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Mandatory Information Disclosure Regulation and Corporate Cash Holdings: Evidence From a Quasi-Natural Experiment

Xiang Zhang[1] | Rui Xu[1] | Hung T. Nguyen[2] | Han Zhou[3]

[1]Chongqing University of Technology, Chongqing, China | [2]Massey Business School, Massey University, Auckland, New Zealand | [3]School of Finance, Massey Institute, Nanjing University of Finance and Economics, Nanjing, China

Correspondence: Han Zhou (9120181113@nufe.edu.cn)

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ABSTRACT

This paper examines the impact of mandatory information disclosure regulation on corporate cash holding decisions, a fundamental component of working capital management. Using industry-specific information disclosure guidelines as a quasi-natural experiment that introduces shocks to disclosure practices across different sectors, we find that the implementation of these regulations leads to a significant reduction in corporate cash holdings. We identify two mechanisms underlying this effect. Specifically, the implementation of the information disclosure regulation lowers agency costs and reduces the operational risks faced by firms, leading to lower cash holdings. Heterogeneity analysis shows that the negative relation between information disclosure regulation and corporate cash holdings is stronger among firms facing greater financial constraints, those with more effective internal controls, firms in highly competitive industries, and those operating in high-tech sectors. The reduction in corporate cash holdings driven by information disclosure regulation enhances firms' sustainable development capacity and alleviates underinvestment problems, supporting more efficient resource allocation and effective working capital management.

1 | Introduction

Liquidity management is the first-order important decisions for firms (Graham and Harvey 2001) and understanding how much cash a company should hold is a key aspect of liquidity management (Faulkender and Wang 2006). A large body of literature has explored the motives behind corporate cash holdings (e.g., Opler et al. 1999).[1] A recurring theme in this literature is the role of information asymmetry, which can give managers opportunities to act in their own interests, weaken shareholders' ability to monitor and incentivize management effectively, leading to agency costs that diminish overall firm value (e.g., Akerlof 1970; Jensen and Meckling 1976; Holmström 1979). While the connection between information asymmetry and corporate cash holding decisions has attracted sustained interest from both academics and practitioners, a major limitation in the literature is the endogenous nature of both information disclosure and firms' strategic cash decisions. In this study, we examine the impact of mandatory information disclosure regulation on corporate cash holdings. This quasi-natural experiment offers two key advantages. First, the regulation introduces variation in disclosure practices that is exogenous to firms' internal policies, enabling us to identify causal effects between information disclosure and working capital management, if there are any. Second, the implementation of industry-specific disclosure guidelines captures shocks to information disclosure across different sectors, creating greater variation in information asymmetry than studies relying on a single market-wide event.

China offers an ideal setting for our research. The state of corporate information disclosure among China's listed companies has improved significantly in recent years, though

challenges remain.[2] In China, the information disclosure regime is primarily overseen by the China Securities Regulatory Commission (CSRC) and the Shanghai and Shenzhen stock exchanges. These regulatory bodies have implemented a range of disclosure requirements for listed firms, including financial statements, related party transactions, executive compensation, and material events. Since the enactment of the Securities Law of the People's Republic of China in 1998, the regulatory framework has undergone several reforms. These include the introduction of the Corporate Governance Code for Listed Companies in 2001 and the Guidelines for Industry Information Disclosure in 2003. Together, these measures require companies to disclose relevant and timely information to enhance market transparency.

Since 2013, the CSRC has initiated a regulatory transformation; the Listed Company Supervision Department explicitly proposes the implementation of a "regulatory model transformation" strategy. The goal is to gradually shift the regulatory oversight of listed companies to a more refined "industry-specific supervision" model. Then, the Shenzhen Stock Exchange and the Shanghai Stock Exchange start to release the industry-specific information disclosure guidelines for listed companies. Several studies have examined the economic effects of mandatory disclosure regulations. For instance, Au et al. (2023) show that mandatory risk factor disclosure reduces stock price cash risk. In addition, mandatory disclosure enables analysts to conduct more differentiated and in-depth analyses, thereby reducing forecast errors and improving accuracy (Liu et al. 2023; Shi et al. 2023), which in turn enhances the information environment (Liu et al. 2025).[3] However, the effect of mandatory information disclosure regulations on corporate cash holdings is largely under-investigated. Using the industry-specific information disclosure guidelines (ISIDG hereafter) as a quasi-natural experiment that introduces shocks to disclosure practices across different sectors, our study aims to fill that gap.

Why the implementation of ISIDG matters for cash holding decisions? Prior literature offers mixed implications. On the one hand, the adoption of ISIDG aims to enhance the transparency and accuracy of corporate information by aligning disclosures with the unique characteristics of each industry. This reduces the potential for management to manipulate financial statements, thus lowering agency costs. Firms can access industry-relevant data, including potential risks, allowing them to adjust their strategies to avoid these risks. This reduction in operational risks lowers the precautionary demand for cash, leading to a decrease in corporate cash holdings. On the other hand, mandatory information disclosure may require firms to reveal proprietary or strategically sensitive information that they would otherwise prefer to keep confidential from external parties such as competitors, creditors, and other stakeholders. This forced transparency can heighten uncertainty surrounding future business operations, limit strategic flexibility, and potentially weaken the firm's competitive position. Moreover, the exposure of internal information may adversely affect investment opportunities and constrain access to external financing. In response to these heightened risks, firms may increase their cash holdings as a precautionary measure, consistent with the precautionary motive theory, to safeguard against potential disruptions and maintain financial flexibility. Thus, the impact of mandatory information disclosure on corporate cash holdings remains unclear and requires a comprehensive empirical investigation.

Using a sample of non-financial listed companies from the Shanghai and Shenzhen A-share markets between 2011 and 2021, this study investigates the effect of mandatory information disclosure on corporate cash holdings. The empirical results suggest a significant reduction in corporate cash holdings after the introduction of the ISIDG. The underlying mechanisms driving this effect are twofold: a decrease in agency costs and a reduction in operational risks. In the heterogeneity analysis, the negative relation between the ISIDG implementation and cash holdings is more pronounced for firms facing greater financial constraints, possessing stronger internal controls, operating in highly competitive industries, and belonging to the high-tech sector.

This paper contributes to literature in the following aspects. First, this paper enriches the literature regarding the determinants of cash holdings by providing more insights into the agency and precautionary motives (e.g., Dittmar and Mahrt-Smith 2007; Harford et al. 2008). To the best of our knowledge, our study is the first to explore the impact of mandatory information disclosure regulations on cash holdings by using a quasi-natural experiment in China that introduces shocks to disclosure practices across different sectors. Second, this paper provides additional evidence on the economic consequences of mandatory information disclosure regulations. While prior studies focus primarily on the improvement of information asymmetry (Li, Shi, et al. 2024; Liu et al. 2025; Xue et al. 2024) and corporate governance (Au et al. 2023; Dai and Zou 2024; Miloud 2024; Xue et al. 2023), little attention has been given to corporate financing strategies. Our study also uncovers the underlying mechanisms through the lenses of agency costs and operational risks. The findings reveal that mandatory information disclosure leads to a decrease in agency costs and a reduction in operational risks. Furthermore, we explore the economic implications of cash holdings following the implementation of these disclosure regulations, offering valuable insights for key corporate stakeholders, including employees, creditors, regulators, suppliers, and customers.

The remainder of this paper is organized as follows: Section 2 provides a brief review of the relevant literature and hypotheses development. The measures of the variables and model specifications are provided in Section 3. Section 4 presents the data and analyses the empirical results. Section 5 presents further analyses, and Section 6 concludes the paper.

2 | Literature Review and Hypotheses Development

2.1 | Literature Review on Cash Holdings

Previous studies suggest that corporate cash holdings are mainly determined by precautionary and agency motives (Opler et al. 1999; Bates et al. 2009). Precautionary motives are primarily driven by risk and uncertainty, since those may cause unexpected future spending; thus, companies tend to hold

more cash. The associated risks and uncertainties include political uncertainty proxied by official government turnover (Xu et al. 2016), oil price uncertainty (Zhang et al. 2020; Alomran and Alsubaiei 2022), cash flow volatility (Han and Qiu 2007; Tawiah and Keefe 2022), text-based measures of ambiguity (Friberg and Seiler 2017), refinancing risk (Harford et al. 2014), and reputation risk (Hasan et al. 2022). Moreover, Begenau and Palazzo (2021) investigate the selection effect of US public firms to show that increased precautionary savings motive explains approximately 50% of the upward trend in cash holdings. Furthermore, Deng et al. (2022) find that social insurance premiums are positively correlated with cash holdings in labor-intensive firms.

The literature identifies several factors that significantly impact cash holdings related to agency problems, including shareholder protection (Dittmar et al. 2003; Kalcheva and Lins 2007; Zhang, Wu, et al. 2025), CEO compensation (Liu and Mauer 2011; Xu 2013; Feng and Rao 2018; Zhang, Xu, and Li 2025), and corporate ownership (Ozkan and Ozkan 2004; Megginson et al. 2014; Anderson and Hamadi 2016). Several studies suggest that corporate governance plays an important role (e.g., Dittmar and Mahrt-Smith 2007; Harford et al. 2008; Bhuiyan and Hooks 2019); however, Elyasiani and Movaghari (2022) challenge these findings by showing that none of the corporate governance variables were selected by the LAD-LASSO model. The impact of managers' characteristics is also investigated, including CEO overconfidence (Aktas et al. 2019) and narcissistic leadership (Qiao et al. 2022). In addition, directors who are former CEOs are negatively related to cash holdings (Li and Lan 2022).

Using a carbon emissions trading system as a quasi-natural experiment, Li et al. (2022) find that environmental regulation has a positive impact on cash holdings, whereas Tan et al. (2021) discovered that environmental rule enforcement causes firms to hold less cash. Nyborg and Wang (2021) propose another motive for cash holdings: the repurchase motive, arguing that enhanced stock liquidity induces firms to hold more cash. In addition, the grabbing hand effect has also been investigated in several studies (Chen et al. 2014). Kusnadi et al. (2015) find that firms in countries with more developed institutions hold more cash because the grabbing hand effect is mitigated; however, due to the financial constraint mitigation effect, Zhang and Zhou (2022) report a negative correlation between institutional development and cash holdings. Park (2022) argues that firms in corrupt environments tend to hold less cash because of the high cost of capital.

2.2 | Policy Background

Beginning in 2013, the CSRC hereafter embarked on a significant regulatory reform, with its Listed Company Supervision Department formally adopting a strategic shift from traditional geographic-based oversight to a new industry-focused disclosure regime. This regulatory innovation, designed to better meet investor information needs, represents a systematic effort to develop a more scientifically grounded and operationally efficient supervision framework for China's capital markets.

The Shenzhen Stock Exchange (SZSE) and Shanghai Stock Exchange (SSE) have implemented a phased rollout of Industry-Specific Information Disclosure Guidelines for listed companies. The SZSE has established a dual framework: first, a specialized system for ChiNext market companies initiated in 2013, emphasizing innovation and entrepreneurship characteristics and currently covering 15 subsectors; second, a parallel system for main board traditional industries launched in 2015, now encompassing 18 industries.

Concurrently, the SSE's guideline system, introduced in 2013, follows the principle of "highlighting key sectors, integrating related industries, and accommodating special cases." The SSE's approach systematically considers each industry's economic significance (measured by its GDP contribution), the number of listed firms within the sector, and its market capitalization weight. This methodology has resulted in 28 comprehensive disclosure guidelines—Guideline No. 1 serving as general provisions, with the remaining 27 addressing specific industries. A detailed timeline of the ISIDG is shown in Appendix B.

2.3 | Hypotheses Development

Industry-specific information constitutes an indispensable component of the informational environment, as industries differ significantly in terms of macroeconomic conditions, business models, and other aspects. Industry-specific disclosure policies require listed companies to provide targeted operational information based on the characteristics of their respective industries. Additionally, firms are required to present unique, customized indicators according to industry standards, which inject rich incremental information into the capital markets. As a result, industry-specific information disclosure, as mandated by the mandatory disclosure regulations released by the Shanghai and Shenzhen stock exchanges, provides a wealth of firm-specific information that greatly improves the informational environment. Enhancing the information environment has significant implications for corporate cash holdings.

Firstly, industry-specific information disclosure can reduce agency costs, thereby lowering corporate cash holdings. According to classic principal-agent theory, there is a misalignment of interests between management and shareholders. When management's personal benefits conflict with those of shareholders, they often prioritize their own interests, creating an agency problem (Meckling and Jensen 1976; Watts and Zimmerman 1990). However, the implementation of industry-specific information disclosure policies can effectively mitigate this issue.

On one hand, the industry-specific disclosure system mandates that companies closely align their disclosures with the unique characteristics of their industry, providing detailed and substantial operational information and related indicators. This measure directly limits the ability of management to manipulate financial statements and significantly increases the potential cost of opportunistic behavior. Specifically, the system enhances the transparency and accuracy of corporate information, thereby reducing the opportunities for

management to engage in information manipulation. On the other hand, industry-specific information disclosure also provides investors with more convenient means to compare and analyze key financial metrics against other companies in the same industry, making it easier to identify potential anomalies. This comparative analysis not only deepens investors' understanding of a firm's operations but also enhances their ability to detect self-interested behaviors by management due to moral hazard (Chen et al. 2012; Ramnath 2002). Therefore, the introduction of industry-specific disclosure guidelines can reduce agency costs, which in turn leads to a decrease in corporate cash holdings.

Secondly, Industry-specific information disclosure can reduce firms' operational risks and subsequently decrease their precautionary motives for holding cash for several reasons. First, industry-specific disclosure guidelines serve as mandatory information disclosure tools, which help reduce information asymmetry of firms (Brown and Hillegeist 2007; Shi 2022). By reducing such asymmetry, firms can acquire and understand operational information relevant to their industry, thus mitigating operational risks that arise from information barriers. Second, these guidelines require listed firms to disclose differentiated industry-related operational information based on the characteristics of each industry, particularly information related to potential risks. After the release of these guidelines, firms gain access to more information about industry peers, industrial policies, operational models, and strategic development plans of other companies. By understanding these changes, firms can promptly adjust their business strategies to avoid potential operational risks (Chang et al. 2021). Furthermore, the introduction of industry-specific information disclosure guidelines effectively addresses issues related to the inconsistency of disclosures across industries. These guidelines encourage firms within the same industry to adopt uniform disclosure standards that align with industry characteristics, thus enhancing the comparability of information across firms (Yip and Young 2012). This provides stakeholders with a more accurate, specific, and direct understanding of a firm's operational status and the risks it faces. Therefore, the issuance of industry-specific disclosure guidelines can reduce firms' operational risks, which in turn decreases the precautionary demand for cash, leading to a reduction in corporate cash holdings.

In the preceding section, we clarified that the implementation of Industry-Specific Information Disclosure Guidelines can reduce firms' demand for cash holdings by lowering both agency and precautionary motives. Below, we discuss how the implementation of ISIDG influences corporate cash holdings by affecting the supply of cash. The implementation of ISIDG effectively enhances the information environment of firms, reducing information asymmetry between firms and banks. The increased transparency in the information shared between banks and firms creates more convenient and favorable conditions for firms to secure additional financing, thereby reducing their financing costs and facilitating access to more indirect financing. Specifically, the differential disclosure of relevant industry policies, corporate performance, and business activities under ISIDG enables financial institutions to obtain more accurate credit information, providing a comprehensive understanding of firms' operational conditions and credit risks. This, in turn, reduces risk premiums in pricing and lowers firms' financing costs (Bharath et al. 2008). As financing costs decrease, firms' financial flexibility increases, making it easier and more convenient for them to access funds, thus diminishing the need to hold excessive cash. This effectively reduces the costs associated with maintaining cash holdings.

Based on the above arguments, we propose our sole hypothesis as follows:

Hypothesis 1. *Corporate cash holdings decrease following the implementation of industry-specific information disclosure.*

3 | Data and Variables

3.1 | Data

We source the data from the China Stock Market and Accounting Research database (CSMAR). Our sample contains annual data from 2011 to 2021. Our sample begins in 2011, as the implementation of industry-specific information disclosure guidelines started in 2013, and we allow 2 years prior to their implementation. Our sample ends in 2021, the latest available data at the time of writing.

Following conventional practices in the literature, we exclude firms in the financial sector; firms marked ST and *ST are also removed. Our dataset forms an unbalanced panel, as some firms have incomplete data and certain observations are missing. To mitigate the impact of outliers, the non-continuous variables are winsorized at the 1st and 99th percentiles.

3.2 | Cash Holdings

To measure corporate cash holdings, we employ the widely used cash-to-net assets ratio, which is defined as cash and cash equivalents to net assets (e.g., Phan et al. 2019; Zhang and Zhou 2022; Zhang, Zhan, and Liu 2023; Zhang, Zhang, and Zhou 2023). The latter depicts the difference between total assets and the sum of cash and cash equivalents. We also consider several alternative measures of cash holding which we will present in the robustness analysis in Section 4.3.

3.3 | Industry-Specific Information Disclosure Guidelines

In this paper, we employ the implementation of industry-specific information disclosure guidelines (ISIDG hereafter) as a quasi-natural experiment. We manually collected the ISIDG information from the official websites of the stock exchanges and mapped out its timeline. With the timeline, we constructed a binary variable to determine whether each listed firm was affected by the reform. Since firms across different industries and boards were affected by the reform at different times, a staggered difference-in-differences approach is well suited to examine its impact on corporate cash holdings.

Our independent variable of interest is a dummy variable, *Infoind*. Specifically, if firm i is subjected to the implementation of industry-specific information disclosure in year t or later, *Infoind* takes a value of 1; otherwise, it is 0.

3.4 | Model Specification

Our empirical methodology builds on the literature that employs exogenous shocks that vary by time and sector for identification to make causal inferences (e.g., Bertrand and Mullainathan 2003; Atalay 2017). Specifically, we follow the literature (Opler et al. 1999; Dittmar et al. 2003; Chen et al. 2014) and employ the generalized difference-in-difference analysis as follows:

$$Cash_{it} = \beta_0 + \beta_1 Infoind_{it} + \sum_k \beta_k CONTROL_{it}^k + \sum Firm_i + \sum Year_t + \varepsilon_{it} \quad (1)$$

where for firm i and year t, *Cash* refers to cash holdings and *Infoind* denotes the implementation of industry-specific information disclosure guidelines. ε represents the unobserved random error. *CONTROL* represents the set of control variables. Following prior studies (e.g., Smith Jr and Watts 1992; Jung et al. 1996), we include a range of control variables that can matter for corporate cash decisions, including leverage ratio (*Lev*), capital expenditure (*Capex*), net working capital (*Nwc*), whether the profit of a firm is negative (*Loss*), whether the chairman of the board and CEO are the same person (*Dual*), the percentage of shares held by the top1 shareholder (*Top1*), operational cash flow (*Cf*), dividend payment (*Div*), natural logarithm of total assets (*Size*), firm age (*Age*), book-to-market ratio (*BM*), ownership structure (*Soe*), ratio of independent directors on the board (*Indep*). We include firm fixed effects and year fixed effects to account for firm-specific heterogeneity and time-specific unobservable factors that may be related to cash holding decisions. The errors are clustered by firms (Petersen 2009). Detailed definitions of the variables are presented in Appendix A.

3.5 | Descriptive Statistics

Panel A of Table 1 presents the descriptive statistics for the variables used in this study. The mean of cash holdings (*Cash*) is 0.275, with a maximum value of 3.096, a minimum value of 0.009, and a standard deviation of 0.283, indicating considerable variation in cash holdings across firms. The average value of *Infoind* is 0.299, suggesting that 29.9% of the sample firms are subject to the implementation of the industry-specific information disclosure guidelines.

Panel B of Table 1 presents the results of the Spearman and Pearson correlation analysis between the variables. The main explanatory variable of interest, *Infoind*, is significantly negatively correlated with the dependent variable, *Cash*, at the 1% level. This suggests that industry-specific information disclosure guidelines can significantly reduce firms' cash holdings, providing preliminary support for our hypothesis. Most correlation coefficients in Panel B are below 0.5, suggesting that there is no significant multicollinearity issue among the variables. The basic statistical information for other variables is consistent with existing studies.

4 | Empirical Results

4.1 | Industry-Specific Information Disclosure and Cash Holdings

Table 4 reports the baseline regression results. Column (1) presents the direct effect of *Infoind* on *Cash* without any control variables and fixed effects. The coefficient of *Infoind* is −0.029, which is significantly negative at the 1% level. When firm and year fixed effects are included in Column (2), the coefficient of *Infoind* is −0.0207 and significant at the 1% level. Column (3) further includes all control variables, and the coefficient of *Infoind* is −0.0233, significant at the 1% level. These results suggest that the implementation of the industry-specific information disclosure guidelines significantly reduces corporate cash holdings, which is in line with our first hypothesis.

The effect is economically meaningful. For instance, considering the economic significance of Table 2's Column (3), given that the average level of corporate cash holdings is 0.271, this implies that the implementation of the industry-specific information disclosure guidelines leads to an 8.6% reduction in cash holdings, which is economically significant.

4.2 | Endogeneity Issues

4.2.1 | Parallel Trend Test

The parallel trend assumption is a fundamental requirement for the application of the difference-in-difference (DID) method. In this section, we conduct a parallel trend test to further investigate and mitigate potential endogeneity concerns.

The empirical findings are presented in Figure 1. Variables *Pre_2*, *Pre_3*, and *Pre_4* represent the Years 2 through 6 before the implementation of the ISIDG, whereas the variable *Current* denotes the year in which the ISIDG is executed. Additionally, *Las_1*, *Las_2*, *Las_3*, and *Las_4* capture the Years 1 through 4 following the ISIDG execution. To address multicollinearity concerns, we use the period immediately prior to the policy change (*Pre_1*) as the reference group.

The results of the parallel trend test reveal that the coefficients for *Pre_2*, *Pre_3*, and *Pre_4* are not statistically significant. This suggests that, before the implementation of ISIDG, there are no meaningful differences in cash holdings between the treatment and control groups. The coefficients for *Current*, *Las_1*, *Las_2*, *Las_3*, and *Las_4* are significantly negative, indicating that the ISIDG implementation resulted in considerable differences in cash holdings between the treatment and control groups. These findings collectively support the validity of the parallel trend assumption.

TABLE 1 | Descriptive statistics of variables and correlation matrix.

Panel A: Descriptive statistics of variables

	N	Mean	SD	Min	p25	p50	p75	Max
Cash	28,377	0.271	0.279	0.009	0.106	0.183	0.328	3.096
Infoind	28,377	0.304	0.460	0	0	0	1	1
Lev	28,377	0.423	0.205	0.054	0.259	0.414	0.576	0.894
Cflow	28,377	0.061	0.090	−0.226	0.010	0.055	0.106	0.461
Age	28,377	2.147	0.838	0	1.609	2.303	2.890	3.401
Nwc	28,377	0.088	0.243	−0.614	−0.073	0.085	0.252	0.687
Capex	28,377	0.061	0.058	0.000	0.019	0.043	0.084	0.380
Size	28,377	22.234	1.294	19.948	21.298	22.048	22.971	26.326
BM	28,377	0.620	0.251	0.057	0.428	0.619	0.808	1.244
Top1	28,377	0.343	0.148	0.084	0.228	0.321	0.444	0.745
Indep	28,377	0.376	0.054	0.333	0.333	0.364	0.429	0.571
Dua	28,377	0.276	0.447	0	0	0	1	1
Div	28,377	0.743	0.437	0	0	1	1	1
Loss	28,377	0.105	0.307	0	0	0	0	1
Soe	28,377	0.361	0.480	0	0	0	1	1

Panel B: Correlation matrix

	Cash	*Infoind*	*Lev*	*Cflow*	*Age*	*Nwc*	*Capex*	*Size*	*BM*	*Top1*	*Indep*	*Dua*	*Div*	*Loss*	*Soe*
Cash	1	−0.009	−0.385***	0.250***	−0.211***	0.249***	0.087***	−0.220***	−0.200***	0.024***	0.022***	0.092***	0.187***	−0.144***	−0.120***
Infoind	−0.048***	1	0.064***	0.020***	0.147***	−0.008	−0.134***	0.139***	0.037***	−0.026***	0.036***	−0.020***	−0.013**	0.038***	0.009
Lev	−0.386***	0.066***	1	−0.195***	0.364***	−0.600***	−0.163***	0.514***	0.378***	0.049***	−0.013**	−0.146***	−0.197***	0.180***	0.293***
Cflow	0.322***	0.015**	−0.206***	1	−0.045***	−0.095***	0.228***	0.045***	−0.115***	0.102***	−0.006	−0.001	0.224***	−0.206***	−0.017***
Age	−0.268***	0.151***	0.372***	−0.047***	1	−0.346***	−0.319***	0.452***	0.181***	−0.047***	−0.031***	−0.259***	−0.218***	0.112***	0.492***
Nwc	0.183***	−0.007	−0.601***	−0.098***	−0.358***	1	−0.120***	−0.373***	−0.239***	−0.049***	0.021***	0.146***	0.181***	−0.153***	−0.298***
Capex	0.127***	−0.128***	−0.157***	0.188***	−0.323***	−0.097***	1	−0.090***	−0.064***	0.045***	−0.011*	0.093***	0.160***	−0.124***	−0.137***
Size	−0.226***	0.153***	0.507***	0.035***	0.431***	−0.344***	−0.104***	1	0.525***	0.161***	−0.025***	−0.200***	0.109***	−0.056***	0.361***
BM	−0.171***	0.044***	0.371***	−0.132***	0.157***	−0.222***	−0.059***	0.544***	1	0.154***	−0.038***	−0.135***	0.046***	−0.006	0.257***
Top1	0.029***	−0.025***	0.053***	0.096***	−0.058***	−0.046***	0.038***	0.206***	0.164***	1	0.033***	−0.057***	0.151***	−0.112***	0.231***
Indep	0.013**	0.034***	−0.005	0.001	−0.022***	0.020***	−0.003	0.006	−0.032***	0.043***	1	0.105***	−0.028***	0.025***	−0.060***

(Continues)

TABLE 1 | (Continued)

Panel B: Correlation matrix

	Cash	*Infoind*	*Lev*	*Cflow*	*Age*	*Nwc*	*Capex*	*Size*	*BM*	*Top1*	*Indep*	*Dua*	*Div*	*Loss*	*Soe*
Dua	0.092***	−0.020***	−0.146***	0.000	−0.258***	0.143***	0.101***	−0.190***	−0.137***	−0.065***	0.104***	1	0.031***	−0.011*	−0.315***
Div	0.143***	−0.013**	−0.211***	0.204***	−0.226***	0.192***	0.127***	0.114***	0.052***	0.146***	−0.029***	0.031***	1	−0.518***	−0.040***
Loss	−0.106***	0.038***	0.196***	−0.189***	0.122***	−0.166***	−0.105***	−0.059***	−0.010	−0.107***	0.025***	−0.011*	−0.518***	1	0.016***
Soe	−0.112***	0.009	0.296***	−0.023***	0.467***	−0.293***	−0.138***	0.373***	0.265***	0.237***	−0.053***	−0.315***	−0.040***	0.016***	1

Note: Panel A of the table reports the descriptive statistics of variables. Definitions of variables are provided in Appendix A. In Panel B, lower-triangular cells report Pearson's correlation coefficients while upper-triangular cells report Spearman's rank correlation.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

4.2.2 | Heterogeneous Treatment Effects

Due to the presence of heterogeneous treatment effects in multi-period DID models, traditional two-way fixed effects difference-in-differences (TWFE) models can suffer from econometric bias when handling time-varying treatment effects (e.g., Goodman-Bacon 2021). Therefore, to ensure the validity and robustness of this study, we apply robust estimation methods that account for heterogeneous treatment effects.

First, we apply the stacked estimator proposed by Cengiz et al. (2019). Specifically, for the period before and after the policy shock, we identify a "clean" control group, which did not experience the shock at the same time as the treatment group and construct a dataset accordingly. We then stack the datasets from different treatment time points and perform regression analysis. The corrected average treatment effect of *Infoind*, denoted as *Infoind_ATT*, and the regression results in Column (1) of Table 3 show that the coefficient for *Infoind* remains negative and significant at the 1% level. We plot the corresponding dynamic trend based on the Stacked DID regression results, as shown in Figure 2A. Our findings confirm that there is no significant difference between the treatment and control groups before the execution of the ISIDG. However, after the implementation of ISIDG, the difference between the treatment and control groups becomes significant.

Moreover, we use the interaction-weighted (IW) estimator proposed by Sun and Abraham (2021) to test the parallel trends assumption and report the results in Figure 2B. Consistent with previous analyses, there is no significant difference in cash holdings between the treatment and control groups prior to the implementation of the ISIDG. However, after the policy's implementation, the difference between the treatment and control groups significantly increases. The Sun and Abraham (2021) estimator consistently verifies the parallel trends assumption.

In addition, following De Chaisemartin and d'Haultfoeuille (2020), we examine the robustness of the DID estimations with TWFE under heterogeneous treatment effects. The weight test of the estimators reveals that, out of 8631 weights, 7743 are positive, whereas 888 are negative. The proportion of negative weights is 10.29%, indicating some inconsistency in the estimation results. To address this issue, following De Chaisemartin and d'Haultfoeuille (2020), we exclude the "bad" control group and weight the average treatment effect based on the "good" control groups. The corrected average treatment effect of *Infoind* is denoted as *Infoind_ATT*, and it is presented in Column (2) of Table 3. The results indicate that the adjusted average treatment effect is −0.0107, which is statistically significant at the 10% level.

Furthermore, we apply an imputation-based counterfactual method proposed by Borusyak et al. (2022) to address the estimation bias in TWFE models. By estimating group fixed effects, time fixed effects, and treatment-control group fixed effects, we obtain more accurate estimates. The regression results, presented in Column (3) of Table 3, show that the average treatment effect of *Infoind_ATT* is −0.0325, which is negative and significant at the 1% level.

TABLE 2 | Industry-specific information disclosure guidelines and cash holdings.

	Cash	*Cash*	*Cash*
	(1)	**(2)**	**(3)**
Infoind	−0.0290***	−0.0207***	−0.0233***
	(−8.09)	(−2.82)	(−3.75)
Lev			−0.5383***
			(−17.63)
Cflow			0.6248***
			(18.46)
Age			−0.2144***
			(−19.90)
Nwc			−0.2245***
			(−8.80)
Capex			0.1417***
			(3.17)
Size			0.0198***
			(3.10)
BM			0.0162
			(1.21)
Top1			−0.0100
			(−0.26)
Indep			−0.0572
			(−1.17)
Dua			0.0076
			(1.34)
Div			0.0119***
			(2.81)
Loss			0.0137***
			(3.13)
Soe			0.0019
			(0.14)
Firm fixed effects	No	Yes	Yes
Year fixed effects	No	Yes	Yes
Observations	28,377	28,377	28,377
Adj. R^2	0.002	0.497	0.612

Note: This table displays the results for the impact of the introduction of industry-specific information disclosure guidelines (ISIDG hereafter) on cash holdings. In Column (1), we regress cash holdings on the indicator presenting the introduction of ISIDG without any control variables. In Column (2), we include firm- and year-fixed effects. In Column (3), numerous control variables are included. The errors are clustered by firms. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level. Definitions of variables are provided in Appendix A.

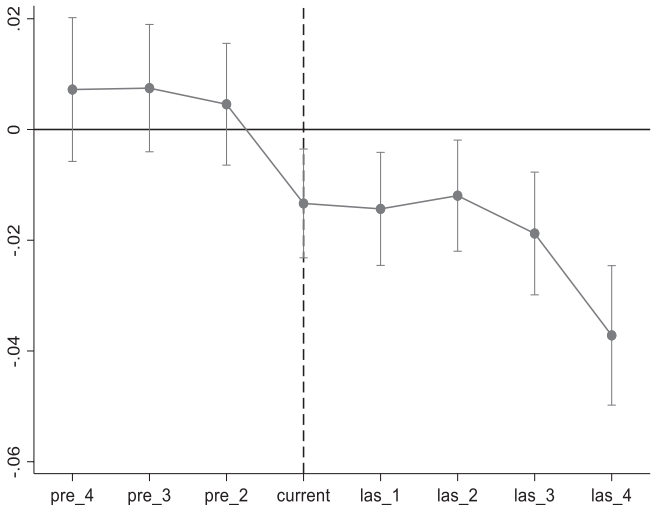

FIGURE 1 | This figure shows the parallel trend results without heterogeneous treatment effect.

Finally, considering that the validity of the estimator proposed by Borusyak et al. (2022) requires the verification of the Gauss-Markov theorem, otherwise estimation bias may persist. Thus, we further employ the weighted difference-in-differences method (CSDID) proposed by Callaway and Sant'Anna (2021). This method provides an unbiased estimate of the difference in outcomes between the treatment group and the never-treated group over two periods. The results, shown in Column (4) of Table 3, indicate that the estimated coefficient for *Infoind_ATT* is −0.0221, which is significantly negative at the 5% level. This confirms the robustness of our baseline regression results.

4.2.3 | Industry-Level Parallel Trend Test

Given that the implementation of ISIDG was conducted in phases across different industries, we further provide empirical evidence on parallel trends at the industry level to strengthen the validity of our difference-in-differences (DID) model in evaluating the effect of this policy implementation.

Specifically, we replace Infoind with five dummy variables: *Pre_4*, *Pre_3*, *Pre_2*, *Current*, and *Las_1*. The industry average cash holdings level is used as the dependent variable, and its coefficient with respect to Infoind exhibits a series of dynamic changes over time. *Pre_2*, *Pre_3*, and *Pre_4* represent the 2–4years prior to the industry's exposure to ISIDG, while Current denotes the baseline year when firms are first affected by ISIDG. *Las_1* indicates the year following the implementation of the policy in the industry.

The results of the industry-level parallel trends test are presented in Figure 3. Prior to the policy implementation, the coefficients for *Pre_4*, *Pre_3*, and *Pre_2* are not statistically significant, indicating no significant differences between the treatment and control groups. Following the policy implementation, the coefficients for *Current* and *Las_1* are both significantly negative, supporting the validity of the parallel trends assumption.

TABLE 3 | Results of different estimators with heterogeneous treatment effect.

	Stacked DID	De Chaisemartin and D'Haultfeuille	DID_Imputation	CS DID
	(1)	(2)	(3)	(4)
Infoind_ATT	−0.0333***	−0.0107*	−0.0325***	−0.0221**
	(−4.75)	(−1.65)	(−4.95)	(−2.47)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Note: This table shows the regression results using estimators with heterogenous treatment effect. Columns (1) to (4) report the results for different estimators following Cengiz et al. (2019), De Chaisemartin and d'Haultfoeuille (2020), Borusyak et al. (2022), and Callaway and Sant'Anna (2021), respectively. In all models, we include firm fixed effects and year fixed effects, and the errors are clustered by firms. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level. Definitions of variables are provided in Appendix A.

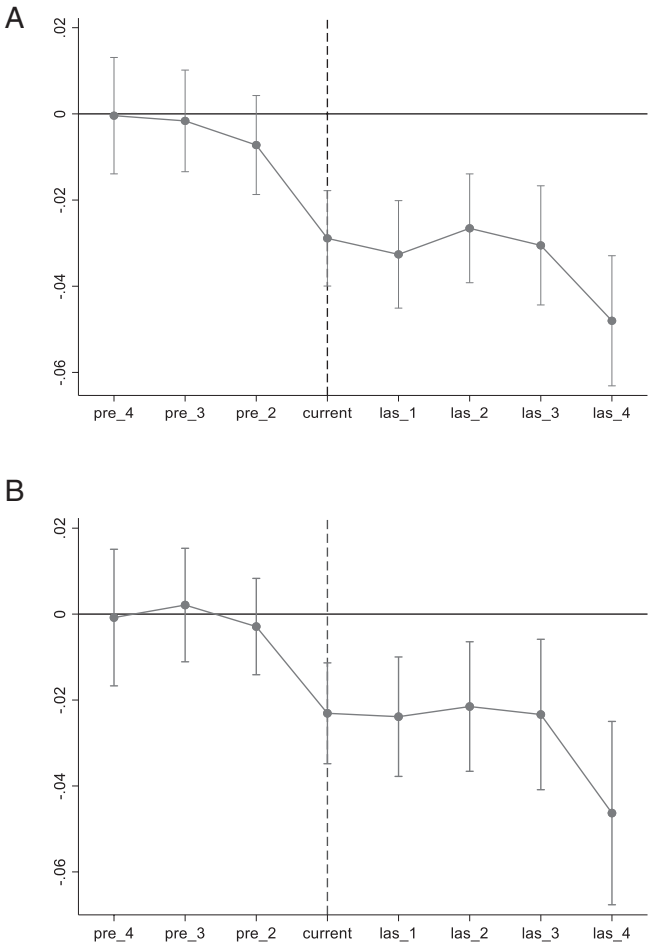

FIGURE 2 | (A) The Figure shows the parallel trend results with heterogeneous treatment effect proposed by Cengiz et al. (2019). (B) The Figure shows the parallel trend results with heterogeneous treatment effect proposed by Sun and Abraham (2021).

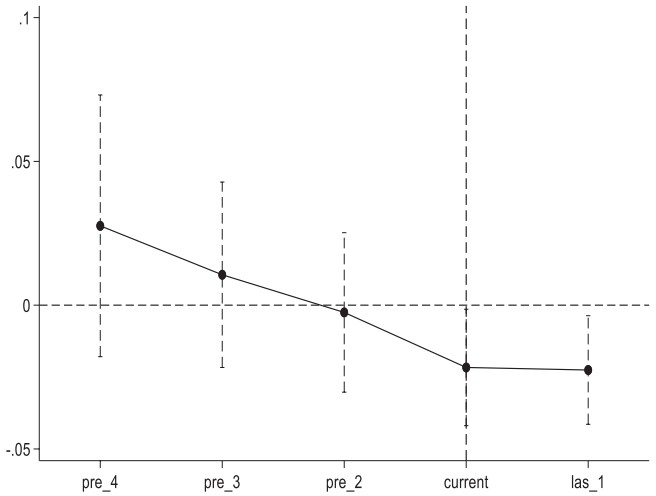

FIGURE 3 | This figure shows the industry-level parallel trend results.

4.2.4 | Placebo Test

To assess whether the observed impact of the implementation of ISIDG on cash holdings is driven by random factors, we conduct a placebo test in this section. Specifically, we randomly assign the treatment group within the sample through random sampling, repeating this process 500 times to analyze the distribution of coefficients.

The results, presented in Figure 4, show that the distributions of the placebo tests are largely consistent with the overall distribution. Furthermore, it can be observed that the estimated coefficient is centered around zero and follows a normal distribution, while the baseline regression coefficient of −0.0233 lies outside the entire distribution. This suggests that the negative impact of industry-specific information disclosure on the cash holdings of randomly selected firms is no longer present, which aligns with the expectations of the placebo test. This finding rules out the influence of random factors on the regression results, further confirming the robustness of the baseline regression results.

4.2.5 | Alternative Sample After PSM and Entropy Balancing Matching

To avoid sample selection bias, we employ propensity score matching (PSM) to select the closest sample from the control group. Specifically, we select a set of control variables from the baseline regression as matching covariates and perform 1:2

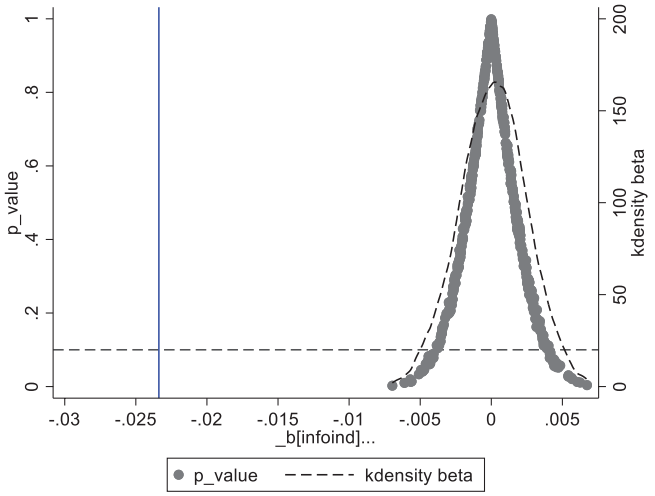

FIGURE 4 | The figure shows the distribution results of *Infoind* coefficients after random sampling.

and 1:3 nearest neighbor matching with replacement. The post-matching regression results are shown in Columns (1) and (2) of Table 4.

The results reveal that the coefficients for *Infoind* are consistently negative and statistically significant at the 10%, 5%, and 1% levels, respectively. This suggests that the PSM-DID results align with the baseline regression results, providing strong support for our hypothesis.

To further mitigate potential endogeneity concerns and address the limitations of sample attrition associated with the PSM method, we employ entropy balancing (Hainmueller 2012) as an alternative matching method. The entropy balancing method adopts a constrained optimization framework, assigning continuous weights to each observation in the control group to ensure that the distributional moments (e.g., mean, variance, skewness) of covariates are closely aligned between the treatment and control groups. This approach enhances comparability while retaining the full sample, thereby improving estimation efficiency.

The results of the entropy balancing estimation are presented in Column 3 of Table 4. After balancing the covariate distributions between the two groups, the coefficient on *Infoind* remains statistically significant at the 1% level, confirming that our primary findings are robust to alternative matching methods.

4.2.6 | Bartik Instrumental Variable

Given that the model specification in this study may be subject to endogeneity concerns arising from endogenous industry selection, omitted variables, and measurement error, we attempt to address these potential issues by constructing an instrumental variable based on the Bartik instrumental variable approach. Specifically, as an instrumental variable for ISIDG, we draw on the methods outlined by Bartik (1991) and Shi (2022) and use the share of firms in a particular industry at its early stage, interacted with the number of publicly listed firms in that industry during the sample period (denoted *IV_Bartik*). This approach contributes to mitigating potential endogeneity concerns.

This method is motivated by two main considerations: First, the number of listed firms in an industry satisfies the relevance assumption for an instrumental variable. When the number of publicly listed companies in an industry is large, the industry's operational characteristics and business models become more pronounced and mature, increasing the likelihood of the industry being included in the list of industries subject to information disclosure regulations, thereby establishing a correlation.

Second, established literature on industry evolution (e.g., Klepper 1996) suggests that the initial patterns of firm entry and distribution are primarily determined by aggregate conditions rather than firm-specific choices. These conditions include the macroeconomic environment (Campbell 1998), institutional factors (Henrekson and Johansson 1999; Aldrich and Fiol 1994), and technological or policy regimes (Djankov et al. 2002; Aghion et al. 2005). Crucially, these determinants—such as aggregate demand, credit availability, and regulatory frameworks—represent common shocks universal to all potential entrants (Djankov et al. 2002). They dictate the general economic feasibility and legitimacy of entry at the industry level, without directly targeting specific individual firms. In contrast, idiosyncratic firm characteristics—such as productivity, managerial quality, and innovation capability—are endogenous outcomes that evolve over time through learning, selection, and market competition (Hopenhayn 1992). These heterogeneity factors drive post-entry growth and survival but do not determine the initial historical distribution. Consequently, the historical share of firms in the industry's early stage is a predetermined structural feature that is unlikely to directly influence a current individual firm's cash holding decisions. This satisfies the exclusion restriction assumption, supporting the validity of our Bartik instrument.

The test results are presented in Table 5. Column (1) reports the first-stage regression, where the Kleibergen-Paap rk LM statistic and the Wald F statistic indicate that the constructed instrumental variable (*IV_Bartik*) does not suffer from issues of "under-identification" or weak instruments. Furthermore, the coefficient of *IV_Bartik* is significantly positive at the 1% level, confirming a positive correlation between the number of listed firms in an industry and ISIDG, thereby satisfying the relevance condition for the instrumental variable. Column (2) presents the second-stage regression, where the coefficient of the instrumented *Infoind* variable is significantly negative. These results suggest that, after addressing endogeneity concerns with the instrumental variable approach, the suppressive effect of ISIDG on corporate cash holdings remains statistically significant.

4.3 | Robustness Check

In this section, we conduct a series of sensitivity analyses. First, we use alternative measures of cash holdings. Second, we examine alternative sample specifications. Third and finally, we apply different model estimations. We discuss each of these in detail below.

TABLE 4 | PSM matching and Entropy balancing matching.

	1:2 matching	1:3 matching	Entropy balancing
	(1)	(2)	(3)
Infoind	−0.0182***	−0.0178***	−0.0211***
	(−2.67)	(−2.87)	(−3.30)
Lev	−0.5080***	−0.4958***	−0.5229***
	(−14.24)	(−15.14)	(−16.06)
Cflow	0.5720***	0.5597***	0.6179***
	(14.79)	(16.03)	(16.68)
Age	−0.1850***	−0.1916***	−0.2205***
	(−12.75)	(−14.65)	(−19.44)
Nwc	−0.2198***	−0.2138***	−0.2207***
	(−7.43)	(−7.92)	(−8.17)
Capex	0.2056***	0.1637***	0.1535***
	(3.47)	(3.11)	(3.46)
Size	0.0129*	0.0154**	0.0196***
	(1.84)	(2.39)	(3.03)
BM	−0.0043	−0.0037	0.0132
	(−0.28)	(−0.27)	(0.98)
Top1	0.0400	0.0291	0.0016
	(0.90)	(0.69)	(0.04)
Indep	−0.0457	−0.0476	−0.0640
	(−0.87)	(−0.98)	(−1.37)
Dua	0.0040	0.0018	0.0075
	(0.62)	(0.31)	(1.34)
Div	0.0058	0.0088*	0.0087**
	(1.16)	(1.91)	(1.99)
Loss	0.0087*	0.0087*	0.0123***
	(1.69)	(1.85)	(2.73)
Soe	0.0003	−0.0007	0.0042
	(0.02)	(−0.05)	(0.33)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	17,509	20,722	28,377
Adj. R^2	0.598	0.603	0.660

Note: This table shows the results of the impact of the introduction of industry-specific information disclosure guidelines (ISIDG) on cash holdings after propensity score matching (PSM) and entropy balancing marching. Columns (1) to (2) present the results for 1:2 and 1:3 propensity score matching, and the results for entropy balancing matching are reported in Column (3). Firm and year fixed effects are included, and the errors are clustered by firms for all models. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

TABLE 5 | Bartik instrumental variable.

	Infoind	*Cash*
	(1)	(2)
Infoind		−0.2177**
		(−2.02)
IV_Bartik	0.0244***	
	(5.14)	
Kleibergen-Paap rk LM statistic	26.919***	
Kleibergen-Paap rk Wald F statistic	26.369	
Controls	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Observations	28,377	28,377
Adj. R^2	0.646	0.157

Note: This table shows the results of instrument variable with 2SLS method. A Bartik instrumental variable is constructed. Column (1) reports the first-stage regression, Column (2) presents the second-stage regression. Firm and year fixed effects are included, and the errors are clustered by firms for all models. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

4.3.1 | Alternative Measures of Cash Holding

To further validate the impact of ISIDG on corporate cash holdings, following Xu et al. (2016), we employ two alternative dependent variables, including the ratio of cash and cash equivalents to total assets (*Cash2*) and the ratio of cash to total assets (*Cash3*). The empirical results are reported on Panel A of Table 6.

The coefficients of *Infoind* are −0.0227 and −0.0062 for *Cash2* and *Cash3*, respectively, and both are significantly negative. The findings are consistent with the baseline regression results, confirming that the implementation of the ISIDG significantly reduces corporate cash holdings.

4.3.2 | Alternative Sample Periods

We consider two alternative samples. First, to account for the interference of the 2015 stock market crash, we exclude the 2015 sample and re-conduct the test. Second, considering the impact of the global COVID-19 pandemic in 2020, we also exclude the data from 2020 and thereafter and re-perform the analysis. The results of the re-estimations are reported on Panel B of Table 6. Column 1 of Panel B reports the results for the sample without the year 2015. The results for the sample without the year 2020 are shown in Column 2 of Panel B.

TABLE 6 | Sensitivity analyses.

Panel A: Alternative measures of cash holding		
	Cash2	*Cash3*
	(1)	(2)
Infoind	−0.0227***	−0.0062**
	(−3.71)	(−2.30)
Controls	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	28,377	28,377
Adj. R^2	0.603	0.644
Panel B: Alternative samples		
	Sample without 2015	**Sample without 2020**
	(1)	(2)
Infoind	−0.0325***	−0.0260***
	(−4.68)	(−4.00)
Controls	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	26,195	24,746
Adj. R^2	0.616	0.609
Panel C: Alternative model estimations		
	(1)	(2)
Infoind	−0.0300***	−0.0223***
	(−3.96)	(−3.21)
Controls	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	No	No
Year × Industry fixed effects	Yes	No
Year × City fixed effects	No	Yes
Observations	28,361	26,869
Adj. R^2	0.636	0.613

Note: In Panel A, we consider two alternative dependent variables, including the ratio of cash and cash equivalents to total assets (*Cash2*), and the ratio of cash to total assets (*Cash3*). In Panel B, Column (1) reports the results for the sample without the year 2015, whereas Column (2) reports the results for the sample without the year 2020. Dependent variable: *Cash*. We include firm and year fixed effects in all models in Panels A and B and consider alternative fixed effects in Panel C. The standard errors are clustered by firms for all models. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

Consistent across two alternative samples, the coefficients for *Infoind* are negative and statistically significant at the 1% level, indicating that the baseline regression results are robust.

4.3.3 | Alternative Model Estimations

To mitigate the impact of unobservable factors that vary across each industry-year, city-year, or city-industry, we run our baseline regression and account for industry-by-year fixed effects, region-by-year fixed effects, or region-by-industry fixed effects. These results are presented in Panel C of Table 6.

Consistent across different model estimations, the coefficients for *Infoind* remain significantly negative at the 1% level, further confirming the robustness of the regression results.

4.3.4 | Other Factors Controlled for Cash Supply

To mitigate concerns regarding potential omitted variable bias arising from macroeconomic fluctuations, we acknowledge that regional economic growth and inflation may impact corporate cash holdings through the channel of money supply. Accordingly, we augment our baseline specification by controlling for regional Gross Domestic Product (*GDP*) and the Consumer Price Index (*CPI*). This approach allows us to further rule out the confounding effects of unobserved regional economic factors.[4]

The corresponding empirical results are reported in Table 7. Specifically, Columns (1) and (2) introduce *GDP* and *CPI* individually, whereas Column (3) controls for both variables simultaneously. Across all specifications, the coefficient on our key explanatory variable, *Infoind*, remains negative and statistically significant at the 1% level. These findings confirm that the negative effect of ISIDG on corporate cash holdings persists even after controlling for macroeconomic determinants of cash supply, thereby supporting the robustness of our baseline conclusions.

TABLE 7 | Other factors controlled for cash supply.

	(1)	(2)	(3)
	Cash	***Cash***	***Cash***
Infoind	−0.0233***	−0.0230***	−0.0230***
	(−3.74)	(−3.71)	(−3.70)
GDP	−0.0105		−0.0097
	(−0.54)		(−0.50)
CPI		0.0073**	0.0073**
		(2.27)	(2.25)
Controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	28,377	28,377	28,377
Adj. R^2	0.612	0.612	0.612

Note: This table shows the results of adding other macro factors of cash supply. Columns (1) and (2) introduce GDP and CPI individually, whereas Column (3) controls for both variables simultaneously. Firm and year fixed effects are included, and the errors are clustered by firms for all models. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

4.4 | Impact Mechanism Analysis

The baseline regression results indicate that the implementation of ISIDG significantly reduces corporate cash holdings. Building on this, we further examine in this section the mechanisms through which the implementation of ISIDG influences corporate cash holdings from the perspective of both cash holdings demand and cash supply. To test this, we consider the following mediation effect model:

$$M_{i,t} = \gamma_0 + \gamma_1 Infoind_{i,t} + \gamma_n \sum Controls + \sum Year + \sum Firm + \varepsilon_{i,t} \tag{2}$$

$$Cash_{i,t} = \sigma_0 + \sigma_1 Infoind_{i,t} + \sigma_2 M_{i,t} + \sigma_n \sum Controls + \sum Year + \sum Firm + \varepsilon_{i,t} \tag{3}$$

In this model, $M_{i,t}$ represents the mediator variables, specifically, the indicators for cash holdings demand are related party transactions (*RPT*) and firm operational risk (*FEPU*), whereas the indicators for cash supply are debt financing costs (*Cost*) and bank loans (*BL*). Additionally, considering that contemporaneous mediation tests do not ensure causal relationships, we lag the core explanatory variable, *Infoind*, by one period (denoted *L.Infoind*), while the control variables are defined in Equation (1).

First, from the perspective of corporate cash holdings demand, we examine the mechanism through which industry-specific information disclosure reduces corporate cash holdings.

From the perspective of agency motives, the implementation of ISIDG enhances corporate transparency, which in turn reduces agency costs (e.g., Huang and Zhang 2012; Zhou et al. 2018). In addition, prior studies suggest that reductions in agency costs among firms lead to a decrease in corporate cash holdings (e.g., Dittmar et al. 2003). To test whether the reduction in agency costs represents a potential channel through which the implementation of ISIDG decreases corporate cash holdings, we use the ratio of related party transactions (*RPT*) as a proxy for agency costs, with higher values indicating greater agency costs and weaker corporate governance (Hope et al. 2019). The results of these tests are reported in Columns (1) and (2) of Table 8.

Column (1) presents the effect of ISIDG implementation on agency costs (*RPT*). The coefficient of *L.Infoind* is −0.0083 and statistically significant at the 1% level, indicating that the implementation of ISIDG significantly reduces agency costs. In Column (2), the coefficients of both *L.Infoind* and *RPT* are significant at least at the 5% level, providing statistical evidence for the agency cost channel. Moreover, the coefficient of *RPT* is significantly positive, suggesting that cash holdings decrease as agency costs are reduced. Overall, the results confirm that the implementation of ISIDG leads to a substantial reduction in agency costs, which in turn contributes to a decrease in corporate cash holdings.

From the perspective of precautionary motives, the implementation of ISIDG can reduce information asymmetry, providing greater insights into operational and development models, as well as competitive strategies, while enhancing the comparability and

TABLE 8 | Impact mechanism: agency costs and operational risk channels.

	(1)	(2)	(3)	(4)
	RPT	***Cash***	***FEPU***	***Cash***
L.Infoind	−0.0083***	−0.0151***	−0.0077***	−0.0162***
	(−4.54)	(−2.65)	(−2.76)	(−2.94)
RPT		0.0866**		
		(2.06)		
FEPU				0.0290**
				(2.07)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	18,970	18,970	23,549	23,549
Adj. R^2	0.747	0.657	0.398	0.645

Note: The empirical results for the agency costs channel are presented in Columns (1) and (2), and the empirical results for operational risk channel are presented in Columns (3) and (4). Firm and year fixed effects are controlled for, and the errors are clustered by firms for all models. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

standardization of industry information. This, in turn, helps firms mitigate operational risks and alleviate the precautionary motive for holding cash, thereby reducing cash holdings. To measure the operational risk faced by firms, following the approach of Zhou et al. (2023) and Zhang, Liu, et al. (2025), this study uses the firm-level Economic Policy Uncertainty (*FEPU*) index as a proxy. Specifically, the *FEPU* index is calculated through text analysis, extracting the frequency ratio of terms related to perceived economic policy uncertainty from firm annual reports. The *FEPU* index is then standardized to a range between 0 and 1. A higher *FEPU* value indicates greater uncertainty in the firm's operational conditions and future development, reflecting higher operational risk. The results are reported in Columns (1) and (4) of Table 8.

Column (3) presents the effect of ISIDG on operational risk (FEPU). The coefficient of *L.Infoind* is −0.0077 and statistically significant at the 5% level, indicating that the implementation of ISIDG significantly reduces operational risk. In Column (4), both the coefficients of *L.Infoind* and *FEPU* are significant at least at the 5% level, providing statistical support for the operational risk channel. Furthermore, the coefficient of *FEPU* is significantly positive, suggesting that cash holdings decrease as operational risk declines. Overall, the results confirm that the implementation of ISIDG leads to a substantial reduction in operational risk, which in turn contributes to a decrease in corporate cash holdings.

The results presented in Table 8 confirm that ISIDG reduces corporate cash holdings by lowering the demand for cash. Furthermore, from the perspective of corporate cash supply, we examine the mechanism through which industry-specific information disclosure contributes to the reduction of corporate cash holdings.

From the perspective of corporate cash supply, the implementation of ISIDG enhances information transparency, thereby improving the business environment, expanding financing channels, and reducing financing costs, which in turn increases the availability of cash for firms. To test whether the increased cash supply represents a potential channel through which ISIDG reduces corporate cash holdings, following Zhang and Chan (2025), we use debt financing cost (denoted *FinCost*) and bank loans received by the firm (denoted *BankLoan*) as proxies for corporate cash supply. Specifically, a lower debt financing cost and a higher level of bank loans indicate greater cash supply availability for the firm. The debt financing cost is calculated as the interest expense based on the average interest-bearing debt ratio, while bank loans are measured as the ratio of bank loan amount to total assets. The results are reported in Table 9.

Column (1) of Table 9 presents the impact of ISIDG on debt financing costs (*FinCost*). The coefficient of *L.Infoind* is −0.0036, which is significantly negative at the 5% level, indicating that the implementation of ISIDG significantly reduces debt financing costs. In Column (2), the coefficients for both *L.Infoind* and *FinCost* are significant at the 5% level, confirming the statistical significance of the debt financing cost channel. Furthermore, *FinCost* is significantly positive, suggesting that cash holdings decrease as debt financing costs decline. Column (3) shows the effect of ISIDG on corporate access to bank loans (*BankLoan*). The coefficient of *L.Infoind* is 0.0043, which is significantly positive at the 5% level, indicating that the implementation of ISIDG significantly increases firms' access to funds. In Column (4), the coefficients for both *L.Infoind* and *BankLoan* are significant at the 5% level, confirming the statistical significance of the funding access channel. Additionally, *BankLoan* is significantly negative, suggesting that cash holdings decrease as bank loans increase. Overall, the results confirm that the implementation of ISIDG reduces financing costs and increases firms' access to financing, leading to a reduction in corporate cash holdings.

TABLE 9 | Impact mechanism: debt financing costs and bank loans channels.

	(1)	(2)	(3)	(4)
	FinCost	***Cash***	***BankLoan***	***Cash***
L.Infoind	−0.0036**	−0.0099**	0.0043**	−0.0170***
	(−2.46)	(−2.16)	(2.01)	(−2.91)
FinCost		0.0777**		
		(2.08)		
BankLoan				−0.0702**
				(−2.31)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	20,197	20,197	19,335	19,335
Adj. R^2	0.398	0.649	0.781	0.625

Note: The empirical results for the debt financing costs channel are presented in Columns (1) and (2), and the empirical results for bank loans channel are presented in Columns (3) and (4). Firm and year fixed effects are controlled for, and the errors are clustered by firms for all models. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

The results in Table 9 confirm that ISIDG reduces corporate cash holdings by increasing the supply of cash to firms.

Considering the economic impact of ISIDG is contingent upon the equilibrium between cash supply and demand, we conduct robustness checks to disentangle these two mechanisms. Our identification strategy involves isolating each channel: specifically, we control for cash supply determinants when examining the cash demand channel, and conversely, we control for cash demand determinants when investigating the cash supply channel.

A potential identification concern is that the observed decline in cash holdings could stem from supply-side constraints rather than a reduction in demand driven by agency or precautionary motives. To isolate the cash demand channel, we explicitly control for supply-side determinants alongside standard macroeconomic variables (*GDP* and *CPI*). Given that credit availability is closely tied to industry-specific financing conditions, we include the industry average cost of debt (*Cost_ind*) as a proxy to capture variations in capital supply. The results of this robustness check, reported in Table 10, confirm that the mediating effect of cash demand remains statistically significant and robust even after controlling for these supply-side factors.

Conversely, an expansion in capital supply, holding demand constant, is likely to reduce the cost of debt and increase credit availability, thereby inducing firms to substitute internal cash reserves with external debt (i.e., the substitution effect). To isolate the cash supply channel, we account for potential demand-side confounders alongside macroeconomic controls (*GDP* and *CPI*). While our baseline specifications already include standard firm-level governance and financial controls, they may not capture managers' subjective perceptions of the external environment, a key driver of precautionary demand. To address this potential omitted variable bias, following Zhou et al. (2023), we augment our model by controlling for firm-level economic policy uncertainty perception (*FEPU*). The results of this robustness test, reported in Table 11, confirm that the mediating role of the cash supply channel remains statistically significant and robust to the inclusion of *FEPU*.

5 | Further Analysis

5.1 | Heterogeneity Analysis

5.1.1 | Financial Constraints

When a firm faces high financing constraints, corporate managers may, driven by the desire to maximize personal interests or enhance short-term performance, excessively hold or utilize the firm's internal cash flow (Denis and Sibilkov 2010; Lee and Park 2016), which will lead to agency cost issues. Furthermore, financing constraints may exacerbate the information asymmetry between management and shareholders (Yuan and Bao 2025), which further induces high agency issues of firms. Thus, the impact of the ISIDG on cash holdings may differ with respect to different levels of financing constraints.

The widely used FC index (*FC*) is employed to measure a firm's financial constraints (Hadlock and Pierce 2010). We split the sample into two subsamples with respect to the median of FC index. The results are presented in Columns (1) and (2) of Table 12. The regression results indicate that, in the high financial constraint group, the coefficient of *Infoind* is significantly negative at the 1% level, whereas in the low financial constraint group, the coefficient of *Infoind* is positive

TABLE 10 | Robustness check for agency costs and operational risk channels.

	(1)	(2)	(3)	(4)
	RPT	***Cash***	***FEPU***	***Cash***
L.Infoind	−0.0082***	−0.0146**	−0.0064**	−0.0161***
	(−4.45)	(−2.57)	(−2.38)	(−2.90)
RPT		0.0876**		
		(2.09)		
FEPU				0.0289**
				(1.96)
GDP	0.0112*	−0.0402**	0.0042	−0.0062
	(1.82)	(−2.30)	(0.46)	(−0.30)
CPI	0.0019**	0.0097***	−0.0015	0.0084***
	(1.98)	(3.13)	(−0.90)	(2.83)
Cost_ind	−0.0002	0.0004	−0.0007	0.0010
	(−1.02)	(0.38)	(−1.29)	(1.08)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	18,969	18,969	23,454	23,454
Adj. R^2	0.747	0.658	0.396	0.645

Note: This table represents the empirical results robustness check for the agency costs and operational risk channel. Macroeconomic variables (*GDP* and *CPI*) and the industry average cost of debt (*Cost_ind*) are added as control variables. Firm and year fixed effects are controlled for, and the errors are clustered by firms for all models. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

but not statistically significant. This suggests that the negative relation between the adoption of ISIDG and corporate cash holdings is more pronounced in firms with high financial constraints.

5.1.2 | Internal Control

Internal control plays a crucial role in enhancing corporate governance by influencing segmental information disclosure. In firms with higher-quality internal controls, management and employees' behaviors are effectively constrained and monitored, significantly reducing the risk of actions that harm the firm's interests for personal gain. Furthermore, a high-quality internal control system greatly improves the transparency and accuracy of financial information (Yan et al. 2024), effectively narrowing the information asymmetry gap. This enables external investors to obtain a more comprehensive understanding of the firm's operational conditions, thereby mitigating agency problems. Additionally, high-quality internal controls can further reduce agency costs through strategies such as optimizing internal resource allocation and improving operational efficiency (Wang et al. 2022). Therefore, when internal control quality is high, segmental information disclosure has a limited effect on reducing corporate cash holdings.

When the quality of internal controls is inadequate, it may be difficult to effectively constrain and supervise the behavior of management and employees, leading them to prioritize personal interests over the firm's interests. Moreover, low-quality internal controls can impair the transparency and accuracy of financial information, exacerbating information asymmetry and deepening agency conflicts. As a result, firms may face higher agency costs to strengthen the supervision and management of the actions of management and employees. Therefore, the effect of ISIDG on corporate cash holdings becomes more pronounced when internal control quality is low.

Following Wang et al. (2025) and Li, Lin, and Zhou (2024), we use the DIB Internal Control Index, denoted *IC*, to measure the strength of a firm's internal control. We divide the sample into two subsamples based on the median value of the *IC* index. The results are presented in Columns (3) and (4) of Table 12.

The findings indicate that, for the group with high internal control quality, the coefficient of *Infoind* is −0.0098, which is not statistically significant. However, in the group with low internal control quality, the coefficient of *Infoind* is −0.0300, which is significantly negative at the 1% level. This suggests that the negative relation between the implementation of ISIDG and

TABLE 11 | Robustness check for debt financing costs and bank loans channels.

	(1)	(2)	(3)	(4)
	Cost	***Cash***	***BL***	***Cash***
L.Infoind	−0.0067***	−0.0092**	0.0062***	−0.0156***
	(−4.42)	(−2.00)	(2.90)	(−2.63)
Cost		0.0904**		
		(2.48)		
BL				−0.0717**
				(−2.26)
GDP	−0.0130**	0.0090	−0.0033	0.0124
	(−2.49)	(0.46)	(−0.44)	(0.52)
CPI	0.0003	0.0065***	−0.0009	0.0114***
	(0.33)	(2.75)	(−0.78)	(3.56)
FEPU	0.0012	0.0115	0.0064	0.0165
	(0.33)	(1.04)	(1.18)	(1.05)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	20,461	20,461	18,878	18,878
Adj. R^2	0.383	0.648	0.780	0.626

Note: This table displays the empirical results of robustness check for the debt financing costs and bank loans channel. Macroeconomic variables (*GDP* and *CPI*) and firm-level Economic Policy Uncertainty perception (*FEPU*) are added as control variables. Firm and year fixed effects are controlled for, and the errors are clustered by firms for all models. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

corporate cash holdings is more pronounced in firms with lower internal control quality. Therefore, when a firm's internal control is weak, the implementation of ISIDG plays a more significant role in reducing corporate cash holdings through its governance effect.

5.1.3 | High-Tech Firms and Non-High-Tech Firms

The precautionary motive for cash holdings in high-tech firms is generally stronger than that in non-high-tech firms. This is because the former often faces higher market uncertainty and technological disruption risks, which may lead them to maintain higher levels of cash holdings (Chen and Chuang 2009; Lyandres and Palazzo 2016). Furthermore, high-tech firms are often subject to greater financing constraints, as their investments are typically more capital-intensive and riskier. This makes them more reliant on internal financing and more inclined to hold larger cash reserves (Guo et al. 2024). In addition, high-tech firms are typically characterized by higher levels of information asymmetry, possibly due to the uncertainty surrounding technology and market conditions. As a result, information asymmetry may lead high-tech firms to face higher financial costs, thereby increasing their precautionary motive for holding cash.

We split the sample into two subsamples: high-tech firms and non-high-tech firms. The results are presented in Columns (1) and (2) of Table 13. The regression results show that, for the high-tech firms, the coefficient of *Infoind* is significantly negative at the 1% level, whereas for the non-high-tech firms, the coefficient of *Infoind* is positive but not statistically significant. This suggests that the negative relationship between the adoption of ISIDG and corporate cash holdings is more pronounced in high-tech firms.

5.1.4 | Market Competition

In industries with high levels of competition, firms face greater market pressures and substitution risks driven by technological advancements, and the strategies of competitors often lead to significant fluctuations in market demand and prices. To effectively manage the uncertainty arising from the competitive environment, firms tend to increase their cash holdings to strengthen their ability to withstand risks. Furthermore, firms operating in highly competitive industries may face more stringent financial constraints, as external stakeholders typically perceive them as riskier (Bernini and Montagnoli 2017). As a result, these firms are

TABLE 12 | Heterogeneity analysis: financial constraints and internal control.

	High FC	*Low FC*	*High IC*	*Low IC*
	(1)	**(2)**	**(3)**	**(4)**
Infoind	−0.0699***	0.0015	−0.0098	−0.0300***
	(−6.36)	(0.27)	(−1.32)	(−3.51)
Lev	−0.6640***	−0.4000***	−0.6267***	−0.4515***
	(−13.51)	(−10.64)	(−16.04)	(−12.38)
Cflow	0.7968***	0.4077***	0.6049***	0.5673***
	(15.23)	(13.96)	(14.83)	(12.52)
Age	−0.2591***	−0.0837***	−0.2014***	−0.2387***
	(−17.24)	(−5.89)	(−14.65)	(−13.79)
Nwc	−0.2569***	−0.2473***	−0.2792***	−0.1741***
	(−6.47)	(−9.21)	(−8.51)	(−5.55)
Capex	0.1398**	0.0104	0.0311	0.1575***
	(2.06)	(0.26)	(0.53)	(2.75)
Size	0.0181	0.0135**	0.0335***	0.0054
	(1.26)	(2.15)	(4.66)	(0.58)
BM	0.0147	−0.0283**	0.0188	−0.0007
	(0.62)	(−2.34)	(1.25)	(−0.04)
Top1	−0.0008	−0.0187	−0.0494	0.0024
	(−0.01)	(−0.53)	(−1.22)	(0.05)
Indep	−0.1138	0.0139	−0.0465	−0.0635
	(−1.33)	(0.37)	(−0.84)	(−0.97)
Dua	0.0069	−0.0009	0.0042	0.0084
	(0.76)	(−0.18)	(0.58)	(1.02)
Div	0.0172**	0.0091**	0.0080	0.0115**
	(2.53)	(2.29)	(1.37)	(2.01)
Loss	0.0156**	0.0033	0.0274**	0.0049
	(2.22)	(0.73)	(2.49)	(0.95)
Soe	0.0439*	−0.0206*	−0.0276	0.0287
	(1.76)	(−1.83)	(−1.64)	(1.53)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	14,241	13,547	13,500	13,146
Adj. R^2	0.620	0.718	0.652	0.590

Note: The sample is divided into two subsamples with respect to the median of KZ index, Column (1) shows the results for firms with high financial constraints, and Column (2) shows the results for firms with low financial constraints. Moreover, we split the sample into two subsamples with respect to the median of DIB Internal Control Index, Column (3) shows the results for firms with high quality internal control, and Column 1 shows the results for firms with low quality internal control. Firm and year fixed effects are included, and the errors are clustered by firms for all models. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

more inclined to rely on internal cash reserves to meet their financing needs, reducing dependence on external sources of capital.

Following Zhang and Zhou (2022), we employ the widely used Herfindahl–Hirschman Index (HHI) to measure market competition. We split the sample into two subsamples based on the

TABLE 13 | Heterogeneity analysis: firm's nature and market competition.

	High-tech	Non-high-tech	High competition	Low competition
	(1)	(2)	(3)	(4)
Infoind	−0.0411***	0.0042	−0.0302***	−0.0001
	(−4.92)	(0.48)	(−3.75)	(−0.02)
Lev	−0.5539***	−0.5239***	−0.5190***	−0.5531***
	(−13.15)	(−12.79)	(−12.64)	(−13.13)
Cflow	0.8234***	0.4036***	0.7140***	0.5464***
	(15.82)	(12.39)	(13.73)	(12.32)
Age	−0.2377***	−0.1515***	−0.2676***	−0.1892***
	(−17.22)	(−9.71)	(−15.41)	(−13.62)
Nwc	−0.2004***	−0.2876***	−0.1738***	−0.2798***
	(−5.71)	(−8.58)	(−4.90)	(−7.92)
Capex	0.2022***	0.0681	0.1622**	0.0813
	(3.28)	(1.11)	(2.48)	(1.27)
Size	0.0317***	0.0113	0.0210**	0.0277***
	(3.30)	(1.44)	(2.23)	(3.24)
BM	0.0479**	−0.0116	0.0281	−0.0014
	(2.55)	(−0.65)	(1.42)	(−0.08)
Top1	−0.0764	0.0637	−0.1184**	0.0576
	(−1.45)	(1.17)	(−2.26)	(1.10)
Indep	−0.0532	−0.0600	−0.0309	−0.0703
	(−0.74)	(−1.03)	(−0.42)	(−1.25)
Dua	0.0029	0.0099	0.0110	0.0118*
	(0.38)	(1.34)	(1.24)	(1.68)
Div	0.0053	0.0169***	0.0107*	0.0114*
	(0.93)	(2.78)	(1.84)	(1.90)
Loss	0.0179***	0.0039	0.0176***	0.0117**
	(3.07)	(0.67)	(2.59)	(2.09)
Soe	0.0302	−0.0295*	0.0239	−0.0066
	(1.54)	(−1.73)	(1.15)	(−0.45)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	16,627	11,661	13,829	13,879
Adj. R^2	0.626	0.629	0.615	0.643

Note: Column (1) shows the results for high-tech firms, and Column (2) shows the results for non-high-tech firms. Moreover, we split the sample into two subsamples with respect to the median of HHI Index, Column (3) shows the results for firms in a more competitive market, and Column (4) shows the results for firms in low competitive market. Firm and year fixed effects are included, and the errors are clustered by firms for all models. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

median of the HHI index. The results are presented in Columns (3) and (4) of Table 13. The regression results indicate that for the high-competition industry group, the coefficient of *Infoind* is significantly negative at the 1% level, whereas for the low-competition industry group, the coefficient of *Infoind* is negative but not statistically significant. This suggests that the negative

relation between the implementation of ISIDG and corporate cash holdings is more pronounced in firms operating in highly competitive industries.

5.2 | Excessive Cash Holdings

Given the widespread phenomenon of excessive cash holdings among Chinese listed companies, we examine the impact of ISIDG on firms' excess cash holdings to further validate our hypothesis. Following Chen et al. (2020) and Yao and Hong (2023), we employ two distinct measures to characterize the level of excess cash holdings.

First, recognizing that industry characteristics are a key determinant of corporate cash holdings, this study defines the variable for excess cash holdings, *EXCash1*, as the difference between a firm's actual cash holdings and the industry average, representing the firm's excess cash position. Second, we measure excess cash by subtracting the optimal cash holdings from the actual cash holdings. Specifically, excess cash is defined as the difference between actual cash holdings and the predicted cash level, estimated as the residual from the following model:

$$\begin{aligned} Cash_{i,t} = {} & \beta_0 + \beta_1 Size_{i,t} + \beta_2 Lev_{i,t} + \beta_3 BM_{i,t} \\ & + \beta_4 Div_{i,t} + \beta_5 CFO_{i,t} + \beta_6 CFO\_Risk_{i,t} + \beta_7 Capex_{i,t} \\ & + \beta_8 Nwc_{i,t} + \beta_9 Soe_{i,t} + Year\ FE + Industry\ FE \\ & + Province\ FE + \varepsilon_{i,t} \end{aligned} \tag{4}$$

In this model, excess cash holdings, *EXCash2*, are measured by the residuals from the regression in the model. A higher value of *EXCash2* indicates a greater level of excess cash held by the firm.

The regression results for excess cash holdings are presented in Columns (1) and (2) of Table 14. The coefficients of *Infoind* are −0.0252 and −0.0259, both statistically significant at the 1% level and negative. These findings suggest that industry-specific information disclosure not only reduces firms' overall cash holdings but also lowers their excess cash holdings. This implies that, under the impact of ISIDG, listed companies are beginning to abandon the inefficient investment behavior of holding excess cash, actively improving the efficiency of capital utilization, and enhancing their motivation to mobilize resources in search of development opportunities and to build competitive advantages.

5.3 | Value of Cash Holdings

In the preceding mechanism analysis, we examined how the implementation of ISIDG can reduce firms' cash holding requirements by decreasing the demand for cash and increasing the supply of cash, thereby lowering overall cash holdings. Furthermore, in the previous section, we confirmed that ISIDG further reduces firms' excess cash holdings, thereby enhancing the efficiency of capital utilization. Based on these findings, we expect that the implementation of ISIDG will lower the value of cash holdings, as firms will no longer need to maintain excessive cash reserves. To verify this outcome, following Faulkender and Wang (2006), we construct the following regression model:

$$\begin{aligned} r_{i,t} - R^B_{i,t} = {} & \mu_0 + \mu_1 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \mu_2 Infoind_{i,t} + \mu_3 Infoind_{i,t} * \frac{\Delta C_{i,t}}{M_{i,t-1}} \\ & + \mu_4 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \mu_5 \frac{\Delta NA_{i,t}}{M_{i,t-1}} + \mu_6 \frac{\Delta RD_{i,t}}{M_{i,t-1}} + \mu_7 \frac{\Delta I_{i,t}}{M_{i,t-1}} + \mu_8 \frac{\Delta D_{i,t}}{M_{i,t-1}} \\ & + Year\ FE + Firm\ FE + \varepsilon_{i,t} \end{aligned} \tag{5}$$

In the model, r represents the stock return, R^B denotes the benchmark return, C is cash holdings, M is the firm's market value, NA refers to net assets, E is earnings before interest and taxes, RD is research and development expenditure, I represents interest expenses, and D denotes dividends. The model also controls for firm and year fixed effects. Our primary focus is on the coefficient μ_3, with the estimation results presented in Column (3) of Table 14. As shown in the results, μ_3 is significantly negative at the 5% level, indicating that the implementation of ISIDG substantially reduces the marginal value of cash holdings, consistent with the aforementioned findings.

5.4 | Firm's Liquidity

To further investigate the economic effects of ISIDG-induced reductions in corporate cash holdings, we will conduct a more detailed analysis by introducing corporate liquidity measures. Specifically, we will divide the sample into two groups—high liquidity (*High CR*) and low liquidity (*Low CR*)—based on the industry-year median of the corporate liquidity measure and compare the impact of ISIDG on cash holdings across firms with

TABLE 14 | Further analysis: excess cash holdings and value of cash holdings.

	(1)	(2)	(3)
	EXCash1	***EXCash2***	$r_t - R_t^B$
Infoind	−0.0252***	−0.0259***	−0.0279**
	(−4.19)	(−4.21)	(−2.03)
*Infoind**$\Delta C_t / M_{t-1}$			−0.2581**
			(−2.08)
$\Delta C_t / M_{t-1}$			0.3343***
			(3.86)
Controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	28,377	28,347	17,091
Adj. R^2	0.554	0.430	0.508

Note: Two measures are used to compute excess cash holdings: EXCash1 and EXCash2. EXCash1 is defined as the difference between a firm's actual cash holdings and the industry average, EXCash2 is measured by the residuals of the model (4), and the results are reported in Columns (1) and (2), respectively. The empirical results for value of cash holdings are presented in Columns (3). Firm and year fixed effects are controlled for, and the errors are clustered by firms for all models. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

different liquidity profiles. The corporate liquidity measure is calculated as the ratio of current assets to current liabilities. A higher value of this measure indicates stronger short-term debt-paying ability and greater asset liquidity.

The results of the grouped regressions are presented in Table 15. As shown, the coefficient of Infoind is significantly negative for firms with higher liquidity (coefficient = −0.0504, $t = -4.59$), whereas it is not statistically significant for firms with lower liquidity. In terms of economic significance, given that the mean cash holding for high-liquidity firms is 0.3655, this implies that ISIDG leads to a 13.79% reduction in cash holdings relative to the mean for high-liquidity firms (i.e., 13.79% = 0.0504/0.3655). This result suggests that ISIDG effectively reduces cash holdings for firms with high liquidity ratios, as such firms typically hold significant liquid assets to manage short-term financial pressures and uncertainty. Therefore, ISIDG is particularly effective in reducing cash holdings in these firms, capitalizing on its ability to mitigate uncertainty. This finding further supports our earlier analysis, which concluded that ISIDG reduces excessive cash holdings in firms.

TABLE 15 | ISIDG, firm's liquidity and cash holdings.

	(1)	(2)
	High CR	***Low CR***
Infoind	−0.0504***	−0.0029
	(−4.59)	(−0.67)
Controls	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	14,315	14,062
Adj. R^2	0.630	0.643

Note: Column (1) shows the results for high liquidity firms, and Column (2) shows the results for high liquidity firms. Firm and year fixed effects are included, and the errors are clustered by firms for all Columns. Dependent variable: *Cash*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

5.5 | Economic Consequences Analysis

Our results in the earlier sections suggest that the implementation of ISIDG reduces corporate cash holdings. An intriguing issue that arises is the extent to which this reduction in cash holdings affects corporate performance and investment activities. In this section, we aim to analyze the economic consequences of reduced cash holdings.

First, we examine the impact of reduced cash holdings on corporate market and accounting performance. To measure these outcomes, we use Tobin's Q ratio (*TQ*) as a proxy for market performance and the return on assets (*ROA*) to capture accounting performance. The regression results are presented in Columns (1) and (2) of Table 16. The regression coefficients for *Infoind*×*Cash* are 0.1560 and 0.0052, both statistically significant at the 5% level. These findings suggest that following the implementation of ISIDG, the reduction in corporate cash holdings leads to a significant improvement in both market and accounting performance. Therefore, the implementation of ISIDG and the resulting decline in cash holdings contribute to the sustainability of

TABLE 16 | Economic consequences: firm's performance and physical investment.

	(1)	(2)	(3)	(4)
	TQ	***ROA***	***Invest_PPE***	***Invest_RD***
*Infoind*Cash*	0.1560**	0.0052**	0.0197***	0.2598**
	(2.28)	(2.14)	(9.88)	(2.15)
Infoind	−0.0845***	−0.0013	−0.0048***	−0.0964
	(−3.78)	(−1.29)	(−6.31)	(−1.41)
Cash	−0.0110	0.0003	−0.0328***	−0.1856**
	(−0.35)	(0.19)	(−17.81)	(−1.98)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	28,377	28,376	27,162	23,189
Adj. R^2	0.788	0.747	0.872	0.030

Note: We use the Tobin's Q ratio (*TQ*) as a proxy for market performance and the return on assets (ROA) to capture accounting performance, the regression results are presented in Columns (1) and (2), respectively. Moreover, capital expenditures on property, plant, and equipment (*Invest_PPE*) and the growth rate of research and development investments (*Invest_RD*) are used as proxies for real investment, the results are reported in Columns (3) and (4), respectively. Firm and year fixed effects are controlled for, and the errors are clustered by firms for all models. Dependent variable: *SGR*. *T*-statistics are reported in parentheses.
***Indicates significance at the 1% level.
**Indicates significance at the 5% level.
*Indicates significance at the 10% level.

corporate profitability and have a substantial positive impact on firm development.

Second, we focus on the allocation of funds and examine whether the reduction in corporate cash holdings following the adoption of ISIDG translates into an increase in firm investment activities. To measure corporate investment levels, we use capital expenditures on property, plant, and equipment (*Invest_PPE*) and the growth rate of research and development (*R&D*) investments (*In*vest_RD) as proxies for real investment.

Columns (3) and (4) of Table 16 present the regression results for *Infoind* × *Cash* and corporate real investment. The regression coefficients for *Infoind* × *Cash* are 0.0197 and 0.2598, both statistically significant at the 1% and 5% levels, respectively. The empirical evidence consistently suggests that the implementation of ISIDG facilitates the reallocation of corporate resources toward productive capital expenditures. Our findings suggest that regulatory intervention significantly increases the intensity of real investment, supporting the effectiveness of this policy in aligning corporate investment behavior with fundamental value creation rather than financial arbitrage opportunities.

6 | Conclusions

Using industry-specific information disclosure guidelines as a quasi-natural experiment that introduces shocks to disclosure practices across different sectors, our findings reveal that the implementation of these regulations leads to a significant reduction in corporate cash holdings. This finding is robust after a series of robustness and endogeneity tests.

Regarding the mechanisms, the reduction in corporate cash holdings resulting from the implementation of ISIDG can be attributed to two potential channels: a decrease in the demand for cash holdings and an increase in the supply of cash. Specifically, from the perspective of cash holding demand, the adoption of ISIDG significantly reduces agency costs and operational risks, thereby weakening the agency and precautionary motives for holding cash and reducing cash reserves. From the perspective of cash supply, the implementation of ISIDG significantly lowers financing costs and increases access to bank loans, thereby enhancing corporate access to cash. The heterogeneity analysis indicates that the negative relationship between ISIDG adoption and corporate cash holdings is stronger among firms with greater financial constraints, weaker internal controls, higher industry competition, or those operating in high-tech sectors.

Furthermore, the reduction in corporate cash holdings induced by industry-specific information disclosure ultimately enhances the sustainability of corporate profitability and market value. Additionally, the implementation of ISIDG fosters more efficient resource allocation and effective working capital management.

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Conflicts of Interest

The authors declare no conflicts of interest.

Endnotes

[1] There is a growing body of literature on the motives behind corporate cash holdings and their economic consequences, such as CEO compensation (Liu and Mauer 2011), corporate ownership (e.g., Anderson and Hamadi 2016), corporate governance (Dittmar and Mahrt-Smith 2007).

[2] In 2020, around 42% of listed companies failed to fully disclose related-party transactions, which is critical for assessing conflicts of interest and agency issues (China Securities Journal 2020). Additionally, 37% provided insufficient or unclear disclosures on executive compensation (SSE 2021), and 30% engaged in some form of earnings management (Xiao and Chen 2011). These issues are especially pronounced in state-owned enterprises (SOEs), where political ties and state influence contribute to weaker disclosure practices, particularly around executive pay and related-party dealings, increasing agency problems and undermining corporate governance (Chen et al. 2009).

[3] Other studies have found that mandatory disclosure can significantly reduce corporate default risk (Li et al. 2025; Do and Vo 2023), increase corporate information transparency and performance (Li, Shi, et al. 2024; Xue et al. 2023, 2024).

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Appendix A

This Table Represents the Definition of Variables

Variables	Definition
Cash	Ratio of cash and marketable securities to net assets
Infoind	An interaction between *Treat* and *Post (Treat* × *Post*)
Treat	If the company is affected by the industry information disclosure guidelines during the sample period, take 1, otherwise take 0.
Post	If the company is in the year after the application of the industry information disclosure guidelines, take 1, otherwise take 0.
Lev	Total liabilities divided by total assets
Cflow	Net cash flow from operating activities/ (total assets—cash equivalents)
Age	Natural logarithm of the number of years since the listing of the company
Nwc	(net working capital—cash equivalents)/ (total assets—cash equivalents)
Capex	Ratio of capital expenditure to total assets
Size	Natural logarithm of total assets
BM	Total assets divided by the market value of the company
Top1	The number of shares held by the largest shareholder divided by the total number of shares
Indep	Proportion of independent directors in the total number of directors
Dua	The general manager and the chairman are the same person, the value is 1, otherwise it is 0
Div	A dummy variable, the value is 1 when paying cash dividends, otherwise it is 0
Loss	A dummy variable, the value is 1 when the net profit is negative, otherwise it is 0
Soe	A dummy variable, the value is 1 if state-owned enterprises, otherwise it is 0
IV_Bartik	The product of the share of companies in the industry during its early stages and the annual number of companies listed within the industry during the sample period.
RPT	The ratio of the total transaction amount between the listed company and its related parties during the year to its total assets at the beginning of the year.
FEPU	The proportion of words related to economic policy uncertainty in the company's annual report relative to the total number of words
Cost	The ratio of the company's interest expense toits average interest-bearing debt
BL	The ratio of bank loans received by the company to its total assets
EXCash1	The difference between the company's actual cash holdings and the industry average
EXCash2	The difference between the company's actual cash balance and its projected cash balance
$r_{i,t}$	Stock return rate
R^B	Benchmark return rate
CR	Ratio of current assets to current liabilities
ROA	Ratio of the company's net profit for the year to its total assets at the end of the period
TQ	(Market value of shareholders' equity + Book value of debt) / Total assets
Invest_PPE	Company fixed asset investment growth rate
Invest_RD	Company R&D investment growth rate
GDP	Natural logarithm of the GDP of the province where the company is registered
CPI	Consumer Price Index of the province where the company is registered
Cost_ind	The industry's average debt financing cost

Appendix B

Timeline of the ISIDG

Date	Shanghai stock exchange	ChiNext of Shenzhen stock exchange	Main and SME boards of Shenzhen stock exchange
2013.01.07		Film and television, pharmaceuticals, biological products	
2013.12.26	Real estate, coal, oil & gas		
2015.07.02		Photovoltaic industry chain, energy conservation & environmental protection	
2015.09.02		Online gaming, online video, e-commerce	
2015.10.01	Electric power, retail, and automobile manufacturing		
2015.12.28			Livestock & poultry, aquaculture, solid mineral resources, real estate
2016.09.19		Digital marketing	
2016.11.14			Construction Machinery, Interior Decoration Services
2017.01.01	Alcoholic beverage industry, broadcasting & transmission, environmental protection services, water production & supply, chemical industry, air transportation, agriculture, forestry & animal husbandry		
2017.03.13		LED industry chain, medical devices	
2017.05.19			Civil engineering construction
2017.10.20			Retail, express delivery services
2018.05.11			Civil explosives, software & it services, jewelry
2019.01.01	Integrated circuits, aerospace, marine & railway transportation equipment manufacturing, medical equipment, food manufacturing, gold & jewelry, film & television, furniture manufacturing, nonferrous metals		
2019.11.03		Industrial robotics, semiconductor integrated circuits, lithium-ion Batteries, non-metallic building materials	