

Corporate social responsibility and cash holdings: insights from China's A-listed corporate sector

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Received 10 October 2024
Revised 13 January 2025
15 March 2025
25 May 2025
Accepted 19 June 2025

Abstract

Purpose – This research examines how corporate social responsibility (CSR) affects cash holding strategies of enterprises.

Design/methodology/approach – By sampling the Chinese A-Share listed firms from 2010 to 2022, we utilize fixed effects, panel EGLS and system GMM models for regression analysis.

Findings – The study finds that firms with higher CSR engagement tend to hold less cash, likely due to improved access to external financing and stronger stakeholder relationships, which encourage reinvestment in sustainable initiatives. The results reveal that debt financing, firm size, asset tangibility and firm efficiency influence cash reserves.

Practical implications – The study offers practical significance by demonstrating how socially responsible practices can enhance financial management and stability in an emerging market context.

Originality/value – This research provides novel insights into the intersection of CSR and corporate finance, highlighting the strategic importance of integrating social responsibility into financial decision-making.

Keywords Corporate social responsibility, Corporate cash holdings, Firm size, Firm efficiency, Sustainability

Paper type Research article

List of acronyms

CSR	Corporate Social Responsibility
CHO	Corporate Cash Holdings
DFR	Debt Financing
FRS	Firm Size
AST	Asset Tangibility
FEF	Firm Efficiency

JEL Classification — G32, M14, Q56

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Asian Journal of Accounting Research
Vol. 10 No. 4, 2025
pp. 415-429
Emerald Publishing Limited
e-ISSN: 2443-4175
p-ISSN: 2459-9700
DOI 10.1108/AJAR-09-2024-0386

1. Introduction

In recent years, the concept of corporate social responsibility (CSR hereafter) has emerged as a worldwide major issue that shapes corporate behavior and decision-making (Haddad *et al.*, 2021). As stakeholders increasingly demand that firms adopt sustainable practices, CSR has evolved from a peripheral activity to a central component of business strategy. This shift reflects the growing awareness of the interconnectedness between corporate actions and their social, environmental, and economic impacts (Sitaloppi *et al.*, 2021). At the same time, corporate cash holdings, or the liquidity maintained by firms, have become a focal point of corporate financial management due to their significant role in mitigating risk and enhancing firm value. However, the relationship between CSR and corporate cash holdings remains a nuanced and complex area of inquiry.

Understanding this relationship is crucial for academics, policymakers, and practitioners who seek to balance financial stability with sustainable development goals. The strategic management of cash holdings and CSR initiatives involves diverse considerations, including risk management, reputational impact, regulatory compliance, and long-term financial performance. Firms with substantial cash reserves may be better positioned to invest in CSR activities that require upfront capital expenditures, such as environmental sustainability projects or community development programs. Conversely, companies with a strong commitment to CSR may adopt conservative cash management policies to maintain the flexibility required to address unforeseen social or environmental responsibilities. Despite the growing importance of CSR and its potential impact on financial decision-making, research examining the relationship between CSR activities and cash holdings remains limited.

This study aims to bridge this gap by exploring how CSR initiatives influence corporate cash holdings, shedding light on the broader implications for corporate governance, financial strategy, and stakeholder engagement. Specifically, it investigates how engagement in CSR activities affects a firm's cash holding levels while also identifying other factors that drive variations in cash holding levels. It also analyzes the role of firm-level characteristics such as debt financing, firm size, asset tangibility, and firm efficiency in shaping the CSR-cash holding relationship. By providing empirical evidence from Chinese A-share listed firms, the study offers insights relevant to other emerging economies.

The motivation behind this study stems from the growing recognition of CSR as a strategic tool that not only enhances corporate reputation but also influences financial policies. While traditional financial management theories advocate maintaining optimal cash reserves to hedge against uncertainty, firms actively engaged in CSR may follow different cash management strategies, reflecting their commitment to sustainability. Prior research has extensively examined CSR's impact on corporate performance, risk, and investment behavior (Dwekat *et al.*, 2022; Singh and Misra, 2022). However, limited attention has been given to its effects on cash holdings, a critical aspect of financial flexibility. As businesses increasingly align their objectives with social and environmental goals, understanding the implications of CSR on various financial decisions becomes essential. Given the dual demands of maintaining sufficient liquidity for operational stability and fulfilling CSR commitments, firms face unique challenges in balancing these objectives. The relationship between CSR and cash management decisions remains a critical area of exploration, as it influences a firm's ability to respond to external shocks, invest in sustainable projects, and enhance overall shareholder value.

This study contributes to the literature in several ways. Theoretically, it challenges conventional views on liquidity management by introducing CSR as a determinant of corporate cash holding policies. Traditional finance theories, such as the precautionary motive for holding cash, suggest that firms accumulate reserves to mitigate financial distress. However, firms with strong CSR engagement may rely on alternative financial strategies, such as enhanced stakeholder trust and improved access to capital, thereby reducing their need for excessive cash reserves. Empirically, the study provides a robust analysis using data from Chinese A-share listed firms over a 12-year period (2010–2022). By employing rigorous econometric techniques, including Panel Estimated Generalized Least Squares (EGLS) and

the System Generalized Method of Moments (GMM), the study addresses endogeneity concerns and dynamic relationships. The findings reveal a significant inverse relationship between CSR and corporate cash holdings, suggesting that socially responsible firms tend to hold lower levels of cash reserves, allocating resources toward long-term value creation, such as environmental sustainability projects and community development.

The insights from this research have important implications for corporate managers, investors, and policymakers. For corporate managers, the study highlights the potential trade-offs between CSR engagement and cash management, suggesting that responsible firms may optimize liquidity strategies differently from conventional firms. For investors, understanding the impact of CSR on cash holdings can enhance risk assessment and investment decision-making. For policymakers, the findings underscore the need for regulations that encourage CSR adoption without compromising financial stability. By integrating CSR into financial decision-making, firms can align corporate governance strategies with broader economic, social, and environmental objectives. This study thus contributes to the ongoing discourse on sustainable business practices, providing a framework for understanding how CSR influences corporate cash policies.

2. Theoretical literature review

2.1 Stakeholder theory

Freeman (1984) introduced a theory asserting that a firm's success is contingent upon its capability to effectively manage relationships with a diverse array of stakeholders. This includes not only shareholders but also employees, customers, suppliers, communities, and the environment. According to this theory, businesses should strive to create value for all stakeholders rather than exclusively focusing on maximizing shareholder wealth. Stakeholder Theory posits that firms have ethical responsibilities to equilibrate the interests of all parties impacted by their activities. By doing so, businesses can foster trust, ensure sustainability, and achieve long-term success. This theoretical framework underpins the understanding of CSR within the context of corporate financial strategies. Stakeholder Theory can explain the inverse relationship between CSR and corporate cash holdings, as observed in this study. Firms that are highly engaged in CSR practices may allocate cash reserves to activities that enhance stakeholder value, such as environmental sustainability initiatives or social programs, thereby reducing their cash holdings. This demonstrates that firms with strong CSR commitments might prioritize stakeholder interests over the precautionary motive of maintaining high levels of liquidity, aligning their financial decisions with broader social responsibilities.

2.2 Resource-based theory

This theory established by Barney (1991) posits that a firm's enduring competitive advantage arises from its possession of distinctive resources and capabilities that are valuable, rare, difficult to imitate, and non-substitutable. According to RBV, firms should leverage their internal resources, e.g. financial capital, human skills, and organizational capabilities to achieve superior performance and create long-term value. The RBV relates to this study by suggesting that CSR activities can be viewed as strategic resources that enhance a firm's reputation, stakeholder loyalty, and operational efficiency. By investing in CSR, firms may reduce their need to hold large cash reserves because their enhanced reputation and stakeholder trust lower the perceived risk and cost of accessing external financing. In this way, CSR can be a resource that mitigates financial constraints, allowing firms to allocate cash more efficiently towards long-term investments and value creation.

2.3 Pecking order theory

This theory developed by Myers and Majluf (1984), posits that firms organize their financing sources according to a hierarchy of preference, which reflects a strategy of minimizing

resistance or effort. This theory asserts that firms prefer to utilize internal financing, such as retained earnings, to external sources of capital, including debt or equity, in order to circumvent the costs associated with adverse selection and to preserve financial flexibility. External financing is pursued only when internal resources are depleted. This theoretical framework provides insight into the observed inverse relationship between CSR and cash holdings in the current study. Firms that are heavily engaged in CSR may deplete their internal cash reserves to fund socially responsible projects, relying less on retained earnings as a source of liquidity. Consequently, these firms may hold lower levels of cash while simultaneously signaling to external stakeholders their commitment to CSR, thus enhancing their reputation and reducing the cost of external financing.

2.4 Agency theory

This theory discussed by [Jensen and Meckling \(1976\)](#), examines the conflicts of interest between the principals (shareholders) and agents (managers) of a firm. It suggests that managers, who are entrusted to operate the firm on behalf of shareholders, may act in their own self-interest, which may not align with shareholder interests. This theory underscores the need for governance mechanisms to ensure that managerial actions are consistent with shareholder wealth maximization. Agency Theory is relevant to understanding why firms engaged in CSR activities might hold lower levels of cash. High cash holdings can lead to agency problems, as excess cash may encourage managerial opportunism or inefficient investment. By reducing cash holdings through CSR investments, managers can demonstrate a commitment to responsible financial practices and align their actions with both stakeholder interests and shareholder value. This can help mitigate agency conflicts, particularly in environments where stakeholders value ethical and socially responsible behavior.

2.5 Signaling Theory

This theory, developed by [Spence \(1973\)](#), posits that firms send signals to the market to communicate their quality or intentions. In the context of corporate finance, firms with strong fundamentals and positive prospects may signal their strength by adopting certain financial policies, such as paying dividends, reducing debt, or engaging in CSR activities. For this study, Signaling Theory suggests that firms with strong CSR engagement use their commitment to social and environmental issues as a signal of their long-term stability and ethical standards. By holding lower levels of cash, these firms signal their confidence in accessing external funding when needed, as their CSR activities enhance their reputation and credibility. This inverse relationship between CSR and cash holdings reflects a strategic decision to use CSR as a means of signaling financial health and commitment to sustainable practices.

These theories collectively provide a comprehensive framework for understanding how CSR influences corporate cash holdings, offering insights into the motivations and financial strategies of firms engaged in socially responsible activities.

3. Empirical literature and hypotheses development

This section synthesizes prior research exploring the relationship between corporate social responsibility (CSR) and corporate financial strategies, with a focus on cash holdings. The findings from these studies provide a robust foundation for understanding the dynamics between CSR engagement and liquidity management, ultimately leading to the development of the hypothesis. CSR activities have been shown to influence firms' financial constraints and access to external financing. [Zadeh et al. \(2023\)](#) found that enhanced CSR transparency among S&P 500 firms reduces the cost of debt, mitigates financial constraints, and improves market valuation. Similarly, [Miao et al. \(2021\)](#) highlighted that high-quality CSR disclosures among Chinese A-share listed companies are associated with lower debt financing costs and improved innovation capacity. These findings align with [Bacha et al. \(2021\)](#), who observed that socially

responsible firms benefit from reduced debt costs, attributed to their favorable risk profiles and reputations, particularly when audited by Big 4 firms.

Research indicates that CSR engagement can influence cash holding strategies. [Rehman et al. \(2023\)](#) demonstrated a negative relationship between eco-innovation and cash holdings in the case of U.S., mediated by goodwill, particularly in environmentally sensitive industries. [Tsendsuren et al. \(2021\)](#) revealed that strong environmental practices reduce reliance on precautionary cash reserves, improving financial stability and profitability in high-risk regions. [Yuan and Gao \(2022\)](#) emphasized that China's "Green Credit Guidelines" led high-pollution firms to hold higher cash reserves, suggesting the strategic interplay between CSR-related policies and liquidity management. [Ariff et al. \(2024\)](#) investigated the relationship between ESG performance and cash holdings, while exploring how Shariah-compliant status moderates this association. Analyzing a comprehensive dataset, the findings revealed that higher ESG performance is linked to an increased cash holdings, with a stronger effect observed in Shariah-compliant firms. These results underscore the strategic role of ethical practices, aligning with stakeholder theory and supporting sustainable investment and corporate strategies.

The role of CSR in enhancing financial stability is well-documented. [Farooq et al. \(2022a, b\)](#) found a significant negative relationship between CSR and financial distress among firms listed on the Pakistan Stock Exchange, validating stakeholder theory. Similarly, [Bai and Ho \(2022\)](#) showed that corporate social performance alleviated financial constraints pre-COVID-19 but noted a weaker relationship during the pandemic due to rising CSP costs. These studies underline the strategic value of CSR in fostering financial resilience.

Studies in emerging markets provide nuanced insights into the CSR-cash holding relationship. [Jadiyappa et al. \(2021\)](#) identified a positive correlation between CSR activities and cash holdings in India, driven by regulatory changes that enhanced the valuation of cash reserves. [Minh et al. \(2022\)](#) explored the non-linear relationship between financial leverage and cash holdings in Vietnam, emphasizing the contextual factors influencing liquidity strategies. The influence of governance and stakeholder orientation on financial decision-making has also been explored. [Chowdhury et al. \(2021\)](#) demonstrated that stakeholder orientation increases the marginal value of cash holdings by mitigating agency costs. [Dimitropoulos and Koronios \(2021\)](#) linked superior corporate environmental responsibility (CER) performance with increased cash holdings, reflecting firms' prioritization of stakeholder value. These findings align with [Islam et al. \(2021\)](#), who reported a positive association between slack resources and CSR expenditures, indicating that financially robust firms are more inclined to invest in CSR. Finally, the integration of sustainability practices into financial management has been highlighted as a driver of efficiency. [Farooq et al. \(2024\)](#) found that BRICS firms engaged in green innovation maintain lower cash reserves, balancing sustainability objectives with optimal liquidity. This complements the findings of [Kalash \(2024\)](#), who observed that firms in high-pollution regions tend to hold larger cash reserves, particularly in environmentally sensitive industries.

In summary, the literature reflects a complex yet discernible relationship between CSR and corporate cash holdings, shaped by access to finance, risk management, stakeholder engagement, and regulatory environments. While some studies report a positive association, particularly in contexts where CSR enhances firm reputation and signals stability, others reveal a negative relationship, often attributed to reduced precautionary motives due to improved stakeholder trust and external financing access. These contrasting findings underline the importance of contextual factors such as market maturity, regulatory frameworks, and cultural orientations. Drawing from stakeholder theory and pecking order theory, this study integrates these empirical insights to hypothesize that firms with higher CSR engagement are better positioned to access external funds and maintain stakeholder confidence, thereby requiring lower levels of cash reserves. Building on these insights, this study posits that CSR engagement influences corporate cash holding strategies. Specifically, firms with stronger

CSR practices may hold less cash, leveraging their enhanced reputation and stakeholder relationships to reduce precautionary reserves. Thus, the following hypothesis is proposed:

- H1.* Corporate social responsibility (CSR) is negatively associated with corporate cash holdings.

4. Data and methods

This research examines the relationship between CSR and cash holdings; focusing on how socially, responsible practices affect corporate liquidity management. Thoroughly investigate this relationship; we analyzed data from Chinese A-share listed firms from 2010 to 2022, creating a robust dataset that reflects various economic cycles, regulatory shifts, and market conditions. The selected period allows for a detailed analysis of the connections between CSR initiatives and cash management strategies, particularly within China's rapidly changing corporate environment. Data for this research obtained from the China Stock Market & Accounting Research (CSMAR) database and Thomson Reuters DataStream, both of which are reputable sources of high-quality financial data widely recognized in academic studies. The use of these databases provides comprehensive coverage of firm-specific financial and CSR-related variables, which enhances the validity and applicability of the results. This study addresses a significant gap in the existing literature and offers new perspectives on how CSR engagement influences cash management decisions, particularly in an emerging market context where CSR practices are becoming increasingly significant.

The institutional settings of China provide a compelling backdrop to justify the significance of studying the relationship between CSR and corporate cash holdings. As a rapidly evolving economy with unique regulatory, cultural, and financial structures, China presents an environment where government policies and societal expectations increasingly emphasize corporate social responsibility. The Chinese government has actively promoted CSR through initiatives such as the Environmental Protection Law and mandatory CSR disclosures for listed companies, reflecting its commitment to sustainable development. Simultaneously, China's transition from a state-led to a market-oriented economy has created complex financial dynamics, where access to external financing, corporate governance practices, and resource allocation strategies play pivotal roles. These factors make China an ideal context to explore how CSR influences financial decisions, such as cash management, particularly in a setting where firms operate under both market pressures and institutional mandates.

4.1 Variables discussion

Corporate cash holdings, a primary variable in this research, refer to the liquid assets that firms maintain to meet operational needs, buffer against financial uncertainty, and capitalize on investment opportunities. This variable represents a firm's liquidity position and is quantified by the ratio of cash and cash equivalents to total assets (Tripathy and Uzma, 2020). Corporate social responsibility (CSR) reflects a firm's dedication to ethical conduct, environmental stewardship, and the promotion of social well-being. It is quantified through a CSR index or score derived from third-party ratings, which captures the extent of a firm's socially responsible activities. It can also be measured as social expenditure divided by total revenue (Cammeraat, 2020). However, corporate debt financing, another central variable, denotes the proportion of a firm's capital structure that consists of debt (Subhani et al., 2021). Leverage is commonly quantified as the ratio of total debt to total assets, indicating the extent to which a firm relies on external financing. Additionally, firm size is incorporated into the analysis, typically measured by the natural logarithm of total assets, to capture the effects of scale on corporate financial strategies and outcomes (Hashmi et al., 2020). Asset tangibility, often characterized by the ratio of fixed assets to total assets, quantifies the degree to which a firm's assets are tangible and can thus be leveraged as collateral for debt financing (Camisón et al.,

2022). Lastly, firm efficiency, often measured by indicators such as return on assets (ROA) or total asset turnover, reflects a firm's operational performance and its ability to effectively utilize resources to generate revenue (Agostino *et al.*, 2020). These variables collectively provide a comprehensive framework for analyzing the determinants and implications of corporate cash holdings within the context of broader financial and strategic considerations. The brief overview of variables is presented in Table 1.

4.2 Econometric equations

This study's econometric models aim to identify the determinants of corporate cash holdings (CHO) while examining the influence of corporate social responsibility (CSR) and other firm-specific variables on cash management strategies. The models incorporate CSR as the primary independent variable, alongside various control variables, such as corporate debt financing, firm size, asset tangibility, and operational efficiency. This approach provides a comprehensive framework for understanding the factors that shape corporate cash management practices.

$$Y_{it} = \alpha_0 + \beta_1 MIV_{it} + \gamma_1 CV_{it} + \varepsilon_{it} \quad (1)$$

Equation (1) generally represents the relationship between the dependent variable Y_{it} , the main independent variable MIV_{it} , and a set of control variables CV_{it} , for firm i at time t . Here, α_0 is the constant term capturing unobserved heterogeneity, β_1 is the coefficient of the main independent variable, and γ_1 represents the vector of coefficients for the control variables. The error term ε_{it} captures any unobserved influences on the dependent variable. This equation serves as a base framework for analyzing how different variables affects the outcome of interest, such as corporate cash holdings in the subsequent equations.

$$CHO_{it} = \alpha_0 + \beta_1 CSR_{it} + \gamma_1 DFR_{it} + \gamma_2 FRS_{it} + \gamma_3 AST_{it} + \gamma_4 FEF_{it} + \varepsilon_{it} \quad (2)$$

Equation (2) specifically models the determinants of corporate cash holdings CHO_{it} , for firm i at time t . The dependent variable CHO_{it} represents corporate cash holdings, which is influenced by multiple explanatory variables. The primary independent variable is CSR_{it} which reflects the firm's corporate social responsibility activities. The coefficient β_1 measures the effect of CSR on corporate cash holdings. Equation (2) specifies the first hypothesis of study in which we assume the effect of CSR on cash holdings. Additionally, the model 1 includes several control variables: corporate debt financing DFR_{it} , firm size FRS_{it} , asset tangibility AST_{it} and firm efficiency FEF_{it} with their respective coefficients ($\gamma_1, \gamma_2, \gamma_3, \gamma_4$) capturing their individual impacts on cash holdings. The error term ε_{it} accounts for the unexplained variability.

Table 1. Variables of study

Acronym	Variable	Measurement	Role	Data source
CHO	Cash holdings	Cash and cash equivalents/current liabilities	Dependent	DataStream
CSR	Corporate social responsibility	Social expenditures/total revenue	Independent	DataStream
DFR	Debt financing	Total debt/total assets	Control	DataStream
FRS	Firm size	Log (total assets)	Control	DataStream
AST	Asset tangibility	Fixed assets/total assets	Control	DataStream
FEF	Firm efficiency	EBIT/total assets	Control	DataStream

Note(s): This table shows the description of variables

Source(s): Previous studies

$$CHO_{it} = CHO_{it-1} + \beta_1 CSR_{it} + \gamma_1 DFR_{it} + \gamma_2 FRS_{it} + \gamma_3 AST_{it} + \gamma_4 FEF_{it} + \varepsilon_{it} \quad (3)$$

The third equation extends the analysis by incorporating a dynamic component, which is the lagged dependent variable CHO_{it-1} . This dynamic model acknowledges that corporate cash holdings at time t are partly determined by their level at the previous period $it - 1$, allowing for the persistence of cash management behavior over time. The inclusion of the lagged dependent variable CHO_{it-1} helps to capture the inertia in cash holdings, where past cash levels influence current levels. The other terms $\beta_1 CSR_{it} + \gamma_1 DFR_{it} + \gamma_2 FRS_{it} + \gamma_3 AST_{it} + \gamma_4 FEF_{it}$ and the error term ε_{it} remain the same as in the previous equation, capturing both the main effects and control influences on corporate cash holdings.

4.3 Methodology

In this study, we employed a multi-step econometric approach to analyze the determinants of corporate cash holdings, beginning with basic regression techniques and progressing to sophisticated models to address specific econometric concerns. The initial analysis utilized a Fixed Effects Model (FEM) to account for unobserved heterogeneity across firms. The FEM controls for firm-specific characteristics that do not vary over time, providing consistent estimates when these characteristics might otherwise bias the results. However, while the Fixed Effects Model effectively controls for time-invariant unobservable factors, it does not account for potential endogeneity issues arising from time-varying unobservable factors or the dynamic nature of corporate cash holdings.

To address these limitations, we next applied the EGLS method. The EGLS approach is particularly useful when dealing with heteroscedasticity or cross-sectional correlation in panel data. By estimating a variance-covariance matrix that corrects for these issues, EGLS provides more efficient parameter estimates than ordinary least squares or fixed effects models alone. Nonetheless, while EGLS improves upon the Fixed Effects Model by accommodating heteroscedasticity, it still may not fully resolve endogeneity concerns or capture the dynamic adjustments in corporate cash holdings. To ensure robust results, we employed a two-step system GMM estimator as our final technique. The system GMM approach extends beyond the Fixed Effects and EGLS models by explicitly addressing endogeneity and accounting for the dynamic nature of the dependent variable. The GMM estimator is particularly suitable for dynamic panel data models where the dependent variable (corporate cash holdings) depends on its lagged values. System GMM also allows for the inclusion of internal instruments to handle potential endogeneity among explanatory variables.

Before proceeding to the main regression models, we conducted diagnostic tests to guide our choice of methodology. The Hausman test was applied to determine whether a Fixed Effects Model or a Random Effects Model was more appropriate. The results reported in Table 2 are favoring the Fixed Effects Model. The Wald test was used to check for heteroscedasticity. The analysis reported in Table 3 is supporting the adoption of EGLS and, subsequently, system GMM to address both heteroscedasticity and endogeneity. This stepwise methodological approach ensures that our findings are robust and reliable, reflecting the

Table 2. Hausman test

Test summary	Chi-sq. statistic	Chi-sq. d.f.	Prob.
Cross-section random	38.931	5	0.000

Note(s): The significant p-value accepts the alternative hypothesis (H1) of the Hausman test i.e. the preferred model is the fixed effects model

Source(s): The analysis conducted by using the EVIEWS software

Table 3. Endogeneity test (Wald test)

Test	Value	d.f.	Probability
F-statistic	259.793	(5, 314)	0.000
Chi-square	1298.969	5	0.000
<i>Normalized restriction (=0)</i>			
C (1)		0.871	0.344
C (2)		0.111	0.052
C (3)		−0.007	0.108
C (4)		−0.023	0.041
C (5)		−1.029	0.131

Note(s): The reported values indicate the likelihood of endogeneity

Source(s): The analysis conducted by using the EVIEWS software

complexities of corporate cash management behavior. The research conducted by [Farooq et al. \(2021\)](#) and [Subhani et al. \(2021\)](#) applied the System GMM technique. Similarly, a subsequent study by [Farooq et al. \(2022a\)](#) made use of the EGLS technique.

5. Results reporting

[Table 4](#) provides descriptive statistics for the key variables used in the study, including corporate cash holdings (CHO), corporate social responsibility (CSR), corporate debt financing (DFR), firm size (FRS), asset tangibility (AST), and firm efficiency (FEF).

[Table 4](#) shows that the mean value of corporate cash holdings is 0.322, indicating that firms, on average, hold 32.2% of their assets in cash. The data is moderately skewed (0.848) with a relatively low standard deviation (0.201), suggesting moderate variability around the mean. The average value of corporate social responsibility is 0.120, with a high skewness (2.517) and kurtosis (9.951), indicating a right-skewed distribution with heavy tails, meaning most firms have low CSR scores. The mean statistic of corporate debt financing is 0.307, reflecting that firms, on average, use debt for 30.7% of their total assets. The skewness (0.419) and kurtosis (2.971) indicate a near-normal distribution. Similarly, the average value of firm size is 8.229 (likely in log form). Moreover, it has low skewness (0.098) and kurtosis (2.586), suggesting a normal distribution around the mean. The mean value of asset tangibility is 0.362, showing that about 36.2% of total assets are tangible. The skewness (0.234) and low kurtosis (1.676) indicate a slightly right-skewed distribution. In the end, the mean value of firm efficiency is 0.051, with a negative skewness (−1.302) and high kurtosis (12.230), suggesting a left-skewed distribution with significant peaks, indicating that most firms have low efficiency with some extreme values. Overall, the statistics show varying distributions across the variables, highlighting the diversity in corporate financial practices and characteristics among the firms in the sample.

Table 4. Descriptive analysis

Variable	Mean	Median	Maximum	Minimum	Std. dev.	Skewness	Kurtosis
CHO	0.322	0.258	0.898	0.023	0.201	0.848	2.829
CSR	0.120	0.071	0.899	0.000	0.152	2.517	9.951
DFR	0.307	0.299	0.807	0.007	0.151	0.419	2.971
FRS	8.229	8.212	9.432	6.876	0.574	0.098	2.586
AST	0.362	0.336	0.882	0.006	0.257	0.234	1.676
FEF	0.051	0.046	0.219	−0.290	0.049	−1.302	12.230

Source(s): The analysis conducted by using the EVIEWS software

Table 5 presents the correlation matrix for the key variables in the study: corporate cash holdings (CHO), corporate social responsibility (CSR), corporate debt financing (DFR), firm size (FRS), asset tangibility (AST), and firm efficiency (FEF). The values indicate the strength and direction of the linear relationships between each pair of variables. The Variance Inflation Factor (VIF) values reported in Table 5 indicate no significant multicollinearity among the independent variables. With VIF values ranging between 2.899 and 3.091, all variables remain below the commonly accepted threshold of 10, suggesting that the predictors are not excessively correlated and can be reliably included in the regression analysis. This ensures the stability and robustness of the estimated coefficients and enhances the credibility of the study's findings.

CHO has a weak positive correlation with CSR (0.130) and firm efficiency (FEF) (0.161), suggesting that as CSR scores or firm efficiency increase, corporate cash holdings also slightly increase. However, CHO shows a moderate negative correlation with corporate debt financing (DFR) (−0.307) and firm size (FRS) (−0.325), indicating that higher debt levels or larger firm size are associated with lower cash holdings. There is a weak negative correlation between asset tangibility (AST) and cash holdings (−0.196), indicating that firms with a higher proportion of tangible assets tend to maintain lower levels of cash reserves. Corporate Social Responsibility (CSR) also exhibits a weak negative correlation with debt financing ratio (DFR) (−0.068) and asset tangibility (AST) (−0.128), suggesting that companies with higher CSR scores generally have lower debt levels and fewer tangible assets. Additionally, CSR shows a very weak negative correlation with firm size (FRS) (−0.070) and a weak positive correlation with financial efficiency (FEF) (0.083). The debt financing ratio (DFR) is moderately positively correlated with asset tangibility (AST) (0.406), implying that firms with more tangible assets are more likely to engage in debt financing. Furthermore, DFR demonstrates a moderate negative correlation with financial efficiency (FEF) (−0.345), indicating that firms with higher debt levels tend to be less financially efficient.

Table 6 presents the results from three regression models (Fixed Effects, Panel Estimated Generalized Least Squares (EGLS), and System Generalized Method of Moments) while analyzing the effect of CSR on corporate cash holdings (CHO), with cash holdings serving as the dependent variable. Each model demonstrates a statistically significant constant term, with coefficients ranging from 0.163 (Panel EGLS) to 0.871 (Fixed Effects), indicating a baseline level of cash holdings when other variables are excluded. In the dynamic models (Panel EGLS and System GMM), the lagged value of cash holdings (CHO(−1)) shows a highly significant positive effect (coefficients of 0.825 and 0.890, respectively), suggesting that past cash holdings significantly influence current cash levels, highlighting a persistent cash management behavior over time. This persistence suggests that firms with strong CSR programs may exhibit more consistent and disciplined cash management behaviors. CSR-oriented firms often prioritize transparency, ethical governance, and stakeholder engagement,

Table 5. Correlation analysis

Variables	CHO	CSR	DFR	FRS	AST	FEF
CHO	1.000					
CSR	0.130	1.000				
DFR	−0.307	−0.068	1.000			
FRS	−0.325	−0.070	0.042	1.000		
AST	−0.196	−0.128	0.406	−0.054	1.000	
FEF	0.161	0.083	−0.345	−0.204	−0.053	1.000
VIF	3.091	2.999	3.011	2.899	3.001	2.998

Note(s): The superscripts a, b, and c denotes the significance level at 1%, 5%, and 10%

Source(s): The analysis conducted by using the EVIEWS software

Table 6. Effect of CSR on cash holding

Variables	Cash holding as a dependent		Panel EGLS		System GMM	
	Fixed effect Coefficients	Probability	Coefficients	Probability	Coefficients	Probability
<i>C</i>	0.871	0.011	0.163	0.005	0.289	0.022
<i>CHO</i> (−1)	–	–	0.825	0.000	0.890	0.000
<i>CSR</i>	−0.111	0.032	−0.050	0.039	−0.139	0.043
<i>DFR</i>	−0.207	0.043	−0.115	0.000	−0.163	0.005
<i>FRS</i>	−0.123	0.004	−0.010	0.098	−0.021	0.098
<i>AST</i>	−1.029	0.000	−0.112	0.021	−0.132	0.002
<i>FEF</i>	−0.194	0.001	−0.147	0.001	−0.509	0.000
<i>Adjusted R-squared</i>		0.749	0.802		0.713	
<i>S.E. of regression</i>		0.100	0.099		0.105	

Note(s): The superscripts a, b, and c denotes the significance level at 1%, 5%, and 10%. *Instrument specification:* *CHO* (−2) *CSR* (−1) *DFR* (−1) *FRS* (−1) *AST* (−1) *FEF* (−1)

Source(s): The analysis conducted by using the EViews software

which can lead to better financial planning and stability. By integrating CSR into their strategic framework, such firms are likely to adopt cash management practices that align with their long-term objectives and stakeholder expectations. These practices may involve maintaining optimal liquidity levels to address operational needs while minimizing the risk of excess cash accumulation that could signal inefficiency.

CSR consistently exhibits a negative and statistically significant relationship with cash holdings across all models. The coefficients are −0.111 (Fixed Effects), −0.050 (Panel EGLS), and −0.139 (System GMM), with *p*-values below 0.05, indicating that firms engaging more in CSR activities tend to hold less cash. DFR is also negatively associated with cash holdings, with coefficients of −0.207 (Fixed Effects), −0.115 (Panel EGLS), and −0.163 (System GMM), all significant at the 5% level, suggesting that higher debt levels are linked to lower cash holdings due to the substitution effect between debt and cash. FRS demonstrates a negative relationship with cash holdings, particularly in the Fixed Effects model (−0.123, *p* = 0.004), though this relationship appears weaker in the Panel EGLS and System GMM models, with *p*-values indicating marginal significance.

The analysis reveals that asset tangibility (AST) has a consistently negative and statistically significant impact on corporate cash holdings across all models. Specifically, the coefficients are −1.029 for the Fixed Effects model, −0.112 for the Panel EGLS model, and −0.132 for the System GMM model. These findings suggest that firms with a higher proportion of tangible assets are likely to maintain lower cash reserves, potentially due to their ability to use these tangible assets as collateral to secure external financing. Similarly, FEF exhibits a negative and statistically significant effect on cash holdings, with coefficients of −0.194 (Fixed Effects), −0.147 (Panel EGLS), and −0.509 (System GMM), implying that more efficient firms manage their cash flows more effectively or have reduced needs for precautionary cash reserves.

6. Discussion on results

The results displayed in Table 6 demonstrate that CSR exerts a consistently negative and statistically significant effect on corporate cash holdings across all three models. This indicates that firms actively involved in CSR activities are more likely to hold lower levels of cash reserves. This inverse relationship can be justified by the argument that companies with higher CSR commitments may have better access to external financing due to enhanced reputational capital and trust from stakeholders, reducing the need for precautionary cash reserves (Yin and Yang, 2023). Additionally, such firms might reinvest their cash more readily into sustainable

projects, thus lowering their cash holdings (Liao *et al.*, 2023). Corporate debt financing (DFR) also shows a significant negative association with cash holdings, which supports the trade-off theory of capital structure. Firms with higher debt levels are likely to maintain lower cash reserves due to the increased costs of holding liquid assets and the potential for financial distress. The substitution effect suggests that debt and cash are inversely related: as firms increase their reliance on debt financing, they reduce their cash holdings to avoid excess liquidity that could be otherwise used to pay down debt or reinvest in profitable opportunities.

The negative impact of CSR on cash holdings aligns with agency theory and stakeholder theory. From an agency perspective, firms engaging in CSR activities may reduce excess cash holdings to mitigate agency conflicts, as higher cash reserves can lead to managerial opportunism. Managers committed to CSR are likely to allocate financial resources toward socially responsible initiatives rather than accumulating idle cash, reflecting efficient cash management. Stakeholder theory further supports this finding, as firms prioritizing CSR seek to build trust and long-term relationships with stakeholders, including investors, employees, and customers. This stakeholder commitment often translates into strategic reinvestment of cash into sustainable and socially beneficial projects rather than hoarding liquidity. Additionally, the resource-based view suggests that firms investing in CSR develop intangible assets such as brand reputation and customer loyalty, reducing the need for excessive cash reserves as a financial buffer. These theoretical perspectives collectively explain why CSR-oriented firms tend to hold less cash, as they strategically deploy financial resources to enhance social and environmental performance while maintaining financial discipline.

Firm size (FRS) is found to have a negative effect on cash holdings, especially in the Fixed Effects model. This negative link indicates that larger firms typically hold less cash, possibly due to their diversified operations and greater access to financial markets, which reduces the necessity to maintain large cash reserves. Larger firms may also have predictable cash flows, allowing them to operate with lower levels of precautionary cash. Asset tangibility (AST) demonstrates a negative and significant relationship with cash holdings across all models. This result aligns with the understanding that firms with a higher proportion of tangible assets tend to hold less cash since such assets can be used as collateral for external financing, reducing the need for cash buffers. This finding further emphasizes that firms with more tangible assets prefer to leverage their asset base for liquidity purposes rather than holding cash. Lastly, firm efficiency (FEF) is also negatively associated with cash holdings. Firms that are more efficient are likely to optimize their cash management practices, reducing the need to hold excess cash. This efficiency is reflected in the significant negative coefficients across all models, which suggests that firms with higher operational efficiency can better manage their cash flows and reduce reliance on liquid reserves.

7. Conclusion and policies

This research investigates the influence of CSR on corporate cash holdings (CHO) within Chinese A-Share listed firms over the period from 2010 to 2022. The analysis is conducted using a combination of Fixed Effects models, Panel EGLS, and system GMM to ensure robust and reliable findings. The findings consistently demonstrate that firms engaging in higher levels of CSR tend to hold less cash, supporting the notion that socially responsible firms might have enhanced access to external financing, better stakeholder relationships, and an inclination to reinvest in sustainable projects rather than retaining cash reserves. Furthermore, the study reveals significant negative relationships between cash holdings and corporate debt financing (DFR), firm size (FRS), asset tangibility (AST), and firm efficiency (FEF), suggesting that these variables also play a critical role in shaping corporate cash management practices.

The findings of this study carry specific implications for corporate managers, policymakers, and investors within the Chinese setting. For corporate managers in China, where firms often operate under unique institutional pressures and government oversight,

understanding the negative relationship between CSR and cash holdings is crucial. Engaging in CSR can enhance a firm's reputation and access to external capital, especially in China's rapidly evolving financial landscape. Managers should leverage these benefits while maintaining sufficient liquidity to address operational needs and economic uncertainties, particularly in a context where access to credit markets may vary across regions. Policymakers in China can incentivize CSR engagement through targeted measures such as tax credits, grants, or subsidies, aligning with national objectives like sustainable development and "common prosperity." Additionally, strengthening financial market transparency and developing regional credit markets can empower firms to optimize liquidity management without relying excessively on cash reserves. These measures can be particularly impactful given the diverse economic environments across China's provinces and industries.

To align the policy implications with recent sustainability movements, the study emphasizes integrating CSR with cash management through contemporary frameworks such as ESG performance metrics, sustainability-linked financial instruments, and carbon transition strategies. Instead of traditional approaches like the Triple Bottom Line, corporate managers can adopt dynamic ESG-linked financial mechanisms, such as sustainability-linked bonds and green financing, to ensure CSR initiatives contribute to long-term financial resilience. Firms should embed CSR into their financial strategies by linking sustainability efforts to measurable economic and environmental outcomes, such as resource efficiency, carbon reduction targets, and sustainable supply chain management. Policymakers can facilitate this transition by introducing advanced regulatory incentives, including ESG taxonomies, mandatory climate-related financial disclosures, and preferential lending rates for sustainable investments. Additionally, rather than solely relying on frameworks like the Global Reporting Initiative (GRI), firms can align with evolving standards such as the Task Force on Climate-related Financial Disclosures (TCFD) and the International Sustainability Standards Board (ISSB) to enhance transparency and accountability in sustainability reporting. This approach ensures that CSR is embedded into corporate strategy as an essential driver of financial stability and long-term value creation.

7.1 Research limitations and future directions

This research focuses exclusively on Chinese A-Share listed firms, potentially limiting its generalizability to other regions or markets. China's unique institutional, regulatory, and cultural environment, characterized by significant state involvement and policy-driven initiatives, may not reflect conditions elsewhere. Moreover, the study period (2010–2022) captures a specific phase of China's economic development, possibly overlooking longer-term shifts in corporate behavior and financial practices.

Future studies should expand the scope to include firms from diverse geographic regions and economic contexts to enhance the understanding of the CSR-cash holdings relationship globally. Incorporating a longer timeframe would allow for a more comprehensive analysis of evolving trends in cash management practices. Additionally, exploring macroeconomic variables such as economic cycles or industry-specific factors, along with the role of corporate governance mechanisms would provide deeper insights into the drivers of this relationship within and beyond China's unique institutional framework.

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