

## Article

# The Moderating Role of Ownership Concentration on Financing Decisions and Firm's Sustainability: Evidence from China

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**Abstract:** We examined the impact of financing decisions on a firm's sustainability in China as it aspires to achieve carbon neutrality. To proxy firms' sustainability performance, we proposed an index for environmental, social, and governance (ESG) performance. The financing decision was proxied by debt funding and equity funding. Using secondary data from China Stock Market Accounting Data from 2016 to 2022, we utilize the fixed effect and fully modified ordinary least squares estimators for the empirical analysis. The analysis indicated a favorable link between debt funding and ESG performance. We uncovered an inconsistent association between equity funding and ESG performance. Moreover, ownership concentration revealed a significant role in moderating the impact of debt financing and ESG performance in China. The findings affirm that firms should rely on debt funding rather than equity funding to enhance their ESG performance. Hence, policymakers should enact laws allowing easy access to debt funding for companies to ensure higher ESG performance. This, in the long term, will contribute to the Chinese dream of carbon neutrality.

**Keywords:** financing decision; capital structure; ESG performance; ownership concentration; China



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## 1. Introduction

Sustainability Reporting (SR) has gained popularity worldwide following the Brundtland Report in 1987, where the integration of human and ecological development concerns came to light. The term “environment social and governance (ESG)” is primarily used in the capital markets to refer to issues that investors consider to assess a company's capacity to manage risks associated with sustainability and to spot new opportunities for generating long-term value for stakeholders [1]. The increased desire for firms to invest in sustainability operations and voluntary initiatives has helped ESG acquire significant traction in recent years [2,3]. The ability of firms to manage their long-term sustainability depends on their financing decisions. Financing decisions are often interchangeable with capital structure (CS). The CS represents the corporate entity's financial framework, which consists of equity and debt to fund the company's assets and general activities [4].

The link between a company's capital structure and ESG performance can be impacted by ownership concentration. Concentrated ownership can enable shareholders to exert more significant influence over corporate decisions. This may involve actively engaging with board members and management to prioritize ESG considerations and push for sustainable practices. According to [5], the quality of corporate social responsibility performance is positively impacted by ownership concentration. Similarly, [6] discovered that ownership concentration had a favorable impact on sustainability performance. Thus,

increased ownership concentration can affect company ESG performance by considering each specific facet of governance, social responsibility, and environmental performance.

More research needs to be done on how financial factors like capital structure (CS) affect ESG involvement or disclosure. Most studies on capital structure focus on firms' financial performance and firm value [7,8]. Few studies have analyzed the effect of financing decisions on sustainability [9]. Even with the few studies, none of the earlier studies used ESG as a proxy for sustainability performance. Moreover, with its potential influence on decision-making and long-term orientation, ownership concentration adds a new dimension to understanding how financial decisions influence a firm's dedication to ESG practices. While prior studies have investigated the connection between capital structure and sustainability [10,11], the role of ownership concentration is always left out when examining the impact of financing decisions on sustainability performance. This study, therefore, sets the pace for addressing this significant literature gap.

This study investigates how capital structure affects ESG performance outcomes in China. The study adds to the knowledge of how capital structure decisions affect a firm's capacity to address ESG concerns. The study relies on trade-off theory to bridge the gap between traditional financial analysis and sustainability practices by investigating the relationship between financing decisions and sustainability. By recognizing the relationship between capital structure and ESG performance, investors can make better-informed decisions about financial approaches and commitments to sustainability. The results may guide decision-makers, such as managers, shareholders, and authorities, in ensuring appropriate financing decisions that will promote sustainability in the long run.

The significance of the research stems from its potential to shed light on crucial firm dynamics. Recognizing how ownership concentration, a critical structural aspect, connects with financing choices and their ensuing impact on the sustainability outcomes of firms could provide invaluable insights given China's complex business environment and business-changing market conditions. By examining the complex relationship between ownership concentration, financing decisions, and sustainability outcomes, this study provides valuable insights into how corporate ownership structure can either strengthen or reduce the effect of financial strategies on a company's long-term viability. Understanding these dynamics becomes not only academically significant but also practically essential for policymakers, investors, and business executives attempting to navigate the complexities of the Chinese business environment as it continues to play an increasingly central role in the world economy.

The study's novelty is how we combine two crucial research fields: finance and sustainability. By examining the impact of capital structure on ESG performance, the study bridges the gap between financial decision-making and sustainable practices by highlighting their interdependence. By concentrating on the unique study query of the influence of capital structure on ESG performance and considering the moderating role of ownership concentration, this study brings a new perspective to the intersection of finance, sustainability, and corporate governance.

The authors utilized a quantitative research design to examine the influence of CS on ESG performance. Secondary data from 223 companies in China from 2016 to 2022 was used in this research due to data availability. The authors employed stepwise regression by using the fixed effect and fully modified ordinary least squares estimators. The empirical results revealed that debt funding substantially influenced ESG performance, while equity funding was negatively associated with ESG performance for manufacturing firms in China. The findings contribute to academia and are considered crucial for developing ESG literature. Furthermore, the results will enable the management of corporations to make pre-informed decisions on whether to finance a firm's ESG initiatives with debt or owners' equity and aid the management in maximizing firm value and reputation.

Additionally, this research contributes significantly to the existing literature in two major ways. Firstly, an exciting aspect of this study is using Environmental, Social, and Governance (ESG) measurements as a primary tool for assessing a firm's sustainability,

making it distinct from previous research. By incorporating ESG metrics, the study comprehensively evaluates a firm's sustainability performance beyond conventional financial indicators. This novel approach enables a more comprehensive understanding of how financing choices influence a firm's sustainability profile. With regard to the practical implications, the findings provide policymakers with more insights concerning which financing choice has a more decisive influence on a firm's sustainability. Hence, policymakers can enact laws that will allow easy access to debt for companies to ensure higher performance of ESG. This, in the long term, contributes to the Chinese dream of carbon neutrality.

The following section focuses on literature review and hypotheses development. The third section elaborates on the methods by providing information on the sample, sampling processes, and population used in the study. Section 4 gives an account of the data analysis and results, while the final part offers the study's conclusion.

## 2. Literature Review

### 2.1. *The Three Foundations of ESG*

ESG's three pillars are environmental, social, and governance considerations. These three are the most essential criteria to consider when evaluating a firm's sustainability and moral effect [12]. The three pillars substantially influence a firm's performance and market returns. Consequently, determining a company's long-term sustainability potential may be influenced by how well each of the three pillars performs.

The environmental (E) pillar covers a wide variety of topics. It mainly focuses on how a company manages the environment. As climate change is one of the most significant ecological concerns that stakeholders, financial managers, and organizational investors study, the environmental pillar often attracts the most attention [13]. All firms face systemic danger from climate change, and environmental law infractions often result in significant penalties [14]. Hence, businesses have started positioning themselves tactically to cope with climate change's increasing elastic sensitivity impacts and solve this issue. Understanding how environmental sustainability affects financial performance is crucial [15].

The social (S) pillar looks at a firm's relationships with its workers, vendors, customers, and the community in which it works [16]. A company might use social concerns and problems to strengthen these relationships. In an era where information travels fast and investors may see and respond to a firm's social behavior in a moment, humanitarian rights, safety, and child labor play a vital role in investment choices [17].

The governance (G) pillar, which is the last, shows how a company manages its top management, executive remuneration, internal controls, and shareholder rights. In contrast to the E and S pillars, the governance pillar concentrates on how a firm operates within itself rather than how its activities affect the outside world. The performance of the business must be tracked and reported on to evaluate governance mechanisms. Investors want to know if a firm's accounting processes are precise and open and whether they are given the chance to vote on essential matters [14]. A firm's financial performance is adversely affected by poor corporate governance [18]. Consequently, more investors are speaking out in favor of corporate governance swings, especially in the wake of the Great Recession [18].

### 2.2. *Theoretical Justification—Trade-off Theory*

According to the trade-off theory, costs and advantages should be weighed before choosing the source of financing to determine the best mix of debt and equity funds [19]. This trade-off will result in an optimal CS with the same additional benefits and reduced loan expenses, raising the firm's value [20]. Debt financing has various benefits, including tax breaks and financial leverage. Firms that incur debt may deduct interest charges from taxable revenue, lowering their tax burden. This boosts the firm's worth by increasing the cash flow available for investment [21]. However, debt financing comes with fees and dangers. Firms must pay interest regularly and refund the principal amount at maturity [22]. If a firm's cash flows are inadequate to satisfy its commitments, it may be forced to declare bankruptcy. As the amount of debt in the firm's capital structure rises, so does the danger

of a financial crisis. As a result, choices on funding sources are made in light of the firm's agenda and strategy for attaining its objectives and maximizing its value.

The choice of funding may depend on corporate plans about ESG, the level to which they accept such endeavors, and the viability of their expected advantages since ESG defends the firm from risk and boosts its capacity to sustain its value [23,24]. The settlement between the additional expenses and advantages of participating in these endeavors, as per Xu [25], includes optional company reporting policies, for instance, social and ecological obligations. As a result, many businesses trade off ESG activities to determine their value [26]. In contrast, others view ESG activities as essential to their plans and dedication to several stakeholders within their strategies to maximize shareholders' value.

### 2.3. Empirical Review and Hypotheses Development

#### 2.3.1. Debt Funding and Firms Sustainability

According to Villarón-Peramat [27], liability can be a proper control tool and enhance corporate governance. Higher ESG performance can be provided by businesses that benefit from a high degree of supervision and responsibility. Additionally, corporate society accountability and capital mix are potent mechanisms for a company's success in uncertain economic conditions and potential threats [23]. Management may use debt to envelop the expense of social accountability endeavors at the cost of equity holders to improve their reputation [28]. Companies may also create an investment strategy centered on social responsibility via capital financing [28]. Benlemli [29] asserts that businesses with high levels of disclosure compliance rely heavily on loan maturities to fuel their sustainability initiatives and enhance their brand. As a result, enterprises provide adequate data about their ESG implementation to boost their image and raise stakeholder satisfaction.

According to a study by Al Amosh [10], financing by debt improves ESG performance across the board, while funding by equity has no impact on ESG. As a result, businesses emphasize debt financing rather than equity to meet their financial and non-financial aims. This is because new shareholders' opportunism will probably force them to prioritize increasing their worth at the expense of other stakeholders, which will negatively impact the ESG performance of the companies. Similarly, Chen [30] posits a strong correlation between economic debt and taking on environmental responsibility. In contrast, a negative correlation between ecological disclosure and leverage ratio was found by Bae [31]. Based on the reviewed literature, the authors assume the following:

**H1.** *Debt funding is positively linked with the ESG performance of firms in China.*

#### 2.3.2. Equity Funding and Firm Sustainability

According to the trade-off theory, businesses must choose between the advantages of debt financing—tax advantages and cheaper capital costs—and its drawbacks [32]. Businesses may be able to prioritize sustainable initiatives without worrying that they will be saddled with excessive debt that will make it difficult for them to accomplish sustainability targets [33].

According to research by Adeneye [34], firms with larger equity financing ratios often perform better regarding ESG factors because equity funding gives them more financial flexibility to launch long-term sustainability initiatives without worrying about debt payments. The compensation between the additional expenses and advantages of participating in this endeavor, as per Xu [25], includes optional company reporting policies, such as social and ecological responsibility. Equity issuance might indicate information asymmetry or an undervaluation of the company's stock, which could impact how investors see the company's commitment to sustainability. Hence, we assume the following:

**H2.** *Equity funding has a negative impact on the ESG performance of companies in China.*

### 2.3.3. Ownership Concentration, Debt Funding, and Firms Sustainability

Ownership concentration adds another dimension of influence to the relationship between debt financing and sustainability performance. Companies with concentrated ownership may be more committed to sustainable practices when using debt financing since there may be a closer connection between owners' interests and sustainability aims [35]. For instance, state-owned businesses may be required by law to respect environmental and social norms, which might be strengthened through debt-financed projects geared towards sustainability goals. Conversely, agency issues may result from ownership concentration when the dominant shareholders put their interests ahead of sustainability. This could lead to businesses ignoring sustainability factors while using debt to increase shareholder wealth in the near term [36]. Private firms with concentrated ownership may have comparable difficulties since sustainability imperatives and dominant interests may only sometimes coincide.

The capacity of a corporation to engage effectively with its constituents may be impacted by ownership concentration. Concentrated ownership arrangements may make it easier for significant shareholders to communicate with firm management, improving knowledge of stakeholders' issues and, as a result, ESG responsiveness [37]. Although some studies have identified a link between concentrated ownership and improved social performance, other investigations have found no conclusive evidence. The unique goals and values of the largest stockholders have a significant impact on major decisions such as sustainability reporting. Thus, large owners can exercise more influence on management, leading to more responsible and sustainable policies [38]. Therefore, we assume the following:

**H3.** *Ownership concentration positively impacts the relationship between debt funding and ESG performance.*

### 2.3.4. Ownership Concentration, Equity Funding, and Sustainability

Ownership concentration significantly impacts how equity financing is used to boost sustainability performance [35]. The congruence between ownership's strategic aims and sustainability goals may be more evident in businesses with concentrated ownership, such as state-owned firms or businesses run by a single family [39]. When equity funding is used, this connection can lead to a higher focus on sustainable activities. In one instance, concentrated ownership may place a higher priority on long-term value creation than on maximizing short-term profits, perhaps leading to more significant investment in sustainability initiatives and methods.

On the other hand, ownership concentration may also result in conflicts of interest. A financing distribution of stock that only partially supports sustainable efforts might result from dominant owners prioritizing their financial interests above sustainability considerations [40]. This may be especially important for privately held businesses when family interests are intimately entwined with ownership. Additionally, the moderating impact of ownership concentration may change how businesses convey their commitment to sustainability to outside stakeholders. Companies with concentrated ownership may have a better channel of communication between ownership goals and sustainability activities, resulting in sustainability reporting that is more effective and trustworthy [41]. Therefore, we hypothesize the following:

**H4.** *Ownership concentration has a negative impact on the relationship between equity funding and ESG performance.*

## 3. Methods

### 3.1. Sampling and Data Sources

The study used manufacturing companies listed in China for the study due to the high carbon emissions from China as a result of increased production activities [3]. Since production produces some extent of ecological harm, there is a need for policymakers

in China to know how the capital structure of companies can be controlled to ensure China's dream of carbon neutrality. Purposive sampling was used to select firms with readily available data on the China Stock Market and Accounting Research (CSMAR) database from 2016 to 2022. The final data extracted were made up of 138 firms from the Shanghai Stock Exchange and 85 firms from the Shenzhen Stock Exchange, making 223 listed manufacturing firms. The study relied on secondary data from CSMAR, financial statements, and the annual reports of the sampled manufacturing firm.

With regard to the dependent variable, the study employed the content analysis technique and, based on the Thomson Reuters ESG scores, the China Environmental Protection Agency requirements, the listing requirements regarding ESG inclusiveness by the Shanghai Stock Exchange, and the firms' social conducted to society, as guided by China's Commerce Industry, to develop an index to quantify ESG. The authors based their conclusions on these policy guide documents since they provide a comprehensive approach to ESG.

The index is categorized into three primary headings: environmental, social, and governance. Three themes were identified under the environmental score: resource consumption, emissions, and innovations. The social score recognized four themes: labor, humanitarian rights, society, and product responsibility. In addition, management, stakeholders, and corporate social responsibility were found under the governance score. In total, there are 10 themes for the three ESG scores. Under each theme, there are some specific items of measurement. We assigned 4 points if the item was disclosed completely, 2 points for fairly disclosed items, and 0 points for items not disclosed. Table 1 provides the scoring items for ESG.

**Table 1.** Scoring items for ESG.

Pillars	Themes	Details
Environmental	Resource use	Water efficiency policy Energy efficiency policy Environmental supply chain management
	Emissions	CO <sub>2</sub> reduction Ecological management system Ecological expenditure
	Innovation	Environmental research and development costs Energy footprints reduction Product innovation/product impact minimization
Social	Workforce	T&D policies Health and safety policy Diversity and opportunity policy
	Human rights	Human right policy Human rights contracts Child labor
	Community	Community policy/investment initiatives Cash donations or donations in kind Crisis management system
	Product responsibility	Product responsibility policy Customer satisfaction Product access low price
Governance	Management	Board diversity Audit committee expertise/independence Compensation/bonus payment
	Stakeholders	Confidential voting rights Shareholders policy Staggered board structure
	CSR Strategy	ESG reporting and transparency GRI reporting guideline Sustainability Committee/CSR committee

The ESG index is made up of three main pillars: Environment, Social, and Governance. The environment pillar consists of three themes. The social pillar consists of four themes, and the governance pillar consists of three themes. In all, the ESG index is made up of ten themes, which have three measuring indicators each for the ten themes.

ESG is then estimated as follows:

$$ESG = \frac{\text{Number of items disclosed in the yearly report of firm}}{\text{total number of items on the disclosure check list}} \quad (1)$$

### 3.2. Model Specification

To establish the link between CS and ESG, the authors developed the model below:

$$ESG_{it} = \alpha_0 + \beta_1 DF + \beta_2 FSIZ_{it} + \beta_3 FAGE_{it} + \beta_4 PRO_{it} + \varepsilon \quad (2)$$

$$ESG_{it} = \alpha_0 + \beta_1 EF_{it} + \beta_2 FSIZ_{it} + \beta_3 FAGE_{it} + \beta_4 PRO_{it} + \varepsilon \quad (3)$$

$$ESG_{it} = \alpha_0 + \beta_1 DF_{it} + \beta_2 EF_{it} + \beta_4 FSIZ_{it} + \beta_5 FAGE_{it} + \beta_6 PRO_{it} + \varepsilon \quad (4)$$

The following regression model examines the moderating influence of ownership concentration on the impact of CS on ESG performance.

$$ESG_{it} = \alpha_0 + \beta_1 (DF_{it} \times OC_{it}) + \beta_2 (EF_{it} \times OC_{it}) + \beta_4 FSIZ_{it} + \beta_6 FAGE_{it} + \beta_7 PRO_{it} + \varepsilon_{it} \quad (5)$$

where ESG represents Environmental, Social, and Governance, DF denotes Debt funding, EF denotes Equity funding, OC represents ownership concentration, FSIZ denotes Firm size, FAGE represents firm age, and PRO denotes profitability. The error term and constant are also included in the model, denoted by the symbols  $\alpha$  and  $\varepsilon$ , respectively.

### 3.3. Definitions and Measurement of Variables

The study variables are summarized in Table 2.

**Table 2.** Summary of research elements.

Categories of Variables	Variables	Notion	Measurement	Expected Sign
Dependent variable	Environmental, social, and governance	ESG	The unweighted scoring method by dividing the actual performance/disclosure score by the highest score	
Independent variables	Debt funding	DF	Measured as the long-term liability over total assets	+
	Equity funding	EF	Total equity over total assets	−
Moderating variable	Ownership concentration	OC	Ownership stake of the largest shareholders by the total outstanding shares	+
Control variables	Firm size	FSIZ	Number of employees	+
	Firm age	FAGE	The year of first listing on the stock exchange is less than the current year (2023).	+
	Profitability	PRO	Net income over total assets	−

## 4. Results and Discussion

### 4.1. Correlation Analysis

The Spearman correlation matrix, shown in Table 3, illustrates the strength of relationships among the variables. We chose the Spearman correlation since it is a reliable indicator of the relationship between continuous variables [42].

**Table 3.** Spearman correlation matrix.

	ESG	DF	EF	OC	FSIZ	FAGE	PRO
ESG	1.0000						
DF	0.1121	1.0000					
EF	−0.7148 ***	0.0679	1.0000				
OC	0.2667 ***	−0.0850	0.1206	1.0000			
FSIZ	0.0450	0.1990	0.0640	−0.0779	1.0000		
FAGE	0.0364	0.0748	−0.0728	0.0439	−0.1458 *	1.0000	
PRO	−0.1855 **	−0.1106	0.0573	0.2248 ***	−0.2937 ***	−0.0389	1.0000

Significant at 10% \*, 5% \*\*, and 1% \*\*\*.

The findings from Table 3 indicate that debt funding (DF), ownership concentration, and ESG are positively correlated. However, equity funding (EF) and ESG performance are negatively correlated at a 1% significant level. Profitability had a strong negative link with ESG performance at a 5% significant level, although firm size and firm age appeared to have negligible positive correlations with ESG. The correlation matrix revealed a combination of feeble and moderate correlations amongst the study variables, with EF and ESG recording the greatest absolute correlation. In contrast, FAGE and ESG revealed the lowest absolute correlation, implying that the variables are highly related. This suggests that FAGE does not matter when it comes to ESG performance. Additionally, Table 3 demonstrates that no predictor pair has a correlation coefficient greater than 0.80, indicating that our dataset is not multicollinear. This means that multicollinearity is not an issue in the way we acquire our data.

#### 4.2. Cross-Sectional Dependency Test

Naturally, several variables, including the strength of the relationship between cross-sections and the kind of cross-sectional dependency, influence the effect of cross-sectional dependence in the estimate [43,44]. It demonstrates how a significant drop in estimating efficiency can occur if there is enough cross-sectional dependence in the data, which needs to be considered in the estimation. In this study, the Frees test of cross-sectional dependence is applied. Table 4 shows the findings of the CD results.

**Table 4.** Cross-sectional dependency test.

Frees' Test of Cross-Sectional Dependence = 0.755	
Critical Values from Frees' Q Distribution	
alpha = 0.010	0.3583
alpha = 0.05	0.4923
alpha = 0.01	0.7678

Frees' test disproves the null hypothesis of cross-sectional dependence, as shown in Table 4. The critical values for  $\alpha = 0.10$ ,  $\alpha = 0.05$ , and  $\alpha = 0.01$  from the Q distribution are provided by Frees' test because  $T \leq 30$ . With at least  $\alpha = 0.01$ , the Frees' statistic is greater than the threshold value. Hence, we conclude that CD does not exist among the variables. This suggests that a shock at one of the sampled companies will not spill over to the others.

#### 4.3. Stationarity Test

To reduce the spurious regression issue, it is essential to look into the normality of panel data and the order of integration. Adhering to the LLC test, as shown by Levin [45], we used the traditional method to determine if our data set was static at level or difference. Table 5 reports the outcomes of the examinations.



**Table 5.** Unit root test (LLC).

Variables	Adj. t-Statistics
ESG	−10.6055 ***
DF	−16.7094 ***
EF	−35.2533 ***
OC	−2.6561 ***
FSIZ	−6.4052 ***
FAGE	−13.5031 ***
PRO	−31.8499 ***

Significant at 1% \*\*\*.

The outcome of the unit root test conducted on the variables used is shown in Table 5. The findings of the LLC test indicate that all the used variables are stationary at their current levels. The Adj. t-statistics for all variables are noteworthy at the 1% level. This implies that all variables are stationary at level I. Hence, further analysis to examine the nature of the relationship can be established.

#### 4.4. Estimation Analysis

To examine the impact of capital structure on the ESG performance of manufacturing firms in China, the authors utilized the Fixed Effect (FE) and the Fully Modified Ordinary Least Square (FMOLS) estimation techniques. The FE estimator addresses unobserved heterogeneity in inclination coefficients within group-specific intercepts. The FE estimator also removes all time-invariant and unknown heterogeneity by measuring group-specific intercepts. The FMOLS is advantageous because it can handle endogeneity issues, leading to solid robustness evaluations even with little data. The FMOLS estimators may be used if cointegration is established. FMOLS manages heterogeneous cointegration, while endogeneity bias and autocorrelation are corrected using a heterogeneous FMOLS estimator [43]. In this study, FE is the primary estimator, and FMOLS is the robustness estimator. We used stepwise regression analysis by utilizing three panels. In Panel A, we examined the impact of debt funding on ESG performance. We explored the connection between equity funding and ESG performance in panel B. We examined the impact of both debt and equity funding on ESG performance in panel C. We used FE in R1 and FMOLS in R2. We used the natural logarithm of the variables for the analysis since all the data were not in a common unit of measurement. Table 6 shows the results of the direct relationship between capital structure and ESG performance.

**Table 6.** Estimation results.

Variables	PANEL A		PANEL B		PANEL C	
	R1	R2	R1	R2	R1	R2
LNDF	0.0806 **	0.2912 **			0.0845 *	0.1934 **
LNEF			−0.4929 **	−0.7267 *	−0.4927	−0.7158
LNFSIZ	0.2306	0.0101 ***	0.5931 *	0.2906 ***	0.5494 *	0.6106 ***
LNFAE	0.3539 *	0.0847 ***	0.0514 ***	0.0947 **	0.4811 ***	0.1162
LNPRO	−0.0731	−0.1232	0.1056 *	0.1837 ***	0.1129 *	0.1674 ***
Adj. R squared	0.6211	0.7102	0.5398	0.7016	0.8121	0.8653
F Statistics	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs	1561	1561	1561	1561	1561	1561

Significant at 10% \*, 5% \*\*, and 1% \*\*\*.

From the result of Table 6, the adjusted R-squared revealed high values for all the panels, indicating how well the model fits the empirical analysis. Additionally, the significant F-statistics values for all the panels further affirm the model's fitness. Therefore, the models adequately account for more than half of the disparity in the independent variables' effects

on the dependent factor. As a result, multiple regression analysis is possible because it is believed that the empirical model's regression effect is appropriate.

From the analysis in Table 6, debt funding and ESG performance showed a 5% statistically significant and positive association in panel A for both R1 and R2. The implication is that when the debt funding goes up by one percent, the sustainability performance goes up by 0.0806 and 0.2912, respectively, for R1 and R2 in panel A. Again, debt funding revealed a positive connection with ESG performance at a 10% and 5% significance level when all the variables are considered in Panel C. This indicates that a 1% increase in debt funding will lead to 0.0806 and 0.2912 increases in ESG performance. Therefore, the first hypothesis is accepted.

In Table 6, the direct relationship analysis results revealed a negative and statistically significant association between equity funding and ESG performance in panel B, considering both the primary estimator (R1) and the robustness estimator (R2). This indicates that a 1% rise in equity funding will lead to 0.4929 and 0.7268 decreases in ESG performance for R1 and R2, respectively. However, in panel C, an inverse but insignificant link was found between equity funding and ESG performance for R1 and R2. This implies that a 1% increase in debt funding will lead to a 0.4927 and 0.7158 decrease in ESG achievement, respectively. However, this link is not statistically significant. Due to the conflicting outcomes from different panels, an inconclusive conclusion was reached.

Corporate governance mechanisms alone do not entirely determine the level of sustainability performance, as in prior studies [2], as the company's financial and capital structure decisions also play a role. Research by Grabinska [9] shows that debt funding boosts sustainability disclosure. Hence, businesses increasingly turn to debt finance rather than equity to achieve their financial and non-financial objectives. Based on this background, the study assumed a positive link between debt financing and ESG performance. A statistically significant positive link between debt funding and ESG performance was found in the research. Hence, our first hypothesis is accepted. This finding is consistent with the result by Amosh [10], which claimed that long-term and short-term debt have a substantial positive relationship with sustainability. Therefore, a company's ESG performance is enhanced by using high-debt funding. Again, the study's findings imply that the sampled manufacturing companies in China prefer debt funding to equity funding as the best strategy for accomplishing their ESG objectives. This is because firms that disclose ESG information enjoy higher credit ratings, enabling them to borrow from financial institutions easily. However, our findings are inconsistent with the results by Bae [31], who argued that, since ESG is capital intensive, the funding source does not impact firms' ESG performance.

ESG performance is essential to stakeholders, including investors who favor investing in businesses with substantial social and ecological duties and clients who consider a company's performance before doing business with the firm [46]. However, shareholders invest more equity capital to improve economic performance and attract investors. Hence, little attention is given to equity funding to improve ESG performance. Based on that, the authors assumed a negative link between equity funding and ESG performance. From the findings, a negative but insignificant relationship between equity funding and a company's ESG performance was scientifically proven in panel C. The findings suggest that equity funding does not impact the sustainability performance of manufacturing firms in China. Thus, if a firm decides to fund itself through shareholders' equity, the interests of the new owners will take precedence over those of other stockholders. However, in panel B, a negative and significant link was established between the two. Hence, the findings were inconsistent with those of the two panels. Hence, we fail to accept or reject the second hypothesis.

#### 4.5. The Moderating Role of Ownership Concentration Analysis

The moderating analysis conducted in this study utilized the moderating effect of ownership concentration (OC) on the relationship between capital structure and ESG performance. We used stepwise regression analysis by utilizing three panels. In Panel A, we examined the impact of debt funding on ESG performance. We explored the connection between equity

funding and ESG performance in panel B. We discussed both debt and equity funding on ESG performance in panel C. We used FE in R1 and FMOLS in R2. Table 7 shows the moderating role of ownership concentration on capital structure and ESG performance.

**Table 7.** The moderating analysis.

Variables	PANEL A		PANEL B		PANEL C	
	R1	R2	R1	R2	R1	R2
LNDFOC	0.5602 **	0.6599 **			0.7509 ***	0.8578 *
LNFOC			−1.4845	−1.8301 ***	2.7555 *	−1.9196 *
LNFSIZ	0.6342	0.4706	1.0307	−2.0106 **	1.0322 **	2.1932 **
LNFACE	0.3721 ***	0.1012	1.4594 ***	3.9006	1.4357 ***	−1.3008 *
LNPRO	−0.7740	−0.5619	−0.4825	−0.2663 *	−0.5558	−0.9841
Adj. R squared	0.6224	0.6932	0.6406	0.7118	0.8383	0.8638
F-statistics	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs	1561	1561	1561	1561	1561	1561

Significant at 10% \*, 5% \*\*, and 1% \*\*\*.

Table 7 outcome showed that all of the panels' adjusted R-squared values were high, demonstrating how well the model matched the empirical analysis. Additionally, the statistically significant F-statistics further affirm the model's fitness. As a result, the models satisfactorily explain more than half of the variation in the effects of the independent variables on the dependent factor.

Tables 6 and 7 results revealed a positive and statistically significant connection between debt funding and ESG performance in panels A and C for R1 and R2. This implies that a percentage increase in DFOC by manufacturing firms in China will lead to a rise in the level of ESG performance of the firms by 0.5602 and 0.6599 in R1 and R2, respectively, of panel A. Similarly, in panel C, a percentage change in DFOC will result in an increase of 0.7509 and 0.8578 in the level of ESG performance for R1 and R2, respectively. The positive relationship was found to be statistically significant. Hence, we fail to reject hypothesis 3. Our findings are consistent with Kapil [35], who contended that companies with concentrated ownership may be more committed to sustainable practices when using debt financing since there may be a closer connection between owners' interests and sustainability aims. However, our findings contradict the findings by Su [33], who argued that businesses may ignore sustainability factors while using debt to increase shareholder wealth.

Lastly, equity funding saw different results when we added the moderating role of ownership concentration in Table 7. In panel B, a negative but insignificant link was established using the primary estimator, whereas using the robustness estimator, an inverse and significant association was found between equity funding and ESG performance. When all the study variables were included in the regression analysis in panel C, a positive and significant impact was recorded between equity funding and ESG performance in R1, while in R2, a negative and significant connection was found between the two. The findings suggest a mixed conclusion after introducing the moderating role of ownership concentration, leading to an inconclusive conclusion for the last hypothesis.

## 5. Conclusions and Policy Implication

There is a need for businesses to incorporate social and environmental considerations into their core business strategies. This will show how business operations affect stakeholders and the society in which they operate. The ability of firms to manage their long-term sustainability depends on their capital structure. However, little attention has been paid to the link between CS and ESG performance. Most studies on capital structure have focused on CS and financial performance. Additionally, the influencing role of ownership structure is often left out in financing decisions of earlier studies. This study consequently addressed this significant gap in the literature by examining the impact of CS on the ESG

performance of manufacturing firms in China, taking into account the moderating role of ownership concentration.

The study relied on secondary data from CSMAR, financial statements, and the annual reports of the sampled manufacturing firm. Purposive sampling was used to select firms with readily available data in the CSMAR database from 2016 to 2022. The final data extracted was made up of 138 firms from the Shanghai Stock Exchange and 85 firms from the Shenzhen Stock Exchange, making 223 listed manufacturing firms. We utilized the FE and FMOLS estimation strategies for the empirical analysis. The estimation techniques confirmed a substantial positive link between debt funding and corporate ESG performance. However, inconsistent results were found between equity financing and ESG performance. Moreover, ownership structure was found to have a moderating influence on debt funding and ESG performance.

Based on the findings, companies' managers are advised to rely on debt funding rather than equity funding to enhance their ESG performance because debt funding positively impacts ESG activities, which may ultimately be advantageous to the company over the long term. On the other side, managers of firms should cut down on equity funding because it obstructs ESG performance for manufacturing firms.

Regarding policy implications, by incorporating ESG metrics, the study comprehensively evaluates a firm's sustainability performance beyond conventional financial indicators. This novel approach enables a more comprehensive understanding of how financing choices influence a firm's sustainability profile. Concerning the practical implications, the findings provide management with more insights regarding which financing choice strongly influences a firm's sustainability. Hence, management should use debt funding for their business operations since it ensures higher sustainability performance. This, in the long term, will contribute to the Chinese dream of carbon neutrality.

The study has three limitations. First, because there is no uniform and consistent method for evaluating ESG performance in China, the study proposed an ESG index based on earlier literature and industry requirements. The index scoring system is entirely arbitrary. Hence, it might not be comprehensive because of the selection of factors utilized to calculate the index. Therefore, future research can consider creating a complete index to evaluate ESG performance for firms. Additionally, the study focused on capital structure and ESG. The study did not include other variables that may also influence ESG performance. Future studies can consider elaborating on other factors, including capital structure, to examine their impact on ESG performance. Lastly, the study's sample consisted solely of manufacturing companies listed in China. Some businesses were not taken into account. A varied link between CS and ESG performance may result from considering all sectors of industries. In a similar vein, not all of the companies were chosen due to data availability. Future studies with available data can incorporate both listed and unlisted firms in their empirical analysis.

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