

Research on the Influence Mechanism of ESG Performance on Institutional Investors' Shareholding: Empirical evidence from China

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Abstract: Since the beginning of the COVID-19 pandemic, the labor force and supply chain have been greatly impacted, the global economy has been in a downturn, and the changes in environmental and social risks have made companies that lack a solid market position or financial foundation suffer great losses. In the new era, institutional investors are in urgent need of judgment criteria other than traditional financial data (such as ESG performance) to ensure that they can select investment projects with high potential and strong anti-risk ability. This paper takes Chinese listed companies from 2010 to 2021 as samples to empirically test the influence mechanism of ESG performance on institutional investors' shareholding. The results show that: (1) ESG performance can significantly promote the shareholding of institutional investors; (2) There is a significant relationship between ESG performance and enterprise internal indicators. Good ESG performance is inversely proportional to business risk and proportional to enterprise value, which reflects the internal economic indicators valued by institutional investors to a certain extent. (3) A good ESG is manifested externally, which significantly promotes the attention of corporate media and analysts, enhances corporate reputation, has a dominant position in public opinion, and increases the shareholding of institutional investors.

Keywords: ESG performance, Institutional investor shareholding, Business risk, Enterprise value, Media attention, Analyst attention.

1. Introduction

As the world's second largest economy faces severe and complex development situations such as COVID-19, climate change and environmental pollution, implementing the new development philosophy is the only way for China to grow stronger in the new era. As a key link in the operation of society, whether enterprises can play a positive role in green development is crucial. The implementation of the ESG (Environment, Social Responsibility, Governance) information disclosure policy, Improving the ESG rating mechanism is a key step in urging and supervising enterprises to play an active role. The essence of ESG is that enterprises seek long-term sustainable investment returns, realize the unity of enterprise value and social value, and provide necessary tools for institutional investors to select investee enterprises with high potential and strong risk resistance ability under the current environment. On October 9, 2020, The State Council issued the Opinions of The State Council on Further Improving the Quality of Listed Companies (hereinafter referred to as the "Opinions"), making systematic and targeted arrangements for improving the quality of listed companies. The Opinions stressed the need to standardize corporate governance and internal control, improve the quality of information disclosure, and take ESG information as an important supplement to the information disclosure of listed companies. On June 28, 2021, China Securities Regulatory Commission issued the revised financial report format standards, adding "Section 5 Environmental and Social responsibility" to the standards, which greatly promoted the promotion of ESG information disclosure and rating. On March 31, 2022, ISSB (International Sustainability Standards Board) released the ESG disclosure system, hoping

to integrate global standards. China Securities Regulatory Commission believes that the implementation of this system will have a great impact on Chinese enterprises. On April 15 of the same year, the Guidelines on Investor Relations Management of Listed Companies were issued, clarifying the main responsibilities of investor relations (IR) management of listed companies and requiring that environmental, social and governance information (ESG) of listed companies be added to the communication content. With the further improvement of domestic ESGs to relevant regulations, the performance of ESGs in the foreseeable future will be an important factor that institutional investors must take into account in addition to financial information. Therefore, studying the mechanism of the influence of ESG performance on institutional investors' shareholding on the one hand enriches the means for institutional investors to choose investee enterprises; on the other hand, investors pay more attention to ESG performance, which is conducive to promoting green investment, improving investment structure, and promoting the stable development of the capital market. In this context, the following questions are discussed in this paper: Can ESG performance influence the shareholding of institutional investors? In what way does ESG performance influence institutional investors' shareholding?

Among the many shareholders of enterprises, institutional investors have the advantages of establishing early relationships and interacting with enterprises more frequently. They also pay more attention to the sustainable development of enterprises, and can make more effective use of ESG to strengthen enterprise risk management ability and improve long-term returns. Due to their professionalism, institutional investors will treat their own funds and raise funds in a more prudent manner than other investors in the capital market.

Due to their emphasis on asset safety, institutional investors will be forced to pay more attention to information collection and analysis, and increase more means to disperse non-systematic risks, so as to effectively reduce expected risks and obtain stable returns. This greatly reduces the noise in the market. When considering the investment portfolio, institutional investors will not only consider the internal governance capabilities such as the professional competence of the enterprise management and the diligence and responsibility of the management, but also pay attention to the external performance of the enterprise in the capital market. A perfect information disclosure system and a good corporate reputation can increase the enterprise's ability to adapt to and withstand pressure in the changing environment. The information contained in ESG performance can provide enough references for institutional investors in the screening of investee enterprises and meet institutional investors' demand for information other than financial information. The good performance of ESG means that there are no major defects in the internal control of the enterprise and the organizational structure is perfect. In terms of management, the management level is honest and has sufficient professional competence, and the management level is due diligence in carrying out the supervision responsibility. With a good external reputation, such companies can avoid systemic risks and reduce government intervention. In the long run, such companies have the potential for sustainable development and can reduce the risks of excessive investment and inefficient investment by institutional investors. Based on the data of China's listed companies from 2010 to 2021, this paper uses Python to capture the scores of Hexun.com as the basis for measuring ESG performance, and empirically tests the mechanism of the impact of ESG performance on institutional investors. It is found that good ESG performance will promote the shareholding of institutional investors. Further research shows that the performance of ESG promotes the shareholding of institutional investors by reflecting the performance of enterprises' internal financial indicators (operating risk, enterprise value). Enterprises with good ESG performance can gain more media attention and analysts' attention outside the enterprise, thus alleviating information asymmetry and promoting institutional investors' shareholding. This indicates that the performance of ESG is one of the key information that institutional investors pay attention to when considering the invested enterprise, and it influences institutional investors through various channels.

Compared with existing literatures, this paper has the following contributions: First, existing researches mainly discuss the influence of ESG performance on the internal economic consequences of enterprises, and study the influence path of ESG performance on enterprise value, financing constraints, etc., while this paper mainly explores the influence mechanism of institutional investors' shareholding behavior from the internal and external perspectives of enterprises, divided into four paths: business risk, enterprise value, media attention and analyst attention. Second, it enriches the research on the economic consequences of ESG performance. Existing literatures have studied the impact of ESG performance on listed companies from the perspectives of enterprise innovation, corporate governance, operational efficiency, corporate performance, etc. Most of them focus on the value of ESG performance on listed companies. However, this paper explores the impact of ESG performance on institutional investors based on the

external third party of enterprises. First, it verifies the necessity for institutional investors to refer to ESG indicators when considering target enterprises, and also provides new empirical evidence for the effectiveness of enterprises to increase ESG input. Thirdly, the data of Chinese listed companies from 2010 to 2021 are selected as research samples, which are large and more persuasive.

2. Institutional Background and Hypothesis Development

2.1. ESG performance can promote the shareholding of institutional investors

As the most important mechanism in the new institutionalism, legitimacy mechanism not only means that enterprises need to abide by laws and regulations in the narrow sense, but also includes the concepts of cultural system, concept system and social expectation that have other influences on enterprise behavior in the broad scope. Legitimacy mechanism is one of the important reasons for enterprises to improve ESG performance. In addition to requiring enterprises to comply with the basic requirements of the law, the legitimacy mechanism can also help enterprises gain social recognition, enhance social status, and strengthen resource exchanges with stakeholders. On the one hand, it explains why more and more enterprises are willing to undertake corporate social responsibility. On the other hand, enterprises actively perform corporate social responsibility, which can be supported by the government and recognized by the society, so as to maintain sustainable differentiated competitive advantages and attract more investors to invest. The legitimacy mechanism is also the reason why institutional investors prefer to hold the enterprises with good ESG performance. In the context of sustainable development, it has gradually become a consensus for enterprises to undertake ESG responsibilities. Under such circumstances, the professional institutional investors in Chinese securities market are more willing to make trading decisions and shareholding choices from the perspective of long-term development and social responsibility. From a certain point of view, the investment behavior of institutional investors must obey the social norms, values, expectations and so on of the economic and social environment. For relatively professional institutional investors, their trading decisions and investment behaviors should reflect the emphasis on fundamentals and corporate ESG responsibility, which can not only reduce the risk of stock portfolio and bring better investment returns, but also gradually form positive moral capital and reduce the possibility of negative evaluation and punishment. In view of the above information, this paper proposes the following hypothesis.

H1: ESG performance can promote the shareholding of institutional investors.

2.2. ESG performance promotes shareholding by institutional investors through internal paths

Stakeholder theory has a rich concept of social responsibility. It illustrates that shareholders are not the only service goal of the enterprise. Stakeholder theory requires that the development of enterprises must meet the interests of stakeholders, and makes clear the role of enterprises in society and the responsibilities they should undertake. Different

stakeholders have different expectations for enterprises: shareholders expect the sustainability of future profits; Debtors expect steady development of enterprises; Employees expect to pursue good and fair treatment; Customers want products that are respected and guaranteed; Companies are expected to operate in compliance and pay taxes on time. In order to adapt to the interests of the above stakeholders, it is required that the enterprise must combine the goals of the stakeholders when formulating the goals so that the enterprise's goals can meet the needs of various parties. As a broad stakeholder that can be converted into shareholders, institutional investors first pay attention to the enterprise's sustainable operation ability and profit creation ability when considering the invested enterprise. To some extent, the performance of ESG can reflect the value of enterprises; on the other hand, it is a measure of the risk management ability of enterprises in crisis environment. According to the resource dependence theory, good ESG performance can help enterprises gain the support of stakeholders and convey the signal that enterprises are trustworthy to the outside world, so as to obtain the business environment and resources necessary for sustainable development, reduce transaction costs, and have competitive advantages in integrating key strategic resources. Based on the above theories, this paper takes enterprise value and operating risk as two internal paths for ESG performance to influence institutional investors' shareholding. On the one hand, most existing studies believe that ESG performance can promote enterprise value and improve business performance or market valuation. Wang Bo et al. (2022) believe that the performance of ESG can reflect the long-term operation ability and embedded value of enterprises to a certain extent, which can promote the promotion of market value. On the other hand, if an enterprise improves its ESG performance and deepens its relationship with stakeholders, the stakeholders will be encouraged to play an active supervisory role and give more feedback on the problems existing in the operation of the enterprise, thus helping the enterprise to improve the efficiency of resource allocation and reduce operational risks. ESG performance is related to advanced management concepts and superb management capabilities, which means that human resource management with high ESG standards can better motivate and constrain senior managers (Gao Jieying et al., 2021). At the same time, in order to distinguish enterprises with poor ESG performance from those with good ESG performance, enterprises will take the initiative to assume social responsibilities, coordinate and maintain the interests of multiple stakeholders more actively to show their good performance in ESG to the outside world. This will send a signal to the market that enterprises actively accept sustainable development, and will gradually form a good expectation for institutional investors on corporate prospects. And bring it into the reference range of the invested enterprises. To be specific, good ESG performance conveys the following two positive signals worth investing to institutional investors: first, it shows that enterprises have good operating performance. Compared with enterprises with poor profitability or operating status, enterprises with large asset scale and high enterprise value are more willing and able to improve ESG performance; Second, the enterprise has a strong sense of social responsibility and a sound internal management system, which can safeguard the interests of stakeholders and has the potential for long-term sustainable development. In view of the above information, this paper

proposes the following hypothesis.

H2a: ESG improves the shareholding of institutional investors by reducing operational risks

H2b: ESG enhances the shareholding of institutional investors by enhancing enterprise value

2.3. ESG performance promotes shareholding by institutional investors through external approaches

Signal theory shows that under the condition of information asymmetry, an enterprise can improve its competitiveness by releasing positive signals of its own ability to the market as an information advantage. Because of the existence of multiple principal-agent relationships, there is information asymmetry between enterprises and numerous stakeholders. The performance of ESG can convey to the market the signal that enterprises actively fulfill their social responsibilities, which is conducive to improving the reputation and influence of enterprises in the public and further attracting the attention of media and analysts, thus laying the foundation for sustainable development. Based on the above theoretical background, the influence of ESG performance on institutional investors' shareholding is further analyzed. In order to improve the performance of ESG, enterprises establish good cooperative relations with various stakeholders, establish an honest and reliable corporate image, convey the sustainable operation status to the outside world, improve the trust level of the government, reduce the extra administrative inspection and intervention, and gradually gain higher media attention, so as to attract investment from institutional investors. In addition, the "insurance effect" brought by ESGs is also the reason why institutional investors pay attention to it. When negative news about the enterprise appears in the media, the good ESG performance of the enterprise makes the public believe that the incident is accidental and caused by mistakes rather than deliberate, which gives the enterprise the opportunity and time to correct mistakes and avoid huge losses. (Godfrey, 2005). Generally speaking, enterprises with good ESG performance will have stronger willingness to disclose information and lower earnings management, which is also more consistent with the characteristics concerned by analysts. When facing such enterprises, investors tend to increase their investment confidence due to more transparent information (Dhaliwal et al., 2011). However, analysts' focus on relatively high enterprises means that most investors are interested in the intrinsic value of stocks of relevant companies (Wang Aiqun et al., 2019). Due to their trust in enterprises with good ESG performance, analysts do not need to dig more private information to support accurate earnings forecasts, which will inevitably reduce the explicit cost of services provided by them. Moreover, enterprises with good ESG performance tend to have a better reputation and lower risk of violating laws and regulations (Chen et al., 2011). In this case, the probability of analyst earnings forecasts being wrong will also be reduced, which correspondingly reduces the hidden cost of analyst reputation damage (Jackson, 2005). The above indicates that enterprises with good performance of ESGs may reduce the difficulty of analysts' earnings prediction and input cost, while more analysts' research reports also reduce the cost of institutional investors to obtain information of investee companies, so they are often more likely to be included in the scope of investee. In view of the above information, this paper proposes the following hypothesis.

H3a: ESG performance promotes shareholding by institutional investors by increasing media attention
 H3b: ESG performance promotes institutional ownership

by increasing analyst focus
 To sum up, the impact mechanism of ESG performance on institutional investors is shown in Figure 1:

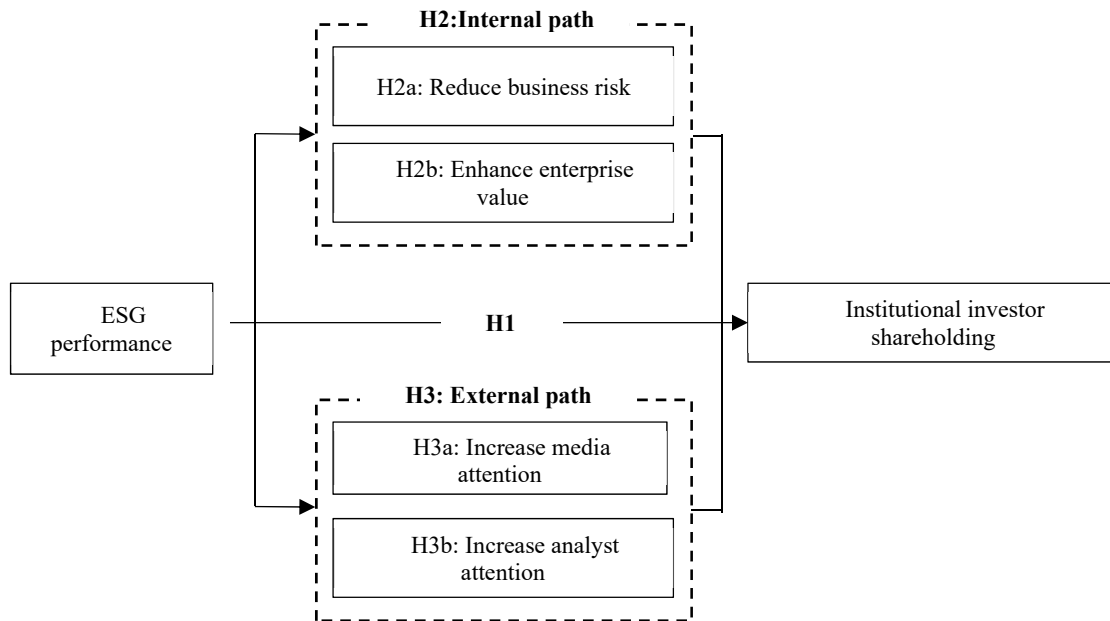


Figure 1. Mechanism of influence of ESG performance on institutional investors

3. Research Design

3.1. Data source and sample selection

This paper takes the period 2010-2021 as the research interval, selects China's A-share listed companies as the research samples, captures the social responsibility performance of Hexun.com and uses it as the performance data of ESG after necessary processing. Measuring media attention with data from the China Listed Companies Financial News Database (CNRDS); Other financial data from the National Tai 'an database. On the basis of data selection, this paper carries out the following processing: (1) the samples of financial industry and real estate industry are excluded; (2) T samples such as ST or *ST are excluded; (3) The missing values of regression variables were removed, and 28267 observed values were finally obtained. (4) In order to reduce the influence of outliers on empirical results, all continuous variables were reduced by 1%.

3.2. Definition of variables

3.2.1. Explained variables

According to the research purpose and main issues of this paper, ESG performance of enterprises should have an impression on the shareholding of institutional investors in the following year. This paper referred to the practices of Liu Jingjun et al. (2012), Lu Yao et al. (2012), Zhou Fangzhao et al. (2020). The data of institutional investor shareholding ratio of Chinese listed companies from 2010 to 2021 lag one period as explained variable (Inst).

3.2.2. Explain variables

The data released by Hexun.com is widely used by domestic scholars as the evaluation index of ESG, which consists of five first-level indexes, namely shareholder responsibility, employee responsibility, supplier, customer and consumer rights responsibility, environmental

responsibility and social donation responsibility. On this basis, the second-level and third-level indexes are set up for more detailed evaluation. In this paper, according to the practices of Liu Bai, Lu Jiarui (2018) and Bai Xiong (2022), the data are processed as follows: Shareholder responsibility, employee responsibility, supplier, customer and consumer rights and interests responsibility in the first-level index score are summed up as the evaluation of corporate Governance, and the remaining two indicators are respectively used as the evaluation of environmental responsibility and charitable donation responsibility. The sum of the above three indicators is divided by 100 as enterprise ESG performance.

3.2.3. Mediating variables

In this paper, the intermediary effect model is used to verify the mechanism of the influence of ESG performance on institutional investors. In order to verify the four influence paths proposed in the influence mechanism, the revised Zscore proposed by Altman(2002) is adopted in this paper to measure the business risk of enterprises. The larger the value, the smaller the business risk. TobinQ value is used to measure enterprise value. Referring to the practice of Zhang Zongyi et al. (2021), the natural logarithm of the sum of the number of company names appearing on the Internet and newspapers was taken as the indicator of media attention. The number of analyst teams tracking listed companies in that year was increased by 1 and logarithm was taken to represent analyst attention.

3.2.4. Control variables

For reference to the studies of Wang Lingling (2012) and Zhou Fangzhao (2020), and combined with the actual situation of China's securities market, this paper considers the following variables as appropriate control variables, specifically defined as follows: The company Size (Size) is expressed by the natural logarithm of the company's total assets at the end of the year, the company Age (Age) is

expressed by the natural logarithm of the company's listed years after adding one, the company's performance and public financial Leverage are measured by the return on equity (Roe) and leverage (Leverage), and the independent company ratio (Indep) is expressed by the number of independent directors

and the size of directors Ratio and ownership nature (Soe) indicate whether state-owned holding is 1, and no is 0. In the specific regression process, the fixed effect model of control Year (Year) and Industry in which the company is located is used for regression.

Table 1. Definitions of variables

Category	Variable name	Sign	Implication
Explained variable	Institutional investor shareholding	Inst	Share of equity held by all institutional investors at year-end
Explanatory variable	ESG performance	ESG	ESG score of Hexun.com
Path variables	Enterprise management risk	ZScore	The productive capacity of an enterprise's assets in spite of tax and financing impacts
	Enterprise value	TobinQ	The ratio between the market value and the book value of the total assets of an enterprise
	Media attention	Media	ln (media coverage +1)
	Analyst focus	Analyst	Take the logarithm of the number of analyst teams covering public companies that year, plus one
Control Variables	Company size	Size	The natural log of the company's total assets
	Profit rate on net assets	Roe	Net profit after tax/net assets of the company
	Asset-liability ratio	Lev	Ratio of total liabilities to total assets
	Company age	Age	The natural logarithm of the age of the company
	The proportion of independent directors	Indep	The ratio of the number of independent directors to the size of directors
	Nature of equity	Soe	Dummy variable, whether state-owned holding, is 1, no is 0
	annual	Year	Control annual dummy variables
	industry	Industry	Control industry dummy variables

3.3. Model construction

In order to test the influence mechanism of ESG performance on institutional investors' shareholding, the multidimensional fixed utility model is used for reference (Wang Linlin, 2022) to carry out linear regression.

First of all, model (1) is established for whether there is a correlation between ESG performance and institutional investors, in order to verify hypothesis 1:

$$Inst = \alpha + \beta ESG + \theta' Controls + \Sigma Industry + \Sigma Year \quad (1)$$

In order to test the specific mechanism by which ESG affects institutional investors, this paper replaces the explained variable in model (1) with the corresponding mechanism variable, and directly tests whether ESG can affect the corresponding mechanism variable. The following model is constructed:

$$ZScore = \alpha + \beta ESG + \theta' Controls + \Sigma Industry + \Sigma Year \quad (2)$$

$$TobinQ = \alpha + \beta ESG + \theta' Controls + \Sigma Industry + \Sigma Year \quad (3)$$

$$Media = \alpha + \beta ESG + \theta' Controls + \Sigma Industry + \Sigma Year \quad (4)$$

$$Analyst = \alpha + \beta ESG + \theta' Controls + \Sigma Industry + \Sigma Year \quad (5)$$

Finally, the path variable and the main explanatory variable are put together to observe whether the dependent variable can explain the explained variable through the path variable, and the model is built as follows:

$$Inst = \alpha + \beta ESG + \lambda ZScore + \theta' Controls + \Sigma Industry + \Sigma Year \quad (6)$$

$$Inst = \alpha + \beta ESG + \lambda TobinQ + \theta' Controls + \Sigma Industry + \Sigma Year \quad (7)$$

$$Inst = \alpha + \beta ESG + \lambda Media + \theta' Controls + \Sigma Industry + \Sigma Year \quad (8)$$

$$Inst = \alpha + \beta ESG + \lambda Analyst + \theta' Controls + \Sigma Industry + \Sigma Year \quad (9)$$

4. Empirical Analysis

4.1. Descriptive statistics

Table 2 shows the descriptive statistics of the main variables. The average shareholding of institutional investors in sample enterprises is 43.97%, indicating that institutional investors hold a large proportion of listed companies, but the minimum value is only 0.326%, and the maximum value is 91.8%, indicating that the shareholding ratio of institutional investors in different companies varies greatly. The mean value of ESG performance is 2.07, but the minimum value is only 0, and the maximum value is 73.69. It can be seen that there are great differences in ESG performance among sample enterprises. Since the descriptive statistical results of mediation variables and control variables are basically consistent with the existing studies, this paper will not be repeated.

Table 2. Descriptive statistics of major variables

Variables	Sample	Mean	SD	Min.	Max.
Inst	28267	43.97	24.86	0.326	91.80
ESG	28267	24.08	15.22	0	73.69
ZScore	28267	5.008	5.852	-0.345	37.75
TobinQ	28267	2.038	1.340	0.866	9.571
Media	28267	0.356	0.584	0.0210	4.111
Analyst	28267	1.490	1.176	0	3.784
Size	28267	22.14	1.297	19.48	26.10
Roe	28267	0.0180	0.0300	-0.0830	0.161
Lev	28267	0.418	0.210	0.0480	0.965
Age	28267	2.775	0.379	1.386	3.434
Indep	28267	0.375	0.0530	0.333	0.571
Soe	28267	0.364	0.481	0	1

4.2. Correlation analysis

The correlation coefficient between the main variables is shown in Table 3. It can be seen from the table that the correlation coefficient between ESG performance (ESG) and institutional investors (Inst) is positive and significant at the level of 1%. It can be preliminarily proved that institutional investors have a clear preference for ESG performance in

China's capital market, which is consistent with hypothesis 1. As for the variables affecting the path and the specific performance of their impact on institutional investors' shareholding, we conducted further in-depth research and regression test in the following paper.

Table 3. Correlation coefficients of major variables

Variables	Inst	ESG	ZScore	TobinQ	Media	Analyst	Size	Roe	Lev	Age	Indep	Soe
Inst	1											
ESG	0.215***	1										
ZScore	-0.096***	0.033***	1									
TobinQ	-0.063***	-0.057***	0.689***	1								
Media	0.220***	0.201***	-0.028***	0.019***	1							
Analyst	0.208***	0.350***	0.060***	0.054***	0.293***	1						
Size	0.437***	0.248***	-0.379***	-0.388***	0.416***	0.341***	1					
Roe	0.088***	0.281***	0.104***	-0.183***	0.084***	0.300***	0.039***	1				
Lev	0.219***	-0.029***	-0.587***	-0.246***	0.171***	-0.035***	0.524***	-0.179***	1			
Age	0.052***	-0.087***	-0.071***	-0.00300	0.00900	-0.192***	0.194***	-0.133***	0.197***	1		
Indep	-0.063***	-0.014**	0.024***	0.040***	0.046***	-0.012**	0.012**	-0.014**	-0.00300	-0.012**	1	
Soe	0.420***	0.132***	-0.170***	-0.132***	0.127***	-0.025***	0.366***	-0.094***	0.311***	0.180***	-0.056***	1

***p < 0.01, **p < 0.05, *p < 0.1

4.3. Analysis of regression results

4.3.1. The impact of ESG performance on institutional investors' shareholding

Model (1) tests the influence of ESG realization on institutional investors' shareholding. Column (1) of Table 4 shows that when controlling time effect and industry effect, the regression coefficient between ESG performance and institutional investors' shareholding is 0.067, and is significantly positive at the 1% level. The above results indicate that ESG performance can significantly affect institutional investors' shareholding. In the case of differences in ESG performance, the shareholding ratio of institutional investors is positively correlated with ESG performance, which verifies hypothesis 1.

4.3.2. ESG performance influences the shareholding of institutional investors through internal paths

In model (2) and model (3), the influence of business risk and business value on institutional investors' shareholding is first tested. The regression results in columns (2) and (3) of

Table 4 show that the correlation coefficient between business risk and institutional investors is 0.0168, and that between business value and institutional investors is 0.00524. Both of them are significant at the 1% level, indicating that the lower the operating risk of an enterprise, the higher the enterprise value, and the more favored by institutional investors. In model (4) and model (5), the functional mechanism of enterprise operating risk and enterprise value in the influence of ESG performance on institutional investors is tested. The regression in columns (4) and (5) of Table 4 shows that ESG performance changes in the same direction as enterprise value, but in the opposite direction with enterprise operating risk. Higher ESG performance reflects higher enterprise value and lower operating risk of the investee, which means that institutional investors can identify enterprises with good internal control and organizational structure by referring to ESG performance, which is in line with the interests of institutional investors in holding shares for a long time and can also reduce the risk of enterprises affecting sustainable operation in the process of holding shares. So we have H1a and H1b.

Table 4. Estimated results of internal path regression model

Variables	(1) Inst	(2) ZScore	(3) TobinQ	(4) Inst	(5) Inst
ESG	0.0670*** (6.79)	0.0168*** (8.03)	0.00524*** (9.91)	0.0614*** (6.23)	0.0533*** (5.44)
ZScore				0.339*** (11.36)	
TobinQ					2.508*** (20.57)
Size	6.514*** (46.40)	-0.616*** (-21.80)	-0.424*** (-59.46)	6.729*** (47.63)	7.584*** (51.05)
Roe	64.56*** (13.16)	3.531*** (3.60)	0.907*** (3.67)	63.19*** (12.91)	61.90*** (12.73)
Lev	-1.765** (-2.11)	-15.18*** (-90.52)	-0.234*** (-5.54)	3.370*** (3.56)	-1.134 (-1.37)
Age	0.0151 (0.04)	0.965*** (11.36)	0.255*** (11.94)	-0.323 (-0.79)	-0.624 (-1.53)
Indep	-16.08*** (-6.38)	2.803*** (5.46)	1.114*** (8.61)	-17.02*** (-6.76)	-18.92*** (-7.56)
Soe	15.70*** (49.80)	0.317*** (4.90)	0.0483*** (2.96)	15.58*** (49.54)	15.52*** (49.66)
cons	-102.4*** (-32.04)	20.68*** (31.89)	10.23*** (62.56)	-109.5*** (-33.71)	-128.1*** (-37.62)
N	23706	23706	23706	23706	23706
Industry fxed effect	Yes	Yes	Yes	Yes	Yes
Year fxed effect	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.3059	0.3880	0.2581	0.3096	0.3180

Robust t-statistics in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1

Table 5. Estimated results of external path regression model

Variables	(1) Inst	(2) Media	(3) Analyst	(4) Inst	(5) Inst
ESG	0.0670*** (6.79)	0.00204*** (8.61)	0.0107*** (24.61)	0.0640*** (6.47)	0.0599*** (6.01)
Media				1.361*** (5.30)	
Analyst					0.709*** (5.01)
Size	6.514*** (46.40)	0.202*** (63.07)	0.467*** (79.63)	6.227*** (41.41)	6.190*** (40.06)
Roe	64.56*** (13.16)	0.842*** (7.59)	6.044*** (29.72)	63.05*** (12.84)	59.65*** (11.93)
Lev	-1.765** (-2.11)	-0.121*** (-6.37)	-1.044*** (-30.02)	-1.574* (-1.88)	-1.016 (-1.20)
Age	0.0151 (0.04)	-0.0250*** (-2.60)	-0.318*** (-18.08)	0.0306 (0.07)	0.246 (0.60)
Indep	-16.08*** (-6.38)	0.488*** (8.40)	-0.188* (-1.76)	-16.70*** (-6.62)	-15.89*** (-6.30)
Soe	15.70*** (49.80)	-0.0419*** (-5.73)	-0.394*** (-29.35)	15.75*** (49.98)	15.97*** (49.96)
cons	-102.4*** (-32.04)	-4.222*** (-57.52)	-7.678*** (-57.08)	-96.31*** (-28.40)	-97.15*** (-28.92)
N	23706	23706	23706	23706	23706
Industry fxed effect	Yes	Yes	Yes	Yes	Yes
Year fxed effect	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.3059	0.2132	0.3481	0.3067	0.3066

Robust t-statistics in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1

4.3.3. ESG performance influences the shareholding of institutional investors through external paths

The relationship between ESG performance and media attention and analyst attention is tested in model (6) and model (7). The regression results in columns (2) and (3) of Table 5 show that the regression coefficient between media attention and ESG performance is 0.00204, and the regression coefficient between media attention and ESG performance is 0.0107, which is significant at the 1% level. Hypothesis H3a and H3b are tested. This indicates that ESGs externally create a good media image for enterprises, while institutional investors themselves will focus on these enterprises exposed to the public for a long time, because a high media degree means strong social supervision. Whether voluntarily or forced, enterprises must maintain their public image for their own interests, thus increasing the degree of self-restraint. This is also consistent with the factors that institutional investors should consider when choosing the invested enterprises; High analyst attention indicates that analyst institutions have made more research reports on enterprises, reducing the cost of institutional investors to investigate the enterprises they intend to invest in. At the same time, institutional investors are more inclined to consider the enterprises with more analysts' attention out of their trust in professional institutions.

4.3.4. Robustness test

Replace explanatory variables. First, in model (1), this paper selects the ESG rating of China Securities to reconstruct ESG2 to measure ESG performance. The higher the rating of China Securities, the better the rating of ESG. China Securities ESG ratings C to AAA are assigned from 1 to 9, that is, the ESG rating C is 1, the ESG rating CC is 2, the ESG rating CCC is 3, and so on. After replacing explanatory variables, the regression of institutional investor shareholding is carried out. Column (1) of Table 6 shows the regression results of ESG2. The regression coefficient of ESG2 is 0.431, which is significantly positive at the 1% level, indicating that replacing explanatory variables does not change the main conclusions of this paper.

Table 6. Replacement variable results

Variables	(1) Inst	(2) Inst
ESG2	0.431*** (3.07)	
ESG3		0.0207*** (0.06)
Controlled variable	Control	Control
Industry fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
N	22905	22905
Adj. R ²	0.2315	0.2312

Robust t-statistics in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1

Endogeneity test. First, the method of delayed explanatory variables is adopted to alleviate the two-way causality problem. The explanatory variables lag one, two and three periods respectively. The regression results of lagged ESG performance variables are listed in Table 7. The regression coefficient of lagged ESG performance variables is 0.712 in

the first period, 0.159 in the second period and 0.150 in the third period, all of which are significantly positive at 1%. It shows that the ESG performance can promote the shareholding of institutional investors.

Table 7. Regression results of lagged variables

	(1) Inst	(2) Inst	(3) Inst
L.ESG	0.172*** (16.81)		
L2.ESG		0.159*** (15.80)	
L3.ESG			0.150*** (15.08)
Controlled variable	Control	Control	Control
Industry fixed effect	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
N	19186	16126	13340
Adj. R ²	0.2563	0.2653	0.2710

Robust t-statistics in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1

Second, two-stage least square method (2SLS). In this paper, referring to the research method of Benlemlih and Bitar (2018), considering that an enterprise will be affected by other enterprises in the same province, and the ESG score of other enterprises is not directly related to the investment efficiency of the enterprise, IV1, the mean value of ESG performance of all listed companies in the province where the enterprise is registered, is selected as the first instrumental variable. In addition, considering that the ESG score of the earliest period of the company has an impact on the ESG performance of the current period, but is not related to the perturbation term of the current model, the ESG performance IV2 of the earliest period of the company is selected as the second instrumental variable. In this paper, the endogeneity test was conducted by using the two-stage least square method. Table 8 shows the regression results of the least square method. In the regression results of the first stage, the coefficients of the instrumental variables IV1 and IV2 are significantly positive, and the F value is far greater than 10, indicating that there is no weak instrumental variable problem, which is consistent with the expected results.

Table 8. Results of two-stage least squares regression.

Variables	Stage I ESG	Stage II F. Inst
ESG		0.095*** (5.37)
IV1	0.278*** (17.19)	
IV2	0.467*** (77.13)	
Controlled variable	Control	Control
Industry fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
N	23,706	23,706
Adj. R ²	0.386	0.299

Robust t-statistics in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1

5. Research Conclusions and Suggestions

The research results of this paper show that good ESG performance shows that internal enterprises have excellent enterprise value and low operating risk, and that enterprises have advantages over other enterprises in sustainable development and long-term profitability. External enterprises have high media attention and analysts' attention, and in the face of adverse environment, enterprises can occupy a dominant position in the public opinion. ESG performance has a significant positive relationship in influencing the shareholding of institutional investors, indicating that when institutional investors consider the invested enterprise, ESG performance can promote institutional shareholding by reflecting the internal and external advantages of the enterprise. This research finding shows that institutional investors hold enterprises with excellent ESG performance. The invested projects with long-term profitability and high risk resistance can be found. Similarly, enterprises can also improve the performance of ESG, so that they can not only gain higher risk resistance in the economy and society with downward economic environment and changeable risks, but also gain the favor of institutional investors and obtain stable financial support. For the Chinese government, which takes sustainable development as a national development strategy, the positive correlation between ESG performance and institutional investor shareholding can provide the government with the way to channel funds to the field of sustainable development. To sum up, this paper gives the following suggestions:

First, ESG can provide additional risk assessment tools for institutional investors to screen out investment projects with high potential and strong anti-risk ability. For professional institutional investors, their investment decisions and behaviors should not only consider the fundamental situation, but also pay attention to the ESG responsibility performance of enterprises. This can not only reduce portfolio risk but also lead to better return performance. Today's economy faces complex and unprecedented challenges. The impact of the COVID-19 pandemic on labor and supply chains from 2020 continues to keep the global economy in the doldrums. At the same time, many companies are suffering from energy shortages or losing talent due to poor working conditions and treatment. Without proper ESG risk management and response strategies, these environmental and social risks can lead to serious losses, especially for young companies without a strong market position or financial foundation. In addition, attention to ESG performance can help investors pay attention to environmental and social responsibility issues that are most closely related to corporate financial performance, which are often neglected in traditional investment decisions. Attention to ESG performance can play a positive role in value recognition, market stabilization and resource allocation efficiency of institutional investors.

Second, for regulators and other investors, we should actively guide enterprises to attach importance to the performance of social responsibility, further pay attention to and promote the disclosure and rating of corporate ESG information, and build an ESG system suitable for China's national conditions and with Chinese characteristics; Guide the capital market to pay attention to enterprises that effectively fulfill their social responsibilities, implement environmental protection, pay attention to corporate

governance, and protect the interests of stakeholders. At the same time, while vigorously promoting the attention of institutional investors and other social professional capital, we should pay attention to the improvement of the institutional environment and avoid "greenwashing" behavior. The status of global ESG disclosure shows that only with clearly stipulated external supervision can more listed companies disclose their own ESG information. Among all the ESG disclosure standards, the EU stands out with its relatively more comprehensive coverage of ESG-related regulations; In contrast, Asia-Pacific markets lagged behind other markets at every level of disclosure, with only about 50 per cent of listed companies disclosing their ESG performance. Unlike the European market, ESG reporting is only mandatory in Hong Kong, Singapore and Malaysia, while mandatory disclosure remains to be implemented in the mainland market. International institutional investors generally believe that the ESG information disclosure of Chinese enterprises is insufficient, so it is difficult to promote the ESG rating. Therefore, enhanced information disclosure will help attract more international funds to allocate to the Chinese stock market.

Third, this paper also has a positive significance for enterprises' own ESGs. Currently, international standards are being incubated, and domestic mandatory disclosure has not been implemented. Enterprises have enough time to understand the best form of ESG management. China Securities Regulatory Commission has made it clear that developing countries are faced with the reality that the relevant basic conditions of information and data are slightly worse than those of developed countries, but in terms of ESG direction, China is consistent with other countries. Similar to the adoption process of international accounting standards, ESG information disclosure standards also have a corresponding adaptation process. In the international community, ESG has become an important indicator concerned by institutional investors. In the continuous development of enterprises, financial performance is not the only goal, but to actively seek change and pursue green, sustainable and high-quality development. At this time, it is the best time for enterprises to pay attention to the improvement of information disclosure level, master the basic knowledge of ESG data management, and equip with relevant infrastructure, including personnel allocation, internal database, and ESG information management skills. Enterprises should actively use ESG framework as a self-assessment tool to improve the performance in the field of risk. Prepare well in advance for the future financial support from institutional investors in the capital market.

Acknowledgment

The study was funded by Anhui University of Finance and Economics Graduate Innovation Fund Project (ACYC2021477).

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