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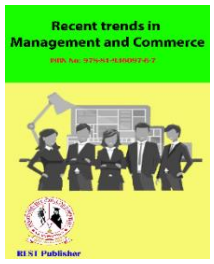

ESG Performance and Coporate Performance: Mediated Effects of Institutional Shareholding and Financing Constraints

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Abstract: *In recent years, China has placed great emphasis on green finance and green low-carbon development, actively developing various green low-carbon financial products. Achieving the "dual carbon" goals is a solemn commitment made by China to the international community. In 2022, the State-owned Assets Supervision and Administration Commission (SASAC) of the State Council further established a Social Responsibility Bureau to guide the development of green and promote enterprises in fulfilling their ESG responsibilities. However, while the role of policy encouragement and regulatory guidance is important under market economic conditions, the key factor lies in stimulating the internal motivation of enterprises. After experiencing the COVID-19 pandemic, the characteristics of the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) environment have become increasingly pronounced, with frequent occurrences of "black swan" and "grey rhino" events. Although some enterprises have managed to grow against the odds, most have faced significant shocks to their survival, growth, and sustainable development. Achieving a "win-win" situation for both social value and market value through better. ESG investment performance is the feasible basis for a new wave of development in development in ESG investment. To explore the economic consequences of ESG performance on corporate performance, this article employs literature research and empirical testing methods, focusing on the impact of corporate Using a sample of 599 listed companies from the Shanghai and Shenzhen stock markets from 2014 to 2023, the study analyses ESG ratings from the Wind database and relevant financial data from the CSMAR database. The empirical findings indicate that: (1) There is a positive correlation between ESG performance and corporate performance, meaning that better ESG performance leads to better corporate performance(2) The study examines the mediating roles of financing constraints and institutional holdings in the positive effect of ESG performance on corporate performance, revealing that ESG performance can enhance corporate performance by alleviating financing constraints and attracting institutional holdings. (3) Compared to state-owned enterprises, non-state-owned enterprises exhibit a more pronounced effect in enhancing corporate performance through improved ESG performance. (4) Compared to heavily polluting enterprises, non-heavily polluting enterprises show a more significant effect in promoting corporate performance through improved ESG performance. This research enriches the theoretical study of the transmission mechanism of the effects of corporate ESG performance on corporate performance by It provides theoretical foundations and empirical evidence for the positive economic consequences of ESG performance and offers insights for enterprises and investors to prioritise ESG performance*

Keywords: *ESG performance; coporate performance; financing constraints; Institutional Holdings*

1. INTRODUCTION

In recent years, Chinese economy has shifted from a stage of high-speed growth to a stage of high-quality development, and the concept of (ESG Environment, Social and Governance), an acronym, has emerged and is closely watched by domestic and foreign investment institutions. for the three words of Environment, Social and Corporate Governance ESG, which is an investment concept that takes the environmental, social and governance performance of enterprises into account in investment decisions, and is an extension and enrichment of the concept of Responsible Investment., Social Responsibility is not only highly in line with the overall layout of the economic, political, cultural, social and ecological civilisation construction, but also with the overall layout of the economic, political, cultural, social and ecological civilisation construction, and the overall layout of the "five-in-

one" strategy. ESG not only fits the overall layout of "economic construction, political construction, cultural construction, social construction and ecological civilisation construction" and the new development concept of "innovation, coordination, greenness, openness and sharing", but also provides a systematic and quantifiable operational framework for sustainable development and green development. The emergence of ESG is not accidental. On the one hand, the endless scandals of enterprises in recent years have shown that there are problems in the management of modern enterprises and non-financial risks lurking in the development of enterprises, and if such risks of these listed enterprises are not effectively controlled and are exposed, it is easy to cause the share price to plummet, which will bring huge losses to investors and even the development of the whole society. The frequent occurrence of share price "flash crashes" has also prompted many investors to pay attention to the non-financial risks of enterprises, which has posed a challenge to rating agencies on how to accurately assess the non-financial risks of listed companies. On the other hand, long before the outbreak of, industrial giants were embracing Corona Virus Disease 2019Stakeholder Capitalism, and there was a growing consensus that Shareholder Primacy was not the way to go. Shareholder Primacy is not the ultimate goal of a company, but rather a company should take a long-term view and consider the interests of other stakeholders, such as customers, employees, and local communities, in order to achieve sustainable development, which has led to the, a rating indicator that takes into account the interests of stakeholder's emergence. As ESG receives more and more attention, many government regulators are paying more and more attention to the disclosure of corporate information and requiring companies to improve their ESG disclosure systems. Internationally, there are also several countries that require companies to pay attention to corporate ESG performance, increase ESG responsibility investment, and improve the quality of information disclosure. ESG However, the current era is facing unprecedented severe VUCA situations, such as the global pandemic pneumonia epidemic that was rampant in the world in the previous few years, and the resulting great global economic and political turbulence and uncertainty, and the global consensus judgement is that the change events are by characterised (Variable, Uncertain, Complex, Ambiguous) as the new normal for the future VUCA [2]. Facing such a market environment, under the principle of market economy, the guiding role of policy encouragement and regulatory rules is certainly important, but it is even more crucial to stimulate the endogenous motivation of enterprises, so as to enable them to obtain higher economic returns and stronger sustainable development capability from better ESG performance, and to realise a "win-win situation"in terms of social and market values. So does good ESG performance contribute to corporate performance? If so, through what mechanism does ESG affect firm performance? In order to explore this topic, based on empirically testing the impact of corporate ESG on corporate performance, the article further explores the mediating transmission mechanism of financing constraints and institutional shareholding, so as to gain a clearer understanding of the deeper relationship between the two. Finally, the paper will also test the differences in the impact of ESG performance on firm performance under different circumstances from the perspective of firm heterogeneity.

2. RELEVANT CONCEPTS AND THEORETICAL FOUNDATIONS

Overview of relevant concepts: This section focuses on defining the variables in the research model in detail and presenting them accordingly.

ESG: ESG is an emerging investment appraisal methodology and evaluation standard, which mainly focuses on the non-financial information of enterprises. The concept of ESG was first formally proposed by the United Nations Environment Programme's Finance Initiative (UNEPFI) in 1992, hoping that investors and related organisations would take ESG factors as one of the considerations in choosing investment and financing targets. Then in 1997, the U.S. non-profit environmental and economic organisation (CERES) and the United Nations Environment Programme (UNEP) co-sponsored the establishment of the Global Reporting Initiative (GRI), which systematically covered the three parts of ESG in sustainability reports. It was not until 2004 that the ESG concept was first formally proposed by the United Nations Global Compact (UNGC) and further promoted by the then UN Secretary General, Mr. Annan, and in 2006, the Principles for Responsible Investment (PRI) was released by the United Nations Principles for Responsible Investment (UNPRI), which further promoted the development of ESG. The organisation further promoted the development of ESG. As a result, Environment (E), Social Responsibility (S) and Corporate Governance (G) have gradually become an integrated whole, which is an important criterion to measure whether a company has the ability to achieve sustainable development, and ESG investment has become a popular investment strategy. Since then, ESG concepts have gradually become popular around the world, and many NGOs and third-party organisations have begun to pay attention to and promote ESG

concepts, information disclosure and evaluation, gradually forming an ESG investment system with "standard-setting, information disclosure, assessment and rating, and investment decision-making" as the main body.

Environment (E): The E-level focuses on the enterprise's implementation of measures to protect the environment and save energy throughout the entire process of development. For example, whether the enterprise's treatment of non-renewable resources has achieved multiple recycling; whether the enterprise has taken certain measures to actively protect natural resources; what kind of attitude it holds towards partners that do not comply with relevant national environmental protection policies or standards; and whether the enterprise has carried out research and training on the impact of the enterprise's ESG performance on corporate value in terms of protecting the environment before its employees are hired. .

Social Responsibility (S): S level is highly concerned about whether enterprises actively undertake and fulfil their social responsibility. There are many different definitions of what social responsibility is in the academic world, for example, some scholars believe that social responsibility is that in order to achieve long-term healthy development, the business activities of an enterprise must be in line with the law of social value, and the corporate behaviour made must not violate the relevant national policy requirements

[5] . Other scholars believe that CSR means that enterprises actively safeguard the interests of stakeholders, such as shareholders, the government, the public and so on [6]

Corporate Governance (G): The performance of corporate governance mainly refers to the work done by enterprises in improving internal and external governance, such as the implementation of the separation of the roles of the chief executive officer and the chairman of the board of directors, as well as to ensure the diversity of the board of directors, etc., through which a series of institutional arrangements are made to coordinate the relationship between the stakeholders, and ultimately achieve the maximisation of the interests of themselves and the stakeholders, and effectively improve the principal-agent problem that often occurs in the enterprise. [7] [8].

3. ENTERPRISE PERFORMANCE

Enterprise performance is used to measure the enterprise in a certain period of time, based on certain resources and environment, to achieve their own business objectives, measure their own operation and development of the relevant indicators. The corporate performance of listed companies is the most intuitive reflection of the overall competitiveness and profitability of the enterprise, including the overall profitability of the enterprise, the future growth of space, the reasonableness of the capital structure, and the use of funds and assets, a comprehensive response to a period of operating results of the enterprise, which has become an important reference indicator for investors to make investment decisions, representing the interests of owners and creditors of the enterprise, and can be used as a standard to judge the operating results and investment returns. It has become an important reference index for investors to make investment decisions, representing the return of the enterprise's owner's equity and creditor's investment, and can be used as a criterion for judging the enterprise's operating results and investment returns.

4. FINANCING CONSTRAINTS

Although there is a growing literature on corporate finance constraints, most of the literature does not clearly define corporate finance constraints and there are differences in the understanding of corporate finance constraints. The article's definition of financing constraints originates from the classic literature on corporate financing constraints, Fazzari Hubbard, and Petersen (1988), in which corporate financing constraints are understood to be the investment decision in which the firm relies more on internal funds due to imperfections in the capital market and the existence of a financing premium on external finance. The degree of constraint by the financing factor (external financing premium) reprisents the degree of the firm's financing constraint. That is to say, corporate financing constraint is a relative concept developed on the basis of MM theory, i.e., corporate investment is constrained by the financing factor external financing premium. In fact, as long as there is external financing due to information asymmetry, there will be an external financing premium and the company's collateralised assets can play a role in mitigating the external financing premium, when the collateralised assets are depleted, the company's external financing premium will increase rapidly and even credit rationing occurs at this point, it can be assumed that the external financing premium tends to infinity. The firm's financing constraints are affected by three factors: the firm's investment opportunities, the degree of information asymmetry between the firm and the capital market, and the firm's own ability to resolve the degree of information asymmetry. In summary, the article

adopts the definition of financing constraint as the significant difference that exists between a firm's endogenous and exogenous financing costs in an imperfect market, i.e. the level of the external financing premium.

Institutional holdings: Institutional investors refer to legal entities specialising in securities investment in the financial market, the main targets include Institutional investors include securities companies, fund companies, insurance asset management, QFII and trust companies. Unlike ordinary retail investors, institutional investors attach more importance to long-term value investment concepts, focus on collecting and analysing the fundamentals of the target investment companies, and are used to applying the principles of economics to analyse the problems, and are followed up by specialised investment teams to make decisions.

5. THEORIES

Signalling theory: Spence first put forward the signalling theory in 1973, he thinks that job seekers know more about their own ability than hirers, so there is information asymmetry between them. Therefore, the job seeker's education level as a signal to the hirer is conducive to the hirer's understanding of the job seeker's ability, so as to alleviate the information asymmetry between the job seeker and the hirer, and to help the hirer to hire the job seeker with a high level of ability. In the capital market, there is a difference in the understanding of relevant information by various types of participants, and there is an asymmetry in the information obtained by both parties in the market economic activities. Enterprise insiders have a more timely and comprehensive understanding of the enterprise's cash flow, profitability, operating capacity and future development and other internal information, and have a greater information advantage compared with outsiders. According to relevant research, information asymmetry will have a negative impact on enterprise financing. The higher the degree of information asymmetry of the enterprise, the more difficult for investors to obtain relevant information about the enterprise, the higher the investment risk of investors, so the willingness of investors to invest will be reduced, and the more difficult for the company to carry out external financing [47] (Myers and Majluf, 1984), and the higher the cost of financing faced. Based on this, one solution is that enterprises can reduce the degree of information asymmetry by transmitting relevant information to the market, increase the understanding of external investors to the enterprise, so as to influence the decision-making of investors [48] (Xu Nianxing et al., 2008), and how enterprises can effectively transmit information to the market has become a hot issue in the research of this field. According to the signalling theory, ESG performance can reflect the non-financial information about the performance of enterprises in environmental, social responsibility and corporate governance related aspects, and transmit the signal of enterprise sustainable development ability to the external market, which is conducive to stakeholders understanding more information about the enterprise, reducing the information asymmetry between external stakeholders and the enterprise, assisting stakeholders in decision-making, and improving investor confidence, and thus alleviate the financing constraints in the next period [20] , in order to enhance corporate performance. Therefore, enterprises should actively invest in the construction of ESG-related aspects, establish a good social image, and transmit to the market the excellent signal that the enterprise has a strong vitality, which prompts stakeholders to make decisions in favour of the development of the enterprise.

Stakeholder theory: Freeman first explicitly proposed the stakeholder theory in 1984. Stakeholder theory believes that stakeholders are crucial to the development of enterprises, and that the development of any company cannot be separated from the participation, trust and support of stakeholders. Enterprises should integrate stakeholders into their corporate governance, change their management style, comprehensively balance the interests of stakeholders, and seek to realise the overall interests of stakeholders. Stakeholders include not only direct stakeholders who have economic dealings with the enterprise, i.e. shareholders, employees, creditors, customers, suppliers and retailers, etc., but also indirect stakeholders who have social relations with the enterprise, i.e. the government, residents and the media. These stakeholders possess various resources needed in the daily production and operation of the enterprise, including equity capital, debt capital, human capital, market capital and public environmental capital. By participating in and supporting the operation and investment activities of the enterprise, the stakeholders can ensure the smooth operation of various activities, thus realising the strategic objectives of the enterprise and promoting the sustainable and healthy development of the enterprise. At the same time, the enterprise should also actively undertake its responsibilities to the stakeholders and safeguard their reasonable demands, such as meeting the basic interests of stakeholders, protecting the ecological environment, relieving poverty, sponsoring and supporting social welfare undertakings, etc. This will not only help the enterprise and its stakeholders to achieve the goals of the enterprise, but also ensure the smooth operation of the activities. Good

ESG performance usually reflects that the enterprise actively protects the environment, undertakes social responsibility and improves corporate governance, which is precisely positive feedback to stakeholders. Therefore, actively it is an effective way to meet the demands of stakeholders by investing in ESG, which can help establish a responsible corporate image, win the trust and support of stakeholders, promote the formation of a long-term and stable cooperative relationship between the enterprise and stakeholders, and obtain more resources such as human resources, capital, technology, knowledge, etc., which will in turn promote the enhancement of the enterprise's performance

6. HYPOTHESIS FORMULATION AND THEORETICAL MODELLING

Research hypothesis:

The Impact of on Firm Performance Corporate ESG Performance: ESG is an investment philosophy that takes into account environment, social responsibility and corporate governance, which is in line with the strategic orientation of the 20th Party Congress to build a modernisation strategy in which material civilisation and ecological civilisation are coordinated, and human beings coexist harmoniously with nature. Most research findings suggest that ESG performance on corporate has a positive impact. performance In fact, good corporate ESG performance can achieve the purpose of improving corporate performance through the following three points.

Firstly, enterprises with good ESG performance are more inclined to disclose their non-financial information on ESG to the public, which, according to the signalling theory, can thus send positive signals to stakeholders in the market about the sustainable development of the enterprise, improve the transparency of corporate information, help to enhance the trust of stakeholders, and promote the establishment of a long-lasting cooperative relationship between the enterprise and various stakeholders (Li Jinglin et al., 2021) [55] . Second, in the context of ecological civilisation construction and the "dual carbon" goal, enterprises actively make ESG investments such as protecting the environment, sponsoring public welfare, and protecting the rights and interests of employees, which is in line with the expectations of the government and regulators. Therefore, good ESG performance helps firms to establish political connections with the government (Li Shu et al., 2014) [57] , which helps firms to obtain policy support such as government subsidies and tax incentives to further improve the supply of corporate resources and enhance corporate performance. (Yu Wei et al., 2012) [58] Finally, according to the principal-agent theory, modern enterprises face more serious agency problems due to the separation of management and ownership. The existence of agency problems not only brings high agency costs to enterprises, but also affects their business decisions, which is not conducive to the long-term development of the enterprise, and the internal and external monitoring mechanisms of enterprises with good ESG performance are more perfect, which can alleviate the agency problems of the enterprise, and then improve the performance of the enterprise. In summary, good ESG performance can not only reduce the degree of information asymmetry between enterprises and stakeholders, promote the establishment of a long-term cooperative relationship between enterprises and various stakeholders, and bring more resources to the enterprise, but also alleviate the agency problem and reduce the agency cost, so as to improve the performance of the enterprise, based on which, the article puts forward the following hypotheses: H1: There is a significant positive correlation between corporate ESG performance and corporate performance.

The mediating role of financing constraints between ESG performance and firm performance: ESG performance is an important indicator of corporate sustainability, and good ESG performance significantly improves corporate performance, whereas financing constraints have a negative impact on corporate performance; in fact, better ESG performance of firms can improve corporate performance by alleviating financing constraints. On the one hand, good ESG performance can alleviate financing constraints. According to pecking order theory, the degree of financing constraints of enterprises is negatively related to information transparency, so that the higher the cost of investors' adverse selection, the deeper the degree of financing constraints. And the degree of information asymmetry of enterprises is determined by their information disclosure policy and its implementation, and existing studies have shown that the information asymmetry of enterprises can be greatly reduced by strengthening information disclosure, which can improve the share price volatility of listed companies and reduce the burden of their external financing, alleviating the financing constraints [61] (XI Longsheng and WANG Yan, 2022). Corporate information disclosure includes two forms: financial information disclosure and non-financial information disclosure. Through the disclosure of non-financial information within the enterprise, it can effectively improve the information asymmetry between the internal and external parts of the enterprise, reduce the risk of investors, and thus reduce the transaction costs of the enterprise (Ditommaso and Thornton, 2020) [62]

. Corporate ESG information as the most important non-financial information, companies with good ESG performance can by increasing ESG ease corporate financing constraints from three aspects obtaining stakeholder recognition, meeting investors' demand for information, increasing investor confidence, On the other hand, alleviating financing constraints will improve enterprise performance. The current imperfections in China's financial environment have led to the problem of financing constraints faced by enterprises in general, and financing constraints will, to a certain extent, inhibit the growth of enterprise performance. Specifically, the existence of financing constraints restricts the ability of enterprises to obtain funds, implying that when an enterprise encounters a higher degree of financing constraints, the scope and scale of its investment will inevitably be severely constrained, forcing the enterprise to give up some of the investment opportunities that have an NPV>0 and help to improve its performance, which affects the rate of return on the project investment. (Lingfang Chen, 2022) [40] In summary, ESG performance can not only reduce the degree of information asymmetry, reduce the cost of investors' adverse selection, but also increase investor confidence, win for the enterprise such as the government and other stakeholders to tilt the resources, in order to alleviate the financing constraints, so that the enterprise has a sufficient scale of capital or lower cost of capital to carry out normal production and operation activities, investment opportunities to improve performance, and ultimately achieve the performance Improvement of the enterprise. Based on this, the article proposes the following hypotheses: H2: Financing constraints play a mediating role between firms' ESG performance and firm performance.

The mediating role of institutional shareholding between ESG performance and firm performance: Good performance indicates a good internal governance environment and reduced agency costs within the enterprise. According to the signalling theory, with the improvement of internal information disclosure, more stakeholders have a deeper understanding of the enterprise's situation, which helps to alleviate the information asymmetry effect between the enterprise and the investors, and thus helps the enterprise to attract more high-quality investors as well as long-term investment funds with relatively high stability, and ultimately, according to the theory of resource dependence, the institutional investor can help to construct a bridge connecting the enterprise's ESG performance and its performance to achieve the enterprise performance improvement. On the one hand, good ESG performance can increase the proportion of institutional shareholding. Good ESG performance information transparency is higher, can provide investors with more reference information, which will help to increase the attention of institutional investors to the enterprise, institutional investors for the enterprise's investment willingness will rise, enterprise shareholders in the proportion of institutional shareholding increased. On the other hand, the increase in the proportion of institutional shareholding helps to improve corporate performance. According to the research of previous scholars, such as Liu Ya et al. (2021), Xia Ning and Li Min (2014), and Lu Li (2020), the participation of institutional investors can help enterprises alleviate information asymmetry effects, reduce internal agency costs, and formulate correct business decisions, which can help enterprises to improve their business performance [120] [121] [122]. In fact, as the proportion of institutional shareholding increases, the willingness of institutional investors to manage the enterprise rises, at which time the capital advantage and professional advantage of institutional investors over retail investors will help the enterprise to revitalise its assets, and at the same time, it can also bring more high-quality customers and business resources, which will help to improve the performance of the shareholding enterprise. In summary, good ESG performance can improve corporate performance by increasing the degree of attention of institutional investors, attracting institutional investors to hold shares, and effectively utilising the capital and professional advantages that institutional investors have over retail investors, based on which, the article puts forward the following hypotheses: H3: Institutional shareholdings play a mediating role between firms' ESG performance and firm performance

7. THEORETICAL MODELLING

Theoretical modelling: Based on the previous research hypothesis, corporate ESG performance will improve corporate performance, and institutional shareholding and financing constraints play an intermediary effect between them, i.e., corporate ESG performance can improve corporate performance by increasing the proportion of institutional shareholding and alleviating financing constraints. the resulting theoretical model of the article is shown in Figure 3-1:

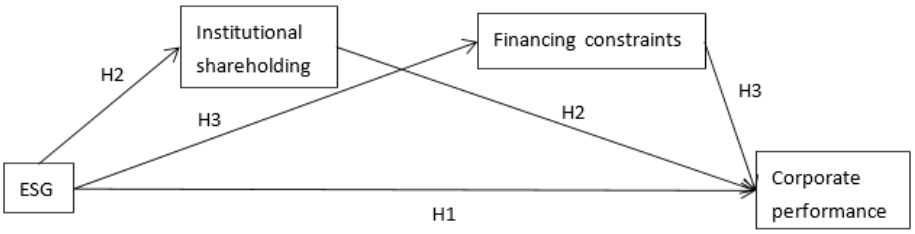

FIGURE 1. Theoretical model diagram

Summary of research hypotheses: Table 1 summarises the research hypotheses of the articles

TABLE 1. Summary of research hypotheses

serial number	Content of the research hypothesis
H1	There is a significant positive correlation between corporate performance and ESG performance.
H2	Financing constraints play a mediating role between corporate ESG performance and firm performance.
H3	Institutional shareholdings play a mediating role between corporate ESG performance and firm performance.

8. RESEARCH DESIGN

Sample selection and data sources

The research sample of the article is Chinese A-share listed companies in Shanghai and Shenzhen, and the time frame of the study is 2014-2023. The relevant data required for the article are from Wind and CSMAR databases, in which the data are obtained from Wind CSM ESG Rating Database to measure the ESG performance of companies. In order to make the data more scientific and effective, the article screens and processes the samples from the following principles:

- Excluding companies with abnormal data, ST and *ST special treatment of samples and midway delisting;
- were excluded Samples with missing and abnormal data on; the main variables
- Firms with data discontinuities during the sample period were excluded;
- In order to reduce the effect of outliers, all variables were subjected to 1% quantile Winsorize.

We obtained after the completion of 5990 observations, including screening and processing 10 years of data from. processing the raw data 599 sample companies the process of forming the panel data is with the help of and completed Excel 2019; finally, the regression analysis and empirical test mainly rely on Microsoft Stata 17 software

Measurement of variables

Explained variable: coporate performance

The explanatory variable is firm performance (ROE). There are various measures for corporate performance. One is the financial evaluation model developed from the DuPont analysis, which uses corporate financial indicators for substitution, such as return on net assets (ROE), return on total assets (ROA), operating profit ratio (OPR), etc.[9] [10] ; two is the value model, such as the economic value added (method EVA) to measure economic performance, and the Tobin Q (TobinQ) to measure market performance [11] [12] [13] ; Thirdly, the comprehensive evaluation model, such as the balanced scorecard, the performance pyramid and the use of principal component analysis to analyse the financial indicators of the enterprise to construct a new financial performance evaluation system and other methods [14] [15] . Corporate performance is divided into financial performance and non-financial performance. The article studies corporate the impact of on corporate performance, mainly considering the impact on financial performance ESG performance, so it chooses based on accounting index method the financial evaluation model. The article is based on the ROE, the net profit margin on net assets, which is commonly used by international scholars to measure corporate performance when studying the

relationship between corporate ESG performance and corporate performance. (Duque-grisale, 2021; Zheng Hui et al, 2024; Li Jinglin, 2021) [66] [67] [68]

Explanatory variables: ESG performance

The explanatory variable is ESG performance (ESG). The methods of measuring corporate ESG performance in previous studies conducted by scholars are very diverse, and there is currently no unified indicator system. Some scholars construct their own indicators, which is largely influenced by the subjectivity of the researcher, and the reliability of the results is yet to be proven. Wang Linlin (2022) argues that the CSI ESG evaluation system is an ESG indicator system constructed by referring to the mainstream international ESG evaluation system and adjusting it with the characteristics of the Chinese market, which is characterised by high frequency of updating (quarterly updating), wide coverage (covering all A-share listed companies) and high data availability. This study refers to its viewpoint, and the data for measuring the ESG performance of enterprises come from the Wind CSI ESG rating database, which ensures the scientific nature of the research data and then the reliability of the research results. [3]

Intermediary variables: institutional ownership, financing constraints

The mediating variables are institutional ownership (Ins), and financing constraints (SA). Institutional investors invest in companies in two main ways, equity and debt, and the article focuses on the equity investment perspective. Therefore, the article uses total number of institutional holdings to the outstanding the company the ratio of the A-shares of to represent institutional holdings and measure the investment of institutional investors in the company. Financing constraints are measured in two main categories in the existing literature: first, using a single indicator, such as interest coverage multiples and dividend payout ratios; and second, using a combination of multivariate indicators to measure them. In contrast, the multivariate indicator method not only covers a wide range of indicators, but also has a strong persuasive power and its reliability is relatively high. previous research literature on corporate financing constraints, the main indicators that measure the degree of corporate financing constraints from this perspective are the KZ index, the SA index and the WW index [16] [17]. The article refers to Xuan Zhang et al. (2019) [69], where the absolute value of the SA index is used as an indicator to measure the degree of financing constraints, and the larger the value is, the more severe the financing constraints encountered by the firms.

Control variables: Corporate performance is a comprehensive response to the company's overall operating conditions, there are many other factors affecting corporate performance, with reference to the relevant literature, this paper mainly from the perspective of the company's financial risk, shareholding concentration and other indicators reflecting the characteristics of corporate fundamentals to select the control variables added to the construction of the regression equation. The gearing ratio index is mainly used to measure the long-term solvency and financial leverage of the enterprise; and the shareholding ratio of the company's largest shareholder and the proportion of independent directors are also selected to represent the company's basic situation and internal governance. In summary, the article selects the following indicators as control variables for this study, specifically: gearing ratio (Alr), independent directors as a proportion of board size (Ind), and the proportion of shares held by the first largest shareholder (Fir) in order to serve as year and industry dummy variables in the fixed effects model. All the variables of the article are summarised in the variable definition table below:

TABLE 2. Definition of variables

Variable type	variable name	Content of the research hypothesis
explanatory variable	ROE	Return on net assets, ROE = net profit/total net assets
explanatory variable	ESG	CSI ESG Rating Score
intermediary variable	SA	The absolute value of the indexSA , SA = Size*(0.043Size-0.737)-0.04Age. where Size is the natural logarithm of firm size divided by one million and Age is the age of the firm.
	Ins	Total institutional holdings as a percentage of outstanding A shares *100 per cent
control variable	Alr	gearing
	Ind	Ratio of independent directors to the number of board members*100 per cent
	Fir	Shareholding ratio of the largest shareholder

Modelling

For the test of research hypotheses H1, H2, and H3, the article draws on Wen Zhonglin (2004) [71] for the test of mediation effect and constructs the regression model as follows:

(Μοδελ 4–1)

$$POE = \alpha_0 + \alpha_1 E\Sigma\Gamma + \upsilon_t + \gamma_\tau + \varepsilon$$

(Μοδελ 4–2)

$$POE = \alpha_0 + \alpha_1 E\Sigma\Gamma + \alpha_2 A\lambda\rho + \alpha_3 Iv\delta + \alpha_4 \Phi\iota\rho + \upsilon_t + \gamma_\tau + \varepsilon$$

(Μοδελ 4–3)

$$\Sigma A = \alpha_0 + \alpha_1 E\Sigma\Gamma + \alpha_2 A\lambda\rho + \alpha_3 Iv\delta + \alpha_4 \Phi\iota\rho + \upsilon_t + \gamma_\tau + \varepsilon$$

(Μοδελ 4–4)

$$POE = \alpha_0 + \alpha_1 E\Sigma\Gamma + \alpha_2 \Sigma A + \alpha_3 A\lambda\rho + \alpha_4 Iv\delta + \alpha_5 \Phi\iota\rho + \upsilon_t + \gamma_\tau + \varepsilon$$

(Μοδελσ 4–5)

$$Iv\sigma = \alpha_0 + \alpha_1 E\Sigma\Gamma + \alpha_2 A\lambda\rho + \alpha_3 Iv\delta + \alpha_4 \Phi\iota\rho + \upsilon_t + \gamma_\tau + \varepsilon$$

(Μοδελσ 4–6)

$$POE = \alpha_0 + \alpha_1 E\Sigma\Gamma + \alpha_2 Iv\sigma + \alpha_3 A\lambda\rho + \alpha_4 Iv\delta + \alpha_5 \Phi\iota\rho + \upsilon_t + \gamma_\tau + \varepsilon$$

Where α_0 is the intercept, $\alpha_i, i = 1, 2, .., 6$ is the regression coefficient of the variable of interest in the regression equation, u_i is the individual fixed effect term, γ_t is the time fixed effect term, ε is the random error, the article will verify in section 5.3 that it is more appropriate to use a two-way fixed effect model in the article.

9. EMPIRICAL ANALYSIS

Prior to the regression analysis, using the raw data was organised into a panel data format. with the help of Microsoft Excel 2019 Descriptive statistics and correlation analyses were first carried out Stata 17 software to measure the differences and correlations between the variables as a whole.

Descriptive statistical analyses

Table 5.1 reports the sample distribution (results are retained to two valid decimals only). It can be seen that the mean value of corporate performance (ROE) is 6.43, and the difference between the maximum and minimum values is large, with a difference of 37.65, indicating that there is a large difference in corporate performance between the sample inter-company firms.The mean value of ESG is 73.52, and the minimum and maximum values are more symmetrical relative to the mean value, and the ratings are not low. It can be seen that under the supervision of relevant policies and the active participation of various organisations, the development of ESG among listed companies in China is on the rise. The mean value of the intermediary variable SA is 3.91 with a standard deviation of 0.19, indicating that the imperfections of the current financial environment in China have led to a certain degree of financing constraints faced by enterprises. The mean value of institutional shareholding ratio is 0.40, while the difference between the corresponding maximum and minimum values of the sample enterprises is close to 0.7, with a standard deviation of 0.21, indicating that the institutional shareholding ratio in the sample enterprises varies greatly and fluctuates greatly, similarly, the control variable of gearing ratio Alr also presents such a distribution, and it is worth mentioning that the average value of the gearing ratio of each enterprise is 42%, which is relatively high. the proportion of shares held by the first largest shareholder The average value of is 30.72%, indicating that the equity of modern enterprises is still relatively concentrated. And the average value of the proportion of independent directors to the number of board members is 37 per cent, indicating that today's society pays more attention to the establishment of independent directors and corporate governance issues

TABLE 3. Descriptive Statistics for Each Variable

variant	Number of observations	average value	(statistics) standard deviation	minimum value	maximum values
ROE	5, 990	6.43	8.61	-14.98	22.67
ESG	5, 990	73.52	4.62	64.54	81.79
SA	5, 990	3.91	0.18	3.62	4.26
Ins	5, 990	0.4	0.21	0.04	0.73
Fir	5, 990	30.72	12.86	11.93	56.51
Alr	5, 990	0.42	0.18	0.13	0.73
Ind	5, 990	0.37	0.05	0.33	0.5

Correlation analysis: In order to verify that the variables selected for this study and the related hypotheses were formulated scientifically and reasonably, were conducted Pearson between the variables correlation tests, and the results are shown in Table 5.2.

TABLE 4. Pearson correlation variables

varian t	ROE	ESG	Ins	SA	Fir	Alr	Ind
ROE	1.0000						
ESG	0.2378*	1.0000					
Ins	0.2516*	0.1270*	1.0000				
SA	-0.0596*	-0.0012	-0.0617*	1.0000			
Fir	0.1642*	0.0619*	0.5834*	-0.1674*	1.0000		
Alr	-0.1440*	-0.0695*	0.1541*	-0.0151	0.0808*	1.0000	
Ind	-0.0698*	0.0315*	-0.0569*	0.0199	-0.0034	-0.0467*	1.0000

where * indicates that bilateral significance holds at 1 per cent

As can be seen from Table 5.2, firm ESG performance is positively associated with firm performance ROE and is significant at the 1% significance level, consistent with Hypothesis H1. In addition, corporate ESG performance is negatively correlated with financing constraints, while financing constraints are significantly negatively

correlated with corporate performance, consistent with Hypothesis H2. Note that although the negative correlation between ESG performance and financing constraints is not significant, this is likely due to the lack of intervention of control variables, did not rule out the interference of control variables and the results, the two in the subsequent regression, the addition of control variables, and rule out the relevant interference, the existence of a significant A negative correlation is sufficient. Secondly, corporate ESG performance is significantly positively correlated with institutional shareholding, while institutional shareholding is significantly positively correlated with corporate performance, which is consistent with hypothesis H3. In addition, from the size of all the correlation coefficients, it can be seen that the possibility of covariance between the variables of the selected samples in this paper is small, in order to further verify whether there is a problem of covariance between different variables, this paper carried out the test of variance inflation factor, and the test results show that the value of is less than VIF 10, which can avoid the occurrence of covariance problems. From the above analyses, it can be seen that the selection of research variables and the formulation of hypotheses in the article are scientifically appropriate

Regression analysis

Hausman test

In order to show that the article's choice of a two-way fixed-effects model in the 4.3 Model construction section is justified, a Hausman test is performed on the model with the following results:

TABLE 5. Hausman test table

```
. hausman FE RE, constant sigmamore

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       FE           RE         Difference          Std. err.
-------------+------------------------------------------------------------
    norm_ESG |    .0200151     .0753684       -.0553532        .0052594
    norm_Fir |    .1286907     .1357535       -.0070628        .0184196
    norm_Alr |   -.1838382    -.1477436       -.0360946        .0116592
    norm_Ind |   -.0439448    -.0528358        .0088909        .0071357
       _cons |    .603182      .556014         .047168         .0097209
------------------------------------------------------------------------------
                           b = Consistent under H0 and Ha; obtained from xtreg.
            B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

    chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            = 122.06
Prob > chi2 = 0.0000
(V_b-V_B is not positive definite)
```

Since the original hypothesis can be rejected at the 1% level of significance, it is reasonable for us to choose fixed effects for subsequent regression tests

The Impact of on Firm Performance Corporate ESG Performance

Table 5.4 gives the results of the two models for the main effects calibration (Model 4-1, Model 4-2), it is easy to find that (4-1) shows that firms' ESG performance on has a significant positive correlation ROE and there are both time and individual effects, and after controlling for the time effect, the individual effect, and the various control variables, (4-2) shows that the results still hold at the bilateral 0.05 significance level holds, which is consistent with our hypothesis H1.

TABLE 6. Tests for main effects

	(4-1) ROE	(4-2) ROE
ESG	0.036***	0.032**
	(2.836)	(2.536)
Fir		0.118***
		(4.718)
Alr		-0.181***
		(-10.282)
Ind		-0.043***
		(-3.186)
_cons	0.574***	0.610***
	(58.463)	(34.237)
time effect	Yes	Yes
individual effect	Yes	Yes
N	5990	5990
R2	0.022	0.046
F	11.892	19.814

***p<0.01", "**p<0.05", "*p<0.10

The mediating role of financing constraints between ESG performance and firm performance

Table 5.5 gives the results of the three models for the mediation effect test (Model 4-2, Model 4-3, and Model 4-4), and it is easy to find from (4-3) that firms' ESG performance has a significant negative correlation with financing constraints, probably because firms' ESG performance not only reduces the cost of investor's adverse selection by alleviating the degree of information asymmetry, but also reduces the cost of investor's adverse selection by winning for the firms' stakeholder resources as a way to alleviate financing constraints. And (4-4) shows that after the introduction of the intermediary variable SA, the regression coefficient of ESG on ROE is significant and reduced but not zero, and the regression coefficient of SA on ROA is significantly negative, which indicates that the positive effect of corporate ESG performance on corporate performance is partially mediated by the intermediary variable financing constraints, which verifies the conclusion of hypothesis H2.

TABLE 7. Tests for the Mediating Effect of Financial Constraints

	(4-2) ROE	(4-3) SA	(4-4) ROE
ESG	0.032**	-0.011***	0.030**
	(2.536)	(-2.926)	(2.415)
Fir	0.118***	-0.014*	0.116***
	(4.718)	(-1.880)	(4.643)
Alr	-0.181***	-0.002	-0.181***
	(-10.282)	(-0.391)	(-10.306)
Ind	-0.043***	0.001	-0.042***
	(-3.186)	(0.245)	(-3.179)
SA			-0.137***
			(-3.022)
_cons	0.610***	0.222***	0.640***
	(34.237)	(41.527)	(31.304)
time effect	Yes	Yes	Yes
individual effect	Yes	Yes	Yes
N	5990	5990	5990
R^2	0.046	0.907	0.047
F	19.814	4015.890	19.079

***p<0.01", "**p<0.05", "*p<0.10

The mediating role of institutional shareholding between ESG performance and firm performance

Table 5.6 gives the results of the three models for the mediation effect test (Model 4-2, Model 4-5, Model 4-6), from (4-5) it is easy to find that the ESG performance of the firms has a significant positive correlation with the institutional shareholding, which indicates that the good ESG performance of the firms can attract the investment holdings of the institutional investors. While (4-6) illustrates that after the introduction of the intermediary variable Ins, the regression coefficient of ESG on ROA is significant and reduced, but not zero, and the regression coefficient of Ins on ROA is significantly positive, indicating that the positive effect of corporate ESG performance on corporate performance is partially mediated by the intermediary variable Institutional Shareholding, which verifies the conclusions of Hypothesis H3.

TABLE 8. Tests for the mediating effect of institutional shareholdings

	(4-2) ROE	(4-5) Ins	(4-6) ROE
ESG	0.032**	0.021**	0.029**
	(2.536)	(2.426)	(2.299)
Fir	0.118***	0.249***	0.081***
	(4.718)	(14.582)	(3.184)
Alr	-0.181***	0.025**	-0.185***
	(-10.282)	(2.071)	(-10.543)
Ind	-0.043***	0.013	-0.044***
	(-3.186)	(1.411)	(-3.347)
Ins			0.150***
			(7.524)
_cons	0.610***	0.377***	0.553***
	(34.237)	(31.035)	(28.760)
time effect	Yes	Yes	Yes
individual effect	Yes	Yes	Yes
N	5990	5990	5990
R2	0.046	0.044	0.056
F	19.814	19.238	22.633

***p<0.01", "**p<0.05", "*p<0.10

Robustness Tests

The article uses firm performance variable replacement as a robustness test. The article further tests the as a proxy variable for firm performance with variable replacement validity of the research hypotheses using return ROA on assets total. The results of the correlation tests after variable substitution are given in Tables 5.7 to 5.10.respectively, noting that the ESG to ROA regression coefficient in Table 5.7, (4-2) is significantly positive, indicating that H1 still holds, whereas the ESG to SA regression coefficient in Table 5.8, (4-3) is significantly negative, and with the introduction of the mediator variable SA, ESG to ROA regression coefficient significantly decreases but not to zero, and the SA to ROA regression coefficient is significantly negative, indicating that after replacing the measure of explanatory variables still financing constraints have a partial mediating effect between firms' ESG performance and firms' performance, i.e., H2 still holds. Similarly, in Table 5.9, (4-5) the regression coefficients of ESG on Ins are significantly positive and the main effect regression coefficients are significantly lower but not zero after the introduction of the mediating variable Ins, suggesting that there is still a partial mediating effect of institutional shareholding between firms' ESG performance and firms' performance after substituting the measurement of the explanatory variables, i.e., H3 still holds. In summary, after replacing the measurement of explanatory variables, all the research hypotheses of the article still hold, indicating the robustness of the research conclusions

TABLE 9. Quadratic tests for main effects

	(4-1) ROA	(4-2) ROA
ESG	0.03 7***	0.029**

	(3.105)	(2.533)
Fir		0.114***
		(4.900)
Alr		-0.299***
		(-18.304)
Ind		-0.037***
		(-3.017)
_cons	0.517***	0.609***
	(55.506)	(36.807)
time effect	Yes	Yes
individual effect	Yes	Yes
N	5990	5990
R2	0.025	0.086
F	13.610	39.128

***p<0.01", "**p<0.05", "*p<0.10

TABLE 10. Quadratic test for the mediating effect of financial constraints

	(4-2) ROA	(4-3) SA	(4-4) ROA
ESG	0.029**	-0.011***	0.028**
	(2.533)	(-2.926)	(2.455)
Fir	0.114***	-0.014*	0.113***
	(4.900)	(-1.880)	(4.850)
Alr	-0.299***	-0.002	-0.300***
	(-18.304)	(-0.391)	(-18.319)
Ind	-0.037***	0.001	-0.037***
	(-3.017)	(0.245)	(-3.011)
SA			-0.082*
			(-1.942)
_cons	0.609***	0.222***	0.627***
	(36.807)	(41.527)	(32.994)
time effect	Yes	Yes	Yes
individual effect	Yes	Yes	Yes
N	5990	5990	5990
R^2	0.086	0.907	0.087
F	39.128	4015.890	36.621

***p<0.01", "**p<0.05", "*p<0.10

TABLE 11. Quadratic test for the mediating effect of institutional shareholdings

	(4-2) ROA	(4-3) Ins	(4-4) ROA
ESG	0.029**	0.021**	0.026**

	(2.533)	(2.426)	(2.286)
Fir	0.114***	0.249***	0.078***
	(4.900)	(14.582)	(3.296)
Alr	-0.299***	0.025**	-0.303***
	(-18.304)	(2.071)	(-18.623)
Ind	-0.037***	0.013	-0.039***
	(-3.017)	(1.411)	(-3.185)
Ins			0.145***
			(7.883)
_cons	0.609***	0.377***	0.554***
	(36.807)	(31.035)	(31.017)
time effect	Yes	Yes	Yes
individual effect	Yes	Yes	Yes
N	5990	5990	5990
R^2	0.086	0.044	0.097
F	39.128	19.238	41.185

***p<0.01", "**p<0.05", "*p<0.10

Heterogeneity analysis

Considering that the results of the positive effect role of ESG performance on firm performance will be affected by certain characteristics of the firms themselves, with reference to Lili Feng and Simin Zhao (2017) and Fernandez- Feijooetal (2014), the article further analyses and conducts grouped regressions based on the different ownership attributes of the firms as well as the industries in which they are located to separately considering the caused by differences in these two types of firm characteristics differences in the impact of performance on firm performance .

Tests of the impact of ESG performance on firm value for firms with different nature of ownership and analysis of results

In order to deeply analyse whether the difference in ownership heterogeneity of listed companies affects the positive correlation between ESG performance and corporate performance, the article divides the sample companies into two groups of state-owned and non-state-owned companies and conducts regressions separately, and the specific results are shown in Table 5.10.

TABLE 12. Impact of ESG Performance on Firm Performance for Firms with Different Nature of Ownership

	state-owned business	non-state enterprise
	ROE	ROE

ESG	-0.006	0.049***
	(-0.298)	(2.994)
Fir	-0.068*	0.195***
	(-1.762)	(6.578)
Alr	-0.282***	-0.100***
	(-9.156)	(-4.688)
Ind	-0.052**	-0.045***
	(-2.563)	(-3.025)
_cons	0.734***	0.555***
	(24.449)	(25.974)
time effect	Yes	Yes
individual effect	Yes	Yes
N	2368	3622
R^2	0.069	0.062
F	11.853	16.485

***p<0.01", "**p<0.05", "*p<0.10

From the empirical results, it can be seen that compared with the non-state-owned enterprises ESG performance and corporate performance still become significantly positively correlated, the state-owned enterprises' the positive effect of performance on corporate performance is no longer significant. This may be because, on the one hand, due to the existence of government backing, according to signalling theory, the cost of adverse selection is low for investors, and the return on investment becomes a "risk-free rate" with a higher interest rate than the risk-free rate, so the expected effect of SOEs to improve their ESG performance to alleviate financing constraints in order to improve corporate performance is naturally lower than that of non-SOEs. Therefore, the expected effect of improving ESG performance of SOEs to alleviate financing constraints and improve corporate performance is naturally lower than that of non-SOEs. In addition, due to the unique nature of their shareholdings, SOEs sometimes have to take on additional policy responsibilities, and sometimes their business decisions may conflict with the goal of profit maximisation, and institutional investors are unable to change this situation. This means that even if institutional investors participate in shareholding, they still have limited say in the overall governance of the enterprise, and thus cannot fully participate in key decisions and strategic policymaking within the enterprise, and thus cannot give full play to the specialised advantages of institutional investors, and therefore the effect of improving ESG performance of SOEs to attract institutional investors to hold shares in order to improve corporate performance is not obvious. On the other hand, in non-state-owned enterprises, the internal stakeholder situation is relatively simple, there is no policy burden, and the pursuit of pure return on assets, so when the ESG performance of the enterprise has the potential for development, and institutional investors are actively involved in shareholding, the unreasonable governance situation and decision-making policy within the enterprise can be corrected; and at the same time, the capital advantage of institutional investors over retail investors can also provide the invested enterprise with At the same time, the capital advantage of institutional investors over retail investors can also provide

Tests of the impact of ESG performance on firm value for firms with different industry characteristics and analysis of results

In order to verify the difference in the impact of ESG performance on enterprise value of enterprises with different industry characteristics, the article distinguishes the sample enterprises into high-pollution enterprises and non-high-pollution enterprises and conducts regression separately, and the specific results are in Table shown 5.11

TABLE 13. Impact of ESG Performance on Enterprise Value for Firms with Different Industry Characteristics

	Highly polluting enterprises	Non-highly polluting enterprises
	ROE	ROE
ESG	0.002	0.048***
	(0.070)	(3.124)
Fir	0.165***	0.089***
	(3.855)	(2.990)
Alr	-0.146***	-0.204***
	(-5.078)	(-9.133)
Ind	-0.027	-0.050***
	(-1.215)	(-3.021)
_cons	0.569***	0.638***
	(19.044)	(28.807)
time effect	Yes	Yes
individual effect	Yes	Yes
N	2210	3780
R^2	0.042	0.053
F	6.658	14.476

***p<0.01", "**p<0.05", "*p<0.10

From the empirical results, it can be seen that compared with the non-high-pollution enterprises ESG performance and corporate performance still become significantly positively correlated, of high-pollution enterprises the positive effect of performance on corporate performance is no longer significant. This may be because, on the one hand, under the current environmental protection concept of "who pollutes, who governs", it is necessary for high-polluting enterprises to increase their investment in the environment, and the public and other relevant stakeholders believe that high-polluting enterprises have the responsibility and obligation to protect the environment as a matter of course, and thus based on the signalling theory, it is not obvious that the effect of high-polluting enterprises to improve ESG performance is not obvious. The effect of improving corporate performance is not obvious. At the same time, due to the influence of national policies, the state restricts the development of high-pollution industries, thus increasing the financing constraints of high-pollution firms, and such firms need to pay more financing costs, which makes it difficult to translate their good ESG performance into economic benefits and further inhibits the increase in corporate performance. In addition, as China's emphasis on ecological civilisation and environmental governance continues to increase, the relevant authorities have stepped up their efforts to regulate high-polluting enterprises, and have increased their support for environmentally friendly enterprises such as new energy and new materials, high-polluting industries have been slow to transform and upgrade due to their technological level, and have been replaced by new industries, and there is a bottleneck in the enhancement of corporate performance. The overall development prospect of the industry is not optimistic, so the attractiveness of the industry to institutional investors decreases. Therefore, the effect of improving ESG performance of high-pollution enterprises to attract institutional investors to hold shares in order to improve corporate performance is not obvious. On the other hand, the good ESG performance of non-highly polluting firms still can alleviate financing constraints by reducing information asymmetry, lowering the cost of adverse selection for investors, and winning the tilt of stakeholder resources for the firms, as well as increasing the willingness of institutional investors to invest in the firms. Both of the above will contribute to the ultimate performance improvement of the firm.

Endogeneity test: To address the endogeneity issue, the article employs two approaches to deal with it at the same time: the use of with dual fixed individual and time effectsa fixed effects model, and the use of an instrumental variables approach. On the one hand, in order to control for possible endogeneity problems arising from omitted variables, the article has used a two-way fixed effects model in the regression analysis, controlling for individual and time effects that may generate endogeneity problems, and the corresponding results still hold.

with panel data On the other hand, the article adopts the instrumental variable (approach IV) to endogeneity testing, introduces relevant instrumental variables to measure the core explanatory variables, and applies two-stage least squares (2SLS) estimation. Drawing on Gao, Jieying et al. (2021) and Benlemlih and Bitar (2018) [82] [83] , the article adopts the average of ESG scores of other listed firms in the city where the same firm is registered (Av ESG) as an instrumental variable for ESG performance, where each firm's ESG performance is affected by the other firms in the same province Each firm ESG performance of 's ESG performance will be affected by the ESG performance of other firms in the same province, while the of other firms ESG performance is not directly related to the investment efficiency of that firm. In the instrumental variable method (instrumental variable method (IVfirst stage of the), the mean ESG scores of other listed companies in the same city of incorporation (used while controlling for the relevant variables), and IV（Av_ESG) are to regress the ESG scores of the firms , and then the fitted values of the ESG scores are regressed in the second stage of the the results of the endogeneity test of the performances and the firms' values are shown in Table 5.12 below.

TABLE 14. Regression Results of Instrumental Variable Approach

	(1) Phase I	(2) Phase II
	ESG	ROE
Fir	0.075***	0.131***
	(0.011)	(0.010)
Alr	-0.056***	-0.115***
	(0.011)	(0.010)
Ind	0.024**	-0.063***
	(0.011)	(0.009)
Av_ESG	0.307***	
	(0.012)	
ESG		0.143***
		(0.035)
Constant	0.340***	0.509***
	(0.011)	(0.019)
Observations	5, 990	5, 990
R-squared	0.102	0.103

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

where column (1) of reports the results of the first-stage regression and column (2) reports the results of the second-stage regression. Table 5.12 It is easy to find that the correlation coefficients of both regressions are significantly positive at the level, which indicates that firms after accounting for the endogeneity issue the contribution of to firm performance remains significant, consistent with the existing findings. ' ESG performance In addition, the weak instrumental variable tests the F-value of is 611.408, indicating that Aves is a suitable exogenous variable.

10. CONCLUSIONS AND IMPLICATIONS

Conclusions: The main research subjects of the article include 599 Shanghai and Shenzhen A-share listed companies, and the time frame of the study is 2014-2023. Using CSI ESG rating data to measure corporate ESG performance and ROE to measure corporate performance, a two-way fixed-effects model is established to empirically test the positive correlation between corporate ESG performance and corporate performance, after which the mediating role of financing constraints and institutional shareholding is further verified, and finally, the transmission mechanism of these two mediating effects is combined and deepened into the chain mediating effect. The article draws the following research conclusions:

- There is a positive correlation between corporate ESG performance and corporate performance ROE. In the short term, corporate investment in ESG will lead to increased capital expenditure and costs, but in the long term it will lead to higher corporate performance. This is because enterprises can strengthen the positive interaction between enterprises and various stakeholders by implementing strategies to actively improve environmental governance and practice social responsibility, which can promote the formation

of long-term and stable cooperative relationships between enterprises and stakeholders, win more resource supply, and ultimately have higher corporate performance.

- Financing constraints play a mediating role in the positive correlation between ESG performance and firm performance; ESG performance not only reduces the cost of investors' adverse selection by reducing the degree of information asymmetry, but also mitigates the financing constraints by winning the tilting of resources from stakeholders, such as the government, so that firms can have enough capital to carry out normal production and operation activities or carry out normal business activities at a lower cost of capital. This will enable enterprises to have sufficient capital or lower capital costs to carry out normal production and operation activities, seize performance-enhancing investment opportunities, and ultimately improve enterprise performance.
- Institutional shareholding plays a mediating role in the positive correlation between ESG performance and corporate performance. Institutional investors have
- more professional investment concepts, and are more likely to recognise ESG concepts than retail investors. Companies with higher ratings are more attractive to institutional investors, and the proportion of institutional shareholding increases. When the proportion of institutional shareholding rises, it will give investors more financial support, form a stronger external supervision role for the enterprise, and institutions are more willing to participate in corporate governance, enriching the enterprise's customer resources, providing more invisible and visible external support for the enterprise, and ultimately realising the enhancement of the enterprise's performance by alleviating the constraints of enterprise financing and reducing the agency cost.
- Compared with state-owned enterprises the positive effect of performance of on corporate performance, which is no longer significant, of non-state-owned enterprises ESG the positive effect of performance on corporate performance is not only significant, but also more obvious. Due to their unique equity nature, state-owned enterprises no longer need to improve ESG performance to ease the financing constraints, and even if institutional investors participate in shareholding, the overall governance of the enterprise's right to speak is still limited, and cannot play the advantages of this relative to retail investors, so that state-owned enterprises cannot be improved through the improvement of ESG performance to achieve the effect of improved corporate performance. However, the above two situations of non-state-owned enterprises are the opposite of state-owned enterprises, and can well realise ESG the positive effect of performance on corporate performance.
- Compared with highly polluting firms the positive effect of performance on corporate performance of, which is no longer significant, of non-highly polluting firms ESG the positive effect of performance on corporate performance is not only significant, but also more obvious. Due to the influence of stakeholders and uncertain development prospects, the good ESG performance of high-polluting enterprises is limited to alleviate financing constraints and increase institutional shareholding, and it is difficult to turn ESG performance into economic benefits. On the other hand, non-high-pollution enterprises still ESG can not only reduce the degree of information asymmetry, reduce the cost of investors' adverse selection, win the inclination of stakeholders' resources for the enterprise, so as to alleviate the financing constraints, increase the proportion of institutional shareholding, and ultimately achieve the effect of enterprise performance improvement.

Research Implications

According to the conclusion of the article, firms with good ESG performance can achieve the effect of improving firm performance by alleviating financing constraints and increasing institutional shareholding, based on which we propose the following research insights:

- Enterprises should improve their ESG performance. First, improve the top-level planning of ESG construction, and fully incorporate ESG into corporate culture construction and mechanism design; second, implement ESG concepts into all aspects of business dealings, product development, employee training, customer service, social welfare, etc.; third, organically integrate ESG factors into the comprehensive business rating system, and set up corresponding assessment indicators, rewards and punishment policies; and fourth, take the initiative to strengthen the disclosure of ESG information and reduce information asymmetry between enterprises and external stakeholders with the help of media and other channels of information dissemination to alleviate financing constraints and achieve the effect of corporate performance enhancement. Fourth, actively strengthen ESG information disclosure and reduce information asymmetry between enterprises and external stakeholders through the information

dissemination function of media and other channels, so as to alleviate financing constraints and achieve the effect of corporate performance improvement.

- Investors should incorporate corporate ESG performance into their investment decision-making framework. Since there is a positive correlation between the ESG performance of enterprises and their performance, investors should additionally introduce non-financial information such as corporate environmental responsibility, social responsibility, and corporate governance on the basis of the macro environment and financial information of enterprises, integrate ESG into the strategic objectives of investment, research and analysis, portfolio management, risk control, due diligence management, etc., and develop financial forecasting models and asset valuation models that include ESG factors, so as to enhance investment returns and reduce investment risks. We also develop financial forecasting models and asset valuation models that include ESG factors to enhance investment returns and reduce investment risks. At the same time, investors' attention to corporate ESG performance will also guide the benign development of listed companies in ESG performance.
- The government and regulatory authorities should create a favourable institutional environment for corporate ESG construction. Firstly, they should reduce their intervention in the market and economic subjects, and improve the scientificity of corporate ESG decision-making and the sensitivity of stakeholders to corporate ESG performance; secondly, they should improve the legal environment, especially the legislative work related to corporate ESG, and increase the cost of poor and false corporate ESG performance; thirdly, they should promulgate ESG disclosure guidelines for listed companies that are relatively uniform and complete, and direct and strengthen the ESG disclosure of listed companies. The third is to promulgate relatively unified ESG disclosure guidelines for listed companies with complete indicators to guide and strengthen the ESG disclosure work of listed companies, and continuously improve the scope and quality of ESG disclosure.
- Institutional investors need to actively play their own advantageous roles to achieve a win-win situation with enterprises. Institutional investors should apply their own resource integration ability to promote the sustainable development of enterprises, increase the support of financial institutions to the real economy, and use their own professional investment concepts to help enterprises improve ESG performance and strengthen corporate governance. At the same time, institutional investors should play a good role in monitoring their own, in-depth understanding of the enterprise, to find the pain points of the industry, and apply advanced investment concepts into practice to help the healthy development of the enterprise, and ultimately achieve a win-win situation with the enterprise.
- sustained and stable financing support for the invested enterprises and alleviate financing constraints. As a result, the performance of the enterprise itself can be significantly improved by combining the above two points.

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