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Does Fulfilling ESG Responsibilities Curb Corporate Leverage Manipulation? Evidence from Chinese-Listed Companies

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Abstract: Against the backdrop of economic transformation and sustainable development, this paper utilizes listed companies from the Shanghai and Shenzhen A-share markets from 2009 to 2021 as research samples, measures corporate leverage manipulation levels using the XLT-LEVM method, and employs a panel fixed effects model to empirically examine the impact of corporate ESG responsibility fulfillment on leverage manipulation behaviors and its underlying mechanisms. The results show that the performance of ESG responsibility can inhibit the leverage manipulation behavior of enterprises, and this effect is more obvious in enterprises with low analyst attention and excessive debt. Mechanism tests reveal that the fulfillment of ESG responsibilities by corporations exerts both reputational and informational effects, which, by mitigating financing constraints and enhancing information transparency, subsequently curtail corporate leverage manipulation. The analysis of economic consequences demonstrates that the inhibitory effect of ESG responsibility fulfillment on corporate leverage manipulation contributes to reducing the risk of corporate debt default. The research conclusions of this paper hold instructive significance for the positive governance role of ESG performance. Consequently, governments and regulatory bodies should guide and support enterprises in assuming ESG responsibilities, and corporations should increase their investments in ESG and enhance their ESG performance.

Keywords: ESG responsibility fulfillment; corporate leverage manipulation; financing constraints; information transparency; debt default risk

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1. Introduction

High leverage among micro-enterprises is a potential trigger for systemic financial risks [1]. Since 2008, the leverage ratio of non-financial corporations in China has been continuously rising. Consequently, "deleveraging and risk prevention" have become critical tasks in economic operations [2]. Since 2015, China has initiated the implementation of a "deleveraging" policy, specifically demanding a reduction in leverage ratios from enterprises, particularly state-owned enterprises. However, under the pressures of regulation and financing, some enterprises have ostensibly reduced their leverage ratios, but in reality, they have engaged in leverage manipulation using accounting methods and financial tools such as off-balance-sheet financing and "formal equity, essential debt", thus concealing their true levels of debt [3,4]. Although corporate leverage manipulation can meet regulatory requirements and market expectations in the short term, in the long run, it may increase the risk of corporate debt default, damage its reputation and investor trust, and potentially lead to broader financial market instability [5,6]. Based on this, studying corporate leverage manipulation and its governance measures holds significant theoretical and practical value.

Against the backdrop of economic transformation, upgrading, and green sustainable development, the concept of ESG (environmental, social, and governance) has received widespread attention [7–9]. The ESG concept guides enterprises to shift from seeking short-term gains to pursuing long-term value and considering the interests of a broader range

of stakeholders, emphasizing that companies should consider environmental protection, social responsibility, and sound governance during their operations [10,11]. Corporate ESG performance not only reflects the social image and brand value of a company but also directly relates to its capacity to acquire capital and long-term development potential [12,13]. Existing research indicates that fulfilling ESG responsibilities can improve financial performance [14], enhance long-term corporate value [15], increase the level of green technological innovation [16], alleviate credit risk and financing constraints [17,18], and reduce the risk of stock price crashes [19]. Although existing studies extensively discuss the positive impacts of ESG responsibility fulfillment on corporate operations and financial performance, few scholars have deeply explored its role in curbing leverage manipulation behaviors. Can the fulfillment of corporate ESG responsibilities curb leverage manipulation behaviors? If so, how are the potential mechanisms of this influence manifested? Furthermore, does this impact exhibit heterogeneous effects due to the characteristics of the companies themselves? An in-depth exploration of these questions holds significant theoretical value and practical guidance for encouraging enterprises to adhere to higher standards of financial integrity and enhance their sustainable development capabilities.

In view of this, based on the theoretical deduction of the impact of ESG responsibility fulfillment on corporate leverage manipulation behaviors, this paper uses listed companies from the Shanghai and Shenzhen A-share markets from 2009 to 2021 as research samples, measures corporate leverage manipulation levels using the XLT-LEVM method, and employs a panel fixed effects model to empirically examine the relationship, transmission mechanisms, and heterogeneous effects between the two. Additionally, this paper conducts robustness tests on the research results by employing various methods, including the replacement of core variables, adjustment of the sample period, instrumental variable method (IV), and propensity score matching method (PSM). The research findings indicate that the fulfillment of ESG responsibilities suppresses corporate leverage manipulation behaviors. This effect is more pronounced in enterprises with lower analyst attention and those that are excessively indebted. Mechanism tests find that the fulfillment of ESG responsibilities by enterprises manifests reputational and informational effects, which, by alleviating financing constraints and enhancing information transparency, subsequently curtail corporate leverage manipulation. The analysis of economic consequences demonstrates that the inhibitory effect of fulfilling ESG responsibilities on corporate leverage manipulation contributes to reducing the risk of corporate debt default.

Compared to the existing literature, the potential marginal contributions of this paper are as follows. First, this study reveals the interactive effects between ESG responsibility fulfillment and corporate leverage manipulation, enriching the research on the direct effects of ESG responsibility on corporate leverage manipulation. Second, this paper deepens the research on the indirect effects of ESG responsibility fulfillment on corporate leverage manipulation. It explores the mechanisms of ESG responsibility's influence on leverage manipulation from perspectives such as financing constraints and information transparency and tests the economic consequences of ESG responsibility's impact on corporate leverage manipulation, offering new insights for better governance of corporate leverage manipulation behaviors. Third, this paper also explores the differential effects of ESG responsibility fulfillment on corporate leverage manipulation under varying levels of analyst attention and debt levels. This helps to gain a deeper understanding of the heterogeneity in the suppressive effects of ESG responsibility on leverage manipulation, further refining the related research. Fourth, the findings of this paper are of significant reference value for regulatory bodies in formulating relevant ESG policies and encouraging enterprises to continuously improve their ESG performance.

2. Theoretical Analysis and Research Hypotheses

2.1. Fulfillment of ESG Responsibilities and Corporate Leverage Manipulation

Complying with policy requirements, enhancing fundraising capabilities, improving credit ratings, and mitigating the risks of high leverage are the primary motivations for

enterprises to exploit regulatory loopholes for leverage manipulation [20,21]. By reviewing research findings on factors influencing corporate leverage manipulation, it is found that strengthening both internal and external governance and improving the financing environment can effectively curb corporate leverage manipulation [5,22–24]. Moreover, ESG practices are considered important means for enhancing corporate governance, improving financing conditions, and promoting sustainable development [15,25]. By actively practicing ESG principles, enterprises can curb leverage manipulation behaviors in multiple dimensions.

Firstly, according to the theories of sustainable development and corporate social responsibility, the process of strengthening ESG practices often fosters a more responsible and ethically high-standard orientation towards long-term value in enterprises [26]. The internalization of a sense of social responsibility and sustainable development principles prompts management and employees to conduct business activities in compliance with regulations, thereby reducing behaviors that pursue short-term gains at the expense of the company's long-term value and reputation, fundamentally curbing leverage manipulation behaviors [27]. Secondly, the governance dimension of ESG emphasizes strengthening internal control and compliance [28]. According to principal-agent theory, in the absence of appropriate supervision and incentive mechanisms, managers may resort to leverage manipulation to beautify financial indicators and maximize their tenure rewards [29]. Through the fulfillment of ESG responsibilities, companies can enhance their corporate governance levels, thereby adopting stricter supervision and control processes to inspect, restrict, and curb leverage manipulation behaviors [30]. Furthermore, according to stakeholder theory, actively fulfilling ESG responsibilities meets stakeholders' expectations for higher standards of business management, which helps companies establish and maintain long-term stable relationships with key stakeholders. This, in turn, enhances the company's brand image and market recognition, thereby increasing corporate value and earnings sustainability [31,32]. The improvement in long-term value and financial stability alleviates financial pressure on companies, thereby reducing the motivation for leverage manipulation. Therefore, we propose the following research hypothesis:

Hypothesis 1 (H1). *The fulfillment of corporate ESG responsibilities can curb corporate leverage manipulation behaviors.*

2.2. Fulfillment of ESG Responsibilities and Corporate Leverage Manipulation: The Mediating Role of Financing Constraints

The fulfillment of corporate ESG responsibilities is conducive to alleviating financing constraints, thereby suppressing the motivation of enterprises to engage in leverage manipulation due to financing pressure. Corporate ESG information disclosure is a beneficial supplement to traditional financial information of enterprises, helping investors comprehensively evaluate the condition of enterprises, reduce risk premiums, and enable enterprises to obtain lower-cost financing [33,34]. According to reputation theory and signaling theory, enterprises engaging in ESG practices not only enhance their social reputation but also send positive signals to the market and stakeholders about their reliability and sense of responsibility [35]. This helps reduce potential investors' and creditors' concerns and perceived risks regarding the future operations of the enterprise, thereby enabling the enterprise to secure lower capital costs and improve the availability of debt financing [36]. On the other hand, according to stakeholder theory, enterprises can establish more stable and amicable stakeholder relationships through high standards of environmental, social, and governance practices [37,38]. The establishment of good relationships not only enhances the enterprise's trustworthiness among business partners and within the supply chain but also strengthens its bargaining power in business credit and transactions, thereby enabling the enterprise to secure more commercial credit financing [39]. Additionally, the fulfillment of corporate ESG responsibilities aligns with the current policy direction of green sustainable development and coordinated shared growth. Enterprises with higher ESG scores are more likely to receive green credits and government subsidies [40,41]. The

combined effect of these factors enables enterprises actively fulfilling ESG responsibilities to maintain greater flexibility and stability in their capital structure and financing strategies, effectively reducing the motivation and necessity for leverage manipulation. Therefore, we propose the following research hypothesis:

Hypothesis 2 (H2). *The fulfillment of corporate ESG responsibilities can curb corporate leverage manipulation by alleviating financing constraints.*

2.3. Fulfillment of ESG Responsibilities and Corporate Leverage Manipulation: The Mediating Role of Information Transparency

In an environment of information asymmetry, corporate ESG practices and ratings play a crucial role, effectively enhancing the transparency of information, which in turn curbs corporate leverage manipulation behaviors. Specifically, the governance dimension within the ESG concept demands that enterprises optimize their governance structure. A high level of corporate governance can enhance the transparency of internal decision-making and the effectiveness of supervision, thereby curbing opportunistic behaviors by management and improving the timeliness and accuracy of external information disclosure [42,43]. Furthermore, according to optimal discrimination theory, when companies actively engage in ESG practices, they tend to disclose more detailed ESG information to distinguish themselves from companies with poor ESG performance [27]. ESG performance, as a crucial component of a company's non-financial information, provides external investors with incremental information about the company's operations and development. This effectively improves the information disadvantage of external investors and helps to reduce internal and external information asymmetry [44]. Additionally, good ESG performance is conducive to attracting the attention of external entities such as institutional investors, analysts, and the media [45]. On the one hand, the attention from external entities can exert a supervisory effect, curbing opportunistic behaviors in corporate information disclosure, thereby enhancing the authenticity and reliability of the information [46]. On the other hand, analysts, institutional investors, and other subjects can play a role in "information revelation", leveraging their expertise to delve into, analyze, and disseminate corporate information through research reports and other means, reducing the asymmetry between internal and external corporate information [47]. The higher the transparency of company information, the greater the risk of management's leverage manipulation being detected and, thus, the weaker the motivation for such manipulation. Based on these considerations, we propose the following research hypothesis:

Hypothesis 3 (H3). *The fulfillment of corporate ESG responsibilities can curb corporate leverage manipulation by enhancing the transparency of corporate information.*

3. Research Design

3.1. Variable Selection and Data Sources

The ESG rating of Huazheng was publicly released in 2009; therefore, this paper uses Chinese-listed companies on the Shanghai and Shenzhen A-shares from 2009 to 2021 as the initial research sample. The Huazheng ESG rating information is sourced from the Huazheng A-share Data Service Platform. The ratings are based on information from listed companies' annual reports, announcements, social responsibility reports, ESG reports, official website information, and third-party data providers. Other relevant corporate financial data and industry data in this paper are sourced from the CSMAR database and the Wind database. These two databases are among the most comprehensive and authoritative financial databases in China. Their data are sourced from official or authoritative institutions and undergo rigorous data validation, ensuring accuracy and reliability. To ensure the reliability of the research conclusions, this paper follows the conventional practices of previous studies to process the initial sample as follows: (1) exclude listed financial and insurance companies; (2) exclude companies listed as ST, *ST, and PT; (3) exclude samples

with missing data; and (4) Winsorize continuous variables at the 1% tails. Through the above screening procedures, this paper ultimately obtained a total of 27,989 observation samples from 3930 listed companies across various industries. Panels A, B, and C in Table 1 display the industry distribution, annual distribution, and ownership structure distribution of the 27,989 observations, respectively.

Table 1. Sample distribution.

	Freq	Percent	Cum
Panel A: Sample distribution by industry			
Agriculture, forestry, livestock farming, fishery	386	0.01	0.01
Mining	706	0.03	0.04
Manufacturing	18,412	0.66	0.70
Production and supply of electricity, gas, and water	1016	0.04	0.73
Construction	789	0.03	0.76
Transportation	1503	0.05	0.82
Information transmission, software, and information technology service	844	0.03	0.85
Wholesale and retail	20	0.00	0.85
Hotel and catering industry	1621	0.06	0.90
Real estate	1248	0.04	0.95
Leasing and commerce service	338	0.01	0.96
Scientific research and technology service	227	0.01	0.97
Water conservancy, environment, and public facilities management	361	0.01	0.98
Resident services and other services	19	0.00	0.98
Hygienism and social work	3	0.00	0.98
Culture, sports, and entertainment	332	0.01	0.99
Public management and social organization	164	0.01	1.00
Total	27,989	1.00	
Panel B: Sample distribution by year			
2009	761	0.03	0.03
2010	1286	0.05	0.07
2011	1563	0.06	0.13
2012	1777	0.06	0.19
2013	1917	0.07	0.26
2014	1981	0.07	0.33
2015	1990	0.07	0.40
2016	2209	0.08	0.48
2017	2378	0.08	0.57
2018	2782	0.10	0.67
2019	2926	0.10	0.77
2020	3068	0.11	0.88
2021	3351	0.12	1.00
Total	27,989	1	
Panel C: Sample distribution by Property Rights			
State-owned enterprises	17,484	62.5%	62.5%
Non-state-owned enterprises	10,505	37.5%	1.00
Total	27,989	1	

3.2. Model Design and Variable Description

To test the impact of ESG responsibility fulfillment on corporate leverage manipulation, this paper constructs a regression model (1):

$$LEVM_{i,t} = \alpha + \beta ESG_{i,t} + \gamma Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (1)$$

This paper expects the coefficient of the explanatory variable to be significantly negative, indicating that the fulfillment of ESG responsibilities can significantly curb corporate leverage manipulation behaviors. The definitions of the variables in the regression model (1) are detailed in the subsequent subsections.

3.2.1. Dependent Variable: Corporate Leverage Manipulation (LEVM)

This paper adopts the XLT-LEVM method proposed by Xu et al. to estimate the extent of corporate leverage manipulation [48]. The XLT-LEVM method can be divided into two categories: the basic XLT-LEVM method and the extended XLT-LEVM method. The basic XLT-LEVM method considers only off-balance-sheet liabilities and "formal equity, essential debt" instruments for narrow leverage manipulation, while the extended XLT-LEVM method considers broad leverage manipulation using accounting measures based on the basic method's measurement. The formulas for both methods are as follows:

$$BLEVM_{\mathrm{i,t}} = \frac{DT_{i,t} + DO_{i,t} + DN_{i,t}}{AD_{i,t} + DO_{i,t}} - LEVB_{\mathrm{i,t}} \quad (2)$$

$$ELEVM_{\mathrm{i,t}} = \frac{DT_{i,t} + DO_{i,t} + DN_{i,t}}{AD_{i,t} + DO_{i,t} - DA_{i,t}} - LEVB_{\mathrm{i,t}} \quad (3)$$

In the above formulas, BLEVM represents the extent of corporate leverage manipulation measured by the basic XLT-LEVM method; ELEVM represents the extent of corporate leverage manipulation measured by the extended XLT-LEVM method; DT, DO, and DN represent the total book debt, total off-balance-sheet debt, and total amount of "formal equity, essential debt" of the company, respectively, where DO and DN can be estimated using the industry median method and the expected model method; AD is the total book assets of the company; DA is the amount of accounting manipulation calculated by the direct method; and LEVB is the company's book leverage ratio. This paper references the research by Peng et al. [49], using the leverage manipulation rates measured by the industry median method under both the basic and extended XLT-LEVM methods as the dependent variables. In the robustness tests, the expected model method's measurement results are used as substitutes for the dependent variables.

3.2.2. Independent Variable: Fulfillment of ESG Responsibilities (ESG)

Currently, the academic community has not yet established a universally recognized evaluation system for the fulfillment of ESG responsibilities. Given that the sample in this paper consists of Chinese A-share listed companies, this study draws on the research by Zhang et al. [50] and uses the ESG Index of Huazheng, which is suitable for China, covers a broad range, spans a long time period, and is frequently updated, to measure corporate ESG responsibility fulfillment. Additionally, this paper assigns the Huazheng ESG evaluation system's C-AAA nine-tier rating values from one to nine sequentially. A higher score indicates better fulfillment of ESG responsibilities by the enterprise.

3.2.3. Control Variables

Control represents the control variables. Drawing on previous research, this paper controls for firm characteristics such as company size (Size), debt-to-asset ratio (Lev), revenue growth rate (Growth), return on total assets (ROA), years listed (ListAge), ownership concentration (Top10), cash flow ratio from operating activities (Cashflow), Tobin's Q (TobinQ), major shareholder funds occupation (Occupy), management shareholding ratio (Mshare), current ratio (Current), and whether the firm is audited by one of the Big Four accounting firms (Big4). Furthermore, to control for unobservable factors that do not vary over time and across industries, this paper includes fixed effects for the year (Year) and industry (Industry).

The specific definitions and calculation methods for each variable are provided in Table 2.

Table 2. Variable declaration.

Variable Symbol	Variable Name	Variable Definition
Size	Company size	The natural logarithm of total annual assets
Lev	Asset–liability ratio	The ratio of total liabilities to total assets at year-end

Table 2. *Cont.*

Variable Symbol	Variable Name	Variable Definition
Growth	Revenue growth rate	The ratio of the current year's operating revenue to the previous year's operating revenue − 1
ROA	Return on Total Assets	The ratio of net profit to the average balance of total assets
ListAge	Listed years	ln(current year–year of listing + 1)
Top10	Ownership concentration	The ratio of the number of shares held by the top ten shareholders to the total number of shares
Cashflow	Cash flow ratio	The ratio of net cash flows generated from operating activities to total assets at the end of the period
TobinQ	Tobin's Q	(market value of tradable shares + number of non-tradable shares × net asset value per share + book value of liabilities)/total assets
Occupy	Funds Occupying by Big Shareholders	Ratio of other receivables to total assets
Mshare	Management shareholding ratio	Ratio of management shareholdings to total shares outstanding
Current	Current ratio	Ratio of current assets to current liabilities at year-end
Big4	Whether audited by one of the Big Four accounting firms.	Coded as 1 if audited by one of the Big Four (PwC, Deloitte, KPMG, Ernst & Young), otherwise 0
Year	Year fixed effects	Annual dummy variables
Industry	Industry fixed effects	Industry dummy variables

3.3. Descriptive Analysis

Table 3 presents the descriptive statistics for each variable. As shown in Table 3, the estimates of the extent of corporate leverage manipulation are generally consistent with the measurements by Xu et al. [48]. The average values of narrow-scope leverage manipulation (BLEVM) and broad-scope leverage manipulation (ELEVM) are 0.109 and 0.110, respectively, which exceed the median value of 0.07. This indicates that leverage manipulation practices are relatively common among Chinese enterprises and that there is a substantial number of samples with high degrees of leverage manipulation. Regarding the ESG responsibility performance indicators, the maximum value is 8, and the minimum value is 1, indicating significant differences in the fulfillment of ESG responsibilities among enterprises. The mean value is 4.0996, which is close to the median, suggesting that the level of ESG commitment among Chinese enterprises is moderate on average and generally exhibits characteristics of a normal distribution. The distribution of other control variables falls within a reasonable range and is generally consistent with existing research.

Table 3. Descriptive statistics of variables.

VarName	Obs	Mean	SD	Min	Median	Max
ELEVM	27,989	0.1090	0.127	−0.07	0.07	0.55
BLEVM	27,989	0.1100	0.125	−0.00	0.07	0.54
ESG	27,989	4.0547	1.133	1.00	4.00	8.00
Size	27,989	22.2724	1.285	19.86	22.09	26.25
Lev	27,989	0.4540	0.200	0.08	0.45	0.91
Growth	27,989	0.1852	0.444	−0.56	0.11	2.92
ROA	27,989	0.0365	0.064	−0.25	0.04	0.21
ListAge	27,989	2.2057	0.773	0.00	2.40	3.33
Top10	27,989	0.5764	0.152	0.23	0.58	0.90
Cashflow	27,989	0.0449	0.068	−0.15	0.04	0.23
TobinQ	27,989	2.0212	1.288	0.85	1.60	8.46
Occupy	27,989	0.0166	0.026	0.00	0.01	0.16
Mshare	27,989	0.1168	0.185	0.00	0.00	0.67
Current	27,989	2.0283	1.625	0.32	1.54	10.11
Big4	27,989	0.0617	0.241	0.00	0.00	1.00

4. Empirical Results and Analysis

4.1. Benchmark Regression

Table 4 reports the benchmark regression results. Column (1) presents the estimates without any control variables, while column (2) includes the results of the regression after adding control variables and controlling for industry and year fixed effects. The results in Columns (1) and (2) show that the ESG regression coefficients are significantly negative at the 1% and 5% levels, respectively. After controlling for other influencing factors, the regression coefficients of ESG with corporate leverage manipulation are −0.0046 and −0.0045, respectively, both significant at the 1% level. This indicates that companies with good ESG performance place greater emphasis on long-term corporate value [30], making it easier for them to obtain social resources and policy support, thereby reducing the motivation and behavior of leverage manipulation [32]. Thus, research hypothesis 1 is validated.

Table 4. Benchmark regression results.

	(1)	(2)	(3)	(4)
	BLEVM	**ELEVM**	**BLEVM**	**ELEVM**
ESG	−0.0048 ***	−0.0014 **	−0.0046 ***	−0.0045 ***
	(−7.3519)	(−2.0403)	(−6.4527)	(−6.2966)
Size			−0.0133 ***	−0.0124 ***
			(−14.9065)	(−14.0003)
Lev			0.0377 ***	0.0273 ***
			(6.2340)	(4.5251)
Growth			0.0020	−0.0027
			(1.1610)	(−1.5837)
ROA			0.2611 ***	0.6933 ***
			(18.1340)	(48.2671)
ListAge			0.0070 ***	0.0086 ***
			(5.2377)	(6.4661)
Top10			0.0271 ***	0.0289 ***
			(4.7369)	(5.0712)
Cashflow			0.2143 ***	−0.2222 ***
			(17.8537)	(−18.5564)
TobinQ			−0.0037 ***	−0.0050 ***
			(−5.3645)	(−7.3344)
Occupy			0.3063 ***	0.2586 ***
			(10.0255)	(8.4831)
Mshare			−0.0353 ***	−0.0406 ***
			(−7.1629)	(−8.2618)
Current			−0.0091 ***	−0.0110 ***
			(−14.2939)	(−17.3929)
Big4			0.0261 ***	0.0247 ***
			(7.9550)	(7.5475)
_cons	0.1297 ***	0.1146 ***	0.3698 ***	0.3813 ***
	(46.7862)	(40.5438)	(19.3603)	(20.0078)
Year	No	No	Yes	Yes
Industry	No	No	Yes	Yes
N	27,989	27,989	27,989	27,989
R2	0.0019	0.0001	0.0675	0.1055
adj. R2	0.0019	0.0001	0.0661	0.1041

t-statistics in parentheses.** $p < 0.05$, *** $p < 0.01$.

4.2. Robustness Tests and Endogeneity Treatment

4.2.1. Replacing the Independent Variables

This paper references the study by Wu et al. [51], reassigning the independent variable ESG to obtain a new variable ESG2. Specifically, when a company's ESG rating is between A and AAA, it is assigned a value of 3; when the rating is between B and BBB, it is assigned a

value of 2; and when the rating is between C and CCC, it is assigned a value of 1. Columns (1) and (2) of Table 5 present the regression results after replacing the independent variable. The coefficients for ESG2 are consistently significant at the 1% level, indicating that the inhibitory effect of corporate ESG responsibility fulfillment on leverage manipulation behaviors remains even after replacing the explanatory variable.

Table 5. Robustness test results.

	(1)	(2)	(3)	(4)	(5)	(6)
	BLEVM	**ELEVM**	**BLEVM_I**	**ELEVM_I**	**BLEVM**	**ELEVM**
ESG2	−0.0100 ***	−0.0099 ***				
	(−5.8618)	(−5.7973)				
ESG			−0.0051 ***	−0.0054 ***	−0.0043 ***	−0.0042 ***
			(−4.2487)	(−4.4280)	(−5.1525)	(−5.0097)
_cons	0.3787 ***	0.3900 ***	0.3220 ***	0.3412 ***	0.3726 ***	0.3828 ***
	(19.8981)	(20.5359)	(10.0159)	(10.3773)	(16.5903)	(17.0437)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
N	27,989	27,989	27,989	27,989	21,570	21,570
R2	0.0673	0.1053	0.0260	0.0607	0.0672	0.0991
adj. R2	0.0658	0.1039	0.0245	0.0592	0.0654	0.0973

t-statistics in parentheses. *** $p < 0.01$.

4.2.2. Replacing the Dependent Variables

Referring to the study by Peng et al. [49], this paper re-measures the extent of corporate leverage manipulation using the expected model method under both the basic and extended XLT-LEVM methods (BLEVM_I/ELEVM_I) and incorporates these into the regression model. The regression results are shown in columns (3) and (4) of Table 5. The ESG regression coefficients are significantly negative at the 1% level, indicating that the findings of this study are robust.

4.2.3. Excluding the Impact of COVID-19

The sudden outbreak of "COVID-19" in 2020 exacerbated the operational and debt repayment pressures on enterprises [52], leading them to potentially employ accounting measures such as leverage manipulation to cope with economic uncertainties and market pressures. To exclude the impact of the COVID-19 pandemic, this paper adjusts the sample time window to 2009 to 2019. The regression results, shown in columns (5) and (6) of Table 5, are consistent with previous findings, indicating that the results of this study are relatively robust.

4.2.4. Instrumental Variables Method

Generally, the ESG performance of other companies within the same industry and period can influence an individual company's ESG performance through competitive pressure and imitation effects, but it usually does not directly affect the individual company's leverage manipulation behavior. Moreover, the leverage manipulation behavior of a single company is unlikely to impact macro industry variables. Therefore, this paper follows the empirical approach of Wang and Yang [53], using the average ESG rating of other companies in the same industry and year as the instrumental variable, and employs the instrumental variable (IV) 2SLS estimation to mitigate endogeneity issues arising from omitted variables and reverse causality. Table 6 reports the 2SLS regression results using an instrumental variable. The first stage regression results are shown in column (1) of Table 6, where the regression coefficient for the instrumental variable ESG_IV is 0.3599, significantly positive at the 1% level, meeting the relevance criterion for the selection of instrumental variables. The second-stage regression results are presented in columns (2) and (3) of Table 6, where the coefficient for ESG is significantly negative at the 1% level, and

the results have passed tests for over-identification and weak instrument issues, confirming the effectiveness of the instrumental variable. These findings indicate that the conclusions of this study remain robust after accounting for endogeneity issues.

Table 6. Regression results of instrumental variable method.

	(1)	(2)	(3)
	The First Stage ESG	**The Second Stage BLEVM**	**The Second Stage ELEVM**
ESG_IV	0.3599 ***		
	(16.9010)		
ESG		−0.0227 ***	−0.0234 ***
		(−3.1484)	(−3.2493)
_cons	−3.2011 ***	0.3280 ***	0.3360 ***
	(−17.9364)	(13.7059)	(14.0434)
Controls	Yes	Yes	Yes
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	27062	27062	27062
R2	0.1876	0.0429	0.0751
adj. R2	0.1863	0.0413	0.0736
Cragg-Donald Wald Fstatistic		285.643	285.643
		{16.38}	{16.38}
LM statistic		283.13	283.13
		{0.0000}	{0.0000}

t-statistics in parentheses. *** $p < 0.01$.

4.2.5. Lagging the Independent Variables by One Period

To avoid endogeneity issues stemming from potential bidirectional causality between corporate ESG responsibility fulfillment and corporate leverage manipulation within the same period, this paper re-estimates the original model by lagging the explanatory and control variables by one period. The regression results, displayed in columns (1) and (2) of Table 7, remain consistent with the conclusions of previous research.

Table 7. Regression results of lagged independent variable by one period and propensity score matching method.

	(1)	(2)	(3)	(4)
	BLEVM	**ELEVM**	**BLEVM**	**ELEVM**
L_ESG	−0.0036 ***	−0.0022 ***		
	(−4.5398)	(−2.7370)		
ESG			−0.0048 ***	−0.0049 ***
			(−4.6990)	(−4.7233)
_cons	0.3187 ***	0.3166 ***	0.3355 ***	0.3571 ***
	(14.8246)	(14.4584)	(10.8563)	(11.5646)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	22224	22224	12088	12088
R2	0.0534	0.0493	0.0688	0.0982
adj. R2	0.0516	0.0475	0.0654	0.0949

t-statistics in parentheses. *** $p < 0.01$.

4.2.6. Propensity Score Matching Method (PSM)

To mitigate potential sample selection bias in the model, this paper employs the propensity score matching method (PSM) to regress on the matched samples. Specifically, using the mean ESG score as the threshold, companies with ESG scores above the mean

are classified as the treatment group, while those below are considered the control group. Additionally, this paper selects control variables along with industry and annual dummy variables as covariates and matches using a 1:1 nearest-neighbor matching method. The regression results for the matched samples are shown in columns (3) and (4) of Table 7. The ESG coefficients remain significantly negative at the 1% level, indicating that the conclusions of this paper still hold after accounting for sample selection bias.

5. Further Research

5.1. Mechanism Tests

The benchmark regression results confirm that corporate ESG responsibility fulfillment significantly curtails leverage manipulation behaviors. This paper aims to further explore the potential mechanisms behind this effect. Based on the theoretical analysis presented earlier, this paper posits that the fulfillment of ESG responsibilities may affect corporate leverage manipulation behaviors through two mechanisms: alleviating financing constraints and enhancing information transparency. Consequently, this paper adopts Jiang's [54] approach to mechanism testing and constructs the following model:

$$M_{i,t} = \alpha + \beta ESG_{i,t} + \gamma Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (4)$$

In Model (4), M represents the mechanism variable, which includes proxy variables for financing constraints and information transparency. The definitions of the remaining variables are the same as in Model (1).

5.1.1. Mechanism Test for Financing Constraints

This paper, referencing the study by Kaplan [55], constructs the KZ index to measure the extent of financing constraints a company faces, with a higher KZ value indicating greater financing constraints. Additionally, following the research by Zhang et al. [56], this study uses the net amount of funds obtained through commercial credit as a percentage of total assets (NTC) as an inverse indicator of financing constraints. The empirical results for the financing constraints mechanism are shown in columns (1) and (2) of Table 8. In column (1), the ESG coefficient is −0.0373, significant at the 1% level, indicating that fulfilling ESG responsibilities can alleviate a company's financing constraints. In column (2), the ESG coefficient is 0.0043, also significant at the 1% level, suggesting that corporate ESG responsibility fulfillment can enhance the company's net commercial credit financing. The alleviation of financing constraints reduces the motivation for companies to manipulate leverage as a means to ease funding pressures and meet financing needs [23]. Therefore, corporate ESG responsibility fulfillment can curb corporate leverage manipulation by alleviating financing constraints, confirming hypothesis 2.

Table 8. Regression results for mechanism tests.

	(1)	(2)	(3)	(4)
	KZ	**NTC**	**Trans**	**ASY**
ESG	−0.0373 ***	0.0043 ***	0.0213 ***	−0.0097 ***
	(−7.3926)	(6.2942)	(27.8377)	(−8.3281)
_cons	1.5377 ***	−0.2689 ***	−1.1803 ***	4.5260 ***
	(11.3583)	(−14.7623)	(−57.5017)	(145.0110)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	27,989	27,989	27,989	27,989
R2	0.8342	0.2859	0.5460	0.6536
adj. R2	0.8340	0.2848	0.5453	0.6530

t-statistics in parentheses. *** $p < 0.01$.

5.1.2. Mechanism Test for Information Transparency

This paper, referencing the research by Xia et al. [57], constructs a composite indicator of information transparency (Trans) using the average percentile ranks of five measures of corporate information transparency: earnings quality, information disclosure assessment index, audit quality, number of analysts following, and accuracy of analysts' earnings forecasts. A higher Trans value indicates greater corporate information transparency. Additionally, following the study by Yu et al. [58], an inverse indicator of information transparency (ASY) is constructed through a principal component analysis of the current ratio, non-current ratio, and earnings reversal indicators. A higher ASY value indicates greater information asymmetry. The empirical results for the information transparency mechanism are presented in columns (3) and (4) of Table 8. Column (3) shows that the regression coefficient of ESG and information transparency (Trans) is 0.0213, significantly positive at the 1% level. Column (4) indicates that the regression coefficient between ESG performance and information asymmetry (ASY) is significantly negative at the 1% level. The above results indicate that companies actively fulfilling their ESG responsibilities can enhance their information transparency, which is consistent with the findings of previous literature [7]. Higher information transparency strengthens the supervisory effectiveness of external governance entities, increasing the difficulty and cost of corporate leverage manipulation, thereby reducing the likelihood of such behavior [21]. Therefore, corporate ESG responsibility can exert an information effect, restraining corporate leverage manipulation behaviors by enhancing corporate information transparency, supporting Hypothesis 3.

5.2. Heterogeneity Analysis

5.2.1. Heterogeneity Analysis of Analyst Attention

As crucial external oversight figures in the capital market, analysts can leverage their professional expertise to optimize the information environment between enterprises and the market, thereby reducing the degree of information asymmetry both internally and externally within companies [59]. The supervisory governance role of analyst attention can diminish the internal informational advantages held by corporate management for leverage manipulation, thereby suppressing such manipulation [21]. Consequently, there may be a substitutive effect between the influence of analyst attention and corporate ESG responsibility performance on mitigating leverage manipulation [19]. In companies with lower levels of analyst attention, the increased information asymmetry augments the opportunities for corporate leverage manipulation. Enhancing the level of ESG responsibility fulfillment can significantly improve information transparency, which in turn reduces the motivation and likelihood of corporate leverage manipulation. Therefore, the effect of ESG responsibility fulfillment in curbing leverage manipulation may be more pronounced in companies with lower analyst attention. To test this, this paper refers to Lehmann [60] and measures analyst attention by taking the natural logarithm of the number of analysts following a listed company plus one, and groups and regresses based on whether analyst attention is above the annual median, with related results shown in Table 9. The regression results indicate that in the group with low analyst attention, ESG is significantly negatively correlated with both BLEVM and ELEVM at the 1% level, while in the high analyst attention group, the ESG coefficient is significantly negative at the 5% level. Additionally, the absolute value of the ESG coefficient in the low analyst attention group is greater than that in the high analyst attention group. This suggests that compared to companies with high analyst attention, the fulfillment of ESG responsibilities has a more pronounced effect on curbing leverage manipulation behaviors in companies with low analyst attention, further validating the pathway of information transparency.

Table 9. Heterogeneity analysis: analyst attention.

	(1)	(2)	(3)	(4)
	High Analyst Attention BLEVM	**Low Analyst Attention BLEVM**	**High Analyst Attention ELEVM**	**Low Analyst Attention ELEVM**
ESG	−0.0023 **	−0.0063 ***	−0.0023 **	−0.0061 ***
	(−2.1703)	(−6.4292)	(−2.1994)	(−6.2312)
_cons	0.3276 ***	0.4214 ***	0.3375 ***	0.4181 ***
	(11.4173)	(13.0353)	(11.7961)	(12.9408)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	13178	14811	13178	14811
R2	0.0986	0.0602	0.1143	0.1122
adj. R2	0.0955	0.0575	0.1114	0.1096

t-statistics in parentheses.** $p < 0.05$, *** $p < 0.01$.

5.2.2. Heterogeneity Analysis of Over-Indebtedness

Over-indebted companies are highly dependent on external financing, but due to their high financial stress and risk of debt default, their financing channels are limited, and they face higher financing costs, thereby having a stronger inclination to engage in leverage manipulation [2]. Corporate fulfillment of ESG responsibilities by enhancing corporate reputation, improving financing conditions, and increasing market trust directly alleviates the financing constraints and debt pressures of over-indebted companies, effectively reducing the necessity and motivation for leverage manipulation. In contrast, although companies that are not over-indebted also benefit from fulfilling ESG responsibilities, due to the absence of similar levels of financing pressure, the effect of ESG fulfillment in alleviating financing constraints and thus curbing leverage manipulation is not as pronounced as in over-indebted companies. To verify this hypothesis, this paper follows the method used by Chang et al. [61] for calculating over-indebtedness, classifying samples into over-indebted and not-over-indebted companies based on whether the difference between the book debt ratio and the target debt ratio is greater than zero, and then conducts group regression, with results as shown in Table 10. The regression results indicate that for over-indebted companies, ESG is significantly negatively correlated with both BLEVM and ELEVM at the 1% level; for companies that are not over-indebted, the ESG coefficient is significantly negative at the 10% level. Additionally, the absolute value of the ESG coefficient in the over-indebted group is greater than that in the not-over-indebted group. This shows that compared to companies that are not over-indebted, the fulfillment of ESG responsibilities has a more pronounced effect in curbing leverage manipulation behaviors in over-indebted companies, further validating the pathway of financing constraints.

Table 10. Heterogeneity analysis: over-indebtedness.

	(1)	(2)	(3)	(4)
	Not Over-Indebted BLEVM	**Over-Indebted BLEVM**	**Not Over-Indebted ELEVM**	**Over-Indebted ELEVM**
ESG	−0.0021 *	−0.0074 ***	−0.0021 *	−0.0071 ***
	(−1.9284)	(−7.9439)	(−1.9025)	(−7.7080)
_cons	0.4911 ***	0.2903 ***	0.4954 ***	0.3191 ***
	(16.5317)	(11.2835)	(16.6522)	(12.4916)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	13813	14176	13813	14176
R2	0.0913	0.0624	0.1049	0.1317
adj. R2	0.0884	0.0595	0.1021	0.1291

t-statistics in parentheses. * $p < 0.1$, *** $p < 0.01$.

5.3. Economic Consequences Analysis

Existing research indicates that corporate leverage manipulation behaviors may lead to implicit debt issues, increasing the potential risk of debt default for companies [22]. Meanwhile, the practice of ESG can have reputation and governance effects that reduce the cost of debt financing, mitigate agency problems, and decrease operational risks [62]. Thus, can the fulfillment of ESG responsibilities help reduce corporate debt default risk by curbing leverage manipulation behaviors? To explore this question, this paper uses the Naive model proposed by Bharath and Shumway [63] to estimate the default probability (EDF) as a proxy variable for corporate debt default risk. Additionally, referencing the study by Sun et al. [64], a post hoc corporate debt default dummy variable (Violate) is set up. Violate is assigned a value of 1 if the difference between the short-term borrowings from the previous year and the current repayment amount is greater than zero, indicating that the company did not repay the loan on schedule; otherwise, it is set to 0, indicating no default. The following model is constructed:

$$\mathrm{EDF}_{i,t} = \alpha + \beta ESG_{i,t} + \delta \mathrm{LEVM}_{i,t} + \theta \mathrm{ESG} \times \mathrm{LEVM}_{i,t} + \gamma Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (5)$$

$$\mathrm{Violate}_{i,t} = \alpha + \beta ESG_{i,t} + \delta \mathrm{LEVM}_{i,t} + \theta \mathrm{ESG} \times \mathrm{LEVM}_{i,t} + \gamma Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (6)$$

In models (5) and (6), LEVM includes the degree of corporate leverage manipulation measured by the basic XLT-LEVM method (BLEVM) and the extended XLT-LEVM method (ELEVM). Controls are the control variables, which are consistent with those used in model (1).

Table 11 reports the regression results on the effect of ESG responsibility fulfillment in curbing corporate leverage manipulation on corporate debt default risk. The results show that the coefficients for both BLEVM and ELEVM are significantly positive, while the coefficients for the interaction terms between ESG and BLEVM (ESG × BLEVM), as well as ESG and ELEVM (ESG × ELEVM), are significantly negative. This indicates that corporate fulfillment of ESG responsibilities can suppress leverage manipulation, thereby reducing corporate debt default risk.

Table 11. Regression results for economic consequences analysis.

	(1)	(2)	(3)	(4)
	EDF	**Violate**	**EDF**	**Violate**
ESG	−0.0000 *	−0.0144 ***	−0.0000 **	−0.0174 ***
	(−1.6693)	(−5.7908)	(−2.1712)	(−.1763)
BLEVM	0.0013 ***	0.2200 ***		
	(3.9736)	(3.9183)		
ESG×BLEVM	−0.0003 ***	−0.0538 ***		
	(−3.7881)	(−3.9611)		
ELEVM			0.0011 ***	0.1126 **
			(3.4435)	(2.0529)
ESG×ELEVM			−0.0002 ***	−0.0282 **
			(−3.2390)	(−2.1369)
_cons	−0.0043 ***	0.4168 ***	−0.0043 ***	0.4312 ***
	(−14.1223)	(7.8998)	(−14.0513)	(8.1592)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	24303	24303	24303	24303
R2	0.0703	0.0507	0.0701	0.0502
adj. R2	0.0685	0.0489	0.0683	0.0484

t-statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

6. Research Conclusions and Policy Implications

In recent years, as the demand for sustainable development has gained increasing attention, the focus on corporate ESG performance has also grown across various sectors. ESG practices are not only a manifestation of a corporation's fulfillment of its social responsibilities but also a key strategy for enhancing competitive advantage and achieving sustainable development, exerting a significant impact on the company's daily operations. To deepen the understanding of the positive impacts of ESG responsibility fulfillment and the governance factors of leverage manipulation, this paper uses listed companies from the Shanghai and Shenzhen A-share markets from 2009 to 2021 as research samples and employs a panel fixed effects model to empirically examine the relationship between corporate ESG responsibility fulfillment and leverage manipulation behaviors, as well as the underlying mechanisms and heterogeneous effects. This study finds that fulfilling ESG responsibilities inhibits corporate leverage manipulation activities, with this effect being particularly notable in companies with lower levels of analyst attention and over-indebtedness. Mechanism tests reveal that corporate ESG responsibility fulfillment exerts both reputation and information effects, which inhibit leverage manipulation by alleviating financing constraints and enhancing information transparency. This occurs because ESG responsibility fulfillment optimizes corporate governance levels and conveys a socially responsible image to stakeholders, which helps to curb opportunistic behavior by management and ease the company's financing constraints, thereby reducing the motivation for leverage manipulation. Economic consequence analysis shows that the inhibitory effect of ESG responsibility fulfillment on leverage manipulation helps to reduce corporate debt default risk.

Based on the aforementioned research conclusions, this paper derives the following policy implications: Firstly, companies should be encouraged to actively engage in ESG practices and strengthen the constraint effect of the long-term value orientation of sustainable development on management's short-sighted behaviors. The findings of this paper reveal that the implementation of ESG principles can effectively curb corporate leverage manipulation behaviors. Therefore, companies should integrate ESG principles into various business segments while focusing on core business development, optimizing the corporate ecosystem, internalizing moral constraints, enhancing sustainable development capabilities, and leveraging the positive impacts of ESG responsibility fulfillment on corporate management and operations. Secondly, companies should combine active fulfillment of ESG responsibilities with improving the quality of ESG information disclosure, enhancing both the initiative and standardization of ESG disclosures. This will increase stakeholders' understanding and recognition of the company's ESG efforts and achievements, thereby fostering a positive social image and reputation for the company and promoting the aggregation of resources and sustainable development. Thirdly, companies should focus on the interaction between internal and external supervision and governance mechanisms. While strengthening the effectiveness of internal supervision, they should also utilize external supervision mechanisms, such as analyst attention, to further ensure the transparency of financial information. Fourthly, the government and regulatory agencies should expedite the establishment of unified ESG disclosure standards and encourage companies to implement effective ESG measures to ensure standardization of transparency and sustainability. Additionally, relevant government agencies can adopt corresponding incentive measures, such as tax benefits or financial subsidies, to support and motivate companies to make necessary ESG-related investments. Fifthly, regulatory authorities should also strengthen the supervision and regulation of leverage manipulation in over-indebted companies by introducing more detailed audit requirements and regular financial inspections to ensure the transparency of corporate financial information.

Compared to existing research, the main innovations and theoretical contributions of this paper are as follows: Firstly, innovation from a research perspective. Unlike previous studies that explore the impact of ESG responsibility fulfillment on corporate value and financial performance, this paper innovatively incorporates ESG responsibility fulfillment

into the research framework of corporate leverage manipulation. Furthermore, it reveals that ESG responsibility fulfillment can effectively curb opportunistic behaviors such as corporate leverage manipulation by improving corporate governance and enhancing resource acquisition. This provides new perspectives and evidence for understanding how ESG influences corporate management decisions. Secondly, this paper enriches and expands the research content of related topics. It deepens the study of the indirect effects of ESG responsibility fulfillment on corporate leverage manipulation by exploring the mechanisms through which ESG responsibility fulfillment impacts leverage manipulation from the perspectives of financing constraints and information transparency and examines the economic consequences of ESG responsibility fulfillment on corporate leverage manipulation. This enhances the applicability of ESG theory in financial management practice and provides valuable evidence and theoretical support for companies adopting ESG strategies and for policymakers. Thirdly, this paper provides practical and feasible experiences for government agencies to formulate ESG-related policies and for enterprises to engage in ESG practices and optimize corporate management, showcasing significant application value. Based on objective and extensive research findings, this paper provides experiential references from both the micro-level of enterprises and the macro-level of government to encourage and guide companies in actively engaging in ESG practices to optimize corporate management while also offering insights for government agencies in developing and refining ESG-related policies and regulations.

Of course, this study still has some limitations. Firstly, the sample selection in this study has certain limitations. This research only selected listed companies from the Shanghai and Shenzhen A-share markets in China from 2009 to 2021 as the study sample, which may limit the generalizability and applicability of the findings. Specifically, the research conclusions may not be broadly applicable to companies in other countries and regions or to different types of enterprises. Therefore, future research could expand and validate our findings by using samples from other countries or regions and including a broader range of company types. Secondly, the explanatory power of some proxy variables in this study may be relatively weak. Due to the lack of a globally unified ESG assessment standard, different institutions or rating systems may have varying evaluations of a company's ESG performance, which could affect the consistency and applicability of the research results. In future research, we will strive to construct and use objective ESG evaluation indicators that are widely recognized by the academic community in order to further enhance the explanatory power of the core variables and the credibility of the research conclusions. Thirdly, the exploration of the mechanisms and the analysis of the heterogeneous effects in this study may still be insufficiently comprehensive. On the one hand, besides financing constraints and information transparency, there may be other potential mechanisms through which ESG responsibility fulfillment affects leverage manipulation. On the other hand, the impact of ESG responsibility fulfillment on corporate leverage manipulation may vary depending on the level of industry competition and other heterogeneous differences among companies. Future research could enrich the research perspective and further deepen the study of the mechanisms, heterogeneous effects, and economic consequences of how ESG responsibility fulfillment influences corporate leverage manipulation.

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