Press the Gourd Dipper Float: ESG Performance Shortfalls and Earnings Manipulation

Rongwei Zhang, Shanyong Wang*

School of Management, University of Science and Technology of China, Hefei, Anhui Province, 230026, P.R. China

* **Corresponding Author:** Shanyong Wang

Tel.: +86-551-18756074842

E-mail address: wsy1988@ustc.edu.cn

Postal address: School of Management, University of Science and Technology of China, No. 96, Jinzhai Road, Hefei, Anhui Province, 230026, P.R. China.

Funding

This work was supported by the National Natural Science Foundation of China (Grant number 71974177 and 72374187).

Declarations of interest: none

Press the Gourd Dipper Float: ESG Performance Shortfalls and Earnings Manipulation

Abstract: Corporate environmental, social and governance (ESG) performance is a core key criterion for investors and other stakeholders to evaluate the level and capability of corporate sustainability. Corporate with ESG performance shortfalls may be exposed to pressures from capital markets and social concerns, which in turn may lead to misconduct behavior in dealing with these pressures. Leveraging data from Chinese A-share companies listed in Shanghai and Shenzhen from 2011 to 2021, our study pioneers an examination of how ESG performance shortfalls influence corporate earnings manipulation behavior. Our findings reveal that both ESG social and historical performance shortfalls amplify corporate manipulation of accrued profits. Mechanism analysis unveils that ESG performance shortfalls escalate the incentives for corporate earnings manipulation by diminishing institutional investor ownership, heightening the risk of stock price crashes, and escalating corporate finance costs. Meanwhile, ESG social and historical performance shortfalls also exerts adverse economic consequences on corporate productivity and scale. Furthermore, cross-sectional analyses indicate that fortifying internal control management, enhancing information disclosure, bolstering media attention, and fostering environmental justice initiatives by the government can effectively mitigate the corporate earnings manipulation behavior triggered by ESG performance shortfalls. This research offers a fresh lens for comprehending corporate ESG performance shortfalls and provides practical guidance for crafting pertinent policies for governments and firms.

Keywords: ESG; ESG Performance shortfalls; Earnings manipulation; Productivity and scale

1. Introduction

The intensifying global climate change and escalating environmental pollution concerns have sparked a growing interest in sustainable development (Trahan & Jantz, 2023). Consequently, there has been a heightened focus on the environmental, social, and governance (ESG) performance of companies in their operational endeavors (He et al., 2022). ESG has emerged as a pivotal topic of discussion among policymakers, institutional investors, and businesses alike (Bofinger et al., 2022), which reflecting the current era's heightened emphasis on sustainability. This heightened focus on ESG has spurred extensive research and reached a pinnacle (Edmans, 2023). Notably, a firm's ESG performance is not only associated with its non-financial aspects such as innovation, branding, and reputation (Jin et al., 2024), but also intricately connected to its financial performance (Nirino et al., 2021).

Despite the ongoing emphasis and urging from investors and regulators for companies to elevate their ESG standards, it is evident that not all companies are meeting these expectations (Barko et al., 2022). Contrary to the desired trend, some firms have experienced a decline in ESG performance rather than improvement, demonstrating notable underperformance in ESG metrics compared with both industry peers and historical benchmarks. Firms that fail to adequately fulfil their ESG responsibilities, referred to in this paper as "ESG performance shortfalls", may face pressures from capital markets and societal concerns (Krüger, 2015; Lioui & Tarelli, 2022). However, these pressures might not necessarily incentivize substantial improvements but could instead lead to financial misconduct behavior aimed at preserving superficial business outcomes (Kałdoński et al., 2020). Of particular to us interest is whether such ESG underperformance correlates with opportunistic financial practices, such as earnings manipulation.

Earnings manipulation involves intentionally altering accounting data to mislead stakeholders about a firm's financial position (Dutta & Gigler, 2002). Considered a form of financial misconduct, earnings management, while often perceived as commonplace, can significantly impact investor decision-making and potentially harm the overall health of the financial market (Bertomeu et al., 2021; Schulz & Wiersema,

2018). Considering the close association between ESG performance and corporate ethics and responsibility, it's reasonable to hypothesize that companies with subpar ESG performance might be more inclined to engage in earnings manipulation (Halbritter & Dorfleitner, 2015). Such poor ESG performance could indicate underlying issues in corporate culture or governance, which might contribute to a heightened likelihood of earnings manipulation. While prior research has delved into the correlation between ESG performance and financial performance, scant attention has been paid to the potential earnings manipulation stemming from inadequate ESG performance (Lee & Raschke, 2023). As the relevance of ESG issues in strategy formulation continues to grow, addressing these concerns has become paramount for investors, shareholders, and governments (Galbreath, 2013). This gap in the literature is particularly significant in a time when corporate transparency and accountability are under intense scrutiny from global investors. Therefore, this study seeks to contribute to literature by empirically examining whether and how ESG performance shortfalls impacts firms' earnings manipulation behavior and the ensuing economic ramifications.

Specifically, our research will address the following key questions: first, and most importantly, how is ESG performance shortfalls delineated and quantified? We introduce an innovative approach by drawing parallels with financial underperformance. ESG social performance shortfall is defined by comparing firms' ESG metrics with the industry average, while ESG historical performance shortfall is gauged by contrasting firms' current ESG performance with that of previous periods. Second, does ESG performance shortfalls incentivize firms to engage in earnings manipulation? Utilizing an annual observational dataset of Chinese firms spanning from 2011 to 2021, we find compelling evidence that ESG underperformance significantly heightens firms' propensity for earnings manipulation. Specifically, ESG historical underperformance explains for approximately 2.21% of the variance in earnings manipulation, while ESG social underperformance explains 4.43%. These findings remain robust across alternative measures and withstand a battery of robustness tests designed to address endogeneity concerns. Third, what are the potential transmission channels involved? We examine this aspect from the perspectives of institutional investors, capital markets,

and other stakeholders. Consistent with prior research, our analysis reveals that ESG underperformance amplifies earnings manipulation by diminishing investors' shareholdings, elevating the cost of corporate finance, and heightening the risk of stock market crashes. Fourth, does ESG performance shortfalls exert negative economic consequences on corporate productivity and scale? Our findings indicate that ESG performance shortfalls significantly diminishes firms' revenue scale and total factor productivity (TFP). The detrimental effects on economic outcomes underscore the critical importance of addressing the profound issue of inadequate ESG performance. Finally, to mitigate the adverse consequences of inadequate ESG performance, we advocate for a multifaceted governance strategy. Governments should bolster the enforcement of environmental regulations and enhance regulatory efficacy. Society ought to prioritize the ESG performance of enterprises and foster responsible corporate conduct through public pressure. Simultaneously, enterprises themselves should reinforce internal controls and transparency while collaborating with multiple stakeholders to achieve sustainable development.

The potential marginal contributions of this paper are manifold. First, our innovative conceptualization and quantification of ESG performance shortfalls, delineating between social and historical dimensions, offer a fresh lens for comprehending corporate ESG performance. This framework not only enriches the discourse on ESG research but also broadens the theoretical horizons of the field, laying a robust foundation for subsequent academic deliberations and empirical investigations. Second, we delve into the plausible economic ramifications stemming from ESG performance shortfalls, shedding light on its effects on firms and their stakeholders. By uncovering the potential transmission channels, we not only substantiate our core findings but also facilitate a holistic comprehension of the repercussions of subpar ESG performance on firms, industries, and even the broader capital market. Finally, by scrutinizing our tripartite approach encompassing government, firms, and society to alleviate the adverse effects of ESG performance shortfalls, we offer fresh strategic insights and empirical evidence through cross-sectional tests. These empirical findings not only corroborate our theoretical predictions but also offer practical guidance for

crafting pertinent policies and implementing corresponding measures by firms.

The rest of the paper is structured as follows. Section 2 reviews pertinent literature and outlines the research hypotheses. Section 3 delineates the research methodology, focusing on variable selection and model specifications. Section 4 presents the empirical findings. Finally, the last section offers conclusions and recommendations. Figure 1 depicts the logical framework diagram of the paper.

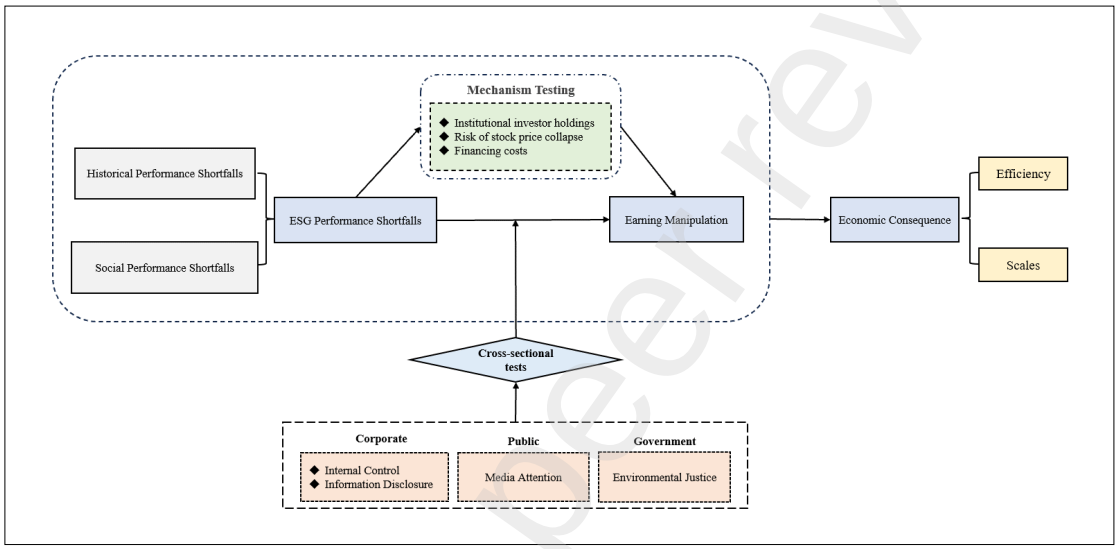

Figure 1 The theoretical framework

2. Literature review and hypothesis development

2.1. ESG performance and earnings manipulation.

Although the concept of ESG initially stemmed from the notion of social responsibility (Garcia et al., 2017), it has evolved beyond mere corporate ethics and compliance, significantly influencing firms' economic outcomes. Existing literature indicates that superior ESG performance positively impacts various aspects of firms' financial performance. For instance, superior ESG performance is associated with enhanced profitability (Taddeo et al., 2024), improved liquidity (He et al., 2023), and reduced cost of equity (Ng & Rezaee, 2015). Moreover, it is believed that superior ESG performance correlates positively with ethical behavior and transparency, potentially lowering the occurrence of misconduct (Bao et al., 2024; Zubeltzu-Jaka et al., 2018).

Executive involvement in ESG matters may also obscure corporate misbehavior (Kim et al., 2012), whereas high-quality ESG engagement can mitigate managerial misconduct by fostering managerial self-regulation (He et al., 2022).

Conversely, firms that mismanage their ESG, such as those with low ESG scores, are more likely to encounter economic losses, reputational risks, and diminishing investor confidence (Apergis et al., 2022; Lee et al., 2021; Shanaev & Ghimire, 2022). Therefore, we hypothesize that some firms may resort to earnings manipulation to conceal their ESG performance deficiencies and evade adverse repercussions. Moreover, given the high asymmetry of ESG information, firms may exploit this disparity to engage in earnings manipulation for short-term competitive advantage (Cui et al., 2018). Thus, we argue that fortifying ESG practices can aid firms in establishing more resilient risk management and internal control mechanisms, consequently reducing the likelihood of earnings manipulation. Improved ESG performance may serve as a pathway to bolster corporate transparency and integrity.

It's noteworthy that research has shown how certain firms might employ apparent ESG commitments to camouflage their misconduct or engage in 'greenwashing' to deceive the public and investors (Leung & Snell, 2021; Yusoff et al., 2023). In such instances, ESG engagement doesn't genuinely reflect the firm's sustainability endeavors but serves as a guide to mask managerial misconduct (Hemingway & Maclagan, 2004).

In summary, existing research primarily focuses on the advantages of strong ESG performance, neglecting the exploration of ESG underperformance. There is insufficient attention given to quantifying ESG underperformance and providing empirical evidence. Furthermore, detailed investigation into how this underperformance impacts a firm's viability as a going concern is lacking. Based on these insights, we propose the following hypotheses:

H1: ESG performance shortfall is positively associated with corporate earnings manipulation.

2.2. Analysis of potential channel

2.2.1. Institutional investor holdings

The maturation of the market and the increasing significance of corporate governance have led to a higher proportion of institutional shareholdings (Borochin & Yang, 2017). As the concept of sustainable development gains acceptance, institutional investors are increasingly focusing on ESG factors, integrating them into their core investment decisions. Research shows that institutional investors strongly prefer firms with high environmental performance and good governance (Dyck et al., 2019; Ferreira & Matos, 2008; Kim et al., 2019). Further studies indicate that institutional investors, particularly those with long-term strategies, prefer firms with strong corporate social responsibility (CSR) performance (Chen T. et al., 2020; Cox et al., 2004).

When firms' ESG performance falls short of industry standards or lags behind their peers, institutional investors may become concerned and adopt an underweight stance on stocks with poor environmental or social metrics (Nofsinger et al., 2019). They may even sell their shares if dissatisfied with management's performance (Parrino et al., 2003). Consequently, inadequate ESG performance can lead institutional investors to reduce their investments in these firms.

Although institutional investors are typically considered stable shareholders, their divestment can lead to declining liquidity and weakened market confidence (Attig et al., 2012; Meier, 2018). Under such pressure, management may resort to earnings manipulation to embellish financial statements to meet market expectations or achieve short-term performance targets. In addition, the exit of institutional investors may weaken the effectiveness of corporate governance, as institutional investors often play a key role in monitoring and promoting the implementation of good governance practices by firms (Ward et al., 2018). Thus, inadequate ESG performance may lead to regulatory laxity (Fich et al., 2015), especially among short-term institutional investors (Koh, 2007), thus creating opportunities for earnings manipulation. We therefore propose the following hypothesis:

H2: ESG performance shortfall reduces institutional investor shareholding, thereby increasing the level of corporate earnings manipulation.

2.2.2. Risk of share price collapse

Stock price crashes are usually triggered by the accumulation and sudden release of negative information (Jin & Myers, 2006; Luo et al., 2023). Uncertainty in the market increases when a large amount of negative non-public information is accumulated within the firm, such as poor financial performance or management problems, and management fails to disclose this information in a timely and transparent manner (Al Mamun et al., 2020; Andreou et al., 2021). Once a tipping point is reached, the accumulated negative information may be suddenly revealed, leading to a rapid loss of market confidence and triggering sharp fluctuations or even a crash in stock prices. When firms fail to meet societal standards for environmental protection, social responsibility, or corporate governance, it may lead to a loss of investor confidence, which in turn triggers a sharp drop in share prices and even creates the risk of a crash. Numerous studies have confirmed that companies with good ESG performance have a lower risk of stock price crashes (Kim et al., 2014; Yu et al., 2023), whereas stocks with low ESG scores may face a more severe risk of crashes (Broadstock et al., 2021; Jia, 2018).

Similarly, as analyzed above, the risk of a stock crash may prompt management to resort to earnings manipulation by improperly embellishing financial statements to mislead investors, hide actual operational problems, or overemphasize the financial health of the firm in an attempt to stabilize or artificially raise the share price. Moreover, the link between stock crashes and earnings manipulation can create a vicious cycle (DuCharme et al., 2004). When the market doubts a firm's financial integrity, its share price may drop further, tempting management to engage in more earnings manipulation to salvage market performance (Xu et al., 2014). This not only harms the firm's reputation and shareholder value but also threatens the stability of the financial market as a whole (Hutton et al., 2009).

Based on the above analyses, we propose the following hypothesis:

H3: ESG performance shortfall raises the risk of share price collapse, thereby increasing the level of corporate earnings manipulation.

2.2.3. Financing costs

The strong link between ESG performance and credit risk has received academic attention (Gigante & Manglaviti, 2022). Research has demonstrated that disclosing positive ESG information is negatively associated with the cost of debt (Raimo et al., 2021). Similarly, companies that score lower on social responsibility tend to pay higher interest rates on bank loans, and this gap is significant compared with the most socially responsible companies (Chari et al., 2019). Better ESG performance corresponds to lower default risk (Atif & Ali, 2021). Investors demand higher returns in order to compensate for the risks associated with poor ESG performance. When firms' ESG performance is substandard, investors and lending institutions may perceive these firms as riskier borrowing entities (Apergis et al., 2022). This increased risk perception typically leads to creditors demanding higher interest rates or, in the case of equity markets, investors seeking higher rates of return to compensate for the potential risk (Goss & Roberts, 2011)

As the cost of financing rises, the profit margins of business pairs are compressed, which undoubtedly puts pressure on the financial health of firms. In an effort to meet or exceed market expectations of profitability while maintaining consistency in financial performance, corporate management may resort to earnings manipulation strategies (Atif & Ali, 2021). While such behaviors may alleviate the pressure due to increased financing costs in the short term, such earnings manipulation may, in the long term, weaken their internal control mechanisms and increase the risk of future financial instability (Atif & Ali, 2021; Jiang et al., 2024).

Hence, in light of the above analyses, we propose the following hypothesis:

H4: ESG performance shortfall will raise the cost of corporate finance and thus enhance the level of corporate earnings manipulation.

3. Material and methods

3.1. Data source

We use Chinese A-share listed companies in Shanghai and Shenzhen from 2011 to 2021 as our research sample. The sample is screened based on the following criteria:

(1) exclusion of financial listed companies; (2) exclusion of ST, *ST, and PT listed companies; (3) exclusion of companies with missing core variables. ESG performance scores are sourced from the Huazheng database (https://www.chindices.com/esg-ratings.html). Data of firm-level variables are gathered from the CSMAR and Wind databases, and data of regional-level variables are sourced from the China Urban Statistical Yearbook and official websites.

3.2. Variable selection

3.2.1. Dependent variable

Most studies on earnings management measurement use manipulable profit as a proxy variable (Nekhili et al., 2022). Following Dechow and Dichev (2002), we employed the Modified Jones model for the calculation, using the following formula:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1\left[\frac{1}{A_{i,t-1}}\right] + \alpha_2\left[\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}}\right] + \alpha_3\left[\frac{PPE_{i,t}}{A_{i,t-1}}\right] + \epsilon_{i,t} \qquad (1)$$

where $A_{i,t-1}$ represents the period-lagged total assets, $\Delta REV_{i,t}$ denotes the incremental operating revenue,$\Delta REC_{i,t}$is the change in accounts receivable, and $PPE_{i,t}$ signifies fixed assets. The residual from this equation is the discretionary accruals (*DA*). The total accruals (TA_t) as referred to in Jones (1991) are calculated as follows:

$$TA_t = \Delta Current\ Asset_t - \Delta Cash_t - \Delta Current\ Liabilities_t - Depreciation\ Expense_t \qquad (2)$$

For robustness tests, we also used the non-linear Jones model as a proxy variable (*DA2*). Referring to Ball and Shivakumar (2006), we calculated it using the following equation:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1\left[\frac{1}{A_{i,t-1}}\right] + \alpha_2\left[\frac{PPE_{i,t}}{A_{i,t-1}}\right] + \alpha_3\left[\frac{DVAR_{i,t}}{A_{i,t-1}}\right] + \alpha_4\left[\frac{DVAR_{i,t} * CFO_{i,t}}{A_{i,t-1}}\right] + \epsilon_{i,t} \qquad (3)$$

Where, $CFO_{i,t}$ represents the net operating cash flow of firm i in year t, and the dummy variable $DVAR_{i,t}$, which is equal to 1 when $CFO_{i,t}$ is less than zero, and vice versa.

Similar to the above, in the formula, the residual $\epsilon_{i,t}$, representing the level of earnings manipulation, is taken as an absolute value. A larger residual indicates a greater extent of earnings management.

3.2.2. Independent variable

The measurement of ESG performance deficiencies is underexplored in the existing literature. However, we can adapt methods from studies assessing financial underperformance to measure ESG performance shortfalls. We classify these underperformance into historical performance shortfall (*ESG_H*) and social performance shortfall (*ESG_S*) based on the existing literature (Cao et al., 2024; Kuusela et al., 2017; Ren et al., 2024).

To measure ESG historical performance shortfall, we compare the firm's current year's ESG performance with the average ESG performance of the past three years. A downward trend is marked as 1, indicating historical underperformance; no downward trend is marked as 0, indicating no historical underperformance. The formula is as follows:

$$ESG\_Historical\ Performance\ Shortfall_{i,t} = ESG_{i,t} - (ESG_{i,t-1} + ESG_{i,t-2} + ESG_{i,t-3})/3 \quad (4)$$

If ESG score $<$ historical aspiration,

$$ESG\_Historical\ Performance\ Shortfall_{i,t} = 1 \quad (5)$$

If ESG score $\geq$ historical aspiration,

$$ESG\_Historical\ Performance\ Shortfall_{i,t} = 0 \quad (6)$$

As for the assessment of ESG social performance deficits, we compare the firm's ESG score for the year with the average ESG performance of the industry in which it operates in that year. If a firm's score is lower than the industry average, it is marked as 1, pointing out that there is a social performance deficit; if it is higher than the industry average, it is marked as 0, implying that there is no social performance deficit. The specific measurement formula is as follows:

$$ESG\_\text{Social}\ Performance\ Shortfall_{i,t} = ESG_{\text{i, t}} - Industry\ average\ ESG_{i,t} \quad (7)$$

If ESG score $<$ social aspiration,

$$ESG\_Social\ Performance\ Shortfall_{i,t} = 1 \quad (8)$$

If ESG score $\geq$ social aspiration,

$$ESG\_\text{Social}\ Performance\ Shortfall_{i,t} = 0 \quad (9)$$

3.2.3. Control variables

Referring to the previous literature (Aouadi & Marsat, 2018; Asimakopoulos et al., 2023; Wang, Zhang, Yang, et al., 2023), we consider control variables from financial and governance levels. At the financial level, we include the book-to-market ratio (*BM*, book value/total market value), enterprise value (*TobinQ*), cash flow ratio (*Cash*, net cash flow/total assets), and fixed assets ratio (*Fix*, net fixed assets/total assets). At the governance level, we include board size (*Board*, logarithm of the number of directors), proportion of independent directors (*Indep*, number of independent directors/total number of directors), dual roles (*Dual*, 1 if the chairman and CEO are the same person, 0 otherwise), years listed (*Listage*), and whether the firm is audited by a Big Four accounting firm (*Big4*, 1 if yes, 0 otherwise). Table 1 shows descriptive statistics for the variables we used.

Table 1 Descriptive statistics of the sample

Variables	Mean.	P50.	Std. Dev.	Obs.
DA	0.064	0.042	0.135	26746
ESG_H	0.482	0.000	0.500	26746
ESG_S	0.469	0.000	0.499	26746
BM	0.610	0.610	0.271	26746
TobinQ	2.114	1.601	2.856	26746
Cash	0.046	0.045	0.075	26746
Fix	0.216	0.182	0.165	26746
Board	2.128	2.197	0.202	26746
Dual	0.258	0.000	0.438	26746
Indep	37.630	36.360	5.654	26746
Listage	2.337	2.398	0.647	26746
Big4	0.062	0.000	0.241	26746

3.3. Empirical models

Using the constructed panel dataset, we apply a two-way fixed effects model to assess the impact of ESG underperformance on corporate earnings manipulation. The corresponding estimating equations are as follows.

$$DA_{i,t} = \alpha_0 + \beta_1 ESG\_H_{i,t} + \varphi X_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (10)$$

$$DA_{i,t} = \alpha_0 + \beta_1 ESG\_S_{i,t} + \varphi X_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (11)$$

where, α_0 is the intercept, $DA_{i,t}$ is the level of earnings manipulation of firm i in year t, $ESG\_H_{i,t}$ and $ESG\_S_{i,t}$ denote whether firm i has ESG performance shortfalls in year t, respectively. $X_{i,t}$ denotes a series of control variables, μ_i denotes a time fixed effect, γ_t denotes an individual fixed effect, and $\varepsilon_{i,t}$ denotes a random error term. The panel dataset may suffer from serial correlation, to address this problem standard errors clustered at the firm level are used.

4. Empirical Findings

4.1. Baseline results

The estimation results are exhibited in Table 2. It can be found that both historical underperformance and social underperformance of firms' ESG have a significant positive effect on firms' earnings manipulation, regardless of whether control variables are added or not. This suggests that inadequate ESG performance significantly

increases management's tendency to engage in earnings manipulation. Given that the standard error of *DA* is 0.135 (see Table 1), the presence of ESG historical underperformance explains about 2.21% (0.00299/0.135=0.0221) of the variation in earnings manipulation. Likewise, the presence of ESG social underperformance explains 4.43% (0.00599/0.135=0.0443) of the variation in earnings manipulation.

Table 2 Results of baseline regression

VARIABLES	DA			
	(1)	(2)	(3)	(4)
ESG_H	0.00267**	0.00299**		
	(0.001)	(0.001)		
ESG_S			0.00568**	0.00599***
			(0.002)	(0.002)
BM		0.00585		0.00649
		(0.016)		(0.016)
TobinQ		0.00076		0.00075
		(0.001)		(0.001)
Cash		-0.13188***		-0.13226***
		(0.033)		(0.033)
Fix		-0.07013***		-0.06986***
		(0.024)		(0.024)
Board		-0.00086		-0.00076
		(0.008)		(0.008)
Dual		0.00002		-0.00005
		(0.002)		(0.002)
Indep		-0.00007		-0.00006
		(0.000)		(0.000)
Listage		0.01750***		0.01698***
		(0.004)		(0.004)
Big4		-0.00726		-0.00733
		(0.005)		(0.005)
Constant	0.06314***	0.04286*	0.06175***	0.04177
	(0.001)	(0.026)	(0.001)	(0.026)
Observations	26,596	26,596	26,596	26,596
R-squared	0.249	0.254	0.249	0.254
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.2. Robustness checks

To enhance the credibility of the results, we conduct a series of robustness tests. First, we use earnings manipulation data calculated with the non-linear Jones model as the dependent variable. The results are presented in columns (1) and (2) of Table 3. Second, we excluded the effect of external crises. The stock market crash in 2015 and the sudden new crown epidemic in late 2019 had a fatal impact on firms' production and operations (Liu & Zhang, 2020). Therefore, we exclude the samples of 2015, 2020 and 2021 and rerun the regression, with results displayed in columns (3) and (4) of Table 3. Third, to prevent omitted variable bias, we follow previous literature (Wang, Zhang, Wan, et al., 2023), and re-estimate the regression model by selecting control variables to be added to the regression model from the city level, the industry level, and the market level, respectively, including industry concentration (*HHI*, measured using the Herfindahl index), the degree of regional marketization (*Market*, measured using the developed Marketization Index), regional economic development level (*PGDP*, measured by GDP per capita), and government support (*Gov*, government fiscal expenditure/GDP). The results are presented in columns (5) and (6) of Table 3.

Table 3 Results of robustness checks

VARIABLES	Replacement of dependent variable		Exclusion of external shocks		Adding Control Variables	
	DA2	DA2	DA	DA	DA	DA
	(1)	(2)	(3)	(4)	(5)	(6)
ESG_H	0.00178**		0.00352*		0.00330**	
	(0.001)		(0.002)		(0.001)	
ESG_S		0.00380***		0.00713**		0.00563**
		(0.001)		(0.003)		(0.002)
BM	-0.01705***	-0.01666***	0.01091	0.01170	0.00766	0.00831
	(0.003)	(0.003)	(0.024)	(0.025)	(0.017)	(0.017)
TobinQ	-0.00007	-0.00008	-0.00002	-0.00003	0.00070	0.00070
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Cash	0.01032	0.01007	-0.14651***	-0.14698***	-0.13866***	-0.13898***
	(0.011)	(0.011)	(0.040)	(0.040)	(0.036)	(0.036)
Fix	-0.00734	-0.00719	-0.06997**	-0.06967**	-0.07385***	-0.07346***

	(0.007)	(0.007)	(0.034)	(0.034)	(0.026)	(0.026)
Board	-0.00345	-0.00339	-0.00710	-0.00699	-0.00176	-0.00168
	(0.005)	(0.005)	(0.010)	(0.010)	(0.008)	(0.008)
Dual	-0.00260	-0.00265	-0.00021	-0.00033	0.00036	0.00029
	(0.002)	(0.002)	(0.004)	(0.004)	(0.003)	(0.003)
Indep	0.00007	0.00007	-0.00025	-0.00024	-0.00011	-0.00011
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Listage	0.01927***	0.01895***	0.01630**	0.01570**	0.01614***	0.01563***
	(0.003)	(0.003)	(0.007)	(0.007)	(0.005)	(0.005)
Big4	0.00002	-0.00002	-0.00256	-0.00268	-0.00816	-0.00823
	(0.004)	(0.004)	(0.007)	(0.007)	(0.006)	(0.005)
HHI					0.00460	0.00469
					(0.006)	(0.006)
Market					-0.00035	-0.00032
					(0.002)	(0.002)
PGDP					-0.00000	-0.00000
					(0.000)	(0.000)
GOV					0.00170	0.00099
					(0.012)	(0.012)
Constant	0.02000	0.01921	0.06692**	0.06535**	0.05281	0.05176
	(0.017)	(0.017)	(0.032)	(0.032)	(0.034)	(0.034)
Observations	26,595	26,595	17,529	17,529	24,989	24,989
R-squared	0.228	0.229	0.283	0.284	0.257	0.257
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

Fourth, we replaced the fixed effects and re-estimated after controlling for region-year interaction fixed effects and industry-year interaction fixed effects, and the results are presented in columns (1) and (2) of Table 4 (Mao & Wang, 2023). Finally, we replaced the estimation models and employed Probit and Tobit models for regression analyses, with results presented in Columns (3) to (6) of Table 4.

The results of the above robustness tests are consistent with the benchmark regression, indicating that our core findings remain valid across different samples and model specifications. This further confirms the reliability and stability of our benchmark regression results.

Table 4 Results of robustness checks

VARIABLES	Replacement of fixed effects		Probit model		Tobit model	
	(1)	(2)	(3)	(4)	(5)	(6)
ESG_H	0.00546**		0.04479**		0.00291**	
	(0.002)		(0.018)		(0.001)	
ESG_S		0.01057***		0.08555***		0.00594***
		(0.002)		(0.028)		(0.002)
BM	-0.00673	-0.00453	0.01799	0.02651	0.00581	0.00644
	(0.013)	(0.013)	(0.171)	(0.170)	(0.016)	(0.016)
TobinQ	0.00161*	0.00158*	0.00308	0.00306	0.00076	0.00076
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)
Cash	-0.15902***	-0.15380***	-1.17092***	-1.17015***	-0.13183***	-0.13221***
	(0.038)	(0.038)	(0.233)	(0.233)	(0.033)	(0.033)
Fix	-0.03364***	-0.03377***	-0.88012***	-0.86851***	-0.07015***	-0.06990***
	(0.011)	(0.011)	(0.244)	(0.241)	(0.024)	(0.024)
Board	-0.02882**	-0.02711**	-0.03463	-0.03191	-0.00088	-0.00077
	(0.014)	(0.014)	(0.105)	(0.105)	(0.008)	(0.008)
Dual	0.00053	0.00012	0.00282	0.00155	-0.00003	-0.00010
	(0.002)	(0.002)	(0.033)	(0.033)	(0.002)	(0.002)
Indep	-0.00031*	-0.00023	-0.00112	-0.00092	-0.00007	-0.00006
	(0.000)	(0.000)	(0.003)	(0.003)	(0.000)	(0.000)
Listage	0.00340*	0.00257	0.28109***	0.27269***	0.01736***	0.01685***
	(0.002)	(0.002)	(0.063)	(0.062)	(0.004)	(0.004)
Big4	-0.00867***	-0.00731**	-0.09044	-0.09227	-0.00741	-0.00747
	(0.003)	(0.003)	(0.075)	(0.075)	(0.005)	(0.005)
var(e.da)					0.01369*	0.01369*
					(0.007)	(0.007)
Constant	0.14252***	0.13380***	-2.91757***	-2.93925***	0.01918	0.02010
	(0.028)	(0.028)	(0.352)	(0.351)	(0.033)	(0.032)
Observations	25,221	25,221	26,596	26,596	26,746	26,746
R-squared	0.123	0.124				
*City*Year FE*	YES	YES				
*Ind*Year FE*	YES	YES				
Firm FE			YES	YES	YES	YES
Year FE			YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.3. Endogeneity treatment

The empirical testing process may have an endogeneity problem due to mutual causation. Specifically, inadequate ESG performance may drive management to engage

in earnings manipulation, while firms under surplus pressure might prioritize financial performance over ESG, resulting in poorer ESG outcomes. To address potential reverse causation, this paper adopts two approaches.

4.3.1. PSM method

Propensity score matching can effectively overcome the selection bias caused by biased estimation and sample selection, and has a clear advantage in addressing the endogeneity of variables (Caliendo & Kopeinig, 2008; Teng & Wu, 2018). We employed radius matching and nearest-neighbor matching, incorporating all covariates. The results, presented in the Table 5, are consistent with our primary findings.

Table 5 Results of PSM estimation

VARIABLES	PSM			
	Radius		Nearest neighbor	
	(1)	(2)	(3)	(4)
ESG_H	0.00278**		0.00297**	
	(0.001)		(0.001)	
ESG_S		0.00572**		0.00596**
		(0.002)		(0.003)
BM	0.00365	0.00420	0.00307	0.00364
	(0.016)	(0.016)	(0.016)	(0.016)
TobinQ	0.00007	0.00004	0.00022	0.00019
	(0.001)	(0.001)	(0.001)	(0.001)
Cash	-0.12258***	-0.12297***	-0.11270***	-0.11320***
	(0.033)	(0.033)	(0.032)	(0.032)
Fix	-0.07121***	-0.07098***	-0.07054***	-0.07023***
	(0.024)	(0.024)	(0.022)	(0.022)
Board	-0.00006	0.00005	-0.00225	-0.00217
	(0.008)	(0.008)	(0.007)	(0.007)
Dual	0.00017	0.00010	0.00082	0.00076
	(0.002)	(0.002)	(0.002)	(0.003)
Indep	-0.00006	-0.00005	-0.00012	-0.00012
	(0.000)	(0.000)	(0.000)	(0.000)
Listage	0.01772***	0.01722***	0.01934***	0.01875***
	(0.004)	(0.004)	(0.005)	(0.005)
Big4	-0.00734	-0.00740	-0.00678	-0.00690
	(0.005)	(0.005)	(0.006)	(0.006)
Constant	0.04274	0.04167	0.04528*	0.04453*
	(0.026)	(0.026)	(0.027)	(0.027)

Observations	26,582	26,582	24,908	24,908
R-squared	0.252	0.253	0.305	0.305
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.3.2. Instrumental variable (IV) estimates

To address endogeneity, we employed the instrumental variable method with two-stage least squares estimation, using air quality (PM2.5) of the prefecture-level city where the firm is located and the regional 2011 blood donation rate as instrumental variables (Jiang & Yao, 2024).

The reason for choosing these two instrumental variables is that air quality is inextricably linked to the degree of local attention to and management of the environment, and the rate of blood donation in the region is closely linked to the sense of morality of the citizens. Both factors will drive firms to be more concerned about ESG performance in the course of their business. Therefore, these two variables are related to the ESG performance of enterprises, satisfying the relevance of instrumental variable selection. Additionally, PM2.5 and blood donation rate will not have a direct impact on the earnings management of enterprises, as they are not logically linked, making the selected instrumental variables exogenous and valid. However, since the regional 2011 blood donation rate is a cross-sectional data, to match the panel data used in this paper, we refer to He et al. (2022), where the cross-product term of PM2.5 and blood donation rate with the annual mean of ESG of firms in the region is used as instrumental variables.

The results are exhibited in Table 6. In the first stage, we find a significant positive correlation between PM2.5 and ESG underperformance, indicating that higher local PM2.5 concentrations (worse air quality) are likely to result in poor ESG performance. Conversely, the regional blood donation rate is significantly negatively correlated with ESG underperformance, suggesting that higher local ethical standards encourage firms to prioritize ESG management, thereby reducing ESG underperformance. Weak

instrumental variable tests show that the F-values are much higher than the empirical values 10. The second-stage regression results align with the basic regression results, further confirming the reliability of our initial conclusions.

Table 6 Results of the IV 2SLS regression

VARIABLES	IV1				IV2			
	ESG_H	DA	ESG_S	DA	ESG_H	DA	ESG_S	DA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IV1	0.00030***		0.00029***					
	(0.000)		(0.000)					
IV2					-0.00091***		-0.00082***	
					(0.000)		(0.000)	
IV-ESG_H		0.00303*				0.00296**		
		(0.002)				(0.001)		
IV_ESG_S				0.00718**				0.00610***
				(0.003)				(0.002)
BM	0.03262***	0.00561	-0.00025	0.00629	0.11000***	0.00586	-0.05210***	0.00650
	(0.008)	(0.016)	(0.008)	(0.016)	(0.022)	(0.016)	(0.020)	(0.016)
TobinQ	0.00013	0.00076	-0.00018	0.00075	0.00079***	0.00076	0.00037	0.00075
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
Cash	0.01048	-0.13428***	0.01144	-0.13476***	0.00255	-0.13188***	0.05877	-0.13227***
	(0.018)	(0.034)	(0.018)	(0.034)	(0.053)	(0.033)	(0.042)	(0.033)
Fix	0.02380	-0.07071***	0.00123	-0.07049***	0.16616***	-0.07012***	0.03192	-0.06987***
	(0.018)	(0.024)	(0.021)	(0.024)	(0.046)	(0.024)	(0.046)	(0.024)
Board	0.00220	-0.00134	0.00176	-0.00120	-0.03248	-0.00086	-0.02817	-0.00075
	(0.013)	(0.008)	(0.015)	(0.008)	(0.037)	(0.008)	(0.036)	(0.008)
Dual	0.00138	0.00019	-0.00063	0.00010	-0.00487	0.00002	0.00877	-0.00005
	(0.004)	(0.002)	(0.004)	(0.002)	(0.012)	(0.002)	(0.011)	(0.002)
Indep	-0.00066*	-0.00009	0.00004	-0.00008	-0.00556***	-0.00007	-0.00417***	-0.00006
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
Listage	0.01663*	0.01759***	0.00726	0.01704***	-0.12371***	0.01750***	0.02899	0.01697***
	(0.009)	(0.004)	(0.010)	(0.004)	(0.023)	(0.004)	(0.024)	(0.004)
Big4	-0.00167	-0.00709	0.00781	-0.00719	-0.01842	-0.00726	0.01001	-0.00733
	(0.012)	(0.005)	(0.013)	(0.005)	(0.034)	(0.005)	(0.028)	(0.005)
Constant	0.01658		0.05198		1.68082***		1.29909***	
	(0.044)		(0.050)		(0.182)		(0.167)	
Observations	26,461	26,461	26,461	26,461	26,844	26,596	26,844	26,596
R-squared	0.897	0.007	0.929	0.007	0.125	0.007	0.495	0.007
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors*

clustered at the firm level are reported in parentheses.

4.4. Mechanism analysis

In Section 2.2, we theoretically analyzed the potential channels through which ESG underperformance promotes earnings manipulation. In this section, we empirically test the mechanisms. Following Zhang R. et al. (2024), we set up the following models to analyze how ESG underperformance affects earnings manipulation.

$$M_{i,t} = \alpha_0 + \beta_1 ESG\_H_{i,t} + \varphi X_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (12)$$

$$M_{i,t} = \alpha_0 + \beta_2 ESG\_S_{i,t} + \varphi X_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (13)$$

where $M_{i,t}$ represents a set of mechanism variables, including institutional investor shareholding (Inst), which we measure using the total number of shares held by institutional investors/shares outstanding; risk of stock price collapse (RSPC), which we measure using the difference between the frequency of downside and upside occurrences in a firm's stock returns (Callen & Fang, 2015; Wu et al., 2019); and financing cost, which we measure using the ratio of finance charges to the ratio of total liabilities at the end of the period as a proxy (Shi et al., 2022). The rest of the signs in Equations (12) and (13) are consistent with Equations (10) and (11), and we focus on the signs and significance of the coefficients β_1 and β_2.

The results are exhibited in Table 7, and the empirical results are consistent with the expectations of our theoretical analysis. Inadequate ESG performance significantly prompts institutional investors to reduce their shareholdings, elevates the risk of share price crashes, and increases corporate financing costs, thereby enhancing management's incentives for earnings manipulation.

Table 7 Results of mechanism tests estimation

VARIABLES	Inst		RSPC		Cost	
	(1)	(2)	(3)	(4)	(5)	(6)

ESG_H	-0.67341***		0.00799**		0.00111***	
	(0.130)		(0.004)		(0.000)	
ESG_S		-0.43122**		0.00853*		0.00164***
		(0.217)		(0.005)		(0.000)
BM	-5.09512***	-5.19239***	0.08870***	0.09009***	0.00412***	0.00433***
	(0.845)	(0.845)	(0.014)	(0.014)	(0.001)	(0.001)
TobinQ	0.08595	0.08562	-0.00145*	-0.00144*	-0.00038***	-0.00038***
	(0.098)	(0.098)	(0.001)	(0.001)	(0.000)	(0.000)
Cash	2.12965	2.15200	-0.05581*	-0.05636*	0.00681**	0.00671**
	(1.444)	(1.448)	(0.031)	(0.031)	(0.003)	(0.003)
Fix	-12.77790***	-12.87581***	-0.01882	-0.01787	0.05117***	0.05130***
	(2.205)	(2.206)	(0.028)	(0.028)	(0.003)	(0.004)
Board	5.62977***	5.63018***	-0.00889	-0.00885	0.00087	0.00090
	(1.463)	(1.464)	(0.020)	(0.020)	(0.002)	(0.002)
Dual	0.33868	0.34564	-0.00681	-0.00693	0.00147**	0.00145**
	(0.385)	(0.386)	(0.007)	(0.007)	(0.001)	(0.001)
Indep	-0.06348*	-0.06159*	-0.00011	-0.00012	0.00009	0.00009
	(0.036)	(0.036)	(0.001)	(0.001)	(0.000)	(0.000)
Listage	-6.72412***	-6.63347***	-0.01551	-0.01667	0.04059***	0.04041***
	(0.858)	(0.858)	(0.013)	(0.013)	(0.002)	(0.002)
Big4	3.12770**	3.14272**	-0.01862	-0.01872	-0.00067	-0.00069
	(1.586)	(1.588)	(0.017)	(0.017)	(0.002)	(0.002)
Constant	56.87849***	56.55026***	0.10795	0.10976	-0.10418***	-0.10423***
	(4.584)	(4.587)	(0.069)	(0.069)	(0.008)	(0.008)
Observations	26,596	26,596	26,059	26,059	26,403	26,403
R-squared	0.860	0.860	0.156	0.156	0.611	0.611
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.5. Analysis of economic consequences

ESG performance shortfall may also exerts adverse economic consequences on corporate productivity and scale. To test the specific effect, we utilize TFP as a proxy for firms' productivity using the LP method (Levinsohn & Petrin, 2003), and select business revenue as a proxy for firm's scale (Wang and Ge (2022). The results in Table 8 reveal negative and statistically significant coefficients at the 1% level. These findings indicate that ESG underperformance diminishes both firms' productivity and scales.

Table 8 Results of the analysis of economic consequences

VARIABLES	TFP		Revenue	
	(1)	(2)	(3)	(4)
ESG_H	-0.01819***		-0.02320***	
	(0.005)		(0.007)	
ESG_S		-0.04318***		-0.07722***
		(0.009)		(0.010)
BM	0.26132***	0.25709***	0.55032***	0.54373***
	(0.037)	(0.037)	(0.049)	(0.049)
TobinQ	-0.01116***	-0.01111***	-0.01984***	-0.01975***
	(0.004)	(0.004)	(0.005)	(0.005)
Cash	0.85224***	0.85452***	0.98269***	0.98761***
	(0.080)	(0.080)	(0.092)	(0.092)
Fix	-1.80047***	-1.80129***	-0.50239***	-0.50359***
	(0.100)	(0.100)	(0.125)	(0.125)
Board	0.29084***	0.29016***	0.52293***	0.52157***
	(0.056)	(0.056)	(0.078)	(0.078)
Dual	-0.00210	-0.00161	0.01475	0.01552
	(0.017)	(0.017)	(0.021)	(0.021)
Indep	0.00368**	0.00360**	0.00565***	0.00546***
	(0.001)	(0.001)	(0.002)	(0.002)
Listage	0.33400***	0.33753***	0.50823***	0.51344***
	(0.035)	(0.035)	(0.044)	(0.044)
Big4	0.15482**	0.15509**	0.22697**	0.22701**
	(0.073)	(0.073)	(0.111)	(0.111)
Constant	7.02618***	7.03629***	18.87832***	18.90500***
	(0.186)	(0.186)	(0.244)	(0.243)
Observations	26,145	26,145	26,244	26,244
R-squared	0.887	0.887	0.912	0.912
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.6. Cross-sectional tests

ESG performance shortfalls amplify corporate earnings manipulation behavior. How to mitigate or eliminate this negative impact? This research further examines the role of internal control, information disclosure, media attention and environmental justice in mitigating the corporate earnings manipulation behavior triggered by ESG

performance shortfalls.

4.6.1. The moderating role of internal control

The quality of a firm's internal control is critical to its performance (Verschoor, 1998) and is directly linked to accounting information quality, operational efficiency, and risk management (Altamuro & Beatty, 2010; Beneish et al., 2008; Chen H. et al., 2020; Chen et al., 2023; Verschoor, 1998). Strengthening internal control seems to be an effective strategy to mitigate earnings manipulation. By establishing clear accounting and auditing processes and implementing rigorous financial oversight, firms can ensure transparency in decision-making and reduce reliance on misleading financial information. Moreover, robust internal control provides a foundation for enhancing ESG performance by promoting compliance and risk management. This approach curbs earnings manipulation behaviors driven by poor ESG performance and boosts investor and stakeholder confidence in the company's ability to create long-term value.

Referring to Liu et al. (2021), we rank the internal control scores of firms and divide them into high and low groups according to the median to explore the impact of internal control on mitigating earnings manipulation caused by ESG performance deficiencies. The data for internal control scores are sourced from the DIB Internal Control and Risk Management database. The results are displayed in Table 9, where it can be found that in the context of inadequate internal control (see columns 1 and 2), the effect of ESG performance shortfalls on earnings manipulation is significant; on the contrary, in the context of firms with high internal control scores (see columns 3 and 4), the effect of ESG performance shortfalls on earnings manipulation is insignificant. This demonstrates that strengthening internal control can effectively mitigate the adverse effects of ESG performance shortfalls on earnings manipulation.

Table 9 Results of the moderating effect of internal controls

VARIABLES	Internal control			
	Lower		Higher	
	(1)	(2)	(3)	(4)
ESG_H	0.00620***		-0.00023	
	(0.002)		(0.002)	

ESG_S		0.00791**		0.00325
		(0.003)		(0.003)
BM	0.00996	0.01127	0.00056	0.00055
	(0.030)	(0.030)	(0.010)	(0.010)
TobinQ	0.00071	0.00071	0.00131	0.00131
	(0.001)	(0.001)	(0.001)	(0.001)
Cash	-0.06516**	-0.06540**	-0.22156***	-0.22191***
	(0.029)	(0.029)	(0.065)	(0.065)
Fix	-0.07203**	-0.07078**	-0.07062***	-0.07100***
	(0.034)	(0.033)	(0.025)	(0.025)
Board	-0.00680	-0.00657	0.00981	0.00989
	(0.009)	(0.009)	(0.013)	(0.013)
Dual	-0.00442*	-0.00453*	0.00745	0.00741
	(0.003)	(0.003)	(0.005)	(0.005)
Indep	0.00024	0.00023	-0.00040	-0.00038
	(0.000)	(0.000)	(0.000)	(0.000)
Listage	0.01837***	0.01695***	0.01588**	0.01603**
	(0.006)	(0.006)	(0.008)	(0.008)
Big4	-0.00771	-0.00805	-0.00737	-0.00748
	(0.008)	(0.008)	(0.007)	(0.007)
Constant	0.04058	0.04127	0.03996	0.03758
	(0.030)	(0.030)	(0.041)	(0.041)
Observations	13,424	13,424	13,172	13,172
R-squared	0.245	0.245	0.280	0.280
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.6.2. The moderating role of information disclosure

Enhanced corporate information disclosure promotes market fairness and efficiency and enhances the ability of investors and regulators to monitor corporate behavior. This is because that it provides a clear, truthful, and comprehensive picture of a firm's position and status, reducing the risk of misleading information (Chen H. et al., 2020). Increased transparency ensures that every corporate decision and its potential impact can be properly monitored and assessed, making it more difficult for firms to engage in inappropriate financial maneuvers and thus discouraging earnings manipulation driven by ESG issues. Moreover, full disclosure fosters active shareholder

engagement and stakeholder participation, motivating firms to pursue economic efficiency while also fulfilling their environmental and social responsibilities (Zhang C. et al., 2024). This holistic approach to transparency not only curbs potential manipulative behaviors but also builds trust and encourages sustainable business practices.

The level of corporate information disclosure is measured using the Disclosure Quality Index from the CSMAR database, which ranges from 1 to 4, with 1 representing failing and 4 representing excellent. Firms are grouped according to the median of the disclosure index, and the results are displayed in Table 10. The findings indicate that firms with a high level of information disclosure significantly inhibit earnings manipulation arising from ESG underperformance issues. This suggests that enhanced transparency through high-quality information disclosure effectively mitigates the adverse effects of inadequate ESG performance on financial practices.

Table 10 Results of the moderating effect of information disclosure

VARIABLES	Quality of information disclosure			
	Worse	Better	Worse	Better
	(1)	(2)	(3)	(4)
ESG_H	0.00545***		-0.00013	
	(0.002)		(0.002)	
ESG_S		0.00759**		0.00379
		(0.003)		(0.003)
BM	0.01365	0.01474	-0.00769	-0.00769
	(0.024)	(0.025)	(0.011)	(0.011)
TobinQ	0.00071	0.00071	0.00113	0.00114
	(0.001)	(0.001)	(0.001)	(0.001)
Cash	-0.10930***	-0.10958***	-0.17976***	-0.18025***
	(0.039)	(0.039)	(0.062)	(0.063)
Fix	-0.07315**	-0.07196**	-0.06530**	-0.06620**
	(0.033)	(0.033)	(0.026)	(0.026)
Board	-0.00323	-0.00332	0.00353	0.00372
	(0.011)	(0.011)	(0.009)	(0.009)
Dual	-0.00492	-0.00495*	0.00803**	0.00801**
	(0.003)	(0.003)	(0.004)	(0.004)
Indep	0.00016	0.00016	-0.00050	-0.00048
	(0.000)	(0.000)	(0.001)	(0.001)

Listage	0.01746***	0.01593***	0.02074***	0.02085***
	(0.005)	(0.005)	(0.008)	(0.008)
Big4	-0.01224*	-0.01231*	0.00041	0.00028
	(0.006)	(0.006)	(0.008)	(0.008)
Constant	0.03556	0.03751	0.04907	0.04611
	(0.034)	(0.034)	(0.041)	(0.041)
Observations	15,025	15,025	11,571	11,571
R-squared	0.247	0.247	0.279	0.279
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.6.3. The moderating role of media attention

The increasing influence of social media as a platform for public discussion and dissemination of information has made it a critical tool in monitoring ESG performance (Capelle-Blancard & Petit, 2019; He et al., 2024). Public attention and discussions on social media platforms can create substantial pressure on companies to be more transparent and accountable in their financial reporting. As a result, earnings manipulation driven by inadequate ESG performance can be mitigated. When firms receive heightened attention on social media, they are likely to emphasize transparency and financial integrity to prevent reputational damage and potential declines in consumer trust.

We measure media attention using quantitative newspaper financial news statistics, including the total number of news stories in which the company appears in the headline and content, sourced from the CNRDS database. Similarly, we classify firms into two groups based on the level of media attention: higher and lower. We then conduct regression analyses for each group separately. The results are displayed in Table 11, clearly showing that the contribution of ESG underperformance to earnings manipulation is significantly suppressed when firms receive high media attention. Therefore, social media attention not only helps to expose improper financial behaviors but also encourages firms to pursue higher ESG standards, thus promoting sustainable development.

Table 11 Results of the moderating effect of media attention

VARIABLES	Media attention			
	Lower		Higher	
	(1)	(2)	(3)	(4)
ESG_H	0.00710***		-0.00004	
	(0.002)		(0.001)	
ESG_S		0.01218***		0.00139
		(0.004)		(0.002)
BM	0.02966	0.03154	-0.00900	-0.00898
	(0.041)	(0.041)	(0.008)	(0.008)
TobinQ	0.00088	0.00088	-0.00013	-0.00013
	(0.001)	(0.001)	(0.001)	(0.001)
Cash	-0.17178***	-0.17246***	-0.10154**	-0.10165**
	(0.052)	(0.052)	(0.043)	(0.043)
Fix	-0.10960**	-0.10852**	-0.03782***	-0.03792***
	(0.051)	(0.050)	(0.013)	(0.013)
Board	-0.00276	-0.00286	0.00066	0.00073
	(0.012)	(0.012)	(0.010)	(0.010)
Dual	-0.00460	-0.00473*	0.00309	0.00309
	(0.003)	(0.003)	(0.004)	(0.004)
Indep	0.00045	0.00047	-0.00038	-0.00038
	(0.000)	(0.000)	(0.000)	(0.000)
Listage	0.02180***	0.02003**	0.01296**	0.01296**
	(0.008)	(0.008)	(0.005)	(0.005)
Big4	-0.02589**	-0.02639**	-0.00012	-0.00011
	(0.011)	(0.011)	(0.006)	(0.006)
Constant	0.01768	0.01710	0.06201*	0.06103*
	(0.042)	(0.042)	(0.033)	(0.032)
Observations	11,451	11,451	15,145	15,145
R-squared	0.269	0.269	0.215	0.215
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

4.6.4. The moderating role of environmental justice

Enhanced environmental justice measures are essential to mitigate earnings manipulation triggered by inadequate ESG performance. A rigorous environmental protection justice system will further strengthen process governance enforcement,

compelling firms to engage in more ESG activities (Wang & Ye, 2024). When firms are aware that they must comply with stringent environmental regulations and be accountable for their environmental impacts, they are more likely to adopt transparent and responsible financial reporting practices proactively (Gao & Huiyu, 2021). Effective environmental enforcement reduces the opportunities for firms to exploit a lax regulatory environment for earnings manipulation, while increasing the potential costs of environmental violations, including legal consequences, reputational damage, and decreased trust. Whereas environmental courts are a well-established instrument of environmental justice, we use Chinese environmental courts as a proxy for environmental justice (Zeng et al., 2024).

Referring to Liu et al. (2021), we analyze whether the sample firms are located in Chinese cities with environmental courts. We divided the sample into two groups: one group was under the surveillance of an environmental court, and the other group was not. Regression analyses were conducted for each of these two groups, and the results are presented in Table 12. The results indicate that the effect of inadequate ESG performance on earnings manipulation is no longer significant for firms located in cities with environmental courts, while for the other group, this effect remains significant. Therefore, strengthening environmental justice helps to optimize the business environment and reduces the likelihood of firms engaging in earnings manipulation. This underscores the importance of robust environmental enforcement mechanisms in promoting transparent and responsible corporate behavior.

Table 12 Results of the moderating effect of environmental justice

VARIABLES	Environmental justice			
	NO		YES	
	(1)	(2)	(3)	(4)
ESG_H	0.00478***		-0.00039	
	(0.002)		(0.002)	
ESG_S		0.00711**		0.00245
		(0.003)		(0.003)
BM	0.04001	0.04091	-0.01425	-0.01442
	(0.029)	(0.030)	(0.014)	(0.014)

TobinQ	0.00272*	0.00271*	0.00042	0.00041
	(0.002)	(0.002)	(0.002)	(0.002)
Cash	-0.06224**	-0.06239**	-0.20592***	-0.20637***
	(0.027)	(0.027)	(0.070)	(0.070)
Fix	-0.08880**	-0.08808**	-0.04189	-0.04230
	(0.039)	(0.039)	(0.031)	(0.032)
Board	-0.00689	-0.00693	0.02234	0.02252
	(0.011)	(0.011)	(0.019)	(0.019)
Dual	0.00256	0.00250	-0.00261	-0.00265
	(0.004)	(0.004)	(0.004)	(0.004)
Indep	-0.00009	-0.00009	0.00071*	0.00072*
	(0.000)	(0.000)	(0.000)	(0.000)
Listage	0.01483**	0.01373**	0.01303	0.01325
	(0.006)	(0.007)	(0.008)	(0.008)
Big4	-0.01559	-0.01586	-0.01670*	-0.01652*
	(0.015)	(0.015)	(0.010)	(0.010)
Constant	0.04038	0.04118	-0.01325	-0.01569
	(0.034)	(0.034)	(0.051)	(0.051)
Observations	14,767	14,767	11,377	11,377
R-squared	0.259	0.259	0.400	0.400
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

*Notes: (1) *, **, *** indicate a significance level of 10%, 5%, and 1%, respectively; (2) Robust standard errors clustered at the firm level are reported in parentheses.*

5. Conclusion and implications

5.1. Conclusion

This study introduces an innovative framework for conceptualizing and quantifying ESG performance shortfalls using data from A-share listed companies in Chinese Shanghai and Shenzhen stock markets spanning from 2011 to 2021. Through empirical analysis, it demonstrates that firms with historical and social ESG performance shortfalls are more prone to engage in earnings manipulation. This finding remains robust even after conducting various tests to validate the results. Mechanistic analyses uncover that such shortfalls may prompt institutional investors to reduce shareholdings, increase the risk of share price collapses, and elevate corporate finance costs, thus incentivizing earnings manipulation and intensifying earnings pressure. Economically, ESG performance shortfalls is associated with a notable decline in firms'

productivity and size. Further cross-sectional analysis indicates that improving the quality of internal controls, enhancing information disclosure, increasing social media attention, and strengthening government environmental enforcement efforts can mitigate the adverse effects of inadequate ESG performance on earnings manipulation. The findings underscore the importance of collaborative efforts among firms, society, and government in enhancing ESG performance and curbing earnings manipulation.

5.2. Policy implications

On the basis of research results, we propose the following recommendations to improve ESG performance and curb earnings manipulation. First, enterprises should comprehensively address ESG considerations such as environmental responsibility and social impact in their business operations. By integrating ESG principles into their strategic planning, companies can continuously enhance their ESG performance. This entails bolstering internal controls and enhancing transparency in information disclosure, particularly through leveraging information technology to efficiently manage ESG data, minimize errors, and ensure data accuracy. These measures not only enhance firms' competitiveness but also align with investors' and stakeholders' expectations for sustainable development, thereby reducing the likelihood of earnings manipulation.

Second, governments and regulators should establish uniform ESG disclosure and rating standards to govern corporate conduct in environmental, social, and governance domains, thereby mitigating information asymmetry. Moreover, reinforcing the enforcement of environmental regulations and encouraging firms to comply can not only directly incentivize improvements in environmental performance but also indirectly curb earnings manipulation stemming from inadequate corporate environmental responsibility.

Finally, all sectors of society should intensify efforts to raise awareness about the significance of ESG through diverse channels, including media campaigns, educational initiatives, and public forums. Heightened public consciousness regarding ESG issues will empower both the market and the public to provide effective oversight and

incentives for companies to enact tangible enhancements in ESG practices, thereby diminishing earnings manipulation triggered by insufficient ESG performance.

5.3. Limitation

This study also has several limitations. First, it evaluates ESG performance shortfall based on a sample of Chinese A-share listed companies in the Shanghai and Shenzhen stock exchanges. Whether these findings can be generalized to other countries requires further investigation. What's more, corporate misconduct can manifest in various forms, and our analysis focuses solely on earnings manipulation. The potential consequences of inadequate ESG performance leading to other forms of misconduct require more extensive research. These areas will be the focus of our future studies.

Declaration of interests: None

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Al Mamun, M., Balachandran, B., & Duong, H. N. (2020). Powerful CEOs and stock price crash risk. *Journal of Corporate Finance, 62*, 101582.

Altamuro, J., & Beatty, A. (2010). How does internal control regulation affect financial reporting? *Journal of Accounting and Economics, 49*(1-2), 58-74.

Andreou, C. K., Andreou, P. C., & Lambertides, N. (2021). Financial distress risk and stock price crashes. *Journal of Corporate Finance, 67*, 101870.

Aouadi, A., & Marsat, S. (2018). Do ESG controversies matter for firm value? Evidence from international data. *Journal of Business Ethics, 151*, 1027-1047.

Apergis, N., Poufinas, T., & Antonopoulos, A. (2022). ESG scores and cost of debt. *Energy Economics, 112*, 106186.

Asimakopoulos, P., Asimakopoulos, S., & Li, X. (2023). The role of environmental, social, and governance rating on corporate debt structure. *Journal of Corporate Finance, 83*, 102488.

Atif, M., & Ali, S. (2021). Environmental, social and governance disclosure and default risk. *Business strategy and the environment, 30*(8), 3937-3959.

Attig, N., Cleary, S., El Ghoul, S., et al. (2012). Institutional investment horizon and investment–cash flow sensitivity. *Journal of Banking & Finance, 36*(4), 1164-1180.

Ball, R., & Shivakumar, L. (2006). The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research, 44*(2), 207-242.

Bao, X., Sun, B., Han, M., et al. (2024). Corporate integrity culture on environmental, social, and governance (ESG) performance. *Corporate Social Responsibility and Environmental Management, 31*(2), 1399-1417.

Barko, T., Cremers, M., & Renneboog, L. (2022). Shareholder engagement on environmental, social, and governance performance. *Journal of Business Ethics, 180*(2), 777-812.

Beneish, M. D., Billings, M. B., & Hodder, L. D. (2008). Internal control weaknesses and information uncertainty. *The accounting review, 83*(3), 665-703.

Bertomeu, J., Cheynel, E., Li, E. X., et al. (2021). How pervasive is earnings management? Evidence from a structural model. *Management Science, 67*(8), 5145-5162.

Bofinger, Y., Heyden, K. J., & Rock, B. (2022). Corporate social responsibility and market efficiency: Evidence from ESG and misvaluation measures. *Journal of Banking & Finance, 134*, 106322.

Borochin, P., & Yang, J. (2017). The effects of institutional investor objectives on firm valuation and governance. *Journal of financial economics, 126*(1), 171-199.

Broadstock, D. C., Chan, K., Cheng, L. T., et al. (2021). The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. *Finance Research Letters, 38*, 101716.

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys, 22*(1), 31-72.

Callen, J. L., & Fang, X. (2015). Religion and stock price crash risk. *Journal of Financial and Quantitative Analysis, 50*(1-2), 169-195.

Cao, Z., Jiang, F., & Wang, D. (2024). Performance shortfalls, response directions, and belief in the effectiveness of responses. *Academy of management Journal, 67*(1), 178-207.

Capelle-Blancard, G., & Petit, A. (2019). Every little helps? ESG news and stock market reaction. *Journal of Business Ethics, 157*, 543-565.

Chari, M. D., David, P., Duru, A., et al. (2019). Bowman's risk-return paradox: An agency theory perspective. *Journal of Business Research, 95*, 357-375.

Chen, H., Yang, D., Zhang, J. H., et al. (2020). Internal controls, risk management, and cash holdings. *Journal of Corporate Finance, 64*, 101695.

Chen, S., Song, Y., & Gao, P. (2023). Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance. *Journal of Environmental Management, 345*, 118829.

Chen, T., Dong, H., & Lin, C. (2020). Institutional shareholders and corporate social responsibility. *Journal of financial economics, 135*(2), 483-504.

Cox, P., Brammer, S., & Millington, A. (2004). An empirical examination of institutional investor preferences for corporate social performance. *Journal of Business Ethics, 52*, 27-43.

Cui, J., Jo, H., & Na, H. (2018). Does corporate social responsibility affect information asymmetry? *Journal of Business Ethics, 148*, 549-572.

Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The accounting review, 77*(s-1), 35-59.

DuCharme, L. L., Malatesta, P. H., & Sefcik, S. E. (2004). Earnings management, stock issues, and shareholder lawsuits. *Journal of financial economics, 71*(1), 27-49.

Dutta, S., & Gigler, F. (2002). The effect of earnings forecasts on earnings management. *Journal of Accounting Research, 40*(3), 631-655.

Dyck, A., Lins, K. V., Roth, L., et al. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of financial economics, 131*(3), 693-714.

Edmans, A. (2023). The end of ESG. *Financial Management, 52*(1), 3-17.

Ferreira, M. A., & Matos, P. (2008). The colors of investors' money: The role of institutional investors around the world. *Journal of financial economics, 88*(3), 499-533.

Fich, E. M., Harford, J., & Tran, A. L. (2015). Motivated monitors: The importance of institutional investors′ portfolio weights. *Journal of financial economics, 118*(1), 21-48.

Galbreath, J. (2013). ESG in focus: The Australian evidence. *Journal of Business Ethics, 118*, 529-541.

Gao, H., & Huiyu, W. (2021). The impact of environmental rule of law on bond financing cost: evidence from environmental courts in China *Journal of Financial Research, 498*(12), 133-151.

Garcia, A. S., Mendes-Da-Silva, W., & Orsato, R. J. (2017). Sensitive industries produce better ESG performance: Evidence from emerging markets. *Journal of Cleaner Production, 150*, 135-147.

Gigante, G., & Manglaviti, D. (2022). The ESG effect on the cost of debt financing: A sharp RD analysis. *International Review of Financial Analysis, 84*, 102382.

Goss, A., & Roberts, G. S. (2011). The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking & Finance, 35*(7), 1794-1810.

Halbritter, G., & Dorfleitner, G. (2015). The wages of social responsibility—where are they? A critical review of ESG investing. *Review of Financial Economics, 26*, 25-35.

He, F., Du, H., & Yu, B. (2022). Corporate ESG performance and manager misconduct: Evidence from China. *International Review of Financial Analysis, 82*, 102201.

He, F., Feng, Y., & Hao, J. (2023). Corporate ESG rating and stock market liquidity: Evidence from China. *Economic Modelling, 129*, 106511.

He, F., Guo, X., & Yue, P. (2024). Media coverage and corporate ESG performance: Evidence from China. *International Review of Financial Analysis, 91*, 103003.

Hemingway, C. A., & Maclagan, P. W. (2004). Managers' personal values as drivers of corporate social responsibility. *Journal of Business Ethics, 50*, 33-44.

Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque financial reports, R2, and crash risk.

Journal of financial economics, 94(1), 67-86.

Jia, N. (2018). Tournament incentives and stock price crash risk. *Accounting Horizons, 32*(3), 101-121.

Jiang, F., Cai, X., & Zheng, X. (2024). The boss behind the scenes: Nonfamily leadership and earnings management. *European Accounting Review, 33*(2), 647-675.

Jiang, Y., & Yao, S. (2024). ESG Disclosure, External Concerns, and Firm Risk. *Journal of Systems & Management, 33*(1), 214.

Jin, C., Monfort, A., Chen, F., et al. (2024). Institutional investor ESG activism and corporate green innovation against climate change: Exploring differences between digital and non-digital firms. *Technological Forecasting and Social Change, 200*, 123129.

Jin, L., & Myers, S. C. (2006). R2 around the world: New theory and new tests. *Journal of financial economics, 79*(2), 257-292.

Jones, J. J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research, 29*(2), 193-228.

Kałdoński, M., Jewartowski, T., & Mizerka, J. (2020). Capital market pressure, real earnings management, and institutional ownership stability-Evidence from Poland. *International Review of Financial Analysis, 71*, 101315.

Kim, I., Wan, H., Wang, B., et al. (2019). Institutional investors and corporate environmental, social, and governance policies: Evidence from toxics release data. *Management Science, 65*(10), 4901-4926.

Kim, Y., Li, H., & Li, S. (2014). Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance, 43*, 1-13.

Kim, Y., Park, M. S., & Wier, B. (2012). Is earnings quality associated with corporate social responsibility? *The accounting review, 87*(3), 761-796.

Koh, P.-S. (2007). Institutional investor type, earnings management and benchmark beaters. *Journal of accounting and public policy, 26*(3), 267-299.

Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of financial economics, 115*(2), 304-329.

Kuusela, P., Keil, T., & Maula, M. (2017). Driven by aspirations, but in what direction? Performance shortfalls, slack resources, and resource‐consuming vs. resource‐freeing organizational change. *Strategic management journal, 38*(5), 1101-1120.

Lee, D. D., Fan, J. H., & Wong, V. S. (2021). No more excuses! Performance of ESG‐integrated portfolios in Australia. *Accounting & Finance, 61*, 2407-2450.

Lee, M. T., & Raschke, R. L. (2023). Stakeholder legitimacy in firm greening and financial performance: What about greenwashing temptations?☆. *Journal of Business Research, 155*, 113393.

Leung, T. C.-H., & Snell, R. S. (2021). Strategies for social and environmental disclosure: The case of multinational gambling companies. *Journal of Business Ethics, 168*(3), 447-467.

Levinsohn, J., & Petrin, A. (2003). Estimating production functions using inputs to control for unobservables. *The review of economic studies, 70*(2), 317-341.

Lioui, A., & Tarelli, A. (2022). Chasing the ESG factor. *Journal of Banking & Finance, 139*, 106498.

Liu, G., & Zhang, C. (2020). Economic policy uncertainty and firms' investment and financing decisions in China. *China Economic Review, 63*, 101279.

Liu, Z., Shen, H., Welker, M., et al. (2021). Gone with the wind: An externality of earnings pressure. *Journal of Accounting and Economics, 72*(1), 101403.

Luo, W., Tian, Z., Fang, X., et al. (2023). Can good ESG performance reduce stock price crash risk?

Evidence from Chinese listed companies. *Corporate Social Responsibility and Environmental Management*.

Mao, Q., & Wang, Y. (2023). Employment effects of ESG: Evidence from Chinese listed companies. *Economic Research Journal, 58*(7), 86-103.

Meier, C. (2018). Aggregate investor confidence in the stock market. *Journal of Behavioral Finance, 19*(4), 421-433.

Nekhili, M., Javed, F., & Nagati, H. (2022). Audit partner gender, leadership and ethics: The case of earnings management. *Journal of Business Ethics, 177*(2), 233-260.

Ng, A. C., & Rezaee, Z. (2015). Business sustainability performance and cost of equity capital. *Journal of Corporate Finance, 34*, 128-149.

Nirino, N., Santoro, G., Miglietta, N., et al. (2021). Corporate controversies and company's financial performance: Exploring the moderating role of ESG practices. *Technological Forecasting and Social Change, 162*, 120341.

Nofsinger, J. R., Sulaeman, J., & Varma, A. (2019). Institutional investors and corporate social responsibility. *Journal of Corporate Finance, 58*, 700-725.

Parrino, R., Sias, R. W., & Starks, L. T. (2003). Voting with their feet: Institutional ownership changes around forced CEO turnover. *Journal of financial economics, 68*(1), 3-46.

Raimo, N., Caragnano, A., Zito, M., et al. (2021). Extending the benefits of ESG disclosure: The effect on the cost of debt financing. *Corporate Social Responsibility and Environmental Management, 28*(4), 1412-1421.

Ren, G., Zeng, P., & Zhong, X. (2024). Differentiation strategies and firms' environmental, social and governance: The different moderating effects of historical and social performance shortfalls. *Corporate Social Responsibility and Environmental Management, 31*(1), 719-740.

Schulz, A. C., & Wiersema, M. F. (2018). The impact of earnings expectations on corporate downsizing. *Strategic management journal, 39*(10), 2691-2702.

Shanaev, S., & Ghimire, B. (2022). When ESG meets AAA: The effect of ESG rating changes on stock returns. *Finance Research Letters, 46*, 102302.

Shi, J., Yu, C., Li, Y., et al. (2022). Does green financial policy affect debt-financing cost of heavy-polluting enterprises? An empirical evidence based on Chinese pilot zones for green finance reform and innovations. *Technological Forecasting and Social Change, 179*, 121678.

Taddeo, S., Agnese, P., & Busato, F. (2024). Rethinking the effect of ESG practices on profitability through cross-dimensional substitutability. *Journal of Environmental Management, 352*, 120115.

Teng, M. J., & Wu, S. Y. (2018). Sustainable development and competitive advantages–utilizing matching to overcome sample selection bias. *Corporate Social Responsibility and Environmental Management, 25*(4), 313-326.

Trahan, R. T., & Jantz, B. (2023). What is ESG? Rethinking the “E” pillar. *Business strategy and the environment, 32*(7), 4382-4391.

Verschoor, C. C. (1998). A study of the link between a corporation's financial performance and its commitment to ethics. *Journal of Business Ethics, 17*(13), 1509-1516.

Wang, F., & Ge, X. (2022). Can Low-earbon Transition Impact Employment Empirical Evidence from Low-earbon City Pilot Policy. *China Industrial Economics, 410*(05), 81-99.

Wang, S., Zhang, R., Wan, L., et al. (2023). Has Central Government Environmental Protection Interview Improved Air Quality in China? *Ecological Economics, 206*, 107750.

Wang, S., Zhang, R., Yang, Y., et al. (2023). Has enterprise digital transformation facilitated the carbon performance in Industry 4.0 era? Evidence from Chinese industrial enterprises. *Computers & Industrial Engineering, 184*, 109576.

Wang, X., & Ye, Y. (2024). Environmental protection tax and firms' ESG investment: Evidence from China. *Economic Modelling, 131*, 106621.

Ward, C., Yin, C., & Zeng, Y. (2018). Institutional investor monitoring motivation and the marginal value of cash. *Journal of Corporate Finance, 48*, 49-75.

Wu, X., Guo, X., & Qiao, Z. (2019). Institutional investor clique and stock price crash risk. *China Industrial Economics, 2*, 117-135.

Xu, N., Li, X., Yuan, Q., et al. (2014). Excess perks and stock price crash risk: Evidence from China. *Journal of Corporate Finance, 25*, 419-434.

Yu, H., Liang, C., Liu, Z., et al. (2023). News-based ESG sentiment and stock price crash risk. *International Review of Financial Analysis, 88*, 102646.

Yusoff, Y. H., Hadzlan, T. P. N. T. M., Nazli, S. S. A., et al. (2023). Role of Due Diligence in Combating Money Laundering in Lens of ESG: A Concept. *Accounting and Finance Research, 12*(4), 1-72.

Zeng, H., Ren, L., Chen, X., et al. (2024). Punishment or deterrence? Environmental justice construction and corporate equity financing—Evidence from environmental courts. *Journal of Corporate Finance*, 102583.

Zhang, C., Li, Z., Xu, J., et al. (2024). Accounting information quality, firm ownership and technology innovation: Evidence from China. *International Review of Financial Analysis*, 103118.

Zhang, R., Wang, S., & Yuan, C. (2024). Shock or opportunity? Unveiling the effect of low-carbon transition on employment. *Journal of Environmental Management, 359*, 120885.

Zubeltzu‐Jaka, E., Andicoechea‐Arondo, L., & Alvarez Etxeberria, I. (2018). Corporate social responsibility and corporate governance and corporate financial performance: Bridging concepts for a more ethical business model. *Business Strategy & Development, 1*(3), 214-222.