samples of the companies that have been specially treated (ST, *ST); ③ exclude the samples of the relevant data are missing. After the above screening, 27,383 observations are finally obtained. In order to avoid the influence of extreme values, all continuous variables are shrink-tailed by 1% before and after.

3.2. Description of major variables

3.2.1. Explained variables

The explanatory variable of this paper is enterprise value. Referring to the study of (Fang Junxiong et al., 2023), this paper adopts the accounting performance net profit divided by total assets to measure the enterprise value. The specific calculation formula is as follows:

$$\text{Enterprise value} = \frac{\text{Accounting performance net profit}}{\text{total assets}} \tag{1}$$

3.2.2. Explanatory variables

The core explanatory variable of this paper is corporate ESG performance, which is measured using CSI's ESG composite score. CSI's ESG rating composite score gives objective data through a score of 0 to 100 points, reflecting the ESG status of enterprises in a more intuitive and quantitative way, and the larger the value, the better the ESG performance of the enterprise.

3.2.3. Grouping variables

This paper sets 2 grouping variables. According to the nature of property rights, this paper takes the value of 1 for state-owned enterprises and 0 for non-state-owned enterprises, and according to the classification of enterprise type, it takes the value of 1 when the enterprise belongs to the high-tech enterprise, and 0 otherwise.

3.2.4. Mechanism variables

Regarding the mechanism variables there are digital transformation, innovation capacity, financial asset allocation, three indicators of the measurement method, this paper makes the following explanation:

Regarding digital transformation, this paper refers to digital transformation drawing on the practice of Wang Tao et al. (2024), which takes the natural logarithm of the word frequency of digital transformation keywords in the text of the annual reports of listed companies to deal with, in order to measure the degree of digital transformation of enterprises. This paper adopts the corresponding keyword word frequency measure in the annual reports published by listed companies as a proxy indicator for the degree of enterprise digital transformation. Regarding innovation capability, referring to most of the literature, this paper uses the number of patent applications to measure the innovation capability of enterprises. Regarding financial asset allocation, with reference to Peng Yuchao et al. (2018), Du Yong et al. (2019), and Hu Yiming et al. (2017), this paper adopts the ratio of the size of financial asset holdings to the total assets of the enterprise to measure the financial asset allocation of the enterprise.

3.2.5. Control variables

A series of control variables that may have an impact on corporate green technology innovation are introduced into the model, including: enterprise size (Size), enterprise age (Age), cash total asset ratio (Cash), and fixed asset ratio (Fix). In terms of enterprise characteristics, gearing ratio (Lev), cashflow ratio (Cashflow), return on net assets (Roe) This paper also controls the dummy variables of industry (Industry) and year (Year).

Table 1. Summary of variables

Variable type	Variable name	Variable code	Indicator selection
Explained Variables	ESG	ESG	CSI's ESG Composite Score Measures
Explanatory variables	Enterprise value	ROA	Accounting performance Net profit divided by total assets
Mechanism Variable	Digital Transformation	DIGIT	Natural logarithm of the frequency of digital transformation keywords in the text of annual reports of listed companies
	Innovation capacity	PATENT	Number of patent applications
Control variable	Ratio of financial asset holdings	RATIO	Ratio of financial asset holdings to total corporate assets
	Enterprise size	SIZE	The total assets of the company are taken as a natural logarithm
	Age of the firm	AGE	Natural logarithm of the firm's establishment time
	Gearing ratio	LEV	Total liabilities divided by total assets

3.3. Model construction

In order to test the relationship between ESG and enterprise value, with reference to Luo Hong and Qin Jidong (2019), this paper constructs the following regression model.

$$ROA_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 Control_{i,t} + \varepsilon_{i,t} \tag{2}$$

i stands for individual firms, t stands for year; ROA is the explanatory variable of firm value, ESG is the explanatory variable; Control is the control variable, ε stands for the residual term. If ESG contributes significantly to firm value, i.e., Hypothesis 1 holds, then α1 should be significantly positive. To improve the robustness of the statistical inference results, robust standard errors are used in the regression model.

4. Empirical testing and analysis of results

4.1. Descriptive statistics and correlation test

Table 2. Descriptive statistics of relevant variables

Variable name	Sample size	Mean	Median	Standard deviation	Minimum	Maximum
ROA	27383	0.0380	0.0380	0.0510	-0.188	0.169
ESG	27389	73.12	73.36	4.656	59.53	83.08
DIGIT	27944	11.95	3	21.40	0	133
RATIO	12951	0.0510	0.0120	0.0800	0	0.403
PATENT	5819	45.25	17	77.76	0	556
CASH	27384	0.153	0.126	0.105	0.0150	0.521
FIX	27383	0.200	0.172	0.138	0.00600	0.619
CASHFLOW	27383	0.226	0.153	0.305	-0.385	1.524
LEV	27383	0.404	0.397	0.185	0.0710	0.840
ROE	27324	0.0590	0.0680	0.0950	-0.513	0.260

Table 2 reports the descriptive statistics of the main variables in this paper. From Table 2, it can be found that the minimum value of the explanatory variable enterprise value (ROA) during the sample period is -0.188, the maximum value reaches 0.169, the mean value is 0.038, and the standard deviation is 0.051, which indicates that illustrates that there are large differences in the business performance of different enterprises in China. Among the explanatory variables, the maximum value of ESG is 83.08, the minimum value is 59.53, and the standard deviation is 4.656, reflecting that the degree of fulfilment of ESG responsibility of each enterprise is different, which is attributed to the different depth of understanding of ESG by domestic enterprises in more aspects, coupled with the short time of development of ESG, and the uneven level of growth of the enterprises, presenting the imbalance; however, its average value is 73.12, indicating that the sample of the However, its mean value is 73.12, indicating that the ESG responsibility fulfilment degree of enterprises in the sample is relatively excellent, which is mainly due to the mandatory disclosure required by relevant regulations for specific industries, as well as the strengthening of enterprises' knowledge of ESG.

4.2. Regression results and analyses

4.2.1. Benchmark regression results

Table 3 presents the regression results of the impact of ESG fulfilment on firm value. Columns (1) to (3) show the regression results of the linear model for univariate regression, adding control variables, and fixing the year and industry, respectively. The results in column (1) show a coefficient of 0.00245 and is significant at the 1% level, indicating that for every 1% increase in ESG rating, firm value increases by 0.245%. Column 1-Column 3, the regression results show a positive and positive correlation between ESG performance and firm value regardless of the inclusion or exclusion of control variables, indicating that the fulfilment of ESG responsibilities can bring economic benefits to the firms and promote the growth of firm value, and Hypothesis 1 is verified. The possible analysis is that the mechanism of corporate ESG performance to enhance enterprise value may contain such paths as stimulating human resources, alleviating agency problems, and alleviating corporate financing constraints. However, whether ESG enhances corporate value through digital transformation, innovative R&D and optimal financial asset allocation needs to be further verified in the mechanism test.

Table 3. Test results of ESG fulfilment on enterprise value

VARIABLES	ROA (1)	ROA (2)	ROA (3)
ESG	0.00245***	0.000169***	0.000177***
	(6.56e-05)	(2.21e-05)	(2.23e-05)
CASH		0.00221**	0.00337***
		(0.00109)	(0.00110)
FIX		-0.00671***	-0.0116***
		(0.000787)	(0.000924)
CASHFLOW		0.0201***	0.0204***
		(0.000415)	(0.000420)
LEV		-0.0435***	-0.0406***
		(0.000643)	(0.000680)
ROE		0.470***	0.468***
		(0.00125)	(0.00125)
Constant	-0.141***	0.0122***	0.0143***
	(0.00481)	(0.00165)	(0.00215)
Time fixed effects	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes
Observations	26,364	23,019	23,019
R-squared	0.050	0.498	0.501

4.2.2. Robustness check

In order to ensure the reliability of the main conclusions of this paper, this paper conducts the following robustness tests:

4.2.2.1 Replacement of explanatory variables

Replace the ESG performance measure. In this paper, the comprehensive score of the S aspect of the CSI ESG to get the variable ESG, Table 4 demonstrates the impact of ESG performance on enterprise value after replacing the ESG performance measure of the enterprise benchmark regression results show that the sign of the coefficients of the key variables and the level of significance did not change significantly, which indicates that the conclusions of this paper are more robust.

Table 4. Replacement of explanatory variables

VARIABLES	ROA (1)
S	6.07e-05***
	(1.12e-05)
CASH	0.00409***
	(0.00108)
FIX	-0.0112***
	(0.000909)
CASHFLOW	0.0204***
	(0.000414)
LEV	-0.0410***
	(0.000670)
ROE	0.467***
	(0.00122)
Constant	0.0222***
	(0.00163)
Observations	23,866
R-squared	0.901

4.2.2.2 Excluding samples in special years

In order to improve the precision of the estimation, this paper excludes the sample after the outbreak of the new crown epidemic in 2020 for the robustness test. Table 5 shows that ESG performance still has a positive impact on firm value, further validating the robustness of the findings.

Table 5. Empirical regression results excluding special years

VARIABLES	ROA (1)
ESG	0.000243***
	(2.71e-05)
CASH	0.00438***
	(0.00140)
FIX	-0.00888***
	(0.00113)
CASHFLOW	0.0189***
	(0.000534)
LEV	-0.0443***
	(0.000839)
ROE	0.473***
	(0.00168)
2015.year	-0.000613
	(0.000466)
2016.year	-0.00118***
	(0.000457)
2017.year	-6.73e-05
	(0.000443)
2018.year	-0.000793*
	(0.000439)
2019.year	-0.00182***
	(0.000440)
Constant	0.0101***
	(0.00258)
Observations	13,282
R-squared	0.902

4.3. Mechanisms analysis

To test Hypothesis 2 that corporate ESG performance enhances firm value by improving digital transformation, this paper conducts regression analysis. Table 6 test results, column (1) describes the regression results of ESG performance on digital transformation (DIGIT), the ESG coefficient is significant and has a positive sign, which is significant at the 1% level indicating that there is a significant positive correlation between ESG and digital transformation (DIGIT). At the same time, digital transformation can improve enterprise value from three aspects: improving corporate governance, alleviating financing constraints, and enhancing the ability of corporate innovation. Enterprises undergo digital transformation to increase corporate performance and optimise corporate goodwill through internal and external synergies, thus enhancing corporate value. In summary, Hypothesis 2 is valid, i.e., enterprise ESG performance enhances enterprise value through improving digital transformation

To test Hypothesis 3, firms enhance corporate value by improving innovation capabilities. Column (2) of Table 6 reports the regression results of ESG performance on innovation capability (PATENT), the ESG coefficients are significant and have a positive sign, which is significant at the 1% level indicating that there is a significant positive relationship between ESG and innovation capability (PATENT). Meanwhile, corporate innovation is a key driver for firms to gain sustained competitive advantage and achieve long-term growth, and enhanced innovation, not only reduces costs, but also builds a unique market position, which brings higher profits and enhances its business performance. In conclusion, Hypothesis 3 is valid, i.e., ESG performance of a company enhances the value of the company by improving digital transformation.

In order to test "Hypothesis H4: Enterprises enhance enterprise value through financial asset allocation", column (3) of Table 6 reports the regression results of ESG performance on financial asset allocation (RATIO), and the coefficients of ESG are significant and have positive signs, which significantly indicate that there is a significant positive correlation between ESG and financial asset allocation (RATIO) at the 1% level. There is a significant positive correlation. At the same time, asset allocation not only enhances capital liquidity and reduces financing costs, but also promotes long-term sustainable development of enterprises by diversifying risks and supporting R&D activities, which has a multifaceted positive impact on the enhancement of enterprise value by improving financing conditions, optimising operating conditions and supporting technological innovation. In summary, Hypothesis 3 is valid, i.e. corporate ESG performance enhances enterprise value through optimising financial asset allocation.

Table 6. Mechanism test results

VARIABLES	DIGIT (1)	PATENT (2)	RATIO (3)
ESG	0.186***	0.000740***	0.558***
	(0.0248)	(0.000149)	(0.194)
CASH	2.512**	-0.103***	10.81
	(1.221)	(0.00743)	(8.249)
FIX	-17.59***	-0.111***	-13.86*
	(1.022)	(0.00656)	(8.192)
CASHFLOW	-1.840***	0.0279***	4.602
	(0.461)	(0.00277)	(3.028)
LEV	4.178***	-0.159***	64.56***
	(0.756)	(0.00463)	(5.699)
ROE	-2.637**	0.0175**	40.90***
	(1.309)	(0.00772)	(10.49)
Constant	-11.82***	0.0667***	-61.01***
	(2.381)	(0.0142)	(17.35)
Observations	22, 780	10, 774	3, 457
R-squared	0.403	0.267	0.145

ESG performance can enhance enterprise value through the three paths of digital transformation, innovation capability, and financial asset allocation. In summary, hypothesis 2, hypothesis 3 and hypothesis 4 proposed in this paper are verified.

5. Further Analyses

In this section, in order to have a more comprehensive understanding of the impact of the relationship between ESG performance and firm value, this paper examines the heterogeneity of the impact of ESG performance on firm value, again from the perspective of firm characteristics.

The nature of corporate ownership and corporate characteristics may be a few factors that differentiate the relationship between ESG performance and firm value. In order to test whether the impact of ESG performance on firm value presents differences in the nature of ownership, this paper divides the sample into state-owned and non-state-owned firms based on the nature of the equity of the firm's controlling shareholders and conducts a split-sample regression as shown in the table below. Column (1) of Table 7 depicts the regression results of ESG performance on firm value (ROA) under state-owned enterprises, and the ESG coefficient is significant and has a positive sign, which is significant at 1% level indicating that there is a significant and positive correlation between ESG performance and firm value (ROA). Column (2) depicts the regression results of ESG performance on firm value (ROA) under non-state-owned firms with insignificant ESG coefficient. The results show that ESG performance enhances the value of state-owned firms more significantly relative to non-state-owned firms.

In order to further examine whether the effect of ESG on firm value presents differences in firm characteristics, this paper draws on the practice of Wenjing Li and Hongxing Peng to divide the sample into high-tech and non-high-tech firms and conduct a sub-sample regression, and the regression results are shown in Table 7.

Table 7. Heterogeneity test of firm characteristics

VARIABLES	SOE=1 (1)	SOE=0 (2)	HIGHTECH=1 (3)	HIGHTECH=0 (4)
ESG	0.000191***	5.40e-05	0.000164***	0.000161***
	(3.77e-05)	(3.70e-05)	(3.98e-05)	(2.61e-05)
CASH	-0.00216	0.00568***	0.00365*	0.00327***
	(0.00201)	(0.00203)	(0.00208)	(0.00125)
FIX	-0.00825***	-0.00999***	-0.0136***	-0.00987***
	(0.00168)	(0.00149)	(0.00160)	(0.00112)
CASHFLOW	0.0181***	0.0226***	0.0216***	0.0188***
	(0.000791)	(0.000791)	(0.000854)	(0.000466)
LEV	-0.0370***	-0.0307***	-0.0360***	-0.0437***
	(0.00123)	(0.00111)	(0.00120)	(0.000824)
ROE	0.493***	0.425***	0.408***	0.498***
	(0.00222)	(0.00198)	(0.00218)	(0.00148)
Constant	0.00343	0.0235***	0.0174***	0.00649**
	(0.00356)	(0.00331)	(0.00332)	(0.00308)
Observations	6, 386	8, 657	7, 278	15, 741
R-squared	0.518	0.488	0.483	0.514

According to Table 7, column (3) describes the regression results of ESG performance on firm value (ROA) under high-tech firms, ESG coefficients are significant and have a positive sign, which is significant at the 1% level indicating that there is a significant positive correlation between ESG and firm value (ROA). Column (4) of Table 7 describes the regression results of ESG on ROA under non-high-tech firms, the coefficient of ESG is significant and has a positive sign, which significantly indicates that there is a significant positive correlation between ESG and ROA at the 1% level.

However, the coefficient is smaller than that of high-tech enterprises, indicating that the effect of ESG performance on enhancing enterprise value is more obvious for enterprises in high-tech its industry than traditional enterprises. Analysing the results, the value effect of ESG performance applies to both high-tech and non-high-tech enterprises, but for non-high-tech enterprises, good ESG performance can bring greater enterprise value enhancement to high-tech enterprises, i.e., compared with non-high-tech enterprises, high-tech enterprises enhance ESG performance to have a greater positive impact on enterprise value. The possible reasons for this are that high-tech firms have long payback periods and high product barriers, which are conducive to increasing long-term enterprise value. Relative to non-high-tech firms, high-tech firms face greater financing constraints. Meanwhile, high-tech firms have higher multiples of valuation metrics relative to non-high-tech firms, and are more sensitive to ESG performance driving firm value.

6. Conclusion and Implications

6.1. Research Conclusion

Against the backdrop of the era when green finance is a key tool to drive the country to achieve carbon neutrality goals and promote sustainable development, ESG investment is gradually attracting widespread attention from all sectors of society and market participants. The core motivation for companies to continuously and actively engage in ESG management lies in the mutual benefit between fulfilling social responsibility and enhancing corporate value. Therefore, it has become a hot topic in academic research to explore "whether ESG performance has an impact on corporate value and how this impact is realised.

This study selects the annual data of A-share listed companies from 2013 to 2023, and employs a series of empirical models to verify the impact of ESG performance on corporate value. After confirming the correlation between ESG performance and corporate value, further research explores the possibility of ESG performance affecting corporate value in three ways, respectively, digital transformation, corporate innovation and financial asset allocation. In addition, this study also analyses in depth the impact of different ownership properties and corporate characteristics of different enterprises in high-tech industries on the relationship between ESG performance and enterprise value.

6.2. Recommendations and Prospects

With the rapid development of ESG investment concepts, China's ESG policy system is being continuously improved, and both corporate practice and market investment have ushered in a wave of ESG reform. This paper explores the key research question of whether and how ESG performance affects firm value, which has important practical implications. Based on the research findings, the paper makes the following recommendations for the three main ESG actors: companies, investors, governments and regulators:

For enterprises, at the environmental policy level, it is recommended that they deepen their understanding of green innovation and enhance the transparency of environmental sustainability, so as to promote the transformation of enterprises to green development. At the corporate governance level, enterprises should refine their management systems, improve operational efficiency, and establish a sound risk management and internal control system to strengthen the monitoring mechanism. In addition, enterprises should accelerate the implementation of digitalisation strategies. Besides, enterprises should rationally allocate the financial assets of the enterprise according to the company's industry characteristics and competitive advantages. Additionally, they should actively promote innovative projects for sustainable development and product development. Considering the impact of corporate heterogeneity, SOEs and hi-tech companies should pay more attention to their ESG management practices and focus on improving their performance in ESG.

For investors, the corporate value of listed companies is closely linked to potential investment returns. Therefore, in addition to conventional financial and industry analyses, they should systematically assess the comprehensive performance of companies in terms of ESG, continuously monitor the ESG-related indicators of companies, and pay attention to the quality and proactivity of companies in self-disclosing ESG information.

For the government and regulators, the legislature should start to optimise and improve the domestic laws and regulations related to ESG investment. It should draw on the regulatory standards of international organisations for ESG compliance to improve the rating standards and system for ESG compliance in China. This will provide the necessary legal and policy support for the sound operation of ESG investment and ensure its long-term stable development. In addition, financial regulators play a crucial role in promoting the healthy development of ESG. regulators should strengthen the supervision of corporate ESG disclosure and enhance the quality of ESG information disclosed by corporations regulators also need to strengthen the supervision of third-party ESG rating agencies. Through these measures, the sustainability of ESG investment in China can be promoted.

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