

ESG Disclosure, Institutional Investor Preferences and Firm Value

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Abstract: Based on stakeholder theory and signal and reputation theory etc, this paper evaluates the quality level of ESG disclosure of listed companies using Wind ESG score, and introduces the variable of institutional investors' shareholding ratio, selects 2780 listed companies from 2018-2022 as samples, analyses whether institutional investors have ESG investment preferences, and investigates the value of the quality level of ESG disclosure on the value of listed companies' impact mechanism, and further heterogeneity analysis on this basis. The empirical results show that, firstly, improving the quality of ESG information disclosure by listed enterprises in China is conducive to significantly increasing their enterprise value; secondly, institutional investors have ESG investment preferences and attach more importance to the ability of listed enterprises to develop in the long term; thirdly, the proportion of institutional investor shareholding plays a partly intermediary role in the process of the impact of ESG information disclosure quality on the value of the enterprise, i.e., listed enterprises with high-quality ESG disclosure level can attract the attention of institutional investors to the enterprise value. Third, the proportion of institutional investors' shareholding plays a partial mediating role in the process of ESG disclosure quality level affecting enterprise value, i.e., listed firms with high-quality ESG information disclosure can attract institutional investors to increase their shareholding, thus enhancing their enterprise value. Fourthly, the extent to which the quality level of ESG disclosure affects the value of listed firms varies according to the attributes of the firms: there is a significant difference between large-scale and small-scale, highly marketised and low-marketised listed firms; and there is no difference shown between state-owned and non-state-owned, light-pollution and heavy-pollution listed firms, and all of the above conclusions are robust. Accordingly, this paper puts forward recommendations to strengthen the construction of the domestic ESG disclosure and governance system, encourage listed enterprises to practice the concept of ESG responsibility, and develop medium- and long-term institutional investors, aiming to promote listed enterprises to achieve sustainable development, and thus promote the construction of the domestic ESG disclosure system.

Keywords: ESG disclosure; Enterprise value; Institutional investors; Mediation effect.

1. Introduction

Since the "dual carbon" goal was proposed, ESG disclosure as the infrastructure of ESG ecosystem has aroused heated debates in both theory and practice. In the wake of the New Crown Epidemic, investors in the global capital market have attached greater importance to sustainable development strategies on the basis of the traditional growth model, which has triggered a new round of ESG investment around the world, especially in Europe and the United States. And it is difficult to conduct a comprehensive and systematic assessment and examination of enterprises only by relying on financial information. At present, domestic enterprises voluntarily disclose relatively little information related to environmental, social and governance performance, and the quality of information disclosure is low and insufficiently motivated, which has become a resistance to the development of ESG investment concepts. Is disclosure of such non-financial performance necessary, how does ESG disclosure affect company value, and how does ESG disclosure affect company value? Do experienced and professional institutional investors have ESG investment preferences? By studying these issues, this paper can enrich China's ESG disclosure and other related theories, and has certain practical significance for enterprises to improve corporate governance and promote sustainable development.

Taking all A-share listed companies that have obtained ESG disclosure quality ratings as the main research object, this paper selects financial data and ESG rating data released

by Wind from 2018 to 2022, and studies the relationship between the ESG disclosure quality level of listed companies and their corporate value and further tests institutional investor preferences. The possible contributions are mainly reflected in three aspects: first, further expanding the research perspective and content of institutional investors. Existing literature focuses on the impact of institutional investors' shareholding on corporate performance, corporate risk and corporate innovation, this paper clarifies the specific role played by institutional investors' shareholding in the development process of corporate ESG disclosure and further analyses the mediating effect. Second, it summarises the channels through which ESG disclosure of listed enterprises can have an effect on their corporate value as improving multi-stakeholder relationships, sending positive signals and establishing a good reputation, which further enriches the theoretical research on the level of ESG disclosure of enterprises. Third, based on the scale of listed enterprises and the degree of marketisation, it explores the heterogeneity of ESG disclosure of listed enterprises in terms of its effect on the value of enterprises, and seeks to promote the value of enterprises. Third, based on multiple perspectives such as the size of listed enterprises and the degree of marketisation, we explore the heterogeneity of ESG disclosure level of listed enterprises to enhance the value of enterprises, and seek to stimulate the motivation of ESG disclosure, enhance the quality of ESG disclosure, and promote the construction of China's ESG disclosure standards.

2. Literature Review

2.1. ESG Disclosure and Institutional Investor Preferences

In the existing studies, foreign scholars have not reached a consistent conclusion on the relationship between the level of ESG disclosure and institutional investors' shareholding for the time being. On the one hand, (Aluchna et al.,2022) argued that institutional investors are more concerned about the negative impacts of ESG information disclosed by enterprises, and this will inhibit the behaviour of enterprises in disclosing ESG information, which is not conducive to the promotion of ESG practices [1]. On the other hand, (Chenet al.,2020) stated that institutional investors focus on the ESG performance ratings of firms in their investment decisions and force firms to actively build ESG disclosure [2]. Yu and vanLuu (2021) focused on the differences between corporate ESG disclosure and institutional investors in the fund sector and further classified the fund types to refine the study [3]. Meanwhile, institutional investors can motivate more enterprises to improve the transparency of their ESG information to mitigate agency conflicts through effective feedback on corporate governance mechanisms. Zhou Fangzhao (2020) and others empirically found that there is a positive and significant relationship between the performance of ESG information ratings and the shareholding ratio of institutional investors, and when further dividing the types of institutional investors, it was found that the performance of ESG information ratings is positively correlated with the shareholding ratio of independent and long-term stable institutional investors, and the conclusion was drawn that institutional investors prefer investing in firms with good ESG performance[11]. Since institutional investors have more solid financial foundations and investment experience, it is important for them to have more experience in corporate governance. financial foundation is more solid and their investment experience is richer, they are better able to identify corporate fraud risks. Therefore, institutional investors tend to focus on companies with high quality level of ESG disclosure.

Therefore, from a long-term investment perspective, sustainability is an important factor in ensuring the long-term sound development of enterprises, including their environmental, social and governance performance. Institutional investors will assess the performance of an enterprise in terms of environmental management, social responsibility and good governance, and use them as important references in their investment decisions. Institutional investors tend to be more inclined to invest in enterprises that can demonstrate a sustainable development strategy and actively fulfil their social responsibilities, thereby reducing the overall risk of their investment portfolios and enhancing the sustainability of their returns.

2.2. Institutional Investor Preferences and Firm Value

Research on institutional investors' participation in corporate governance focuses on investor protection [12], surplus management [13], governance level [14] [15], information disclosure⁴, and firm value⁶. With the rise of ESG responsible investment concepts, institutional investors are increasingly looking at relevant information such as non-financial indicators disclosed by companies. (JOSEPH et al.,2016) show that institutional investors tend to prefer

holding stocks of listed companies with higher information transparency, better corporate governance, and relatively lower risk[5]. Cao et al. (2020), in their study of the U.S. stock market, find that despite the current compounded excess returns on corporate stocks, institutional investors are willing to invest in firms that incorporate ESG factors, which suggests that institutional investors have a strong tolerance for companies with low short-term returns but high ESG performance[6]. Yuhuan Zhao and Maolei Guo (2019) classify institutional investors and find that among them, weak stress-resistant institutional investors' shareholding participation does not have a significant effect on the enhancement of corporate value, while the increase of shareholding by stress-resistant institutional investors can significantly enhance corporate value[17]. Jieyi Zhou et al. (2023) study corporate performance and investor concern from the perspective of corporate operating performance and investor attention to explore the impact of ESG ratings on corporate stock investment value using ESG rating data released by CSI as explanatory variables, and found that ESG ratings can promote the enhancement of corporate internal operating performance and external market value by attracting investor attention[18]. Li Feng et al. (2021) found that there is an inverse relationship between the level of corporate ESG information disclosure and institutional investors' shareholding preferences have an inverted U-shaped relationship, in which the relationship between non-financial indicators disclosed by firms and the performance presented by ESG information also shows an inverted U-shape[12].

In summary, the higher the quality level of corporate ESG information disclosure, the more it can attract the attention of professional institutional investors, who will be able to gain more access to the ESG and other aspects of corporate disclosure, and improve the possibility of correct investment. Institutional investors can process the disclosed information of listed companies by virtue of their professional data analysis ability, provide and convey positive investment reference opinions to other investors, solve the agency problem of enterprises to a certain extent, and then enhance the value of enterprises. When the proportion of shares held by institutional investors in the enterprise reaches a certain percentage, institutional investors will also participate in the governance of the company, which can play a supervisory role in regulating the operational activities of listed enterprises, and achieve the purpose of obtaining high returns from the enterprise, thus prompting the listed enterprise to enhance its value.

2.3. ESG Disclosure and Corporate Value

Most of the current research on corporate ESG is related to the field of sustainable development, mainly focusing on corporate social responsibility and the economic consequences of ESG performance. This is reflected in the research on corporate financial performance, business performance, stock market performance, financing costs, corporate value, etc. Reber et al. (2022) suggest that a high degree of transparency in ESG information can enable external stakeholders to fully understand the company's efforts in sustainable development, which builds up a positive corporate brand image in the minds of various types of investors and enhances the company's financial performance (Atif and Ali, 2021)[7] [8] and increase the competitiveness of the firm in the whole market and the long-term sustainability

value of the firm (Chengetal, 2022) [9].

In terms of firm value, Liu Zhuochong et al. (2023) show that ESG information ratings have a significant positive impact on firm value, and vary by industry, region and firm attributes, especially in terms of the degree of economic development of the firm and the nature of state ownership [19]. Wang Bo (2022) finds that ESG performance achieves its impact on increasing market value and book value through different channels [20]. Wang et al. (2021) find that ESG performance can increase the market value and book value of firms through different channels. Wang et al. (2021), based on a study in the Malaysian context, found that ESG performance rating certification significantly increased the Tobin's Q value of firms, which led to an increase in the market value of the firms [10]. Li Jinglin et al. (2023) found that firms with better ESG performance had higher information transparency and lower costs in terms of operational risks and financing constraints, which led to an increase in the performance and value of the firms in various aspects of performance and value [21].

In summary, domestic researchers have studied ESG later than foreign researchers, and there is still a lack of research on the mechanism of ESG disclosure quality considering a variety of factors. Research on institutional investors focuses on their impact on the business performance and innovation of enterprises and the relationship with individual E, S, and G dimensions, but there are only a handful of studies on the overall role of the level of corporate ESG disclosure quality on enterprise value, involving the perspective of institutional investor shareholding, and scholars have not come to a unanimous view on the relationship between the two.

3. Theoretical Analysis and Research Hypotheses

3.1. ESG Disclosure and Corporate Value

From the financial dimension, on the one hand, ESG disclosure practices adopted by enterprises can effectively reduce the possibility of adverse selection problems at the corporate governance level. On the other hand, ESG practices can reduce the costs of enterprises in all aspects. Enterprises practicing ESG can gain recognition of their corporate value from the capital market and society, which is conducive to obtaining more financing, reducing direct costs, and indirectly creating value for the enterprise. From the non-financial dimension, enterprises actively improving the quality of their ESG disclosure is conducive to the accumulation of social reputation, and good social reputation is an important factor essential for enterprises to enhance their business value. At the same time, positive CSR actions have a reputational insurance effect, reducing the negative impact of corporate misbehaviour and possible economic losses, improving investors' profit expectations, and thus reducing stock market risks. Based on the above analysis, the first hypothesis of this paper is proposed:

Hypothesis 1: Listed companies improve the quality level of their own ESG disclosure can positively promote their enhancement of corporate value.

3.2. ESG Disclosure and Institutional Investor Preferences

Institutional investors have more professional and rich financial knowledge, stronger ability to collect key information and stronger financial strength, and play a

significant role in the domestic investment market. On the one hand, enhancing ESG disclosure is regarded by enterprises as an important way to achieve their sustainable development, which can provide institutional investors with information about the financial risks of enterprises, and at the same time, institutional investors will analyse a variety of information disclosed by enterprises as a criterion for making investment decisions. On the other hand, it can provide companies with significant resources and increase organisational resilience. Institutional investors may be more sensitive to policies and regulations and have better analytical skills, which can quickly reduce corporate risks. In addition, institutional investors usually invest in several companies at the same time, and attracting institutional investors to increase their shareholdings can promote mutual benefits for companies involved in co-investments. In the long run, good ESG performance not only improves financial performance and corporate value, but also improves firms' innovation ability [23]. Therefore, for specialised institutional investors, they are bound to consider the quality of ESG disclosure as well as the rating status of the firms they invest in as well. This leads to the second hypothesis of this paper.

Hypothesis 2: The high-quality ESG disclosure level of a listed firm can induce institutional investors to increase the proportion of shares of that firm in their hands.

3.3. The mediating effect of institutional investors' preferences

Institutional investors are mostly well-funded, have more information about the enterprise and shareholding stability, focusing on long-term stock holding rather than selling easily. They can choose multi-party co-operation to increase the overall shareholding ratio, and the larger the overall shareholding ratio, the greater the impact of the threat of their exit on the enterprise, which will push enterprises to take the initiative to improve the level of ESG information disclosure, and practice the concept of ESG responsible investment. In addition, institutional investors, through their own professional skills, interpretation of information, participation in corporate decision-making, play a supervisory role in the enterprise, not only can greatly improve the internal governance of the enterprise, but also attract the attention of small and medium-sized investor groups, optimise the investment structure, reduce the cost of financing, alleviate the constraints on corporate financing, thus enhancing the value of the enterprise. On the one hand, high-quality ESG disclosure can send a positive signal to the external market, indicating that the enterprise should conduct its business activities in a credible and sustainable manner, thus obtaining the trust of multiple stakeholders and recognition from the market, and thus increasing the value of the enterprise. On the other hand, the higher the level of ESG disclosure quality of enterprises, the more they can attract the attention of prudent institutional investors, thus increasing the investment of professional institutional investors, and sending positive signals to the outside world through the influence of institutional investors as a market driver, thus creating a good reputation of enterprises, further enhancing enterprise value and bursting market vitality. Accordingly, the third hypothesis of this paper is proposed.

Hypothesis 3: The high-quality ESG disclosure level of listed enterprises can attract institutional investors to increase their shareholdings, send positive signals to the market that the sustainability of the enterprise operates well, and

positively affect its enterprise value, i.e., there is an intermediary effect of the proportion of institutional investor shareholdings.

4. Research Design

4.1. Sample selection and data sources

This paper selects all listed stocks in the A-share market from 2018 to 2022 as a sample for empirical research. In order to maximise the accuracy of the research results, all indicator data are selected based on the following principles:

(1) Excluding ST, *ST and delisted stocks of listed companies in the study period.

(2) Excluding listed companies with missing data of some financial data and Wind ESG rating data.

(3) Excluding listed companies in the financial industry and public utilities category. The financial industry as well as the public utilities category have special characteristics and are not comparable.

(4) In order to prevent the influence of extreme values, the variable values were Winsorized to exclude sample data below 1% and above 99%.

After screening, 13,726 sample data were finally obtained. The data used in this paper are from Wind database, Cathay Pacific database (CSMAR), and Flush Information Financial Terminal System, and the measurement software uses Stata 16.0.

4.2. Defining Variables

4.2.1. Explained variable: Tobin's Q value

Existing studies mainly choose return on assets, operating income growth rate, etc. to measure enterprise value, but these measures focus on the short-term business activities of

enterprises to generate revenue, with certain limitations, the long-term growth of enterprises to pay less attention to the ESG concept of more attention to the long-term growth and sustainability of enterprises, so this paper mainly chooses the TobinQ to measure the value of listed companies. TobinQ is the ratio of market value/replacement cost of assets of an enterprise.

4.2.2. Mediating variable: institutional investors' shareholding ratio

Referring to the mainstream domestic research methods and Cathay Pacific database classification, this paper selects the sum of the shareholding ratios of the enterprise's current funds, qualified foreign investors, brokerage firms, insurance, social security, trusts, finance companies, and banks as an indicator to measure the shareholding ratios of the enterprise's institutional investors.

4.2.3. Explanatory variables: ESG disclosure quality level

The Wind ESG rating indicator system refers to the international mainstream ESG system architecture, and combines the development of China's capital market, regulatory policies and ESG practices of listed companies to form a localised indicator system, which can comprehensively reflect the level of ESG management practices, the ability of sustainable operation and major unexpected risks of enterprises, measure the commitment and performance of listed companies in ESG, and help investors to identify important risks and opportunities in their investments. and help investors identify important risks and opportunities in their investments.

Table 1. Variable Definitions and Descriptions

Variable type	variable code	variable name	Variable Definition
explanatory variable	TQ	Tobin's Q	Tobin's Q = (Market value of outstanding stock options at the end of the period + Market value of non-outstanding stock options at the end of the period+) / (Market value of net debt at end of period) / total assets at end of period
Core explanatory variables	Wind ESG	Wind ESG Rating Index	ESG Disclosure Quality Score in Wind
intermediary variable	Hold	Institutional investors' shareholding	
control variable	lnAge	Company age	The difference between the year of the study and the year of the company's establishment is taken in natural logarithms
	lnSize	Company size	Natural logarithm of total assets of the enterprise at the end of the year
	LEV	gearing	Gearing ratio = total liabilities at year-end / total assets at year-end
	ROE	profitability	Return on net assets = net profit after tax of the company / net assets
	Growth	growth capacity	Total assets growth rate = (total assets at the end of the period - total assets at the beginning of the period) / total assets at the beginning of the period
	CF	solvency	Cash flow ratio = net cash flow from operating activities/current liabilities
	InEx	Number of directors and supervisors	The number of directors and supervisors is taken as the natural logarithm of the number of directors and supervisors
	INP	Investment behaviour	Institutional investors' unusual investment behaviour takes the value of 1, otherwise 0
	Year Industry	Annual dummy variables Industry dummy variables	

4.2.4. Control Variables

Referring to the study of Bai Xiong[24] and others, the control variables selected in this paper include firm size, gearing ratio, firm age, firm profitability (return on net assets), firm growth ability (total asset growth rate), number of directors and supervisors, and firm solvency (cash flow ratio). Also, the paper controls for year and industry fixed effects. The specific definitions of the variables are shown in Table 1.

4.3. Model construction

4.3.1. Benchmark model

In order to test the impact of ESG disclosure quality of listed firms on firm value and study the mediating role of institutional investors' shareholding in it, this paper constructs the following model:

$$TQ_{i,t} = \alpha_0 + \alpha_1 WindESG_{i,t} + \alpha_2 C_{i,t} + \eta_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$Hold_{i,t} = \beta_0 + \beta_1 WindESG_{i,t} + \beta_2 C_{i,t} + \eta_i + \sigma_t + \varepsilon_{i,t} \quad (2)$$

$$TQ_{i,t} = \gamma_0 + \gamma_1 WindESG_{i,t} + \gamma_2 Hold_{i,t} + \gamma_3 C_{i,t} + \eta_i + \sigma_t + \varepsilon_{i,t} \quad (3)$$

α 、 β 、 γ denote the parameter values to be estimated for the explanatory, mediating and control variables, $C_{i,t}$ is the set of control variables, with reference to the existing literature on the setting of control variables, η_i is an individual fixed effect, σ_t is a year fixed effect and $\varepsilon_{i,t}$ denotes a robust standard error.

4.3.2. Institutional investor preference test

Generally speaking, when the enterprise's operating performance rises, institutional investors will increase their shareholdings in pursuit of investment returns; when the operating performance declines, institutional investors will reduce their shareholdings in order to avoid losses, and the investment decisions made by institutional investors in these two cases are considered to be in line with the common sense investment decisions, i.e., focusing on the operating performance of the listed enterprise in the current period. Institutional investors also make irrational investment decisions in two cases: they choose to reduce their shareholdings in a listed company with rising operating performance, or they choose to increase their shareholdings in a listed company with declining operating performance. Based on the above analyses, this paper uses a panel logit

model to test this, and the model is set as follows:

$$INP_{i,t}^* = \delta_0 + \delta_1 WindESG + \delta_2 X_{i,t} + \eta_i + \sigma_t + \varepsilon_{i,t}$$

$INP_{i,t}$ is a binary logistic variable and $INP_{i,t}^*$ is the variable

obtained by performing the logit transformation. $X_{i,t}$ is a quantitative explanatory variable, and its explanatory variable setting is consistent with the set of control variables in the previous section. Based on the operating performance of listed enterprises, the return on assets of enterprises in the current period. $CH_ROA_{i,t}$ is subtracted from the value of the previous period to obtain the change in return on assets. When $CH_ROA_{i,t} > 0$, it indicates that the operating performance of the listed enterprise rises, and vice versa, the operating performance declines; secondly, subtracting the proportion of shares held by institutional investors of the listed enterprise in the current period from the value of the previous period, we get the change in the proportion of shares held by institutional investors $CH_Hold_{i,t}$. when $CH_Hold_{i,t} > 0$, it indicates that the institutional investors increase their holdings, and vice versa, it means that the institutional investors decrease their holdings.

5. Analysis of Empirical Findings

5.1. Descriptive statistical analyses

As can be seen in Table 2, with a sample of 13,726 observations, the mean value of the TQ of firms' value is 1.937 with a standard deviation of 1.430, and the maximum value is 29.17 and the minimum value is 0.625, which suggests that there is a large difference in the value of the firms within the sample. The mean value of the ESG rating score of the sample firms is 6.030, with a standard deviation of 0.787, with a range of fluctuations, and the maximum value of the sample is 9.610, with a minimum value of 3.350. This indicates that the quality level of ESG disclosure of the sample firms varies, and the average ESG disclosure level of the firms maintains around 6, which is located in a medium level of the Wind's ESG rating system. This shows that the level of ESG disclosure of enterprises needs to be further improved. The mean value of institutional investors' shareholding ratio is 41.38%, the minimum value is 0.000%, and the maximum value is 152.1%, indicating that there are large differences in the shareholding ratio of institutional investors in the sample companies

Table 2. Descriptive Statistics for Key Variables

variant	average value	standard deviation	minimum value	maximum values
TQ	1.937	1.430	0.625	29.17
ESG	6.030	0.787	3.350	9.610
Hold	41.38	25.42	0	152.1
Lev	0.422	0.187	0.0143	0.994
lnSize	22.47	1.342	19.08	28.64
ROE	0.0585	0.155	-2.094	1.536
growth	0.142	0.840	-0.929	77.70
CF	0.0545	0.0680	-0.744	0.839
lnAGE	2.992	0.280	1.386	4.007
lnEx	2.739	0.212	2.079	3.555

Notes: *p<0.1, **p<0.05, ***p<0.01

5.2. Regression analysis

5.2.1. Analysis of regression results on the impact of ESG disclosure on firm value

Column (1) of Table 3 shows that the estimated coefficient of the variable Wind ESG is 0.096, i.e., it is significantly positive at the 1% level, which indicates that the level of high-quality ESG disclosure of listed companies is able to enhance the value of the firms, thus supporting Hypothesis 1. Column (2) shows that the estimated coefficient of the variable Wind ESG is 0.981 and it is significantly positive at the 1%

level, which means that the high-quality ESG information disclosure level can effectively promote institutional investors to increase their shareholdings, which supports Hypothesis 2. The estimated coefficient of institutional investor shareholding Hold and the variable Wind ESG in Column (3) are also positive at the 1% significance level, and the size of the coefficient decreases from 0.096 to 0.085 when Hold is not added, which side by side indicates that there is a partially mediated effect of institutional investor shareholding Hold, and then Hypothesis 3 holds.

Table 3. Benchmark model regression results

	(1) TQ	(2) Hold	(3) TQ
WindESG	0.096*** (6.41)	0.981*** (3.93)	0.085*** (5.75)
Hold			0.012*** (23.38)
Lev	-0.643*** (-8.60)	-5.613*** (-4.52)	-0.576*** (-7.86)
lnSize	-0.217*** (-19.03)	7.241*** (38.26)	-0.303*** (-25.73)
ROE	0.934*** (11.71)	11.060*** (8.35)	0.803*** (10.25)
growth	0.032** (2.47)	0.393* (1.83)	0.027** (2.16)
CF	2.563*** (14.55)	12.797*** (4.38)	2.411*** (13.95)
lnAGE	-0.217*** (-5.21)	-0.734 (-1.06)	-0.208*** (-5.10)
lnEx	-0.070 (-1.19)	17.116*** (17.45)	-0.273*** (-4.65)
Ind	YES	YES	YES
Year	YES	YES	TES
Industry	YES	YES	TES
N	13726	13726	13726
r2	0.247	0.343	0.276

Notes: *, ** and *** indicate significant at the 10%, 5% and 1% levels, respectively.

5.2.2. Institutional investor preference tests

The estimation results in Table 4 show that the estimated coefficient of the variable Wind ESG is positive at the 10 per cent significance level, indicating that listed firms improving

the quality level of their ESG disclosure can, to some extent, motivate institutional investors to make the decision to make irrational investments as defined above, i.e., the existence of ESG investment preferences among institutional investors.

Table 4. Institutional Investor Preference Test Results

	(1) Exception1	(2) Exception2
ESG	0.049* (1.78)	-0.046* (-1.74)
Lev	-0.496*** (-3.52)	0.796*** (5.90)
lnSize	0.128*** (6.26)	-0.192*** (-9.55)
ROE	-1.375*** (-9.38)	3.819*** (16.46)
growth	0.114*** (3.01)	-0.852*** (-8.00)
CF	-1.208*** (-3.53)	-0.110 (-0.34)
lnAGE	0.178** (2.28)	-0.058 (-0.80)
lnEx	-0.344*** (-3.04)	0.190* (1.78)
Year	Yes	Yes
Industry	Yes	Yes
N	13726	13726

Notes: *p<0.1, **p<0.05, ***p<0.01

5.3. Heterogeneity analysis

5.3.1. Heterogeneity of enterprise property rights

In this paper, the whole sample is divided into state-owned enterprises and non-state-owned enterprises according to the nature of enterprise ownership for heterogeneity test, and observe the difference between the two groups of samples in terms of the impact of the quality level of ESG disclosure on their enterprise value, and the results are shown in Table 5. The regression results show that both state-owned enterprises and non-state-owned enterprises improve the quality level of ESG disclosure will promote their enterprise value, i.e., Wind ESG has a significant positive effect on TQ at the 1% level, in which the regression coefficient of Wind ESG for state-owned enterprises is 0.097, and the regression coefficient of Wind ESG for non-state-owned enterprises is 0.082, and there is no difference according to the nature of ownership of the enterprise. There is no difference depending on the nature of enterprise ownership.

5.3.2. Analysis of firm size on heterogeneity

In this paper, according to the average level of the size data of listed enterprises in each year, the median size level of the total sample of enterprises is divided into small-scale enterprises and large-scale enterprises based on the median size level of the total sample of enterprises. As shown in Table 5, the Wind ESG regression coefficient of small-scale enterprises is 0.002, which is not significant; the Wind ESG regression coefficient of non-state-owned enterprises is 0.019, which shows a significant positive effect at the level of 1%, i.e., the larger the size of an enterprise is, the more significantly it can enhance the value of the enterprise by improving the quality level of its ESG information disclosure. The reason may lie in the fact that large-scale enterprises pay more attention to their social responsibility and are more likely to gain the attention and recognition of the public through high-quality ESG disclosure, which in turn helps them to obtain more benefits and enhance their enterprise value.

Table 5. Heterogeneity Analysis

	(1) State-owned business	(2) Non-state enterprise	(3) Limited scale	(4) Broad scale
	TQ	TQ	TQ	TQ
ESG	0.097*** (4.82)	0.082*** (3.90)	0.002 (0.06)	0.109*** (6.36)
Lev	-0.656*** (-6.79)	-0.694*** (-6.19)	-0.504*** (-4.38)	-0.797*** (-8.32)
lnSize	-0.234*** (-14.68)	-0.185*** (-11.60)	-0.735*** (-21.29)	-0.085*** (-5.29)
ROE	0.816*** (8.38)	1.080*** (7.29)	0.356*** (2.97)	1.641*** (14.77)
growth	0.129*** (4.00)	0.004 (0.37)	0.354*** (4.70)	0.016 (1.38)
CF	3.097*** (13.93)	1.394*** (5.09)	2.085*** (8.00)	3.022*** (13.11)
lnAGE	-0.199*** (-3.72)	-0.183*** (-2.69)	0.020 (0.30)	-0.403*** (-7.88)
lnEx	-0.121 (-1.53)	0.075 (0.80)	-0.001 (-0.01)	-0.053 (-0.76)
Ind	YES	YES	YES	YES
Year	YES	TES	TES	TES
N	9436	4289	6379	7347
r2	0.218	0.330	0.217	0.310

Notes: *p<0.1,**p<0.05,***p<0.01

5.3.3. Heterogeneity of contamination levels

In this paper, according to the pollution status of the industry from which the enterprise is subordinate to the enterprise will be divided into light polluting enterprises and heavy polluting enterprises, the regression results are shown in Table 6. The regression results show that improving the quality level of ESG disclosure by both lightly polluted and heavily polluted firms promotes their enterprise value, i.e., Wind ESG has a significant positive effect on TQ at the 1% level in both cases, with the regression coefficients of Wind ESG for lightly polluted firms being 0.092 and those for heavily polluted firms 0.109, which do not differ according to the degree of pollution of the firms. There is no difference depending on the pollution degree of the enterprises.

5.3.4. Heterogeneity in the degree of marketisation

In this paper, the whole sample is divided into low-marketisation enterprises and high-marketisation enterprises according to the degree of marketisation of the enterprise's location. From the results of group regression, the Wind ESG regression coefficient of listed enterprises in high-marketisation regions is 0.098, and the Wind ESG has a significant positive effect on TQ at the 1% level, i.e., the listed enterprises in regions with high marketisation will promote the enhancement of their enterprise value by improving the quality of their own. The Wind ESG regression coefficient of listed firms in regions with low marketisation is 0.004, which is not significant. Therefore, the difference in the degree of marketisation of the listed companies' regions affects the effect of the quality of ESG disclosure on corporate value.

Table 6. Heterogeneity Analysis

	(5) Light pollution	(6) Heavy pollution	(7) Low degree of marketisation	(8) High degree of marketisation
	TQ	TQ	TQ	TQ
ESG	0.092*** (5.23)	0.109*** (3.76)	0.004 (0.09)	0.098*** (6.06)
Lev	-0.690*** (-7.93)	-0.589*** (-3.98)	-0.609*** (-2.99)	-0.623*** (-7.75)
lnSize	-0.205*** (-15.39)	-0.250*** (-11.33)	-0.197*** (-6.02)	-0.217*** (-17.76)
ROE	0.823*** (9.03)	1.253*** (7.03)	1.353*** (5.40)	0.902*** (10.76)
growth	0.064** (2.28)	0.079** (2.35)	0.040 (0.91)	0.031** (2.28)
CF	2.733*** (13.54)	1.994*** (5.46)	1.816*** (3.71)	2.667*** (14.21)
lnAGE	-0.258*** (-5.44)	-0.066 (-0.75)	0.080 (0.64)	-0.261*** (-5.90)
lnEx	-0.031 (-0.44)	-0.149 (-1.31)	-0.079 (-0.54)	-0.083 (-1.30)
Ind	YES	YES	YES	YES
Year	YES	YES	YES	YES
N	9985	3736	1630	12095
r2	0.260	0.213	0.395	0.245

Notes: *p<0.1, **p<0.05, ***p<0.01

5.4. Robustness Tests

5.4.1. Changing the explanatory variables

In order to avoid the subjectivity of variable selection and ensure the robustness of the research results, this paper conducts a robustness test by replacing the indicators of enterprise value, selecting the enterprise value indicators in the Cathay Pacific database and taking the logarithm of the value as a proxy for the Tobin's Q. The regression results are shown in Tables 7, with the estimated coefficient of the core explanatory variable, lnValue, at 0.041, and that of the

mediating variable, Hold, at 0.981, both of which are significantly positive. The estimated coefficient of core explanatory variable lnValue is 0.041, and the estimated coefficient of intermediary variable Hold is 0.981, both of which are significantly positive, which indicates that listed companies improve their ESG disclosure level can significantly enhance enterprise value, and the proportion of institutional investor shareholding has a partially intermediary effect in this mechanism of action, which is in line with the empirical results obtained from the previous paper.

Table 7. Empirical Results of Replacing Explained Variables

	(1)	(2)	(3)
	lnvalue	Hold	lnvalue
Wind ESG	0.045*** (9.95)	0.981*** (3.93)	0.041*** (9.27)
Hold			0.004*** (28.55)
Lev	-0.161*** (-7.13)	-5.613*** (-4.52)	-0.137*** (-6.23)
lnSize	0.871*** (252.98)	7.241*** (38.26)	0.840*** (238.59)
ROE	0.353*** (14.65)	11.060*** (8.35)	0.305*** (13.01)
growth_A	0.011*** (2.93)	0.393* (1.83)	0.010** (2.57)
CF	0.858*** (16.14)	12.797*** (4.38)	0.803*** (15.53)
lnAGE	-0.097*** (-7.69)	-0.734 (-1.06)	-0.094*** (-7.65)
lnEx	-0.009 (-0.51)	17.116*** (17.45)	-0.083*** (-4.74)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	13726	13726	13726
r2	0.906	0.343	0.912

Notes: *p<0.1, **p<0.05, ***p<0.01

5.4.2. One-period lag test

In order to test the possible reverse causality between the quality level of ESG disclosure and enterprise value, and taking into account that there is a delayed effect in the role effect of ESG disclosure on enterprise value, this paper lags the core explanatory variables by one period, the control variables are consistent with the above, and the empirical

results are shown in Table 8. The estimated coefficients of its empirical results are basically consistent with the estimated coefficients of the empirical results before replacement, which are all significantly positive at the 1% level, i.e., there is a significant positive impact of ESG disclosure on enterprise value. This shows that the empirical study in this paper is not affected by the reverse causality problem.

Table 8. Results of one-period lag test

	(1) TQ	(2) TQ
ESG	0.096*** (6.41)	
上期 ESG		0.060*** (3.37)
Lev	-0.643*** (-8.60)	-0.746*** (-8.31)
lnSize	-0.217*** (-19.03)	-0.225*** (-16.56)
ROE	0.934*** (11.71)	0.972*** (10.19)
growth	0.032** (2.47)	0.039*** (2.60)
CF	2.563*** (14.55)	2.814*** (13.29)
lnAGE	-0.217*** (-5.21)	-0.284*** (-5.51)
lnEx	-0.070 (-1.19)	-0.092 (-1.30)
Year	Yes	Yes
Industry	Yes	Yes
N	13726	11002
r2	0.247	0.239

Notes: *p<0.1,**p<0.05,***p<0.01

5.4.3. Sobel test

In order to test the existence of mediating role of institutional investors' shareholding between ESG disclosure and enterprise value of listed enterprises, this paper supplements the Sobel test, and the test results are shown in

Table 9, according to the table, Sobel's Z-value is 3. and the P-value is less than 0.01, which rejects the original hypothesis, i.e. the mediating effect is tested, and the enterprise's high-quality ESG disclosure affects enterprise's market value by influencing the institutional investors' shareholding path to affect the market value of the enterprise.

Table 9. Sobel test results

	Coef	StdErr	Z	P> Z
Sobel	0.012	0.003	3.876	0.000
Goodman-1	0.012	0.003	3.872	0.000
Goodman-2	0.012	0.003	3.879	0.000
Percent of total effect that is mediated:12.039%				
Ratio of indirect to direct effect:0.1368				

6. Key Findings and Policy Recommendations

This paper takes 2780 listed enterprises with a total of 13,726 panel data from 2018-2022 as samples, and empirically investigates the impact of the quality level of ESG disclosure of listed enterprises on their enterprise value and the mechanism of its role using two-way fixed effects and mediation effects models; on this basis, it further analyses whether institutional investors have ESG investment preferences; in addition, this paper investigates the heterogeneity of listed enterprises for the difference of ESG

disclosure quality level affecting their enterprise value. The results of the study are as follows: first, there is a significant positive correlation between the level of ESG disclosure of listed enterprises and their enterprise value, indicating that the level of high-quality ESG disclosure of listed enterprises can enhance their enterprise value.

Second, there is a partial mediating effect of institutional investors' shareholding ratio, i.e., the higher the quality level of ESG disclosure of listed firms, the more it can induce institutional investors to increase their shareholding ratio, which in turn can enhance corporate value. Thirdly, further heterogeneity analysis finds that high-quality ESG disclosure

water can effectively enhance its enterprise value when the enterprise is larger in size and more marketised; the difference in the effect of the attributes of the enterprise, such as state-owned or non-state-owned, light or heavy pollution, etc., is not significant.

Accordingly, this paper puts forward the following suggestions: first, strengthen the construction of domestic ESG disclosure standards and governance system. The government should establish clear and high-quality ESG disclosure standards in accordance with relevant principles, and promote the ESG disclosure system to gradually change from voluntary disclosure by enterprises to mandatory disclosure in accordance with requirements, so as to improve the quality level of ESG disclosure by listed enterprises. Second, encourage listed enterprises to strengthen the construction of ESG information disclosure and enhance the awareness of social responsibility. Small-scale and low-marketisation enterprises should take the initiative to assume social responsibility and strengthen the quality of ESG disclosure to meet the investment needs of institutional investors to a higher degree. Third, develop a target group of medium- and long-term institutional investors to promote the development of ESG responsible investment concepts. Such institutional investors are more concerned about the long-term development ability of listed enterprises, have the ability to activate the capital market, promote all stakeholders and the public to practice investment concepts closer to ESG responsible investment, to a certain extent, improve the risk-resistant ability of the capital market, and help enterprises achieve long-term development.

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