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ESG Performance and Stock Returns in China: Uncovering the Financial Distress Channel

Jing Mou, Wei-Theng Lau, Lee Chin

School of Business and Economics, Universiti Putra Malaysia, Malaysia

Corresponding Author Email: lwtheng@upm.edu.my

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Abstract

As ESG has become increasingly prominent and gradually incorporated into capital market pricing, whether ESG performance is reflected in stock returns has emerged as a central research question. Using a sample of 4,452 Chinese A-share listed firms from the Shanghai and Shenzhen stock exchanges over the period 2014–2024, this study employs a two-way fixed effects model to examine the effects of overall ESG performance and its environmental, social, and governance pillars on stock returns, while further exploring the mediating role of financial distress. The findings show that overall ESG performance is significantly positively associated with stock returns, suggesting that the capital market assigns a premium to firms with superior ESG practices. Further analysis reveals that the environmental and social pillars do not exhibit significant positive market effects, whereas the governance pillar exerts a significant positive effect on stock returns. Mediation analysis indicates that financial distress serves as a significant mediator in the relationship between ESG performance and stock returns, with the mediating effect mainly driven by the governance pillar. The results remain robust to a series of robustness checks and endogeneity tests. This study enriches the literature on the capital market consequences of ESG performance by focusing on stock returns and provides new empirical evidence on the heterogeneous effects of ESG pillars and their underlying mechanisms in emerging markets.

Keywords: ESG Performance, ESG Pillars, Stock Returns, Financial Distress, Bankruptcy Risk

Introduction

Amid intensifying climate change, widening social inequality, and rising corporate governance risks, sustainable finance has become a central concern in global capital markets. Against this background, ESG investing has expanded rapidly and is widely regarded as an important investment strategy. As of 2025, the United Nations-supported Principles for Responsible Investment had 5,261 signatories representing US$139.6 trillion in assets under management, highlighting the growing mainstream acceptance of ESG in global asset allocation. As an evaluation framework that extends beyond traditional financial indicators, ESG information has been incorporated more widely into investment analysis and portfolio allocation. With the continued development of sustainable finance, investors and other market participants have become increasingly attentive to ESG information, and ESG

performance has emerged as an important basis for assessing firms' long-term value and risk management capacity (Verheyden et al., 2016). However, whether stronger ESG performance is associated with superior stock returns remains an open empirical question, especially in markets where information frictions and pricing inefficiencies are more pronounced. This issue is particularly important in China, where the A-share market remains characterized by relatively high information asymmetry, strong retail investor participation, and substantial market frictions. In this context, it remains unclear whether ESG performance is fully reflected in stock returns (Pedersen et al., 2021).

Theoretically, the effect of ESG on stock returns is ambiguous. On the one hand, stronger ESG performance may improve firms' information transparency and governance quality, thereby strengthening investor confidence and supporting firm valuation. From the perspective of stakeholder theory, stronger ESG performance helps firms build more stable stakeholder relationships, which may enhance operating resilience and future cash flow expectations (Freeman, 1984; Shanaev & Ghimire, 2022). More specifically, environmental practices such as emissions reduction, pollution control, and green technology investment can reduce environmental risk and compliance costs, while social practices can enhance stakeholder trust and firm reputation (Feng et al., 2022). From the perspective of information asymmetry, ESG disclosure, as an important form of non-financial information, can improve firm transparency and help external investors better assess firms' long-term value (Cui et al., 2018). More comprehensive ESG information helps alleviate investors' concerns about potential risks and operational uncertainty, reduces the valuation discount associated with information asymmetry, and supports more favorable capital market pricing (Fatemi et al., 2018). From the perspective of agency theory, ESG practices may strengthen board oversight and constrain managerial opportunism, thereby reducing agency conflicts (Jensen, 1986). This not only improves decision quality and resource allocation efficiency but also enhances investor confidence and firm valuation, which may in turn be reflected in stock returns (Rostami et al., 2016). On the other hand, ESG investment may also involve substantial upfront costs, delayed payoffs, and uncertain short-term benefits. As a result, the relationship between ESG performance and stock returns remains theoretically ambiguous and may differ across institutional contexts and ESG pillars.

Existing studies have extensively examined the economic consequences of ESG, with most of the literature focusing on financial performance, financing costs, and green innovation (Amore & Bennedsen, 2016; Bai et al., 2022; Bamel et al., 2025; Wong et al., 2021). Although growing attention has been paid to whether ESG is rewarded by capital markets, the empirical evidence remains mixed across different institutional settings and market environments (Luo, 2022; Pedersen et al., 2021; Wang et al., 2024). On the one hand, some studies suggest that strong ESG performance enhances investor confidence and improves market expectations, thereby generating superior stock returns (Yin et al., 2023). On the other hand, other studies argue that ESG engagement may involve substantial upfront costs and a relatively long payback period, such that its effect on stock returns may be weak, unstable, or even absent in the short run (Chen et al., 2017). These mixed findings suggest that the relationship between ESG and stock returns is not yet fully understood. Two main gaps remain insufficiently addressed in the existing literature. First, most studies rely primarily on aggregate ESG scores or a single dimension of corporate social responsibility, with relatively limited attention paid to the distinct roles of the environmental, social, and governance pillars

(Doku et al., 2023; Tsai & Wu, 2022). This limitation is crucial because the ESG pillars differ substantially in their economic content, visibility to investors, and relevance to risk and cash flow expectations. Second, the transmission mechanisms through which ESG affects stock returns remain insufficiently examined. Existing studies provide initial evidence that ESG may influence stock returns through channels such as financing constraints and market attention (Bai et al., 2022; Zhao et al., 2024). However, limited attention has been paid to financial distress (Habib, 2023). This omission matters because stock returns reflect not only expected growth, but also investors' assessment of downside risk and firms' resilience to adverse shocks. If ESG performance helps reduce financial distress by improving governance quality, stakeholder support, and risk management capacity, then financial distress may represent a key channel through which ESG affects stock returns.

To address these gaps, this study uses a sample of Chinese A-share listed firms from the Shanghai and Shenzhen stock exchanges over the period 2014–2024 and employs a two-way fixed effects model to examine the impact of ESG performance on firm stock returns. The study further examines the environmental, social, and governance pillars separately to identify their heterogeneous effects on stock returns. To better understand how ESG affects stock returns, it also investigates the mediating role of financial distress. To enhance the reliability of the findings, several robustness checks are conducted, including the use of an alternative measure of stock returns, the exclusion of years affected by the COVID-19 pandemic, and the inclusion of additional control variables. To further address potential endogeneity concerns, the study employs one-period-lagged ESG indicators, the Heckman two-stage model, and the system Generalized Method of Moments (GMM) estimator.

This study contributes to the literature in three respects. First, it examines not only the impact of overall ESG performance on stock returns but also the separate effects of the environmental, social, and governance pillars, thereby revealing the heterogeneous effects of different ESG dimensions. By identifying the distinct roles of each pillar in shaping stock returns, this study addresses the limited attention paid to differences across ESG pillars in the existing literature. Second, this study examines financial distress as a mediating channel through which ESG affects stock returns. By incorporating financial distress into the analytical framework, the study deepens understanding of how ESG affects stock returns and provides new empirical evidence on the role of financial distress in transmitting the capital market effects of ESG. Finally, this study provides evidence from China's capital market, thereby enriching the emerging market literature on ESG and stock returns. As the world's largest emerging market, China's capital market is characterized by severe information asymmetry and a market structure dominated by retail investors. The pricing of ESG information and its underlying mechanism may therefore differ substantially from those in developed markets. Evidence from the Chinese A-share market fills an important gap in the emerging market literature and offers useful insight into how ESG influences stock returns under information asymmetry and market frictions.

Literature Review and Hypotheses

Existing research on the relationship between ESG performance and stock returns remains inconclusive. A growing body of literature suggests that stronger ESG performance can enhance investor confidence, improve market expectations, and strengthen firms' resilience under uncertainty, thereby supporting superior stock market performance. For example, Yin

et al. (2023) find that ESG significantly enhances stock returns in the Chinese market, partly through financial performance and innovation capability, while Yadav et al. (2024) document a similar positive relationship in India. Shanaev and Ghimire (2022) show that ESG rating upgrades trigger positive return reactions, whereas downgrades lead to substantial declines. Likewise, Engelhardt et al. (2021) report that firms with higher ESG ratings experienced higher abnormal returns and lower stock volatility during the COVID-19 shock. However, other studies question the stability and direction of this relationship. Feng et al. (2022), using Chinese firm-level data, report that corporate social responsibility improves stock returns, whereas ESG performance has a negative effect for most firms. Luo (2022) also finds a negative relationship between ESG and stock returns and shows that any ESG premium is concentrated in low-liquidity stocks. Moreover, Limkriangkrai et al. (2017) find no significant difference in risk-adjusted returns across ESG-sorted portfolios, suggesting that ESG investing does not impair performance but may not consistently generate excess returns. Pedersen et al. (2021) further argue that there is no single linear relationship between ESG and stock returns, rather, the relationship depends jointly on the informational value of ESG and investors' sustainability preferences. Using data from U.S. markets, Escobar-Saldívar et al. (2025) find that ESG scores are negatively related to stock returns, whereas ESG momentum is positively associated with returns and negatively associated with volatility. Recent studies also suggest that the market effect of ESG may depend on the consistency of ESG ratings. In particular, Wang et al. (2024) show that ESG rating disagreement weakens investor sentiment and depresses stock returns. Vasenin et al. (2026) show that ESG rating upgrades lead to positive abnormal returns, whereas downgrades result in negative abnormal returns in global equity markets. Their findings suggest that investors actively respond to shifts in ESG assessments, further indicating that the ESG-stock return relationship remains dynamic and sensitive to how ESG signals are interpreted by the market. Related evidence further indicates that rating divergence can distort investors' perceptions of firms' ESG performance and reduce abnormal stock returns, especially when disagreement is concentrated in social pillar ratings (Wang et al., 2024). Overall, these findings suggest that the effect of ESG on stock returns remains mixed. Nevertheless, the broader literature generally indicates that ESG performance can shape investor perceptions, firm risk assessment, and capital market pricing. Given the mixed evidence and the distinctive features of the Chinese capital market, it remains necessary to examine whether stronger ESG performance is associated with more favorable stock market returns. Therefore, this study proposes the following hypothesis:
H1: ESG performance is positively associated with firm stock returns.

Although the overall ESG score provides a useful summary measure of firm sustainability, the ESG pillars differ substantially in relevance to firm risk and future cash flow expectations. As a result, their effects on stock returns may not be uniform. For the environmental pillar, the evidence remains mixed. Some studies argue that stronger environmental performance can improve stock market returns by attracting green investors and strengthening firms' position under rising climate awareness. For example, Fan et al. (2023) show that the stock market responds positively to green bond issuance announcements, while Ma et al. (2024) find that Chinese firms with stronger environmental performance earn higher abnormal returns. Other studies, however, suggest that environmental performance does not necessarily translate into higher returns. De Haan et al. (2012) argue that the negative relationship between corporate environmental performance and stock returns may result from the joint effect of environmental risk exposure and investor preferences, while Horváthová's (2010) meta-

analysis further suggests that environmental performance does not uniformly translate into better economic outcomes and may even be negatively associated with firm performance in portfolio-based studies.

For the social pillar, the existing literature generally provides stronger support for a positive effect of social responsibility performance on stock returns. Dorfleitner et al. (2018) find that corporate social responsibility ratings have a positive effect on stock returns and that firms with stronger CSR performance significantly outperform those with weaker CSR performance over the medium to long term. Similarly, Lins et al. (2017) show that trust built through investments in social capital can translate into higher returns, especially during financial crises. Tsai and Wu (2022) likewise find that improvements in corporate social responsibility performance help increase portfolio returns, with this positive effect becoming more pronounced during periods of financial crisis. Nevertheless, some studies suggest that social responsibility investment does not necessarily generate a positive market response and that its effect may depend on firms' underlying operating conditions. Chen et al. (2017) show that CSR activities can increase costs and reduce stock returns for low-value firms, whereas high-value firms are more likely to translate CSR investment into higher stock prices. This suggests that the capital market effect of social performance may depend on firms' underlying quality and their ability to translate stakeholder-oriented activities into economic value.

For the governance pillar, robust corporate governance is generally viewed as an important mechanism for reducing agency problems and strengthening market confidence. Rostami et al. (2016) examine six governance elements and find that institutional ownership, board independence, CEO duality, and CEO tenure are positively associated with stock returns, whereas ownership concentration and board size are negatively related to stock returns. Similarly, Hunjra et al. (2020) show that board size and CEO duality significantly reduce stock price crash risk, suggesting that governance factors may improve market performance by lowering downside risk. Cardoso et al. (2019) further show that portfolios composed of firms with strong corporate governance are more resilient to short-term market fluctuations, exhibiting shorter periods of volatility. However, some findings remain conditional. For example, Doku et al. (2023) find that board independence is significantly positively associated with stock return volatility, whereas board size helps reduce stock return volatility only when it reaches a sufficiently large level. Overall, the existing literature suggests that the three ESG pillars may affect stock returns through different channels and with different degrees of pricing relevance. Environmental performance is more closely related to regulatory exposure and transition risk, social performance is more strongly linked to stakeholder trust and reputation, and governance performance is more directly associated with agency costs and internal controls. These differences make it necessary to examine the three pillars separately rather than relying solely on an aggregate ESG score. Therefore, the following hypothesis is proposed:

H2: The environmental, social, and governance pillars are positively associated with firm stock returns.

Financial distress is an important determinant of firms' capital market performance, because it directly affects investors' expectations regarding firms' survival prospects, future cash flows, and downside risk. Bankruptcy risk, in particular, is widely used to capture the severity of financial distress. Early studies suggest that firms with higher bankruptcy risk tend to earn

below-market stock returns, indicating that financial distress weakens investors' expectations regarding future cash flows and firms' going-concern prospects, thereby depressing stock returns (Dichev, 1998). Similarly, Gao et al. (2018) find a significant negative relationship between default probability and stock returns and further argue that the stock prices of financially distressed firms may be temporarily overvalued in some cases. As risk is gradually revealed, the market eventually corrects such mispricing downward. Against this background, a growing body of research has examined the relationship between ESG and financial distress. Existing studies generally suggest that stronger ESG performance reduces the likelihood that a firm will fall into financial distress. Habib (2023) finds that firms pursuing a stronger cost leadership strategy tend to exhibit better ESG performance and a lower probability of financial distress, suggesting that ESG may be closely related to operating stability and risk resilience. Wang et al. (2024) further show that better ESG performance is associated with lower bankruptcy risk, thereby enhancing corporate resilience. Gao et al. (2025) also find that ESG engagement reduces bankruptcy risk through multiple channels, including improved information transparency, alleviated financing constraints, enhanced operating performance, and lower leverage, with the governance pillar playing the most prominent role. Related evidence also suggests that responsible corporate behavior may reduce downside risk by improving transparency. Hua et al. (2026) find that ESG activities improve firms' resilience through greater information transparency and better corporate governance, thereby helping mitigate stock price crash risk. Similarly, Kim et al. (2014) show that CSR performance is negatively associated with future crash risk, although this effect may reverse if managers use CSR strategically to conceal negative information or divert shareholder attention.

Despite these two related strands of literature, whether financial distress serves as a transmission mechanism linking ESG performance to stock returns has not yet been systematically examined (Zhou et al., 2025). This gap is non-trivial, because stock returns reflect not only expected growth, but also investors' assessment of downside risk and firms' ability to withstand adverse shocks. If stronger ESG performance helps reduce financial distress by strengthening stakeholder support, enhancing transparency, and improving governance quality, then lower financial distress may stabilize investor expectations and improve stock market performance. This mechanism may be particularly relevant in the Chinese market, where information asymmetry and financial frictions may amplify the pricing effect of financial distress. Based on this, financial distress may constitute a key mechanism through which ESG affects stock returns. Therefore, this study proposes the following hypotheses:

H3: Financial distress mediates the relationship between ESG performance and firm stock returns.

H4: Financial distress mediates the relationship between the environmental, social, and governance pillars and firm stock returns.

Methodology

Sample selection and data sources

This study uses a sample of A-share listed firms from the Shanghai and Shenzhen stock exchanges over the period 2014–2024. Consistent with prior studies, the sample excludes firms designated as ST, *ST, or PT during the sample period, firms in the financial and insurance industries, and observations with missing ESG or financial data. To mitigate the influence of outliers, all continuous variables are winsorized at the 1st and 99th percentiles.

The final sample consists of 29,810 firm-year observations from 4,452 listed firms, yielding an unbalanced panel dataset. ESG scores are obtained from the Sino-Securities Index Information Service Co., Ltd. (SNSI), and the financial data are sourced from the China Stock Market and Accounting Research (CSMAR) Database.

Variable measurement

Explained variable. Following Luo et al. (2022) and Zhao et al. (2024), this study defines stock returns as annual individual stock returns considering the reinvestment of cash dividends. This measure incorporates ex-rights and ex-dividend adjustments arising from cash dividends, stock dividends, and rights issues, and therefore better reflects investors' actual holding-period total returns. Specifically, $P_{n,t}$ denotes the comparable closing price of stock n on the last trading day of year t, adjusted for the reinvestment of cash dividends. The calculation formula is as follows:

$$Return_{\mathrm{n,t}} = \left(\frac{\mathrm{P_{n,t}}}{\mathrm{P_{n,t-1}}}\right) - 1 \tag{3.1}$$

Explanatory variables. This study uses the SNSI ESG Index to measure corporate ESG performance. Compared with international ESG ratings, the SNSI ESG rating provides broader coverage of Chinese A-share listed firms and thus provides more comprehensive data support (Xue et al., 2025). Moreover, this rating system incorporates China-specific institutional and market characteristics, making it more relevant to the local context (Chen et al., 2025). In addition, the SNSI ESG rating is released quarterly and dynamically updated when firms experience major ESG-related events, which enhances its timeliness. The overall ESG score, together with the environmental, social, and governance pillar scores, ranges from 0 to 100, with higher values indicating better ESG performance.

Mediating variable. Financial distress is measured by the Altman Z-score, which is a widely used composite indicator for assessing a firm's bankruptcy risk and overall financial health (Altman, 1968). The Z-score combines five financial ratios that capture different dimensions of a firm's financial condition, including liquidity, cumulative profitability, operating efficiency, leverage, and asset turnover. Specifically, X_1 is measured as working capital divided by total assets, X_2 as retained earnings divided by total assets, X_3 as earnings before interest and taxes divided by total assets, X_4 as the market value of equity divided by the book value of total liabilities, and X_5 as sales divided by total assets. A higher Z-score indicates stronger financial health and a lower likelihood of financial distress. The calculation formula is as follows:

$$Z = 1.2\mathrm{X_1} + 1.4\mathrm{X_2} + 3.3\mathrm{X_3} + 0.6\mathrm{X_4} + 1.0\mathrm{X_{15}} \tag{3.2}$$

Control variables. This paper controls for firm age (Age), firm size ($Size$), growth capacity ($Growth$), fixed asset ratio ($Fixed$), total asset turnover (TAT), Price-to-book ratio (PB), board size ($Board$). Table 1 provides the definitions and measurements of all variables.

Table 1
Variable definitions

Variables	Definition
Stock returns (Return)	Annual individual stock returns considering the reinvestment of cash dividends
ESG performance (ESG)	ESG performance is measured by the Sino-Securities ESG score.
Financial distress (Zscore)	$Z = 1.2\mathrm{X}_1 + 1.4\mathrm{X}_2 + 3.3\mathrm{X}_3 + 0.6\mathrm{X}_4 + 1.0\mathrm{X}_{15}$
Firm age (Age)	Natural logarithm of 1 plus the number of years for firm has been listed
Firm size (Size)	Natural logarithm of total assets
Growth capacity (Growth)	Ratio of current year revenue minus previous year revenue to previous year revenue
Fixed asset ratio (Fixed)	Ratio of fixed assets to total assets
Total Asset Turnover (TAT)	Ratio of operating revenue to average total assets
Price-to-book ratio (PB)	Current closing price divided by total shareholders' equity per share
Board size (Board)	Natural logarithm of the number of board directors

To examine the effect of ESG performance on firm stock returns, Model (3.3) regresses stock returns on the overall ESG performance while controlling for firm-specific characteristics, industry fixed effects, and year fixed effects. To capture potential heterogeneity across ESG pillars, Model (3.4) decomposes the overall ESG performance into the environmental, social, and governance pillar performance and estimates their separate effects on stock returns. Based on Hypothesis H1, this study specifies the following baseline regression models:

$$Return_{it} = \alpha_0 + \alpha_1 ESG_{it} + \alpha_2 Age_{it} + \alpha_3 Size_{it} + \alpha_4 Growth_{it} + \alpha_5 Fixed_{it} + \alpha_6 TAT_{it} + \alpha_7 PB_{it} + \alpha_8 Board_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (3.3)$$

$$Return_{it} = \alpha_0 + \alpha_1 E_{it} + \alpha_2 S_{it} + \alpha_3 G_{it} + \alpha_4 Age_{it} + \alpha_5 Size_{it} + \alpha_6 Growth_{it} + \alpha_7 Fixed_{it} + \alpha_8 TAT_{it} + \alpha_9 PB_{it} + \alpha_{10} Board_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (3.4)$$

To examine whether ESG performance affects firm stock returns through financial distress, this study specifies a mediation model and adopts the stepwise regression approach proposed by Baron and Kenny (1986). Specifically, the first-step regression uses Z-score as the dependent variable to test the effect of ESG performance on firms' financial distress conditions. The stock return model then includes both ESG performance and Z-score to examine whether Z-score is statistically significant and whether the ESG coefficient changes relative to the baseline model. If the coefficient on Z-score is statistically significant and the ESG coefficient declines relative to the baseline model, this suggests that the financial distress channel plays a mediating role in the relationship between ESG performance and corporate stock returns. If the ESG coefficient remains significant after including Z-score but its absolute value decreases, this indicates partial mediation. If the ESG coefficient becomes insignificant after Z-score is introduced, this indicates full mediation.

$$Zscore_{it} = \alpha_0 + \alpha_1 ESG_{it} + \alpha_2 Age_{it} + \alpha_3 Size_{it} + \alpha_4 Growth_{it} + \alpha_5 Fixed_{it} + \alpha_6 TAT_{it} + \alpha_7 PB_{it} + \alpha_8 Board_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (3.5)$$

$$Return_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 Zscore_{it} + \beta_3 Age_{it} + \beta_4 Size_{it} + \beta_5 Growth_{it} + \beta_6 Fixed_{it} + \beta_7 TAT_{it} + \beta_8 PB_{it} + \beta_9 Board_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (3.6)$$

Furthermore, to identify the distinct transmission mechanisms of the three ESG pillars, this study specifies mediation models for each pillar. The testing procedure follows that of the overall ESG model, allowing an assessment of whether financial distress mediates the relationship between each ESG pillar and firm stock returns.

$$Zscore_{it} = \alpha_0 + \alpha_1 E_{it} + \alpha_2 S_{it} + \alpha_3 G_{it} + \alpha_4 Age_{it} + \alpha_5 Size_{it} + \alpha_6 Growth_{it} + \alpha_7 Fixed_{it} + \alpha_8 TAT_{it} + \alpha_9 PB_{it} + \alpha_{10} Board_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (3.7)$$

$$Return_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 G_{it} + \beta_4 Zscore_{it} + \beta_5 Age_{it} + \beta_6 Size_{it} + \beta_7 Growth_{it} + \beta_8 Fixed_{it} + \beta_9 TAT_{it} + \beta_{10} PB_{it} + \beta_{11} Board_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (3.8)$$

Results and Discussion

Descriptive Statistics And Pearson Correlation Test

Table 2 presents the descriptive statistics for the main variables. The mean ESG score is 0.6876, with a standard deviation of 0.0848, indicating that the sample firms exhibit a moderately high level of ESG performance with some cross-sectional variation. At the pillar level, the mean scores for the environmental, social, and governance pillars are 0.6183, 0.7591, and 0.7895, respectively, suggesting that the sample firms perform better in the social and governance pillars than in the environmental pillar. The mean stock return is 0.0976, indicating that stock returns are positive on average, although substantial variation exists across firms. The mean Z-score is 4.9668, suggesting that most sample firms are in relatively sound financial condition, while a subset still faces higher financial distress risk. The control variables also display plausible distributions, which supports the subsequent regression analysis.

Table

Summary statistics

Variable	N	Mean	SD	Min	Max
ESG	29810	0.6876	0.0848	0.4412	0.8840
E	29810	0.6183	0.0650	0.4688	0.8055
S	29810	0.7591	0.0671	0.5304	0.9208
G	29810	0.7895	0.0544	0.6101	0.8968
Return	29810	0.0976	0.4566	-0.5613	2.0458
Zscore	29810	4.9668	5.6174	-0.0035	36.2005
Age	29810	3.0468	0.2818	2.1972	3.6376
Size	29810	22.3920	1.2425	20.1062	26.2772
Growth	29810	0.1245	0.3332	-0.5290	1.9067
Fixed	29810	0.2144	0.1522	0.0033	0.6743
TAT	29810	0.6325	0.4198	0.0851	2.6291
PB	29810	3.3093	2.8466	0.5424	18.5801
Board	29810	2.1046	0.1965	1.6094	2.6391

Table 3 presents the Pearson correlation matrix for the main variables. ESG is significantly negatively correlated with stock returns, suggesting a negative association between the two variables before controlling for other firm characteristics and fixed effects. Meanwhile, ESG is significantly positively correlated with financial distress, suggesting that firms with stronger ESG performance tend to exhibit greater financial stability. In addition, the variance inflation

factor (VIF) test shows that the mean VIF is 1.11, indicating that multicollinearity is unlikely to be a serious concern.

Table 3
Pearson correlation

	ESG	Return	Zscore	Age	Size	Growth	Fixed	TAT	PB	Board
ESG	1									
Return	-0.031***	1								
Zscore	0.068***	0.205***	1							
Age	-0.037***	-0.076***	-0.101***	1						
Size	0.169***	-0.032***	-0.344***	0.150***	1					
Growth	-0.021***	0.155***	0.031***	-0.108***	0.033***	1				
Fixed	-0.084***	0.011*	-0.160***	0.042***	0.148***	-0.040***	1			
TAT	0.024***	0.063***	-0.047***	0.032***	0.122***	0.181***	-0.043***	1		
PB	-0.101***	0.364***	0.406***	-0.117***	-0.339***	0.124***	-0.123***	0.020***	1	
Board	-0.017***	0.010*	-0.108***	0.088***	0.269***	0.001	0.127***	0.017***	-0.086***	1

Notes: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$; Standard errors are reported in parentheses

Baseline Regression

This section reports the effects of ESG performance and its three pillars on firm stock returns. The Hausman test yields a p-value of 0.000, indicating rejection of the null hypothesis at the 1% significance level and supporting the use of a two-way fixed effects model. Table 4 reports the baseline regression results. Column (1) shows that the coefficient on ESG is 0.0806 ($p < 0.01$), suggesting that stronger ESG performance is associated with higher stock returns. This result indicates that the capital market positively prices ESG performance and thus supports Hypothesis H1. The finding is consistent with stakeholder theory and information asymmetry theory. Stronger ESG performance may improve stakeholder relationships and reduce information asymmetry, thereby strengthening investor expectations and supporting higher stock returns. This result is also consistent with Yin et al. (2023), who report a significant positive effect of ESG performance on stock returns for Chinese listed firms.

Table 4
Baseline regression results

	(1) Return	(2) Return	(3) Return	(4) Return
ESG	0.0806***			
	(0.0267)			
E		-0.0155		
		(0.0323)		
S			-0.0792**	
			(0.0324)	
G				0.2349***
				(0.0409)
Age	0.0120	0.0099	0.0088	0.0133
	(0.0082)	(0.0082)	(0.0082)	(0.0082)
Size	0.0295***	0.0312***	0.0320***	0.0303***
	(0.0019)	(0.0020)	(0.0019)	(0.0019)
Growth	0.1726***	0.1721***	0.1723***	0.1722***
	(0.0085)	(0.0085)	(0.0085)	(0.0085)
Fixed	0.0396**	0.0388**	0.0378**	0.0444***
	(0.0158)	(0.0158)	(0.0158)	(0.0157)
TAT	0.0152**	0.0159**	0.0164***	0.0155**
	(0.0062)	(0.0062)	(0.0062)	(0.0061)
PB	0.0515***	0.0513***	0.0513***	0.0518***
	(0.0019)	(0.0020)	(0.0020)	(0.0019)
Board	0.0018	0.0015	0.0022	0.0047
	(0.0103)	(0.0103)	(0.0103)	(0.0102)
Cons	-0.8693***	-0.8341***	-0.7993***	-1.0284***
	(0.0483)	(0.0482)	(0.0500)	(0.0564)
N	29808	29808	29808	29808
R^2	0.3995	0.3994	0.3995	0.4001
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes

Notes: *p < 0.10, **p < 0.05, ***p < 0.01; Standard errors are reported in parentheses

After decomposing ESG performance into its three pillars, Columns (2) and (3) show that the coefficient on the environmental pillar is -0.0155 and statistically insignificant, whereas the coefficient on the social pillar is -0.0792 ($p < 0.05$). These results indicate that Hypothesis H2 is not supported for the environmental and social pillars. One possible explanation is that environmental management and social responsibility investment tend to generate higher costs in the short run, whereas their benefits in terms of regulatory compliance and operational stability may take longer to materialize. As a result, the market may be more inclined to view environmental and social expenditures as cost burdens that reduce short-term profitability, thereby exerting downward pressure on stock returns. This finding is consistent with Chen et al. (2017), who show that CSR activities increase costs for low-value firms and thus negatively affect stock returns.

Column (4) shows that the coefficient on the governance pillar is 0.2349 ($p < 0.01$), indicating a significant positive association between governance performance and stock returns. Among the three pillars, governance exhibits the strongest positive effect, providing partial support for Hypothesis H2. This result is consistent with agency theory, which suggests that stronger

governance reduces managerial opportunism, improves decision quality and transparency, and enhances investor confidence in future cash flows. Compared with the environmental and social pillars, governance improvements are also more likely to translate quickly into better internal controls and operating efficiency, making them easier for capital markets to recognize and price. This finding is also consistent with Wang et al. (2024), who show that disagreement in the governance dimension has a more pronounced effect on stock returns, highlighting the importance of governance-related information in investor decision-making. In addition, the baseline model also includes a range of firm-level controls, and the estimated coefficient signs are broadly in line with theoretical expectations.

Mechanism Analysis

Table 5 reports the results of the mediation analysis, where financial distress is proxied by Z-score. Columns (1) and (2) show that ESG is positively associated with financial distress, with a coefficient of 9.1733 ($p < 0.05$), indicating that stronger ESG performance is linked to better financial health and lower financial distress risk. The coefficient on financial distress is 0.0078 and significant at the 1% level, suggesting that stronger financial stability is associated with higher stock returns. After including financial distress in the return regression, the coefficient on ESG declines to 0.0089 and becomes statistically insignificant. This indicates that the effect of ESG performance on stock returns is fully mediated through the financial distress channel, thereby supporting Hypothesis H3. The Sobel test ($z = 14.76$, $p < 0.001$) and Bootstrap test ($z = 11.39$, $p < 0.001$) further confirm the significance of the mediating effect. Mechanistically, stronger ESG performance may improve information transparency, strengthen stakeholder relationships, and enhance firms' access to financing, while also reducing financial distress risk through better risk management and operational stability. Lower financial distress risk, in turn, can strengthen investor confidence in firms' future cash flows, thereby supporting higher stock returns. This result is consistent with Habib (2023), who show that stronger ESG performance helps reduce financial distress risk.

Table 5
Mediation analysis of financial distress

	(1) Zscore	(2) Return	(3) Zscore	(4) Return	(5) Zscore	(6) Return	(7) Zscore	(8) Return
ESG	9.1733***	0.0089						
	(0.7467)	(0.0264)						
E			1.6205**	-0.0282				
			(0.7922)	(0.0322)				
S					0.7112	-0.0848**		
					(0.7428)	(0.0324)		
G							23.7718**	0.0521
							(1.0231)	(0.0401)
Zscore		0.0078**		0.0078**		0.0078**		0.0077**
		(0.0007)		(0.0007)		(0.0007)		(0.0007)
Age	-0.1101	0.0129	-0.3367	0.0126	-0.3292	0.0114	-0.0065	0.0133
	(0.2347)	(0.0083)	(0.2382)	(0.0083)	(0.2389)	(0.0083)	(0.2233)	(0.0083)

Size	-1.1386***	0.0384**	-1.0105***	0.0391**	-0.9917***	0.0398**	-1.0445***	0.0383**
	(0.0656)	(0.0021)	(0.0670)	(0.0021)	(0.0653)	(0.0021)	(0.0618)	(0.0021)
Growth	0.0538	0.1722**	0.0243	0.1719**	0.0120	0.1722**	0.0120	0.1722**
	(0.1101)	(0.0084)	(0.1110)	(0.0084)	(0.1110)	(0.0084)	(0.1064)	(0.0084)
Fixed	-5.0548***	0.0792**	-5.1878***	0.0794**	-5.1650***	0.0783**	-4.5855***	0.0797**
	(0.4863)	(0.0156)	(0.4945)	(0.0156)	(0.4958)	(0.0156)	(0.4630)	(0.0156)
TAT	-0.5489***	0.0195**	-0.4783***	0.0197**	-0.4773***	0.0201**	-0.5081***	0.0194**
	(0.1751)	(0.0062)	(0.1754)	(0.0062)	(0.1752)	(0.0062)	(0.1700)	(0.0062)
PB	0.5719***	0.0470**	0.5525***	0.0470**	0.5534***	0.0470**	0.5999***	0.0472**
	(0.0406)	(0.0019)	(0.0415)	(0.0019)	(0.0416)	(0.0019)	(0.0384)	(0.0019)
Board	-0.3708	0.0047	-0.4185	0.0048	-0.4165	0.0054	-0.0832	0.0053
	(0.3059)	(0.0103)	(0.3122)	(0.0103)	(0.3118)	(0.0103)	(0.2861)	(0.0103)
Cons	24.8037**	-1.0632***	28.0848**	-1.0544***	28.0900**	-1.0196***	9.1022***	-1.0984***
	(1.6204)	(0.0526)	(1.6192)	(0.0525)	(1.7079)	(0.0542)	(1.6826)	(0.0595)
N	29808	29808	29808	29808	29808	29808	29808	29808
R^2	0.2863	0.4061	0.2712	0.4062	0.2710	0.4063	0.3195	0.4062
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *p < 0.10, **p < 0.05, ***p < 0.01; Standard errors are reported in parentheses

Furthermore, this study examines the heterogeneous mediation effects across ESG pillars. Column (3) shows that the environmental pillar is positively associated with financial distress, with a coefficient of 1.6205 ($p < 0.05$), suggesting that stronger environmental performance is linked to better financial stability. However, because the direct effect of the environmental pillar on stock returns is not statistically significant in the baseline regression, mediation through the financial distress channel is not supported for the environmental pillar. One possible explanation is that environmental investment may reduce compliance risk and environmental incident risk while improving financial stability, but its economic benefits often materialize slowly and may not yet be fully recognized by the market (Horváthová, 2010). Second, Columns (5) and (6) report the mediation results for the social pillar. Although the coefficient on the social pillar in the financial distress regression is 0.7112, it is not statistically significant. This indicates that the financial distress channel does not mediate the relationship between the social pillar and stock returns, and Hypothesis H4 is therefore not supported for the social pillar. A plausible explanation is that social responsibility investment may enhance reputation and operational stability over the long term, but tends to function as a short-term cost burden without significantly reducing financial distress (Chen et al., 2017).

Third, Columns (7) and (8) examine the mediating effect of the governance pillar. The governance pillar is positively associated with financial distress, with a coefficient of 23.7718 ($p < 0.01$), indicating that stronger governance is linked to lower financial distress risk. The

coefficient on financial distress is 0.0077 ($p < 0.01$), suggesting that stronger financial stability is associated with higher stock returns. After including financial distress, the coefficient on governance performance declines to 0.0521 and becomes statistically insignificant, indicating full mediation through the financial distress channel. This result supports Hypothesis H4 for the governance pillar. The Sobel test ($z = 15.58$, $p < 0.001$) and Bootstrap test ($z = 12.05$, $p < 0.001$) further confirm the significance of the mediating effect. Mechanistically, strong corporate governance can reduce agency conflicts, improve resource allocation efficiency and decision quality, and strengthen firms' cash flows and financial stability. Lower financial distress risk, in turn, enhances market confidence in firms' future operating prospects and supports higher stock returns. This finding is consistent with Gao et al. (2025), who show that ESG engagement reduces bankruptcy risk through multiple channels, with the governance pillar playing the most prominent role.

Robustness Checks

To assess the reliability of the baseline results, this study conducts a series of robustness checks. Table 6 reports the robustness check results. First, Column (1) uses stock price as an alternative measure of stock returns. The coefficient on ESG remains significantly positive, indicating that the baseline finding is not sensitive to the specific choice of stock returns measure. Second, Column (2) excludes observations for 2020 and 2021, the years most affected by the COVID-19 pandemic, to remove the potential influence of this external shock on firm performance and investor sentiment. The coefficient on ESG remains significantly positive, suggesting that the baseline result is robust to pandemic-related market fluctuations. Third, Column (3) adds two governance-related controls, managerial ownership (Mngmhld) and institutional investor ownership (InsInvestor), to mitigate potential omitted variable bias. The ESG coefficient remains significantly positive after the inclusion of these controls, indicating that the main finding is robust to additional governance-related factors. Overall, both the sign and significance of the ESG coefficient remain consistent across all robustness checks. These results provide strong support for the robustness of the positive relationship between ESG performance and stock returns.

Table 6
Robustness check results

	(1) Sprice	(2) Return	(3) Return
ESG	1.8931***	0.1223***	0.0724***
	(0.0888)	(0.0334)	(0.0267)
Age	-0.4275***	-0.0976***	0.0149*
	(0.0343)	(0.0102)	(0.0081)
Size	0.0322***	0.0206***	0.0286***
	(0.0097)	(0.0026)	(0.0021)
Growth	0.3505***	0.0777***	0.1716***
	(0.0155)	(0.0102)	(0.0085)
Fixed	-0.5451***	0.1056***	0.0400**
	(0.0649)	(0.0210)	(0.0157)
TAT	0.0363	0.0368***	0.0146**
	(0.0239)	(0.0081)	(0.0062)
PB	0.1050***	0.0601***	0.0513***
	(0.0048)	(0.0024)	(0.0020)

Board	-0.0471	0.0485***	0.0010
	(0.0422)	(0.0132)	(0.0103)
Mngmhld			0.0250
			(0.0153)
InsInvestor			0.0246**
			(0.0121)
Cons	1.5836***	-0.5384***	-0.8620***
	(0.2275)	(0.0686)	(0.0517)
N	29808	23996	29808
R^2	0.3983	0.1492	0.3996
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes

Notes: *p < 0.10, **p < 0.05, ***p < 0.01; Standard errors are reported in parentheses

To further address potential endogeneity concerns, this study conducts several endogeneity tests. Table 7 reports the endogeneity test results. First, Column (1) uses the one-period-lagged ESG indicator as the key explanatory variable to mitigate potential reverse causality. Because firms with better market performance may have greater capacity to invest in ESG practices, the use of lagged ESG helps address this concern. The coefficient on L.ESG remains significantly positive, suggesting that the baseline findings are unlikely to be driven primarily by reverse causality. Second, Column (2) employs the Heckman two-stage model to correct for potential sample selection bias. In the first stage, the model estimates the probability that an observation enters the sample and calculates the inverse Mills ratio (IMR). In the second stage, the IMR is included in the return regression to control for the influence of sample selection. The IMR coefficient is significantly positive, indicating the relevance of correcting for selection bias. After this correction, the ESG coefficient remains significantly positive, suggesting that the baseline result is not driven by sample selection bias. Third, Column (3) applies the GMM estimator to a dynamic panel specification to further address omitted variable bias and dynamic persistence. The coefficient on ESG remains positive, indicating that the main finding continues to hold after accounting for the dynamic structure of the model. Moreover, the AR(2), Sargan, and Hansen test support the validity of the model specification and the instrumental variables. Overall, the effect of ESG on stock returns remains positive and robust across all endogeneity tests, consistent with the baseline regression results.

Table 7
Endogeneity test results

	(1) Return	(2) Return	(3) Return
L.ESG	0.1163***		
	(0.0290)		
L.Return			0.0883*
			(0.0479)
ESG		0.0913***	1.1861**
		(0.0273)	(0.4804)
Age	0.0036	0.0004	0.0218
	(0.0094)	(0.0090)	(0.0186)
Size	0.0264***	0.0367***	0.0300***
	(0.0021)	(0.0031)	(0.0083)

Growth	0.1867***	0.1707***	0.1197***
	(0.0100)	(0.0066)	(0.0160)
Fixed	0.0188	0.0349**	0.2029***
	(0.0176)	(0.0174)	(0.0375)
TAT	0.0148**	0.0192***	0.0175
	(0.0067)	(0.0060)	(0.0111)
PB	0.0523***	0.0506***	0.0896***
	(0.0022)	(0.0009)	(0.0052)
Board	0.0171	-0.0022	0.0232
	(0.0111)	(0.0113)	(0.0234)
IMR		0.0604***	
		(0.0194)	
Cons	-0.8402***	-0.7907***	-1.8960***
	(0.0531)	(0.0869)	(0.2415)
N	24793	29760	24796
R^2	0.3942	0.3996	
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes

Notes: *p < 0.10, **p < 0.05, ***p < 0.01; Standard errors are reported in parentheses

Conclusion and Implications

This study systematically investigates the effects of ESG performance and its pillars on corporate stock returns using a sample of Chinese listed firms, while also examining the mediating role of financial distress. The baseline results show that overall ESG performance has a significant positive effect on stock returns, suggesting that the capital market positively prices stronger ESG performance. After decomposing ESG into its environmental, social, and governance pillars, the results reveal clear heterogeneity across dimensions. Specifically, the environmental pillar has no significant effect on stock returns, the social pillar has a significant negative effect, and the governance pillar has a significant positive effect. These findings suggest that the capital market is more likely to recognize and positively price improvements in governance. The mediation analysis further shows that the financial distress channel significantly mediates the relationship between overall ESG performance and stock returns, indicating that the positive ESG effect is largely transmitted through improvements in firms' financial stability. At the pillar level, full mediation is found for the governance pillar, suggesting that governance improvement not only directly strengthens market confidence but also enhances stock returns indirectly by alleviating financial distress.

Based on the above findings, several policy implications are proposed. First, at the firm-level, ESG should be treated as an important component of firm strategy for enhancing stock market performance and strengthening financial stability. In implementing ESG practices, firms should focus more on substantive improvements in the governance pillar, such as stronger board oversight, more transparent disclosure, and more effective risk management systems. Rather than pursuing ESG scores alone, firms should pay greater attention to how ESG can be translated into a substantive ability to reduce financial distress risk and improve stock returns. Second, at the government level, continued efforts are needed to improve the ESG institutional framework and disclosure regulation. Because the capital market does not respond equally to all ESG pillars, policy support should be directed toward the environmental and social dimensions, whose market effects remain relatively limited. By strengthening institutional incentives and policy guidance, the government can help ease the short-term

cost pressures associated with environmental and social investment and promote more balanced development across ESG pillars. Third, financial institutions should incorporate ESG information more systematically into risk assessment and resource allocation decisions. ESG not only reflects firms' sustainability capacity but also provides valuable information on financial stability and risk resilience. Greater use of ESG indicators in credit screening and risk management can improve capital allocation efficiency, while market-based incentives can further encourage firms to strengthen their ESG performance.

Research Limitations and Future Research Directions

This study has two main limitations. First, it does not directly examine the effects of specific ESG policies or institutional changes. Future research could incorporate policy shocks to explore how different regulatory arrangements shape the economic consequences of ESG. Second, this study focuses exclusively on Chinese listed firms, and its conclusions may be specific to China's institutional and market environment. Future studies could extend the analysis to a cross-country setting and examine whether the effect of ESG performance on stock returns varies across different institutional contexts and market environments.

Conflict of Interest

All authors declare that they have no conflicts of interest.

Data availability

The data are available from the corresponding author upon reasonable request.

Ethical approval

This article does not contain any studies with human subjects or animals performed by any of the authors.

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