Financial Statistical Journal 2025, 8(1), 11102.
https://doi.org/10.24294/fsj11102

Article

Effects of ESG on the relationship between ownership concentration and cash holdings

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CITATION

Bo L, Li B, Li P. Effects of ESG on the relationship between ownership concentration and cash holdings. Financial Statistical Journal. 2025; 8(1): 11102. https://doi.org/10.24294/fsj11102

ARTICLE INFO

Received: 27 December 2024
Accepted: 22 January 2025
Available online: 5 February 2025

Abstract: This paper examined the impact of ownership concentration on cash-holding levels, including 4832 Chinese-listed companies. This study employed the Fixed Effects Model and the Generalized Method of Moments for quantitative analysis. This study shows a positive relationship between ownership concentration and cash holdings. Furthermore, ESG can mitigate the direct correlation between ownership concentration and corporate cash holdings. Finally, the impact described above is particularly noticeable for non-state-owned enterprises. In summary, the empirical findings offer a new analytical perspective on the cash-holding decisions of corporations in the Chinese capital market. Furthermore, this study illustrates the importance of ESG in corporate development to mitigate ownership concentration and excess cash holdings. As a result, the findings show that non-financial reporting, such as ESG disclosure, can reduce agency issues, making more accurate assessments of enterprise performance.

Keywords: ownership concentration; cash holdings; ESG; enterprise performance; Chinese-listed companies

1. Introduction

A key factor in determining finance is cash. Investments and operations ultimately influence the company's value. Achieving the optimal level of cash reserves is essential for managing financial risks and governance challenges, as it alleviates the uncertainties and risks that are associated with both cash shortages and surpluses. Companies should implement a robust risk management framework that evaluates risks objectively and effectively manages them to enhance firm value. However, an extensive and outdated banking industry primarily controls China's financial system. Additionally, the country has a developing but inefficient and unequal capital market. These problems result in expensive external financing. In addition, daily operations and market friction create transaction costs, motivating each company to maintain a certain level of cash reserves. Therefore, the study of corporate cash flow behavior is an important area for enterprises.

According to Liu et al.'s [1] research, there are 2632 companies with major shareholders in China's A-share market, of which 30 have more than 30% share, 154 have more than 40% share, and among the major shareholders, the number of professional institutional shareholders accounts for about 29%, and the proportion of natural persons has reached 40%. Therefore, studying the shareholding ratio of major shareholders has enormous practical significance for determining the development direction of China's enterprises and facilitating the domestic economy. However, major shareholders' control over the enterprise is excessively large, and the majority shareholders have easier access to the enterprise's capital chain, allowing them to conveniently use the enterprise's public funds for their personal benefit. Jensen and Meckling [2] illustrated that cash, as the most liquid and relatively safe asset in the current market, is the best and preferred way for large shareholders to embezzle public funds.

Shen et al. [3] illustrated that the ESG (Environmental, Social and Governance) rating is a comprehensive evaluation method that measures a company's risk and sustainability ability from three dimensions: environmental, social and governance. Feng et al. [4] pointed out that with the deepening of the openness of China's capital market, the proportion of foreign participation and investor shareholding has gradually increased, and the high recognition of ESG investment by foreign and institutional investors has forced Chinese enterprises and investors to pay more attention to the impact of ESG.

ESG disclosure highlights a company's efforts to engage with various stakeholders, such as employees, investors, regulators, and society [5,6]. Greening and Turban [7] show that these activities have the potential to set firms apart from their competitors, promote investor loyalty, improve employee retention, and boost operational efficiency. Investors find ESG disclosure to be a valuable tool for making informed investment and cash-holding decisions [8].

The company's disclosure of its E and S factors indicates its evaluation of environmental (E) and social (S) risk profiles. Furthermore, it serves as a method of external surveillance for investors and other stakeholders. Similarly, enhanced governance (G) denotes the efficacy of the internal governance framework. Hence, companies' emphasis on increased ESG disclosure enables them to enhance their sustainability, enhance investor confidence, and eventually impact their financial choices [9–11].

Current research pays more attention to the impact of equity concentration and cash holdings on the number of shareholders [12], the level of shareholder protection [13,14], the structure of board shareholders [15], corporate internal governance [16], and so on. Fama and Jensen [17] demonstrated that an effective resolution to the agency problem involves implementing an effective monitoring system, both internally and externally. An ESG disclosure functions as a monitoring mechanism that meets this purpose, as highlighted by Lu et al. [18]. Nevertheless, the previous research has not sufficiently investigated the influence of ESG disclosure as a governance tool on decisions about cash holding. Furthermore, the existing research focuses on the influence of equity concentration on cash-holding levels and capital structures, with only a few studies linking major shareholders, ESG, and cash holdings within a unified framework. In this study, we will examine whether and how ESG affects the relationship between major shareholder ownership concentration (OC) and cash holdings (CH).

Compared with existing research, this paper focuses on the following points: First, this paper links major shareholders, ESG, and cash holdings within a unified framework. Second, from the perspective of information asymmetry, this study uses ESG as an external governance mechanism to analyze to check the influence of ESG on the relationship between major shareholders and cash holdings. These findings contribute to a deeper understanding of the interaction between ownership concentration and firm cash holdings, particularly ongoing ESG advancements.

This study reveals the association between OC and CH, as well as the impact of ESG on this correlation. ESG as an internal and external governance mechanism to address the issue of asymmetric information and agency problems, which mitigates conflicts of interest within a company and reduces financing costs [19]. Furthermore, this study investigates how ESG influences ownership concentration and cash holdings for different types of firms.

The sample period is between 2010 and 2022, with 5708 observations. We find a positive correlation between OC and CH. However, ESG mitigates the correlation between OC and CH, which means it mitigates the positive correlation above. The results demonstrate that companies with more comprehensive ESG disclosure exhibit reduced levels of cash reserves. This is because ESG, as a governance tool, reduces information asymmetry and agency problems. As a result, ESG mitigates conflicts of interest within a company and reduces corporate cash holdings.

Compared with previous studies, this study has two contributions: First, the study analyzes the influence of OC on CH through the perspective of ESG performance, thereby enhancing the existing research framework on the impact of ESG performance on corporate economic consequences and influencing factors [20,21]. Second, this research provides a new perspective on the cash-holding management of enterprises to mitigate agency problems and improve cash-use efficiency, which is conducive to providing more targeted suggestions for the cash-holding management of Chinese enterprises.

The remaining sections of this study are organized as follows: Section 2 presents the theories and empirical hypotheses of the study. Section 3 presents the data sources, the measurement of each variable, and the empirical strategy. Section 4 analyzes and evaluates the findings and their reliability and stability. Section 5 presents a concise overview and the final outcomes of the investigation.

2. Literature review and hypothesis

Agency problems are a common issue in the relationship between external investors and internal managers [22–25]. According to Agrawal and Knoeber's [26] research, the primary conflict in the agency problem of enterprises typically arises from the contradiction between the two parties. Furthermore, when the majority shareholder possesses a significant amount of stock, particularly in terms of exerting complete control over the company, they typically possess unrestricted authority and will make their effort to safeguard their control [27].

The second agent problem arises when major shareholders move corporate assets to pursue their private profits, disregarding the interests of minority owners [28]. The agency problem emerges due to the inefficiency of external governance mechanisms, leading to conflicts between majority and minority shareholders [29]. Furthermore, Shleifer and Vishny [30] demonstrated that major shareholders prefer pursuing their interests rather than distributing the gains earned by the company among minority shareholders. Johnson et al. [31] employ the term 'tunnelling' to refer to transferring assets and income from enterprises to individuals who control them to benefit them. According to Gozlugol [32], major shareholders can take advantage of minority shareholders by engaging in intra-group transactions. Casado et al. [33] provided evidence that greater concentration of ownership is linked to a higher probability of extracting profits at the cost of minority shareholders while also reducing protection for shareholders. Scafarto et al. [34] conducted a study revealing that reducing ownership concentration enhances the positive influence of board independence on business performance. In addition, Liu and Tian [35] observed that when controlling owners engage in "tunneling activities", it might result in the adoption of a high-debt policy, which ultimately erodes value.

Significant stakeholders are more likely to utilize liquid funds in order to augment their financial prosperity [8]. Furthermore, when the major shareholders in the firm's ownership increase, there is a greater likelihood that the corporation will utilize its cash holdings in an atypical manner to satisfy the personal interests of the shareholders [36]. According to the aforementioned theoretical study, the underlying assumption is as follows:

H1: Ownership concentration positively related with cash holdings.

The essence of ESG is integrating environmental, social, and governance aspects into enterprise operation management, which will enhance its competitiveness by avoiding and reducing negative externalization in enterprises and improving product quality and operational efficiency [37]. ESG ratings can reduce corporate information asymmetry, alleviate financing constraints, and reduce corporate cash holdings' precautionary motivation in environmental, social, and governance dimensions. Furthermore, increasing information transparency strengthens enterprise supervision and reduces agency issues. This means that the higher ESG rating effectively reduces the excess cash holdings.

First, from the environmental dimension, companies that strengthen environmental information disclosure can reduce the degree of information asymmetry. High-quality environmental information disclosure can help investors better predict a company's operations and development, thereby reducing estimated risks. This increase in transparency can help release the financing constraints faced by companies and alleviate the problem of excessive cash holdings due to precautionary motives.

Secondly, from the social perspective, disclosing social responsibility information can significantly improve the transparency of corporate accounting information. When the quality of a company's social responsibility information disclosure is higher, the transparency of its accounting information will be correspondingly enhanced. This facilitates more effective monitoring activities for managers, thus alleviating agency problems. Alleviating agency problems can reduce the tendency of firms to hold excessive cash due to agency motives.

Furthermore, from the perspective of governance, it is crucial to improve the corporate governance structure and enhance the governance mechanism. Companies with higher ESG ratings tend to have better governance structures and mechanisms, which can promote managers to actively manage the company, reduce information asymmetry, and alleviate agency problems. At the same time, good corporate governance can reduce the financing constraints of enterprises, thereby reducing the phenomenon of enterprises excessive accumulation of cash due to financing difficulties.

In addition, ESG ratings themselves also have a direct impact on corporate cash holdings. Research shows that ESG ratings can significantly reduce the level of excess cash holdings of companies. This impact is more significant among non-state-owned enterprises, high-growth enterprises and manufacturing enterprises. The improvement of ESG ratings helps companies establish a green and low-carbon brand image and attract more investors' attention, thereby improving the company's financing environment and reducing the need for cash holdings.

According to Li et al. [38] and Bilyay-Erdogan et al. [39], excellent ESG performance can improve enterprises' investment efficiency and reduce under-investment through two channels: alleviating agency costs and financing constraints. In a company's governance, managers may hold cash based on self-interested motives or over-invest in projects with NPV. Based on agency motivation, ESG performance can reduce cash holdings. On the one hand, better ESG performance often means enterprises have suitable governance mechanisms. When corporate governance mechanisms are better, management's self-interest motivation is limited, alleviating agency conflicts and reducing cash holding demand based on agency motivation. In addition, ESG performance provides more reliable and informative data, which alleviates the level of information asymmetry and agency motivation. We propose the following hypotheses based on the previously conducted analysis:

H2: ESG plays a negative moderating role between high equity concentration and company cash holdings.

3. Methodology

3.1. Sample construction

In order to validate our hypotheses, we collected data from Chinese public companies using the CSMAR database between 2010 and 2022. This investigation related the data that have been collected: (1) Financial institutions were omitted. (2) Companies classified as Class ST were omitted. (3) IPO samples were excluded. Stata statistical software was employed to analyze the data plan, which is derived from the CSMAR database.

3.2. Measuring variables

Table 1 shows each variables definition and meaning, which is used in the Model 1 and Model 2. ESG was collected by the CSI rating. The CSI rating framework comprises three primary indicators, 26 secondary indicators, and 130 tertiary indicators. It utilized the industry-weighted average technique to thoroughly assess the company's ESG performance. The ESG rating of China Securities was categorized into nine grades ranging from "C" to "AAA". The explanatory variable for the ESG rating in this study was derived from the aforementioned grading system. The ESG rating assignment details are presented in **Table 2**.

Table 1. Main variables and description.

Variable name	Variable symbol	Variable meaning
Cash holding	CH	(Monetary funds + trading financial assets/Total assets)
Ownership concentration	OC	top 5 ownership concentration/the number of shares outstanding at the end of fiscal year.
Environment, Social responsibility and Corporate Governance	ESG	The higher the ESG level, the higher ESG performance
Internal control	IC	High-quality internal control takes 1, otherwise, IC takes 0
Firm size (CNY-100 million)	Size	Natural logarithm of the total assets at the end of the year
Dividend payment	Div	Dividend payment is taking 1, otherwise, Div takes 0
The two duties are integrated	Du	If the chairman and the general manager are held by the same person, the value is 1. Otherwise, 0
Enterprise nature	State	SOE is1. Non-SOE value 0

Table 2. ESG rating assignment.

ESG rating	C	CC	CCC	B	BB	BBB	A	AA	AAA
assignment	1	2	3	4	5	6	7	8	9

3.3. Research models

We present a regression model (Model 1) to examine the correlation between OC and CH. To assess the influence of ESG on the relationship between OC and CH. Model 2 was measured as follows:

Model 1:

$$CH_{\mathrm{it}}=\beta_0+\beta_1 OC+\beta_2 Size_{it}+\beta_3 Div_{it}+\beta_4 Du_{it}+\beta_5 HIC_{it}+\beta_6 State_{it}+\sum Year+\sum Industry+\varepsilon \tag{1}$$

Model 2:

$$CH_{\mathrm{it}}=\beta_0+\beta_1 OC+\beta_2 ESG+\beta_3 OC{*}ESG+\beta_4 Size_{it}+\beta_5 Div_{it}+\beta_6 Du_{it}+\beta_7 HIC_{it}+\beta_8 State_{it}+\sum Year+\sum Industry+\varepsilon \tag{2}$$

CH is the abbreviation for corporate cash holding in Models 1 and 2. OC represents ownership concentration, while ESG includes environmental, social, and corporate governance factors. Firm size is denoted by Size, dividend payment is denoted by Div, and internal control is denoted by HIC. Du denotes the integration of two responsibilities, State denotes the essence of the enterprise, and ε denotes an error term.

4. Result

Table 3 displays descriptive statistics for these variables. The descriptive statistics indicated that there were 45,708 observations for the variable. The maximum CH in the sample is 98%, while the minimum is nearly zero at 0.136%. The maximum OC is 0.550, the minimum is 0, and the average value is 0.186. The ESG rating for enterprises is considered favorable, as it has a mean value of 4.7 and a maximum value of 8.

Table 3. descriptive statistics.

Variable	Obs	Mean	Std.dev.	Min	Max
CH	45,708	0.179	0.123	0.00136	0.980
ESG	45,708	4.742	1.971	1	8
OC	45,708	0.186	0.169	0	0.550
Du	45,708	0.164	0.370	0	1
HIC	45,708	0.958	0.200	0	1
Size	45,708	22.88	1.416	17.64	28.61
Div	45,708	0.708	0.455	0	1
State	45,708	0.702	0.457	0	1

Note: All variable descriptions are shown in **Table 1**.

Table 4 demonstrated a significant correlation between OC and CH, with a significance level of 1%. The ESG exhibited a negative connection with CH. Multicollinearity issues arise when correlation coefficients surpass 0.8 (Wang et al. [40]). However, the correlation coefficients for the variables range from −0.128 to 0.143, which is below the threshold of 0.8. Therefore, this study did not experience any issues related to multicollinearity.

Table 4. Correlation test.

	CH	ESG	OC	Du	HIC	Size	Div	State
CH	1							
ESG	−0.0170*	1						
OC	0.116***	−0.045***	1					
Du	0.0170	−0.0170	0.293***	1				
HIC	0.026*	0.022*	0.028**	0.045***	1			
Size	−0.128***	0.0200	−0.187***	−0.094***	0.061***	1		
Div	0.143***	−0.041***	0.052***	−0.0140	0.062***	0.235***	1	
State	−0.035***	−0.0130	−0.284***	−0.263***	−0.002	0.204***	0.071***	1

Note: *t*-statistics in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All variable descriptions are shown in **Table 1**.

Table 5 displayed the association between OC and CH using Fixed Effects Model (FEM) analysis with model 1. The first column displayed the coefficient of the OC variable, which is 0.098, with a significance level of 1%. From an economic perspective, a rise of one standard deviation in OC (0.169) leads to a corresponding increase of 0.135 in CH, relative to the sample standard deviation (= 0.098 × 0.169/0.123). Furthermore, **Table 5** displayed a statistically significant negative coefficient for the interaction term OC*ESG at the 1% level. This indicated that ESG factors effectively reduce the positive connection mentioned above. ESG enhances the clarity and dependability of information. External investors have the ability to verify the accuracy of a company's operating conditions and financial data, thereby decreasing the expenses associated with obtaining information and enhancing the quality of their assessments. This, in turn, leads to a reduction in financing restrictions and reliance on internal cash reserves.

Table 5. Regression of ownership concentration, ESG and cash holdings.

VARIABLES	(1)	(2)
	CH	**CH**
OC	0.098***	0.173***
	(10.50)	(8.74)
ESG		0.0003
		(0.52)
OC_ESG		−0.018***
		(−4.28)
HIC	0.005	0.005
	(0.80)	(0.74)
Size	−0.009***	−0.008***
	(−4.12)	(−3.96)
Du	−0.009**	−0.009**
	(−1.99)	(−2.01)
Div	0.015***	0.015***
	(4.51)	(4.54)
State	−0.009*	−0.010**
	(−1.87)	(−2.01)
Constant	0.368***	0.359***
	(7.67)	(7.48)
Observations	45,708	45,708
R-squared	0.040	0.044
Number of code	4832	4832
ind FE	YES	YES
Year FE	YES	YES

Note: *t*-statistics in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All variable descriptions are shown in **Table 1**.

Strong corporate governance ensures that management does not misuse cash resources and avoids overinvestment and agency problems. At the same time, higher cash holdings allow management to be more flexible in the face of emergencies and able to respond to various challenges without affecting daily operations. Therefore, robust tests should pay more attention to addressing potential issues like endogeneity, especially reverse causality and measurement errors.

For the 2SLS and GMM, although these two measures are mitigating the endogeneity problem, they focus on two different perspectives for the endogeneity problem. 2SLS focuses on mitigating independent variable endogeneity problems, and 2SLS is a static model. However, GMM introduces a new independent variable—L.Y. This new variable may be highly related to error terms, which leads to an endogeneity problem. Besides, GMM is a dynamic model, which is different from 2SLS.

Compared with these two models, we choose GMM as the second robust test. The main reason for choosing GMM rather than 2SLS is that GMM is more flexible and able to handle more complex model structures and data characteristics. If the data has problems such as heteroskedasticity and autocorrelation, or the model structure is complex, GMM will be a better choice. 2SLS, on the other hand, is more suitable for solving endogeneity problems in simple linear models and when suitable instrumental variables can be found.

Table 6. Robust test for GMM.

	OC = OM	**OC = OM**
VARIABLES	**CH**	**CH**
L.CH	0.218**	0.366***
	(2.10)	(3.30)
OC	0.131*	0.838*
	(1.96)	(1.86)
OC_ESG		−0.195*
		(−1.73)
ESG		0.017**
		(1.97)
HIC	−0.037	−0.004
	(−0.26)	(−0.24)
Size	−0.014	0.009
	(−0.67)	(0.85)
Div	0.013	−0.051*
	(0.38)	(−1.80)
Du	−0.060	0.062
	(−0.87)	(0.80)
State	0.085***	0.038
	(2.69)	(0.88)
Constant	0.423	−0.183
	(1.08)	(−0.65)
Observations	45,296	45,296
Number of code	4702	4702
ar1	−3.520	−5.024
ar1p	0.000431	5.06×10^{-7}
ar2	0.617	0.278
ar2p	0.537	0.781
hansen	42.90	26.65
hansenp	0.141	0.321
N	4296	4296

Note: *z*-statistics in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All variable descriptions are shown in **Table 1**.

Endogeneity issues may occur when relevant factors are missing. This study expands upon previous research conducted by Cheng and Masron [41]. The GMM (Generalized Method of Moments) was employed to validate the first regression findings and tackle the problem of endogeneity. **Table 6** displayed the findings that

OC has a greater value and is positively associated with CH. The regression analysis revealed a statistically significant positive correlation at the 10% significance level, with a value of 0.131. Essentially, an increase of one unit in OC can result in a corresponding increase of 0.131 units in CH. Furthermore, the presence of OC*ESG demonstrated a statistically significant positive correlation at the 10% significance level. This suggests that companies with high-quality environmental, social, and governance factors are able to effectively reduce their excess cash in daily operations. This finding supports Hypotheses 1 and 2.

5. Further analysis

Differences in property rights result in differences between state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), as well as corporate governance and the regulatory environment. Additionally, the nature of property rights may influence the relationship between OC and CH by ESG. The Chinese government exerts a "paternal effect" on SOEs. When SOEs face financial difficulties, the government takes the initiative to assist them. Even if the SOEs do not demonstrate excellent ESG performance, the government will still assist them in resolving their issues. At the same time, the government has a more significant influence on the credit decisions of commercial banks. Because of the ownership relationship between the government and SOEs, the government is more willing to provide credit guarantees for SOEs to obtain financial institutions' support quickly. Ding et al. [42] found that political connections can help firms improve their external financing capacity and reduce financing constraints. Non-state-owned enterprises lack the advantages of financial institutions and face more significant financing constraints. From the perspective of motivation to disclose ESG performance, non-SOEs are more motivated to convey information about their operating conditions through positive ESG performance and to maintain stakeholder relationships to broaden financing channels than their state-owned counterparts. As a result, the ESG performance of non-SOEs may have a more substantial dampening effect on cash holding levels. We propose the following hypotheses based on the previously conducted analysis:

Compared with SOEs, ESG performance significantly reduces the level of cash holdings of non-SOEs.

Table 7 divides the research sample into state-owned and non-state enterprises based on the nature of the enterprises' actual controllers. For SOEs, the effect of ESG on the relationship between OC and CH is insignificant, indicating that ESG ratings do not have a practical inhibitory effect on the cash-holding behavior of SOEs. For non-SOEs, the regression coefficient is −0.098 and significant at the 1% level. This indicates that the ESG rating can mitigate major ownership in non-SOEs from holding excess cash. ESG ratings effectively prevent non-state-owned enterprises from holding excess cash.

Table 7. Heterogeneity analysis between SOEs and non-SOEs.

VARIABLES	State = 0	State = 1
	CH	**CH**
OC	0.844***	0.127***
	(8.08)	(5.21)
ESG	0.001	−0.001
	(0.79)	(−0.50)
OC_ESG	−0.098***	−0.008
	(−4.74)	(−1.49)
HIC	−0.002	0.023*
	(−0.29)	(1.75)
Du	0.006	−0.020**
	(1.12)	(−2.49)
Div	0.012***	0.033***
	(3.11)	(4.89)
Size	−0.017***	−0.015**
	(−4.84)	(−2.32)
Constant	0.476***	0.741***
	(5.12)	(4.11)
Observations	25,009	21,699
R-squared	0.141	0.180
Number of code	2396	2214
ind FE	YES	YES
Year FE	YES	YES

Note: *t*-statistics in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All variable descriptions are shown in **Table 1**.

6. Conclusion and discussion

In recent years, with sustainable development gaining popularity, investors have paid more and more attention to corporate ESG performance. In this context, this study examines the relationship between the OC, ESG and CH. The findings show that the high level of ownership concentration leads to the high level of cash holding and ESG mitigates the positive association above. In addition, the ESG performance can substantially decrease the amount of cash that non-state-owned firms have. Compared with previous studies, this study has two contributions: First, the study analyzes the influence of OC on CH through the perspective of ESG performance, thereby enhancing the existing research framework on the impact of ESG performance on corporate economic consequences and influencing factors [20,21]. Second, this research provides a new perspective on the cash-holding management of enterprises to mitigate agency problems and improve cash-use efficiency, which is conducive to providing more targeted suggestions for the cash-holding management of Chinese enterprises. Based on the above analysis, we suggest the following policy recommendations:

First, enterprises should focus more on ESG performance, actively enhance

ESG disclosure and practices, raise the level of corporate ESG disclosure, and increase capital investment in ESG to improve corporate ESG performance [43,44]. This will lead to a higher market evaluation and enhanced corporate reputation, both of which are beneficial for the long-term development of enterprises. According to this study's conclusions, the inhibitory effect of ESG performance on cash holding levels is more significant in non-state-owned enterprises. Non-state-owned enterprises should pay more attention to disclosing ESG performance information, communicate favorable information about their operational circumstances to the financial market and investors, improve relationships with stakeholders, secure stakeholder acknowledgment and backing, alleviate enterprise funding limitations, and make more prudent decisions regarding cash reserves.

Second, regulators should improve relevant systems, give full play to the positive role of ESG performance in corporate governance, and create a favorable environment for ESG disclosure and application. Promoting and supporting businesses to adopt sustainable development practices, urging them to publish information about their ESG performance. Establish systems of rewards and penalties for managing ESG performance and provide guidance in making informed ESG decisions. All of which can contribute to enhancing the overall operational efficiency of enterprises. Simultaneously, this study's conclusions recommend enhancing the marketization process through reform, bolstering the financial industry's growth, enhancing the rule of law, minimizing unnecessary intervention, and fully leveraging the role of ESG performance in cash holding decisions.

In summary, ESG can help alleviate the problem of excessive corporate cash holdings caused by concentrated ownership by improving the level of information disclosure and governance in the three dimensions of environment, society and governance. Companies should actively fulfill ESG responsibilities and improve ESG ratings to optimize cash holding strategies and achieve sustainable development.

The research conclusions of this study may not be applicable to public companies in other countries, as it is founded on Chinese listed companies as the analysis object. This is due to the fact that China has distinct social and cultural systems. Chinese enterprises have been influenced by traditional Confucian culture. These cognitive deviations present a challenge in ensuring that ESG is not completely implemented in the corporate governance experiences of other countries. Consequently, in order to implement the aforementioned recommendations, public companies in other countries must establish a strong connection with the native culture and social environment.

In the future research, we need to connect different countries to analyze the impact of the ESG on the relationship between ownership concentration and cash holdings and connect with digital transformation, as digital transformation can enhance the development of the ESG.

Author contributions: Conceptualization, PL and BL; methodology, LB; software, LB; validation, PL, BL and LB; formal analysis, LB; investigation, LB; resources, LB; data curation, LB; writing—original draft preparation, PL, BL and LB; writing—review and editing, LB; visualization, LB; supervision, LB; project

administration, LB. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

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