Does ESG Performance Enhance Corporate Cash Holding Value?

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Abstract: Given the critical role of cash holdings in corporate operations, examining the relationship between corporate ESG (Environmental, Social, and Governance) performance and the value of cash holdings helps elucidate how ESG practices enhance resource allocation efficiency and value creation. This study investigates the impact and mechanisms of ESG performance on cash holding value using a sample of Chinese A-share listed companies from 2009 to 2021. The findings indicate that superior ESG performance significantly enhances the value of corporate cash holdings. These conclusions contribute incremental evidence to the ESG-corporate value literature and offer practical insights for understanding the economic consequences of ESG initiatives and optimizing cash value management.

***Keywords*:** ESG performance, cash holding value, agency problems, information transparency

1. Introduction

Cash is vital for business operations, growth, and risk management. Chinese listed companies held an average cash ratio of 23% from 2012-2019, higher than the global 12%, raising concerns about capital efficiency and potential misuse[1]. With ESG performance gaining importance in China, its impact on cash holding value remains underexplored. ESG promotes value beyond profit, aligning with national goals. This study investigates how ESG affects cash holding value, focusing on transmission mechanisms and varying effects across ownership and industry, offering insights for corporate strategies and investment decisions[2].

2. Literature review

2.1 ESG performance and corporate value

The relationship between ESG performance and corporate value remains inconclusive despite extensive academic investigation since the ESG concept gained prominence. Some scholars posit a positive correlation, attributing this to ESG's capacity to enhance corporate reputation , strengthen stakeholder relationships[3], improve competitive advantages[4], alleviate financing constraints[5], and optimize operational efficiency, all contributing to value creation. Conversely, others contend that ESG investments negatively impact corporate value, arguing that expenditures on environmental and social initiatives with strong externalities lead to resource depletion and competitive erosion, ultimately impairing financial performance[6]. Alternative perspectives suggest no discernible relationship[7]. Furthermore, conditional relationships have been identified: Li et al.[8] demonstrate that corporate value increases proportionally with the extent of ESG disclosures, while Nollet et al.[9] reveal threshold effects where ESG performance only enhances value when surpassing critical scoring levels.

2.2 Cash holding value

Imperfect capital markets reduce the marginal value of cash held by firms, often making it worth less than 1 yuan. Studies mainly focus on agency costs, showing that management may expropriate shareholder interests, harming cash holding value. Effective governance can mitigate these issues, improving cash holding value[10]. Research also highlights the role of internal controls, promotion incentives, and external factors like short-selling, audit fees, and investor protection in influencing cash holding value[11]. While ESG's effect on firm value remains unclear, few studies explore how holistic ESG performance impacts cash holding value, suggesting a need for further research in this area.

3. Theoretical analysis and research hypotheses

Cash is essential for corporate operations, but internal inefficiencies often reduce its value due to agency problems. ESG (Environmental, Social, and Governance) performance can mitigate these issues by reducing information asymmetry, enhancing transparency, and improving cash utilization. Strong ESG practices foster investor confidence, improve supplier relationships, accelerate capital turnover, and reduce cash misuse, thereby increasing cash holding value. Additionally, ESG

performance strengthens governance, discouraging insider misuse of funds and promoting resource allocation efficiency. As firms with strong ESG performance show higher sustainability and innovation, they attract more investment, resulting in higher cash holding value. Thus, stronger ESG performance is positively correlated with higher cash holding value[12]. Based on the above analysis, this study proposes the following hypothesis:

H1: ESG performance is positively correlated with corporate cash holding value; the stronger the ESG performance, the higher the cash holding value.

4. Research design

4.1 Sample selection and data sources

To test the aforementioned hypothesis, this study employs a sample of A-share listed firms from 2009 to 2021 to empirically examine the relationship between ESG performance and corporate cash holding value. The initial data were processed as follows: (1) firms in the financial industry were excluded; (2) ST and *ST firms were excluded; (3) firms with a debt-to-asset ratio greater than 1 were excluded; and (4) firms with missing key financial data were excluded. The final sample consists of 26,237 firm-year observations. ESG rating data were obtained from the Wind database, while financial data were sourced from the CSMAR database. To mitigate the influence of outliers, all continuous variables were winsorized at the 1% and 99% levels.

4.2 Variable definitions

4.2.1 Cash holding value

Drawing on the methodologies of Faulkender and Wang and Kim et al. , the dependent variable is measured as the excess stock return, which reflects the market valuation of an additional yuan of cash held by the firm. Specifically, the marginal value of cash is estimated using the following model:

$$r_{i,t}-R_{i,t}=\alpha_0+\alpha_1\frac{\triangle Cash_{i,t}}{Mv_{i,t-1}}+\alpha_2\frac{\triangle EBIT_{i,t}}{Mv_{i,t-1}}+\alpha_3\frac{\triangle Na_{i,t}}{Mv_{i,t-1}}+\alpha_4\frac{\triangle R\&D_{i,t}}{Mv_{i,t-1}}+\alpha_5\frac{\triangle Int_{i,t}}{Mv_{i,t-1}}+\alpha_6\frac{\triangle Div_{i,t}}{Mv_{i,t-1}}+\alpha_7\frac{Cash_{i,t-1}}{Mv_{i,t-1}}+$$
$$\alpha_8 Lev_{i,t}+\alpha_9\frac{Cash_{i,t-1}}{Mv_{i,t-1}}*\frac{\triangle Cash_{i,t}}{Mv_{i,t-1}}+\alpha_{10}Lev_{i,t}*\frac{\triangle Cash_{i,t}}{Mv_{i,t-1}}+\sum Industry+\sum Year+\varepsilon_{i,t} \quad (1)$$

ri,t represents the stock return rate of firm i in year t, while Ri,t is the benchmark return rate for the group to which firm i belongs in year t. The benchmark return rate is calculated by dividing all sample firms into five groups based on size and book-to-market ratio, resulting in 25 sub-sample groups. The average stock return rate for each company within each sub-sample group is then determined, and this value serves as the benchmark return rate for that group. ri,t - Ri,t indicates the excess stock return rate earned by the firm. The variable Cash represents cash and cash equivalents, EBIT denotes earnings before interest and taxes, Na stands for non-cash assets, R&D indicates research and development expenses, Int refers to financial expenses, Div represents cash dividends, Lev is the debt-to-assets ratio, Mv signifies market value, and Industry and Year are dummy variables for industry and year, respectively. In this model, α1 represents the impact of changes in cash holdings on the firm's excess stock return. If α1>o, indicates that the firm's cash holding value is positive; conversely, it suggests that the firm's cash holding value is negative.

4.2.2 ESG performance

This study uses the Hua Zheng ESG rating to assess corporate performance, covering all listed companies with frequent updates over a long period. It includes 26 key indicators tailored to China's market and uses an industry-weighted average. Ratings range from C (lowest) to AAA (highest), assigned scores from 1 to 9, with a logarithmic transformation applied. Calculation methods are detailed in Table 1.

4.2.3 Model design

To examine the impact of ESG performance on corporate cash holding value, we introduce the variable ESG into the marginal value model and construct the following model for testing:

$$r_{i,t}-R_{i,t}=\alpha_0+\alpha_1 ESG_{i,t}*\frac{\triangle Cash_{i,t}}{Mv_{i,t-1}}+\alpha_2\frac{\triangle Cash_{i,t}}{Mv_{i,t-1}}+\alpha_3\frac{\triangle EBIT_{i,t}}{Mv_{i,t-1}}+\alpha_4\frac{\triangle Na_{i,t}}{Mv_{i,t-1}}+\alpha_5\frac{\triangle R\&D_{i,t}}{Mv_{i,t-1}}+\alpha_6\frac{\triangle Int_{i,t}}{Mv_{i,t-1}}+\alpha_7\frac{\triangle Div_{i,t}}{Mv_{i,t-1}}+$$
$$\alpha_8\frac{Cash_{i,t-1}}{Mv_{i,t-1}}+\alpha_9 Lev_{i,t}+\alpha_{10}\frac{Cash_{i,t-1}}{Mv_{i,t-1}}*\frac{\triangle Cash_{i,t}}{Mv_{i,t-1}}+\alpha_{11}Lev_{i,t}*\frac{\triangle Cash_{i,t}}{Mv_{i,t-1}}+\sum Industry+\sum Year+\delta_{i,t} \quad (2)$$

The model (2) is used to test Hypothesis H1. If the coefficient is significantly positive, it indicates that as cash holdings increase, the better the firm's ESG performance, and the higher the value of cash holdings. Conversely, if the coefficient is significantly negative, it suggests that as cash holdings increase, the better the firm's ESG performance, the lower the value of cash holdings.

Table 1. Variable Definitions

Variable Name	Variable Symbol	Calculation Method
Stock Return	r	Individual Stock Return
Benchmark Return	R	Refer to Faulkender and Wang for specific calculation methods.
Excess Return	r-R	Difference between stock return and benchmark return.
ESG Performance	ESG	Assigned values from 1 to 9 based on Hua Zheng ESG ratings, with natural logarithm applied.
Cash Holdings	Cash	Cash and Cash Equivalents
Earnings Before Interest and Taxes	EBIT	Sum of total profit and financial expenses.
Non-Cash Assets	Na	Total assets minus cash and cash equivalents.
Research and Development Expenses	R&D	Replaced by capital expenditures.
Interest Expenses	Int	Represented by financial expenses.
Dividends	Div	Cash Dividends
Financial Leverage	Lev	Total liabilities divided by total assets.
Market Value	Mv	Product of total shares issued and year-end closing price.

5. Empirical analysis

5.1 Descriptive statistics and correlation Analysis

Table 2 shows that the mean of $r_{i,t}-R_{i,t}$ is –0.001 with a standard deviation of 0.482, indicating significant variation in excess stock returns, with most firms below the benchmark. The median ESG score is 1.861, with a maximum of 2.197, suggesting many firms have ratings between BBB and AAA. The mean and median of $\Delta Cash_{i,t}/Mv_{i,t-1}$ are 0.006 and 0.002, reflecting a modest increase in cash holdings.

Table 2. Descriptive Analysis of Main Variables

Variable	Sample Size	Mean	Standard Deviation	Median	Minimum	Maximum
$r_{i,t}$-$R_{i,t}$	26237	-0.001	0.482	-0.119	-0.701	1.920
$ESG_{i,t}$	26237	1.861	0.186	1.792	0.000	2.197
$\Delta Cash_{i,t}/Mv_{i,t-1}$	26237	0.006	0.055	0.002	-0.158	0.221
$\Delta EBIT_{i,t}/Mv_{i,t-1}$	26237	0.003	0.037	0.003	-0.138	0.159
$\Delta Na_{i,t}/Mv_{i,t-1}$	26237	0.077	0.125	0.052	-0.183	0.656
$\Delta R\&D_{i,t}/Mv_{i,t-1}$	26237	0.004	0.030	0.001	-0.083	0.130
$\Delta Int_{i,t}/Mv_{i,t-1}$	26237	0.000	0.004	0.000	-0.012	0.015
$\Delta Div_{i,t}/Mv_{i,t-1}$	26237	0.001	0.009	0.000	-0.028	0.040
$Cash_{i,t-1}/Mv_{i,t-1}$	26237	0.102	0.086	0.077	0.006	0.432
$Lev_{i,t}$	26237	0.435	0.203	0.431	0.058	0.886

To preliminarily examine the relationships between ESG performance, cash holding value, and other variables, this study conducts a correlation analysis of the main variables. The results of the correlation analysis are presented in Table 3. Both $ESG_{i,t}$, $ESG_{i,t}\times\Delta Cash_{i,t}/Mv_{i,t-1}$ and $r_{i,t}-R_{i,t}$ are significantly positively correlated at the 1% level,This indicates that, without considering other variables, ESG performance has a positive impact on cash holding value, providing initial support for Hypothesis H1. Furthermore, the absolute values of the correlation coefficients among the variables are all below 0.5, confirming the absence of multicollinearity issues and demonstrating the reasonableness of the variable selection.

Table 3. Correlation Analysis of Main Variables

Variable	$r_{i,t}$-$R_{i,t}$	$ESG_{i,t}$
$r_{i,t}$-$R_{i,t}$	1.000	
$ESG_{i,t}$	0.028***	1.000
$\Delta Cash_{i,t}/Mv_{i,t-1}$	0.059***	0.035***
$ESG_{i,t}*\Delta Cash_{i,t}/Mv_{i,t-1}$	0.060***	0.032***
$\Delta EBIT_{i,t}/Mv_{i,t-1}$	0.169***	0.001
$\Delta Na_{i,t}/Mv_{i,t-1}$	0.102***	0.075***
$\Delta R\&D_{i,t}/Mv_{i,t-1}$	0.006	0.005
$\Delta Int_{i,t}/Mv_{i,t-1}$	-0.007	0.001
$\Delta Div_{i,t}/Mv_{i,t-1}$	0.093***	0.030***
$Cash_{i,t-1}/Mv_{i,t-1}$	0.098***	0.072***
$Lev_{i,t}$	-0.061***	0.076

***, **, *indicate significance at the 1%, 5%, and 10% levels, respectively. Values in parentheses represent t-statistics. The same applies below.

5.2 Regression results

Table 4 shows that the interaction term $ESG_{i,t}\times\Delta Cash_{i,t}/Mv_{i,t-1}$ has a positive and significant coefficient of 0.059, confirming that better ESG performance is linked to higher excess stock returns and cash holdings, supporting Hypothesis H1. Positive coefficients for $\Delta Cashi,t/Mv_{i,t-1}$ and $r_{i,t}$-$R_{i,t}$ indicate investors value firm cash holdings. Positive coefficients for $\Delta EBIT_{i,t}/Mv_{i,t-1}$, $\Delta Na_{i,t}/Mv_{i,t-1}$, and $\Delta Div_{i,t}/Mv_{i,t-1}$ and a negative one for $Lev_{i,t}$ suggest higher operating revenue, net assets, cash dividends, and lower debt-to-asset ratios improve stock returns. However, the negative coefficient for $\Delta R\&Di,t/Mv_{i,t-1}$ implies R&D investment lowers cash holding value, contradicting earlier studies, possibly due to R&D's high resource demand, uncertainty, and long payback periods, as noted by Yang et al.

Table 4 Baseline Regression Results

Variable	$r_{i,t}$-$R_{i,t}$
$ESG_{i,t}*\Delta Cash_{i,t}/Mv_{i,t-1}$	0.059*** (2.664)
$\Delta Cash_{i,t}/Mv_{i,t-1}$	0.053 (0.258)
$\Delta EBIT_{i,t}/Mv_{i,t-1}$	2.886*** (28.892)
$\Delta Na_{i,t}/Mv_{i,t-1}$	0.108*** (3.880)
$\Delta R\&D_{i,t}/Mv_{i,t-1}$	-0.387*** (-3.694)
$\Delta Int_{i,t}/Mv_{i,t-1}$	-2.223*** (-3.309)
$\Delta Div_{i,t}/Mv_{i,t-1}$	3.552*** (8.154)
$Cash_{i,t-1}/Mv_{i,t-1}$	1.054*** (23.773)
$Lev_{i,t}$	-0.130*** (-6.126)
$ESG_{i,t}$	0.023 (1.644)
$Cash_{i,t-1}/Mv_{i,t-1}*\Delta Cash_{i,t}/Mv_{i,t-1}$	1.793 (1.611)
$Lev_{i,t}*\Delta Cash_{i,t}/Mv_{i,t-1}$	0.673* (1.834)
Cons	0.160** (2.314)
Year/Industry	Yes
N	26237
Adj-R^2	0.455

5.3 Robustness tests

5.3.1 Variable substitution

(1) Substitution of the independent variable.

Drawing on the approach of Zhang and Huang, this study replaces the original ESG rating score with the ESG composite performance score (ESGi,t_HX) provided by Hexun, a third-party rating agency. Hexun's data, which has been widely used in domestic research, has been available since 2010. The regression of Model (2) is re-run using this alternative measure. The results, presented in Column (1) of Table 5, show that the coefficient of the interaction term ESGi,t×ΔCashi,t/Mvi,t−1 remains significantly positive, confirming the robustness of the findings.

(2) Substitution of the dependent variable.

This study also adjusts the benchmark return by following the methodology of Hou et al. . Firms are sorted into three groups based on Beta values, firm size, and book-to-market ratio, resulting in 27 benchmark groups (3×3×3). The excess stock return (N−ri,t−Ri,t) is recalculated accordingly. The regression results indicate that the coefficient of the interaction term ESGi,t×ΔCashi,t/Mvi,t−1 remains significantly positive at the 1% level, consistent with the earlier findings.

5.3.2 Propensity score matching (PSM)

Propensity Score Matching (PSM) is employed to mitigate endogeneity issues arising from sample selection. Firms with ESG ratings above "BBB" are designated as the treatment group, while those with ratings from "C" to "BBB" are designated as the control group. The control variables from Model (2) are used as matching variables to estimate the propensity scores, and a 1:1 nearest-neighbor matching is performed for the treatment group. The regression results after matching indicate that the coefficient of ESGi,t×ΔCashi,t/Mvi,t−1 is 0.129 and remains statistically significant at the 1% level, consistent with the earlier conclusions.

5.3.3 Lagged independent variable regression

The previous findings suggest that firms with better ESG performance have higher cash holding value, but firms with higher cash holding value may also be more inclined to engage in ESG practices. To address potential bidirectional causality, the study re-runs the regression using the one-period lagged ESG performance as the independent variable in Model (2). The results show that the coefficient of ESGi,t×ΔCashi,t/Mvi,t−1 remains significantly positive, supporting the validity of the hypothesis.

6. Conclusions

Recent research has focused on the impact of ESG performance on corporate value, but no consensus exists. This study examines the relationship between ESG performance and the value of cash holdings using a sample of non-financial A-share listed companies in China from 2009 to 2021. The results show that better ESG performance increases the value of corporate cash holdings.

Policy recommendations based on these findings:

(1) Listed companies should enhance ESG practices. Strong ESG performance boosts cash holding value, so companies should integrate ESG principles into their culture and operations, improve ESG disclosure, and promote sustainable development.

(2) The government should improve systems and policies to support ESG practices. ESG performance increases resource efficiency and sustainability, but China's ESG practices are still developing. Regulators should establish ESG rating systems, improve disclosure standards, and implement reward and penalty mechanisms to encourage value creation.

(3) Investors should consider ESG performance when making investment decisions, focusing on both financial and non-financial factors. Due to flaws in China's ESG rating systems and the risk of "greenwashing," investors should be cautious, avoiding companies with excessive ESG packaging and ensuring funds support businesses with strong ESG performance.

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