Article

Accounting Restatements and Corporate Cash Policy

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Abstract

Using a difference-in-differences approach, we find that the cash holdings of firms increase significantly after announcements of irregularity-related restatements. The increase is larger for firms with a higher demand for precautionary savings and is smaller for firms with less pronounced increase in shareholder control after the restatements. Investments and repurchases of irregularity firms become more sensitive to excess cash after the restatements. In addition, we find that the market value of cash holdings increases after restatements. Overall, the evidence suggests that strengthened shareholder control reduces cash holdings, but this effect is weaker than the increase in cash holdings due to exacerbated precautionary savings concerns. Our study contributes to the literature on the effect of financial reporting credibility on real corporate decisions.

Keywords

financial statement restatements, financial reporting credibility, cash holdings, fund allocation, precautionary savings, shareholder control, real effect

Introduction

In a perfect capital market, firms do not need to reserve cash because they can raise external capital when required. Due to market frictions including information asymmetry and moral hazard, however, raising external capital from the spot market is costly (Jensen & Meckling, 1976; Myers & Majluf, 1984). This creates a ''precautionary savings motive'' to hoard cash as a safeguard against future cash flow shortfalls (Holmstrom & Tirole, 1998; Keynes, 1936). In addition, self-interested managers have incentives to hoard excess cash for private benefits (Dittmar, Mahrt-Smith, & Servaes, 2003).

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A fundamental objective of financial reporting is to reduce information asymmetry and facilitate the monitoring of the management. However, little empirical research investigates how financial reporting quality affects a firm's cash policy. Thus, this study examines the change in corporate cash holdings after accounting restatements. On one hand, perceived information asymmetry between managers and outside investors increases after a restatement can decrease financial reporting credibility (Chen, Cheng, & Lo, 2014). Thus, raising future external financing from the spot market becomes more costly, and the value of cash reserves as insurance against future cash shortfalls is magnified. This suggests that firms should reserve more cash after restatements. On the other hand, because restatements provide an adverse signal to market participants, managers are likely to be subjected to more intensive market scrutiny. In addition, internal and external governance mechanisms are strengthened after restatement announcements (e.g., Cheng & Farber, 2008; Farber, 2005). Consequently, managers may reduce cash holdings because the private benefits of holding excess cash are lower. Thus, accounting restatements result in conflicting incentives with regard to corporate cash holdings, and the combined effect is ultimately an empirical question.

To test the effect of accounting restatements on corporate cash policy, we identify a sample of 949 firms that announced accounting restatements from 1997 through 2006 (GAO, 2003, 2006). Following Hennes, Leone, and Miller (2008), we partition the restatements into those related to accounting irregularities and those related to errors. Our final sample contains 270 irregularity-related restatements and 679 error-related restatements. To ensure that any change in cash holdings after a restatement is not driven by an intertemporal trend in cash holdings (Bates, Kahle, & Stulz, 2009), we match each restatement firm with a non-restatement firm based on a propensity score, and we conduct a difference-in-differences test. We include a number of covariates that are associated with accounting restatements and corporate cash holdings to estimate the propensity score (Roberts & Whited, 2013).

We find that the announcement of accounting restatements has a statistically significant effect on firm cash holdings. Specifically, we find that restatement firms increase their cash holdings after a restatement announcement, and this increase is significantly higher than the contemporaneous increase in cash for the matched non-restatement firms. We also find that the effect is concentrated in the irregularity sample and is insignificant in the error sample. This is consistent with findings that irregularity-related restatements are more damaging than error restatements to financial reporting credibility (e.g., Chen, Cheng, & Lo, 2013; Hennes et al., 2008). The effect is also economically significant. The increase in cash holdings after the announcement of an irregularity restatement is higher than the contemporaneous increase in cash holdings for the control firms by 3.4% of total assets. Stated alternatively and using average cash holdings before restatements as a benchmark, the relative increase in cash holdings for the irregularity firms is 20% higher than that for the control firms.

Precautionary savings theory contends that cash holdings are more sensitive to information asymmetry when the risk of a future internal shortfall is higher; that is, when the demand for precautionary savings is higher (Acharya, Almeida, & Campello, 2007). Prior research suggests that the demand for precautionary savings is higher when operating cash flows (Opler, Pinkowitz, Stulz, & Wiliamson, 1999) and investment opportunities (Duchin, 2010) are more volatile, and when investment opportunities tend to arrive when operating cash flows are low (Acharya et al., 2007; Duchin, 2010). We construct a composite measure of the demand for precautionary savings as the mean value of the percentile ranks of

three variables: the industry volatility of operating cash flows, the industry volatility of investment opportunities, and the negative correlation between operating cash flows and investment opportunities at the industry level. We then partition the irregularity firms into two subsamples based on this composite measure, and examine how the change in cash holdings varies across the two subsamples. Consistent with the precautionary savings hypothesis, we find that the effect of irregularity-related restatements on cash holdings is highly significant for firms with a high demand for precautionary savings, but the effect is statistically insignificant for the firms with a low demand for precautionary savings.

We also partition the sample based on proxies for the change in shareholder control around restatements. We consider the CEO/CFO turnover, change in CEO compensation, and change in investment behavior (Cheng & Farber, 2008; Farber, 2005; Hennes et al., 2008). Firms with more pronounced increases in shareholder control are more likely to replace the top management team and cancel their planned overinvestment (Hennes et al., 2008). These firms are also more likely to reduce option compensation after restatements because excessive option compensation is likely to increase managers' incentives to misreport (Cheng & Farber, 2008). We find that the increase in cash holdings after restatements is greater and highly significant for irregularity firms with a less pronounced increase in shareholder control. In contrast, the increase in cash holdings is statistically insignificant for irregularity firms with a more pronounced increase in shareholder control. Overall, our evidence suggests that strengthened shareholder control reduces cash holdings, but the effect of strengthened shareholder control is weaker than that of increased precautionary savings concerns. This results in an overall increase in cash holdings.

To further identify the mechanisms through which the restatements affect cash policy, we examine whether and how irregularity firms change the way they deploy excess cash after restatements. We find a significant greater increase in the sensitivity of investment to excess cash for irregularity firms compared with that of control firms. This is consistent with the notion that cash holdings are more valuable in mitigating underinvestment after restatements (Denis & Sibilkov, 2010), supporting the precautionary savings hypothesis. We also find that irregularity firms increase their propensity to distribute excess cash to shareholders after restatements. This is consistent with the notion that strengthened shareholder control reduces the private benefits of cash holdings or forces managers to disgorge excess cash (Faleye, 2004; Harford, Mansi, & Maxwell, 2008).

Finally, we examine the change in the market value of cash holdings after restatements. We find an increase in the market value of cash holdings after restatements which is more pronounced for irregularity firms than for the control firms. This further supports the notion that cash reserves are more valuable in mitigating underinvestment problems after restatements.

Our article makes several important contributions to the literature: First, we contribute to the literature that investigates the economic consequences of financial reporting credibility in general and of accounting restatements in particular. We show how accounting restatements affect an important component of corporate liquidity management—corporate cash policy (Tirole, 2006). Recent studies highlight the effect of liquidity management on a firm's investment decisions and on performance (e.g., Duchin, Ozbas, & Sensoy, 2010). We demonstrate how a reduction in financial reporting credibility could affect a firm's optimal consumption−investment choices, and consequently, its cash management policies.

Prior literature suggests that agency costs and precautionary savings benefits are two important economic forces that shape corporate cash policy (e.g., Opler et al., 1999). The relative importance of these two forces is likely to vary by context. Gao, Harford, and

Li (2013) find that private firms hold less cash than public firms despite higher financing frictions. Huang, Elkinawy, and Jain (2013) find that firms cross-listed in the United States, which have lower financing constraints and less severe agency problems, hold more cash and enjoy a higher market value of cash. Their evidence suggests that it is optimal for shareholders to allow managers to hold more cash when binding mechanisms are more effective. Chen, Chen, Schipper, Xu, and Xue (2012) find that the split-share reform in China reduces Chinese firms' cash holdings by lowering private benefits and precautionary savings benefits. Our article contributes to the literature by examining changes in cash holdings after accounting restatements and identifying the mechanisms leading to these changes.

The remainder of this article is organized as follows: The next section develops our hypothesis. The Research Design section describes our sample selection procedure and other aspects of our research design. The next three sections present the results from our empirical tests, and the last section concludes.

Related Literature and Hypothesis Development

The Determinants of Corporate Cash Holdings

Precautionary savings and agency problems are two prominent explanations for corporate cash holdings (Bates et al., 2009; Harford et al., 2008; Opler et al., 1999). Due to market frictions, firms may be unable to raise sufficient funds from spot markets when the need arises (Holmstrom & Tirole, 1998). Cash reserves provide insurance against future shortfalls (Acharya et al., 2007) and reduce the deadweight loss of underinvestment resulting from costly (or unavailable) external financing in future periods. However, carrying cash also requires forgoing profitable investment opportunities in the current period. Therefore, optimal cash holdings equate the marginal benefit of reducing future underinvestment and the marginal cost of forgoing current investment opportunities. As information asymmetry increases, future external financing becomes more costly, leading to a greater potential risk of underinvestment (Opler et al., 1999). This suggests that higher information asymmetry resulting from a restatement should lead to an increase in cash holdings.

Harford et al. (2008) argue that agency conflicts between shareholders and managers can either decrease or increase cash holdings. On one hand, excess cash typically exacerbates agency problems, so shareholders may prefer cash levels to be lowered. Consistent with this, Chen et al. (2012) find that Chinese firms reduced cash holdings after improvements in governance from the split-share reform. Faleye (2004) finds that cash-rich firms are more likely to be proxy contest targets, and they distribute more cash to shareholders after the contest. On the other hand, self-interested managers may prefer current overinvestment to the ability to invest cash reserves in the future, and may find ways to spend any cash reserves. If so, more effective control over managers would prevent them from making overinvestments, leading to increased cash reserves (Stulz, 1990). Consistent with this, Huang et al. (2013) find that foreign firms cross-listed in the United States hold more cash, and Harford et al. (2008) find that firms with weaker shareholder rights have lower cash holdings and are more likely to invest excess cash.

Accounting Restatements and Corporate Cash Holdings

One of the fundamental goals of financial reporting is to reduce the information asymmetry between managers and outside capital providers. Accounting restatements damage

management reputation, and cast doubt on the reliability and credibility of financial reporting (Palmrose, Richardson, & Scholz, 2004). Therefore, investors reduce their reliance on the information contained in financial reports when making decisions (Chen et al., 2014), and this decreased reliance typically worsen the information environment (Griffin, 2003) and increases the cost of external financing (Graham, Li, & Qiu, 2008; Hribar & Jenkins, 2004). Hence, the precautionary savings benefits of cash holdings increase, and firms should hold more cash (the precautionary savings hypothesis).

Accounting restatements also affect cash holdings because of agency problems. Restatements send an adverse signal to outside investors and increase market scrutiny. In addition, restatement firms may improve their corporate governance to restore investor confidence (Cheng & Farber, 2008; Collins, Masli, Reitenga, & Sanchez, 2009; Farber, 2005; Hennes, Leone, & Miller, 2014). These changes strengthen shareholder control over managers which may increase or decrease cash holdings. On one hand, strengthened control reduces managers' private benefits of cash holdings and, therefore, their incentives to hold cash. In addition, strengthened control may force managers to disgorge excess cash. On the other hand, strengthened control reduces managers' overinvestment. To the extent that these funds are not distributed to shareholders or used to pay down debt, cash holdings will increase. Thus, strengthened control after restatements could either increase or decrease cash holdings (the strengthened control hypothesis).

Overall, accounting restatements result in conflicting economic forces that could change cash holdings in either direction. The above discussion leads to our hypothesis, stated in the null form, as follows:

Hypothesis 1: The level of cash holdings does not change after an accounting restatement.

Research Design

Sample Selection and Propensity Score Matching

We collect the accounting restatement data from Hennes et al. (2008), which include restatements disclosed in Government Accountability Office (GAO) reports from 2003 to 2006. These reports contain restatements announced from January 1997 through June 2006. We conduct a difference-in-differences test to ensure that any change in cash holdings is not driven by a time trend (Bates et al., 2009). Specifically, we match each restatement firm to a non-restatement firm based on a propensity score (Roberts & Whited, 2013). We provide the details of the matching procedure and the diagnostic statistics in the appendix.

Panel A of Table 1 presents the sample selection procedure. Our initial sample contains 2,705 accounting restatement observations from GAO (2003, 2006). We first delete 203 duplicate restatements and 296 restatements for firms not in Compustat. Second, if a firm announces multiple restatements in the sample period, we retain only the first restatement to ensure that the pre-restatement period is not contaminated by previous restatements. This removes 396 restatements. Third, we remove 270 restatements from financial firms (Standard Industrial Classification code [SIC] 6000-6999) and 60 restatements from utility firms (SIC 4900-4999). Fourth, we eliminate observations with missing financial data, cash holdings exceeding the value of total assets, total assets and market value of equity below US $10 million, or growth in assets or sales exceeding 100%. This removes another 496

restatements from the sample. Finally, we remove seven restatements without matched control firm observations and 28 without data in the post-restatement periods. This yields a final sample of 949 restatements, of which 679 are related to errors and 270 are related to irregularities.

The Baseline Regression Models

To examine the change in cash holdings after a restatement, we compare the cash holdings in the 3 fiscal years after the restatement announcement (i.e., years [+1, +3]) with cash holdings in the 3 fiscal years before the announcement (i.e., years [−3, −1]). We define the fiscal year of the restatement announcement as year 0. Our main test excludes year 0 because it is not clear whether there is sufficient time for a restatement firm to adjust its cash holdings in this year. We estimate the following baseline regression separately for the restatement firms and the control firms (McInnis & Collins, 2011):

$$CASH_{i,t} = \alpha_i + \beta POST_{i,t} + CONTROLS + \varepsilon_{i,t}, \quad (1)$$

where *CASH* is the level of cash holdings, defined as cash and short-term investments (Compustat data item *#CHE*) scaled by total assets (*#AT*), and *POST* is a dummy variable that equals 1 after the restatement, and 0 before the restatement. The treatment effect of the restatements on the level of cash holdings is captured by the difference in the coefficient on *POST* (β) between the restatement and control firms.

Following Opler et al. (1999), we include a number of control variables. Tobin's *Q* (*Q*) is defined as the book value of total assets (*#AT*) plus the difference between the market value of equity (*#PRCC_F* × *#CSHO*) and the book value of equity (*#CEQ*), all scaled by book value of total assets. Firm size (*SIZE*) is the natural logarithm of total assets. Operating cash flow (*CF*) is net operating cash flow (*#OANCF*) scaled by total assets. Net working capital (*NWC*) is noncash working capital (*#ACT* − *#CHE*) − (*#LCT* − *#DLC*) scaled by total assets. Leverage (*LEV*) is the sum of long-term debt (*#DLTT*) and short-term debt (*#DLC*) scaled by total assets. Industry volatility of operating cash flow (*SIGMA*) is the industry-median value of the standard deviation of operating cash flow over the previous 10 years. Number of business segments (*NSEG*) is the count of business segments with nonzero identifiable assets, set to 1 if the value is missing. Firm age (*AGE*) is the natural logarithm of the number of years since the firm first appeared in Compustat. We include firm fixed effects (α_i) to control for time-invariant unobservable firm heterogeneity, and we cluster standard errors at both the matched pair (of the restatement and control firms) and year levels (Gow, Ormazabal, & Taylor, 2010).

Accounting Restatements and the Level of Cash Holdings

Summary Statistics and Univariate Tests

Panel B of Table 1 presents summary statistics, and Table 2 presents the results from univariate tests. For each restatement and matched control firm, we first compute the average value of *CASH* in the pre-restatement and post-restatement periods. We then compute the change in the firm-specific average value of *CASH* from the pre- to post-restatement periods. Finally, we examine the difference in the change in average *CASH* between the restatement firms and the matched control firms.

Table 1. Sample Selection and Summary Statistics.

Panel A: Sample Selection.

All accounting restatements from 1997 through 2006 from GAO (2003, 2006)			2,705
Less:	Duplicate announcements	(203)	
	Firms nonlisted in COMPUSTAT	(296)	
	Subsequent restatements	(396)	
	Financial firms (SICs between 6000 and 6999)	(270)	
	Utility firms (SICs between 4900 and 4999)	(60)	
	Firms with missing variables used to estimate the propensity scores	(496)	
	Firms that cannot be matched to a control firm	(7)	
	Firms missing in the post-restatement period	(28)	
Restatements included in the final sample			949
Irregularity and error restatements as identified by Hennes, Leone, and Miller (2008)			
	Irregularity firms		270
	Error firms		679

Panel B: Summary Statistics.

	Error sample			Irregularity sample		
Variable	*n*	*Mean*	Median	*n*	*Mean*	Median
CASH	7,120	0.165	0.094	2,825	0.166	0.088
POST	7,120	0.498	0.000	2,825	0.494	0.000
Q	7,120	1.883	1.495	2,825	1.969	1.512
SIZE	7,120	5.951	5.851	2,825	6.390	6.399
CF	7,120	0.069	0.084	2,825	0.068	0.076
NWC	7,120	0.113	0.089	2,825	0.112	0.103
LEV	7,120	0.219	0.171	2,825	0.220	0.192
SIGMA	7,120	0.067	0.068	2,825	0.071	0.071
NSEG	7,120	4.898	3.000	2,825	5.110	3.000
AGE	7,120	2.638	2.565	2,825	2.658	2.565
CAPX	7,120	0.060	0.042	2,825	0.050	0.036
ACQUISITION	7,120	0.021	0.000	2,825	0.025	0.000
R&D	7,120	0.087	0.000	2,825	0.081	0.007
DIV	7,120	0.006	0.000	2,825	0.006	0.000
DEBT_XFIN	7,107	0.003	0.000	2,823	0.001	−0.001
EQUITY_XFIN	6,998	0.031	0.006	2,776	0.031	0.007
MATURITY	7,119	0.349	0.207	2,822	0.343	0.193
NO_LOAN	7,120	0.690	1.000	2,825	0.647	1.000
N_FINCOV	7,120	0.471	0.000	2,825	0.526	0.000
N_GENCOV	7,120	1.044	0.000	2,825	1.228	0.000
BigN	7,120	0.855	1.000	2,825	0.880	1.000
CAPXACQ	6,778	0.095	0.057	2,645	0.090	0.049
REPURCHASE	6,778	0.022	0.000	2,645	0.022	0.000
DIVPAY	6,778	0.007	0.000	2,645	0.006	0.000
EXCASH	6,778	−0.005	−0.017	2,645	−0.016	−0.026
$R - R^B$	6,352	0.000	−0.088	2,404	0.013	−0.071
$\Delta CASH$	6,352	0.007	0.002	2,404	0.008	0.003
ΔE	6,352	0.017	0.006	2,404	0.020	0.007
ΔNA	6,352	0.004	0.028	2,404	0.012	0.028
ΔRD	6,352	0.000	0.000	2,404	−0.001	0.000

(continued)

Table 1. (continued)

Panel B: Summary Statistics.

	Error sample			Irregularity sample		
Variable	*n*	*Mean*	Median	*n*	*Mean*	Median
ΔI	6,352	0.000	0.000	2,404	0.000	0.000
ΔD	6,352	0.000	0.000	2,404	0.000	0.000
lagCASH	6,352	0.155	0.084	2,404	0.145	0.077
L	6,352	0.199	0.128	2,404	0.209	0.139
NF	6,352	0.003	0.000	2,404	0.005	−0.001

Note. CASH is defined as the ratio of cash and cash equivalent to total assets. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. *Q* is Tobin's *Q, SIZE* is the natural logarithm of total assets, *CF* is the operating cash flow scaled by total assets. *NWC* is the net working capital scaled by total assets. *LEV* is the sum of long-term and short-term debts scaled by total assets. *SIGMA* is the industry volatility of cash flow, *NSEG* is the number of business segments, *AGE* is firm age, *CAPX* is capital expenditures scaled by total assets, *ACQUISITION* is acquisitions scaled by total assets, *R&D* is research and development expenditures scaled by sales, *DIV* is dividends scaled by total assets, *DEBT_XFIN* is external debt financing, *EQUITY_XFIN* is external equity financing, *MATURITY* is the proportion of long-term debt due within 3 years to total long-term debt. *NO_LOAN* is an indicator variable that equals 1 if there is no bank loan obtained in the fiscal year, and 0 otherwise. *N_FINCOV* is the weighted average of the number of financial covenants, and *N_GENCOV* is that of general covenants of all bank loans obtained in the fiscal year, where the weight is the deal amount of each loan. If no bank loan is borrowed, then *N_FINCOV* and *N_GENCOV* are set to 0. *BigN* is an indicator variable that equals 1 if the annual report is audited by one of the Big 5 (or 4) auditors and 0 otherwise. *CAPXACQ* is net capital expenditure plus acquisition (*#CAPX* − *#SPPE* + *#AQC*) scaled by lagged total assets (*#AT*). *DIVPAY* is cash dividends (*#DV*) scaled by lagged total assets. *REPURCHASE* is repurchase (*#PRSTKC*) scaled by lagged total assets. *EXCASH* is the residual value of annual regressions of *CASH* on *Q, SIZE, CF, NWC, LEV, SIGMA, NSEG, AGE*, and industry fixed effects using all nonfinancial firms in Compustat. *R* is stock return over the fiscal year, and R^B is the benchmark portfolio return over the same period. We use the 25 Fama and French portfolios formed on size and book-to-market as the benchmark portfolio. $\Delta CASH$ is the change in cash and short-term investment. ΔE is the change in earnings, where earnings is defined as earnings before extraordinary items (*#IB*) plus interest expense (*#XINT*), deferred taxes (*#TXDI*), and investment tax credit (*#ITCI*). ΔNA is the change in noncash assets (*#AT* − *#CHE*). ΔRD is the change in *R&D* expenditures (*#XRD*), ΔI is the change in interest expenses (*#XINT*), ΔD is the change in dividends (*#DVC*). *L* is the total debt, defined as the sum of long-term debt (*#DLTT*) and short-term debt (*#DLC*). *NF* is net external financing, defined as total equity issuance (*SSTK*), minus repurchases (*PRSTKC*), plus debt issuance (*DLTIS*), minus debt redemption (*DLTR*). *lagCASH* is lagged cash and cash equivalent. $\Delta CASH$, ΔE, ΔNA, ΔRD, ΔI, ΔD, *L, NF*, and *lagCASH* are scaled by lagged market value of equity. GAO = Government Accountability Office; SIC = Standard Industrial Classification code.

Panel A presents the results for all restatement firms and matched control firms. The increase in *CASH* for the restatement firms is 0.016 (0.179 − 0.163), significant at the 1% level based on both the *t* test ($t = 4.58$) and the Wilcoxon rank sum test ($Z = 4.86$). In contrast, the change in *CASH* is not significantly different from 0 for the matched control firms. The difference in the change in *CASH* between the restatement and control firms is significant at the 1% level ($t = 3.22$; $Z = 3.30$). We repeat this test for the error restatements (Panel B) and irregularity restatements (Panel C) separately. Both sets of firms experience a significant increase in cash holdings after the restatement, but the matched control firms do not. The difference in the change in *CASH* is also statistically significant.

Multivariate Regression Analysis

Table 3 presents results from multivariate regression investigating the average effects of accounting restatements on corporate cash holdings. Panel A presents results from the

Table 2. Univariate Tests.

	Mean value of *CASH*			Test of difference	
	Pre-restatement [1]	Post-restatement [2]	Post–pre [3]	*t* statistics [4]	*Z* statistics [5]
Panel A: All restatements					
Restatement firms (R)	0.163	0.179	0.016	4.58***	4.86***
Matched firms (C)	0.168	0.169	0.001	0.27	0.86
(R) – (C)	−0.005	0.011	0.016	3.22***	3.30***
Panel B: Restatements due to errors					
Restatement firms (R)	0.162	0.175	0.014	3.24***	3.16***
Matched firms (C)	0.168	0.168	0.000	0.01	0.43
(R) – (C)	−0.006	0.007	0.014	2.36**	2.14**
Panel C: Restatements due to irregularities					
Restatement firms (R)	0.166	0.189	0.023	3.47***	4.07***
Matched firms (C)	0.167	0.170	0.003	0.50	0.92
(R) – (C)	−0.001	0.019	0.020	2.33**	2.81***

Note. This table presents the results of the univariate tests of the change in *CASH* after the restatements. *CASH* is defined as cash and short-term investment scaled by total assets. For each restatement firm and its matched control firm, we compute the average value of *CASH* in the pre- and post-restatement periods. The first row in each panel presents the mean value of the average *CASH* for the restatement firms in the pre- (column 1) and post-restatement periods (column 2), the difference between the post- and pre-restatement periods (column 3), and the *t* statistics of the *t* test (column 4) and the *Z* statistics of the Wilcoxon rank sum test (column 5) for the null hypothesis that the difference between the post-restatement period and the pre-restatement period (column 3) equals 0. The second row in each panel presents the corresponding statistics for the matched firms, and the third row presents the corresponding statistics for the difference between the matched pair. The sample in Panel A includes all restatement and matched control firms, and the sample in Panel B (C) includes all restatements related to errors (irregularities) and the corresponding matched control firms.
*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

baseline regressions, and columns 1 and 2 present results for restatement and matched control firms, respectively. The coefficient on *POST* in column 1 is positive and significant (0.029, $t = 7.21$), revealing that restatement firms significantly increase their cash holdings after restatements. Consistent with a general increasing trend in the cash holdings of U.S. firms (Bates et al., 2009), the coefficient on *POST* is also positive for the control firms (0.011, $t = 2.20$). Most importantly, the treatment effect of restatements is highly significant (0.018; $p = .003$).

We repeat these tests separately for the error and irregularity restatement samples. Column 3 reveals that error firms experience a statistically significant increase in cash holdings. The coefficient on *POST* is positive and significant (0.020, $t = 4.89$). Column 4 reveals that the control firms also experience an increase in cash holdings (0.011; $t = 1.80$), but the treatment effect is insignificant (0.009; $p = .199$). In column 5, the coefficient on *POST* for the irregularity firms is positive and highly significant (0.046, $t = 4.84$) and in column 6, the corresponding coefficient for the control firms is positive but smaller (0.012, $t = 1.90$). The treatment effect of irregularity-related restatements is significant (0.034; $p = .002$). These analyses reveal that the effect of accounting restatements on cash holdings is concentrated in the irregularity sample. The treatment effect of the restatements on cash

holdings is also economically significant. For example, the results in columns 5 and 6 reveal that the average increase in cash holdings is 3.4% of total assets greater for irregularity firms than for the control firms. In addition, the increase in cash holdings relative to the pre-restatement level is approximately 20% higher for the irregularity firms than for the control firms.[1]

Opler et al. (1999) show that cash holdings are associated with investments and dividends. In addition, recent studies find that accounting restatements affect firms' financing behavior (Chen et al., 2013; Graham et al., 2008), which may affect their cash holdings (Harford, Klasa, & Maxwell, 2014). In the baseline regression, we do not control for investments and dividends because these variables are jointly determined with cash holdings (Duchin, 2010). However, as a robustness check, we test whether the results in Panel A hold after controlling for variables related to investments, external financing, and dividends. The results, reported in Panel B of Table 3, are qualitatively similar. *CAPX* is capital expenditure (#*CAPX*) scaled by total assets, *ACQUISITION* is acquisition (#*AQC*) scaled by total assets, *R&D* is research and development (#*XRD*) scaled by total sales (#*SALE*), and *DIV* is dividends (#*DVC*) scaled by total assets. *DEBT_XFIN* is net long-term debt issuance (#*DLTIS* − #*DLTR*) plus change in current debt (#*DLCCH*) scaled by total assets (#*AT*). *EQUITY_XFIN* is sale of common and preferred stock (#*SSTK*) scaled by total assets. *MATURITY* is the ratio of long-term debt due within 3 years (sum of #*DD1*, #*DD2*, and #*DD3*) to total long-term debt (#*DLTT* + #*DD*1). *N_FINCOV* is the weighted average number of financial covenants, and *N_GENCOV* is the weighted average number of general covenants for all bank loans obtained in the fiscal year, where the weight is the deal amount of each loan, both set to 0 when no bank loan was obtained. *NO_LOAN* is an indicator variable that equals 1 if no bank loan was obtained in the fiscal year, and 0 otherwise. We also include a Big-*N* auditor (*BigN*) indicator because the proportion of firms audited by the Big-*N* differs significantly between the restatement and control firms (Table A1). The increase in cash holdings is significantly greater for the restatement firms than for the control firms. In addition, the effect is concentrated in the sample of restatements related to irregularities, and its economic significance is similar to that inferred from Panel A.

Cross-Sectional Analyses

Findings in Table 3 are consistent with the view that both increased precautionary savings concerns and strengthened control increase cash holdings. However, it is possible that the strengthened control reduces cash holdings, but the effect is weaker than that of increased precautionary savings concerns. Thus, in this section, we conduct cross-sectional analyses to separate the precautionary savings and strengthened shareholder control hypotheses.

Precautionary savings. The precautionary savings hypothesis predicts that firms hold cash to insure against future shortfalls which could prevent them from investing in profitable projects (Opler et al., 1999). According to this hypothesis, corporate cash holdings should be more sensitive to information asymmetry when the risk of internal funds running out in future periods is higher (Acharya et al., 2007). Therefore, the increase in cash holdings after restatements should be greater when the demand for precautionary savings is higher.

The demand for precautionary savings is determined by the joint distribution of investment opportunities and internal cash flows over time (Duchin, 2010). Other things being equal, the demand is larger when future cash flows and investment opportunities are more volatile, and when future internal funds and investment opportunities tend to arrive at

Table 3. Average Effect of Accounting Restatements on Cash Holdings.

Panel A: Baseline Model.

	All restatements		Restatements related to errors		Restatements related to irregularities	
Variable	Restatement firms [1]	Control firms [2]	Restatement firms [3]	Control firms [4]	Restatement firms [5]	Control firms [6]
POST	**0.029*****	**0.011****	**0.020*****	**0.011***	**0.046*****	**0.012***
	(7.21)	(2.20)	(4.89)	(1.80)	(4.84)	(1.90)
Test of difference in the coefficient of *POST*						
	[1] − [2]		[3] − [4]		[5] − [6]	
Coefficient difference	**0.018*****		0.009		**0.034*****	
[*p* value]	[.003]		[.199]		[.002]	
Control variables						
Q	0.009***	0.011***	0.005**	0.009***	0.017***	0.013***
	(3.65)	(4.32)	(2.10)	(3.51)	(2.66)	(3.25)
SIZE	−0.024***	−0.004	−0.018**	−0.006	−0.035***	0.001
	(−3.38)	(−0.72)	(−2.00)	(−0.85)	(−3.12)	(0.09)
CF	0.097***	0.007	0.105***	0.014	0.064	−0.010
	(3.93)	(0.30)	(3.83)	(0.51)	(1.32)	(−0.19)
NWC	−0.325***	−0.430***	−0.347***	−0.432***	−0.287***	−0.430***
	(−11.14)	(−13.59)	(−9.43)	(−10.18)	(−5.32)	(−7.77)
LEV	−0.103***	−0.116***	−0.136***	−0.108***	−0.048*	−0.139***
	(−5.46)	(−6.08)	(−5.44)	(−4.31)	(−1.70)	(−4.31)
SIGMA	0.656	1.013***	0.352	1.143***	1.421**	0.732
	(1.49)	(2.88)	(0.66)	(2.80)	(2.13)	(1.39)
NSEG	−0.001**	−0.001	−0.001	−0.002	−0.002*	−0.001
	(−1.99)	(−1.35)	(−1.59)	(−1.63)	(−1.80)	(−0.36)
AGE	−0.044***	−0.031***	−0.032**	−0.028**	−0.069**	−0.039**
	(−3.50)	(−2.88)	(−2.40)	(−2.32)	(−2.35)	(−2.17)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.156	.141	.157	.134	.180	.162
n	4,941	5,004	3,550	3,570	1,391	1,434

(*continued*)

Table 3. (continued)

Panel B: Expanded Model.

Variable	All restatements		Restatements related to errors		Restatements related to irregularities	
	Restatement firms [1]	Control firms [2]	Restatement firms [3]	Control firms [4]	Restatement firms [5]	Control firms [6]
POST	**0.025*****	**0.011****	**0.017*****	**0.009***	**0.041*****	**0.014****
	(6.83)	(2.18)	(3.96)	(1.67)	(4.64)	(2.26)
Test of difference in the coefficient of *POST*						
	[1] − [2]		[3] − [4]		[5] − [6]	
Coefficient difference	**0.014****		0.008		**0.027*****	
p value	[.012]		[.300]		[.008]	
Control variables						
Q	0.007***	0.008***	0.004	0.007***	0.012**	0.011***
	(2.89)	(3.80)	(1.41)	(2.97)	(2.13)	(2.90)
SIZE	−0.020***	−0.005	−0.014	−0.005	−0.029***	0.000
	(−2.75)	(−0.72)	(−1.61)	(−0.72)	(−2.64)	(0.01)
CF	0.185***	0.101***	0.192***	0.110***	0.152***	0.087
	(8.50)	(3.46)	(6.73)	(3.53)	(3.48)	(1.32)
NWC	−0.316***	−0.415***	−0.336***	−0.425***	−0.281***	−0.409***
	(−9.87)	(−13.54)	(−8.51)	(−10.28)	(−5.06)	(−7.20)
LEV	−0.117***	−0.145***	−0.154***	−0.141***	−0.064**	−0.160***
	(−5.98)	(−7.01)	(−6.25)	(−5.45)	(−2.28)	(−4.83)
SIGMA	0.510	0.794**	0.263	0.954**	1.025*	0.370
	(1.21)	(2.45)	(0.51)	(2.38)	(1.83)	(0.79)
NSEG	−0.002**	−0.001	−0.001*	−0.002**	−0.002*	0.000
	(−2.11)	(−1.61)	(−1.66)	(−2.06)	(−1.69)	(−0.29)
AGE	−0.048***	−0.041***	−0.036***	−0.037***	−0.071***	−0.056***
	(−3.97)	(−3.55)	(−2.64)	(−2.77)	(−2.61)	(−3.05)
CAPX	−0.468***	−0.436***	−0.472***	−0.448***	−0.456***	−0.435***
	(−8.90)	(−9.12)	(−7.60)	(−6.63)	(−4.83)	(−4.04)
ACQUISITION	−0.275***	−0.354***	−0.328***	−0.362***	−0.184***	−0.349***
	(−9.56)	(−8.81)	(−9.89)	(−7.90)	(−3.91)	(−6.81)

(continued)

Table 3. (continued)

Panel B: Expanded Model.

Variable	All restatements		Restatements related to errors		Restatements related to irregularities	
	Restatement firms [1]	Control firms [2]	Restatement firms [3]	Control firms [4]	Restatement firms [5]	Control firms [6]
R&D	0.068***	0.068***	0.049**	0.071**	0.084*	0.068
	(2.67)	(2.71)	(2.29)	(2.15)	(1.75)	(1.61)
DIV	0.260*	−0.226	0.251	−0.003	0.292	−0.952***
	(1.94)	(−1.34)	(1.36)	(−0.01)	(1.16)	(−3.66)
DEBT_XFIN	0.176***	0.242***	0.206***	0.241***	0.130**	0.248***
	(7.23)	(9.77)	(9.23)	(9.05)	(2.37)	(5.95)
EQUITY_XFIN	0.194***	0.187***	0.192***	0.189***	0.183***	0.189***
	(7.68)	(6.34)	(5.45)	(7.18)	(3.56)	(2.49)
MATURITY	−0.012**	−0.009**	−0.009	−0.010**	−0.016	−0.004
	(−2.21)	(−2.12)	(−1.48)	(−2.16)	(−1.64)	(−0.34)
NO_LOAN	0.013***	0.007**	0.011**	0.006*	0.017***	0.009
	(4.18)	(2.15)	(2.45)	(1.69)	(2.61)	(1.17)
N_FINCOV	−0.003*	0.000	−0.003	−0.001	−0.004	0.005
	(−1.86)	(0.01)	(−1.25)	(−0.58)	(−1.11)	(0.96)
N_GENCOV	0.002*	−0.001	0.001	0.000	0.002	−0.003
	(1.86)	(−0.95)	(1.51)	(−0.13)	(1.06)	(−1.64)
BigN	0.007	−0.017*	0.005	−0.023**	0.011	0.013
	(0.72)	(−1.75)	(0.41)	(−2.03)	(0.83)	(0.83)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	.230	.230	.235	.221	.237	.261
n	4,855	4,900	3,490	3,494	1,365	1,406

Note. The dependent variable is *CASH*, defined as the ratio of cash and cash equivalent to total assets. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. *Q* is Tobin's *Q, SIZE* is the natural logarithm of total assets, *CF* is operating cash flow scaled by total assets. *NWC* is net working capital scaled by total assets. *LEV* is the sum of long-term and short-term debts scaled by total assets. *SIGMA* is the industry volatility of cash flow, *NSEG* is the number of business segments, *AGE* is firm age, *CAPX* is capital expenditures scaled by total assets, *ACQUISITION* is acquisitions scaled by total assets, *R&D* is research and development expenditures scaled by sales, *DIV* is dividends scaled by total assets, *DEBT_XFIN* is external debt financing, *EQUITY_XFIN* is external equity financing, *MATURITY* is the proportion of long-term debt due within 3 years to total long-term debt. *NO_LOAN* is an indicator variable that equals 1 if there is no bank loan obtained in the fiscal year, and 0 otherwise. *N_FINCOV* is the weighted average of the number of financial covenants, and *N_GENCOV* is that of general covenants of all bank loans obtained in the fiscal year, where the weight is the deal amount of each loan. If no bank loan is borrowed, then *N_FINCOV* and *N_GENCOV* are set to 0. *BigN* is an indicator variable that equals 1 if the annual report is audited by one of the Big 5 (or 4) auditors and 0 otherwise. The *t* statistics (in parentheses) and *p* values (in brackets) are based on standard errors adjusted for clustering at both the matched pair and year levels, with the regressions of the restatement and control samples estimated simultaneously.

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

different times (i.e., when the correlation is low).[2] We construct a proxy for the demand for precautionary savings by considering three variables that characterize the joint distribution of internal funds and investment opportunities (Duchin, 2010). The first variable is the industry volatility of operating cash flows (*CF*), defined as the standard deviation of the industry-median *CF* over the previous 10 years.[3] The second variable is the industry volatility of investment opportunities, defined as the standard deviation of the industry-median Tobin's *Q* over the previous 10 years. The third variable is the negative correlation between the industry-median *CF* and the industry-median Tobin's *Q* over the previous 10 years. For each variable, a higher value suggests higher demand for precautionary savings, other things being equal. In each year, we convert the above three variables into percentile ranks. Our composite measure of demand for precautionary savings (*PS_DEMAND*) is constructed as the mean of the three ranks.

We partition the irregularity firms into two subsamples (high and low) based on *PS_DEMAND*, and we assign the matched control firms to the same subsample as the corresponding restatement firms. We reestimate the baseline regressions within each partitioned sample and present the results in Panel A of Table 4 (reporting the statistics for *POST* for brevity).

For the subsample of firms with high precautionary savings demand (mean *PS_DEMAND* = 0.769), the treatment effect of irregularity restatements is larger and highly significant (0.064; $p = .001$), but for firms with low demand for precautionary savings (mean *PS_DEMAND* = 0.391), the treatment effect is smaller (0.016; $p = .226$). A formal test reveals that the difference in the treatment effects is significant (0.048; $p = .031$). This provides evidence consistent with the precautionary savings hypothesis.

We also partition the sample based on each individual measure of the demand for precautionary savings. The results, reported in Panel B, are qualitatively similar but less significant. One possible reason is that the demand for precautionary savings is determined by the joint distribution of internal funds and investment opportunities, but each individual measure only captures one dimension of the joint distribution, resulting in lower testing power.

Strengthened shareholder control. As discussed previously, strengthened shareholder control over managers can increase or decrease cash holdings (Harford et al., 2008). To further investigate the effect of strengthened shareholder control, we partition the sample based on proxies for the increase in shareholder control. We consider three proxies. The first proxy is a dummy variable for whether the irregularity firms replace their CEO/CFO in the year of or after the restatement announcement because newly appointed managers may be subjected to more monitoring (Coles, Daniel, & Naveen, 2014). Firms that replace the management team are also more likely to reduce overinvestment planned by the previous management.

The second proxy is the decrease in option compensation of the CEO (*DECREASE_OPTION*) because Cheng and Farber (2008) suggest that restatements are linked to excessive option compensation, and restatement firms that decrease the use of option compensation experience better post-restatement performance improvements. We define *DECREASE_OPTION* as the average percentage of option compensation (*OPTION_PER*) for the CEO over years $t - 3$ to $t - 1$ minus *OPTION_PER* in year $t + 1$.[4] A positive (negative) value for *DECREASE_OPTION* indicates a decrease (an increase) in options as a percentage of total CEO compensation.

Table 4. Cross-Sectional Analysis to Test the Precautionary Savings Hypothesis.

Panel A: Partition Based on the Composite Measure *PS_DEMAND*.

	Partitioned by *PS_DEMAND*		
Coefficient (*t* stat) of *POST* in each subsample	High (*Mean* = 0.769)	Low (*Mean* = 0.391)	Difference (high – low) [*p* value]
Irregularity firms (R)	**0.070*****	**0.029*****	**0.041****
	(4.26)	(2.97)	[.024]
	n = 689	*n* = 702	
Control firms (C)	0.006	0.013	−0.007
	(0.64)	(1.32)	[.607]
	n = 713	*n* = 721	
Difference (R – C)	**0.064*****	0.016	**0.048****
[*p* value]	[.001]	[.226]	[.031]

Panel B: Partition Based on Individual Measures of Demand for Precautionary Savings.

	Partitioned by *IND_STDCF*		
Coefficient (*t* stat) of *POST* in each subsample	High (*Mean* = 0.026)	Low (*Mean* = 0.014)	Difference (high – low) [*p* value]
Irregularity firms (R)	**0.048*****	**0.041*****	0.007
	(3.70)	(3.44)	[.661]
	n = 698	*n* = 693	
Control firms (C)	0.007	0.014	−0.007
	(0.74)	(1.56)	[.609]
	n = 718	*n* = 716	
Difference (R – C)	**0.041*****	**0.027***	0.013
[*p* value]	[.009]	[.077]	[.525]

	Partitioned by *IND_STDQ*		
Coefficient (*t* stat) of *POST* in each subsample	High (*Mean* = 0.427)	Low (*Mean* = 0.143)	Difference (high – low) [*p* value]
Irregularity firms (R)	**0.071*****	**0.028*****	**0.043****
	(4.50)	(2.94)	[.016]
	n = 692	*n* = 699	
Control firms (C)	0.013	0.011	0.002
	(1.22)	(1.20)	[.854]
	n = 713	*n* = 721	
Difference (R – C)	**0.058*****	0.017	**0.041***
[*p* value]	[.003]	[.134]	[.057]

	Partitioned by *NEG_IND_CORR*		
Coefficient (*t* stat) of *POST* in each subsample	High (*Mean* = 0.512)	Low (*Mean* = −0.137)	Difference (high – low) [*p* value]
Irregularity firms (R)	**0.060*****	**0.034*****	0.026
	(4.04)	(3.43)	[.145]
	n = 714	*n* = 677	

(continued)

Table 4. (continued)

Control firms (C)	0.008	**0.015***	−0.007
	(0.94)	(1.80)	[.548]
	n = 731	*n* = 703	
Difference (R – C)	**0.052*****	0.019	0.033
[*p* value]	[.003]	[.132]	[.132]

Note. The dependent variable is *CASH*, defined as the ratio of cash and cash equivalent to total assets. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. *Q* is Tobin's *Q, SIZE* is the natural logarithm of total assets, *CF* is operating cash flow scaled by total assets. *NWC* is net working capital scaled by total assets. *LEV* is sum of long-term and short-term debts scaled by total assets. *SIGMA* is the industry volatility of cash flow, *NSEG* is the number of business segments, and *AGE* is firm age. *IND_STDCF* is standard deviation of industry (based on Fama and French's 48-industry classification) median operating cash flows. *IND_STDQ* is standard deviation of industry-median Tobin's *Q*. *NEG_IND_CORR* is the negative correlation between industry-median operating cash flows and industry-median Tobin's *Q*. *PS_DEMAND* is the mean value of the percentile ranks of *IND_STDCF, IND_STDQ*, and *NEG_IND_CORR*. The *t* statistics (in parentheses) and *p* values (in brackets) are based on standard errors adjusted for clustering at both the matched pair and year levels, with the regressions of the restatement and control samples estimated simultaneously.
*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

The third proxy is the decrease in overinvestment (*DECREASE_XINV*). A detailed definition is provided in the note to Table 5. A positive (negative) value for *DECREASE_XINV* indicates a decrease (an increase) in overinvestment. An advantage of *DECREASE_XINV* is that it captures the effect of all governance mechanisms on overinvestment.

Panel A of Table 5 reports the results from partitions based on CEO/CFO turnover. The treatment effect for firms without CEO/CFO replacement is positive and significant (0.038; $p = .005$), and the effect is insignificant for firms with CEO/CFO replacement (0.024; $p = .259$), but the difference in the treatment effects between the two subsamples is not significant ($p = .540$).

Panel B reveals that the treatment effect of irregularity restatements is larger (0.059, $p = .001$) for firms with low *DECREASE_OPTION* (*Mean* = −0.155) than for firms with high *DECREASE_OPTION* (*Mean* = 0.323), where the treatment effect is insignificant (0.016, $p = .369$). The difference in the treatment effect is significant ($p = .083$).

Panel C presents the results after splitting the sample based on *DECREASE_XINV*. For firms with low *DECREASE_XINV* (*Mean* = −0.154), the treatment effect is larger and highly significant (0.065, $p < .001$). In contrast, for firms with high *DECREASE_XINV* (*Mean* = 0.169), the treatment effect is insignificant (0.018; $p = .216$), and the difference is significant ($p = .051$).

Overall, the results in Tables 3 through 5 suggest that there are two mechanisms through which restatements affect cash holdings. On one hand, restatements increase the demand for precautionary savings. This effect leads firms to increase cash holdings. On the other hand, shareholders tighten control over managers. This effect leads to a decrease in cash holdings. However, the first effect (precautionary savings) is greater than the second (shareholder control), resulting in a net increase in cash holdings.

Alternative explanation—Managers' uncertainty about investment opportunities. Restatements can increase managers' uncertainty about investment opportunities. Real option theory (Dixit & Pindyck, 1994) suggests that this uncertainty decreases a firm's (partially) irreversible investment. The effect of uncertainty is more pronounced for

Table 5. Cross-Section Analysis to Test the Strengthened Shareholder Control Hypothesis.

Panel A: Partition Based on CEO/CFO Replacement After the Restatements.

Coefficient (*t* stat) of *POST* in each subsample	Do the irregularity firms replace CEO/CFO till year +1?		Difference (yes – no) [*p* value]
	Yes	No	
Irregularity firms (R)	**0.041****	**0.049*****	−0.008
	(2.51)	(4.15)	[.665]
	n = 527	*n* = 847	
Control firms (C)	0.017	0.010	0.007
	(1.60)	(1.43)	[.600]
	n = 537	*n* = 884	
Difference (R – C)	0.024	**0.038*****	−0.014
[*p* value]	[.259]	[.005]	[.540]

Panel B: Partition by Decrease in the Portion of Option Pay of the CEO (*DECREASE_OPTION*).

Coefficient (*t* stat) of *POST* in each subsample	Partitioned by *DECREASE_OPTION*		Difference (high – low) [*p* value]
	High (*Mean* = 0.323)	Low (*Mean* = −0.155)	
Irregularity firms (R)	**0.028****	**0.061*****	**−0.033***
	(2.09)	(4.40)	[.088]
	n = 617	*n* = 620	
Control firms (C)	0.012	0.002	0.010
	(1.02)	(0.25)	[.486]
	n = 640	*n* = 623	
Difference (R – C)	0.016	**0.059*****	**−0.043***
[*p* value]	[.369]	[.001]	[.083]

Panel C: Partition Based on Decrease in Overinvestment After the Restatements (*DECREASE_XINV*).

Coefficient (*t* stat) of *POST* in each subsample	Partitioned by *DECREASE_XINV*		Difference (high – low) [*p* value]
	High (*Mean* = 0.169)	Low (*Mean* = −0.154)	
Irregularity firms (R)	**0.034*****	**0.069*****	**−0.035****
	(3.44)	(4.75)	[.050]
	n = 656	*n* = 658	
Control firms (C)	0.016	0.004	0.012
	(1.48)	(0.49)	[.410]
	n = 658	*n* = 674	
Difference (R – C)	0.018	**0.065*****	**−0.047***
[*p* value]	[.216]	[.000]	[.051]

Note. The dependent variable is *CASH*, defined as the ratio of cash and cash equivalent to total assets. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. *Q* is Tobin's *Q, SIZE* is the natural logarithm of total assets, *CF* is operating cash flow scaled by total assets. *NWC* is net working capital scaled by total assets. *LEV* is the sum of long-term and short-term debts scaled by total assets. *SIGMA* is the industry volatility of cash flow, *NSEG* is the number of business segments, and *AGE* is firm age. *DECREASE_OPTION* is decrease in the percentage of option compensation of *CEO (OPTION_PER)*, measured by the mean *OPTION_PER* of years −3 to −1 minus *OPTION_PER* of year +1. A positive (negative) number of *DECREASE_OPTION* means decrease (increase) in the percentage of option compensation. *OPTION_PER* is measured as the ratio of

Black–Scholes value of option grant to total compensation. We collect CEO compensation data from Execcomp. For firms not covered by Execcomp, we collect the compensation data manually from proxy statements. *DECREASE_XINV* is defined as the mean *XINV* over years −3 to −1 minus the mean *XINV* over years +1 to +3. A positive (negative) number of *DECREASE_XINV* implies decrease (increase) in *XINV*. Following McNichols and Stubben (2008), *XINV* is defined as the residual term from the following annual regression estimated within each industry based on Fama and French's (1997) 48-industry classification. $INV_t = a + b_1 Q_{t-1} + b_2 Q_{t-1} \times QTR2 + b_3 Q_{t-1} \times QTR3 + b_4 Q_{t-1} \times QTR4 + b_5 CF_t + b_6 GRW_{t-1} + b_7 INV_{t-1} + e_t$. We follow McNichols and Stubben (2008), and define *INV* as capital expenditure scaled by lagged net property, plant, and equipment. *GRW* is the natural logarithm of the assets growth rate. *QTR*2, *QTR*3, and *QTR*4 are indicator variables that equal 1 if Q_{t-1} is in the second, third, and fourth quartile within the industry, and 0 otherwise. The *t* statistics (in parentheses) and *p* values (in brackets) are based on standard errors adjusted for clustering at both the matched pair and year levels, with the regressions of the restatement and control samples estimated simultaneously.
*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

investments that are more irreversible (Badertscher, Shroff, & White, 2013). To the extent that any funds reallocated from investment opportunities are saved as cash, restatements will increase firms' cash holdings.[5] In this case, the increase in cash holdings should be more pronounced for firms operating in industries where investments are more irreversible.

We follow Badertscher et al. (2013) and measure investment irreversibility (*INV_IRREVERS*) as industry return comovement.[6] An asset's liquidity, defined as the gap between its selling price and its value in best use, depends on how other firms in the same industry are performing (Shleifer & Vishny, 1992). If firms that are likely to be the next best users of the assets for sale are also experiencing financial difficulty, it will be difficult for a selling firm to find a buyer within the industry willing to pay a price close to the value in best use. Thus, the seller may have to look to buyers in different industries (i.e., outsiders). Because outsiders know less than firms in the industry about the quality of the assets, they will only buy at a considerably lower price than the value in best use. This makes asset illiquidity (i.e., investment irreversibility) higher in industries that are more often hit by common shocks than in other industries.

We partition the sample based on industry investment irreversibility (*INV_IRREVERS*) and present key results from our tests in Table 6. The treatment effect of irregularity restatements on cash holdings for the subsample with high *INV_IRREVERS* (*Mean* = 0.252) is 0.032 (p = .059), but the treatment effect is similar (0.034, p = .017) for the subsample with low *INV_IRREVERS* (*Mean* = 0.122) and the difference between the two subsamples is insignificant (p = .946). This suggests that the increase in cash holdings after restatements is not driven by an increase in management uncertainty about investment opportunities.

Irregularity Restatements and How Excess Cash Is Deployed

To further understand the channels through which the restatements affect cash holdings, we examine how restatements affect the way in which firms deploy excess cash. Specifically, we examine changes in the sensitivity of investments and payouts to excess cash. The precautionary savings hypothesis suggests that investment is more sensitive to cash holdings for more financially constrained firms, suggesting an increase in the sensitivity of investment to excess cash after restatements. In contrast, the strengthened shareholder control hypothesis predicts the opposite because managers are less likely to waste cash.

If strengthened shareholder control reduces the private benefits of holding excess cash or allows shareholders to force managers to disgorge excess cash, we would observe a

Table 6. Investment Irreversibility and the Effect of Restatements on Cash Holdings.

Coefficient (*t* stat) of *POST* in each subsample	Partitioned by *INV_IRREVERS*		Difference (high – low) [*p* value]
	High (*Mean* = 0.252)	Low (*Mean* = 0.122)	
Irregularity firms (R)	**0.056*****	**0.031*****	0.025
	(4.09)	(2.93)	[.188]
	n = 658	*n* = 656	
Control firms (C)	**0.024****	−0.003	**0.027***
	(2.25)	(−0.32)	[.053]
	n = 674	*n* = 658	
Difference (R – C)	**0.032***	**0.034****	−0.002
[*p* value]	[.059]	[.017]	[.946]

Note. The dependent variable is *CASH*, defined as the ratio of cash and cash equivalent to total assets. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. *Q* is Tobin's *Q, SIZE* is the natural logarithm of total assets, *CF* is operating cash flow scaled by total assets. *NWC* is net working capital scaled by total assets. *LEV* is the sum of long-term and short-term debts scaled by total assets. *SIGMA* is the industry volatility of cash flow, *NSEG* is the number of business segments, and *AGE* is firm age. *INV_IRREVERS* is industry investment irreversibility measured by industry return comovement. We follow Badertscher, Shroff, and White (2013) to compute industry return comovement for each industry (based on Fama and French, 1997, 48-industry classification) and each restatement announcement year. For each firm in the industry, we compute the partial correlation coefficient between monthly firm returns and monthly industry returns, controlling for the monthly market returns. We use the monthly return data in the 5 years before the restatement year and require at least 30 observations. The industry returns are defined as the equal-weighted monthly returns of all firms in the same industry. The industry comovement is defined as the mean value of the partial correlation coefficients of all firms in the same industry. Higher industry comovement means that firms in the industry are likely to suffer common shocks more severely, and that idiosyncratic shocks are less important. Thus, high industry comovement implies higher industry investment irreversibility. Mean value of *INV_IRREVERS* of each subsample is reported. The *t* statistics (in parentheses) and *p* values (in brackets) are based on standard errors adjusted for clustering at both the matched pair and year levels, with the regressions of the restatement and control samples estimated simultaneously.

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

higher sensitivity of payouts to excess cash after restatements. Higher information asymmetry also implies a stronger need to mitigate investor concerns about agency conflicts and/or adverse selection (Hail, Tahoun, & Wang, 2014). Therefore, the precautionary savings hypothesis also predicts an increase in the sensitivity of payouts to excess cash after restatements. In contrast, if shareholders allow managers to hold more cash reserves when they have tighter control (Harford et al., 2008), the sensitivity of payouts to excess cash is expected to be lower after restatements.

We estimate the following regression separately for the irregularity firms and control firms:

$$DECISION_{i,t} = \alpha_i + \beta_1 EXCASH_{i,t-1} + \beta_2 POST_{i,t} + \beta_3 POST_{i,t} \times EXCASH_{i,t-1} + CONTROLS + \varepsilon_{i,t}, \quad (2)$$

where *DECISION* is *CAPXACQ, DIVPAY*, or *REPURCHASE. CAPXACQ* is the sum of net capital expenditures and acquisitions (*#CAPX − #SPPE + #ACQ*), *DIVPAY* is cash dividends (*#DV*), and *REPURCHASE* is the sum of the repurchase of preferred and common

stocks (*#PRSTKC*). All three variables are scaled by lagged total assets. *EXCASH* is the residual term from the annual regression of cash holdings on Tobin's *Q* (*Q*), firm size (*SIZE*), operating cash flows (*CF*), net working capital (*NWC*), leverage (*LEV*), industry cash flow volatility (*SIGMA*), number of business segments (*NSEG*), firm age (*AGE*), and industry fixed effects using all nonfinancial firms in Compustat. The optimal value of cash holdings is defined as the cash holdings predicted by the annual regressions. The control variables (*CONTROLS*) include *Q, SIZE, CF*, and *LEV*, as defined in the third section. To test for the effect of restatements on financial decisions, we focus on the difference in β_3 between the irregularity firms and control firms.

The results are reported in Table 7. Panel A reveals that the increase in the sensitivity of *CAPXACQ* to excess cash for the irregularity firms is significantly greater than that for the matched control firms ($p = .057$). This is consistent with the notion that cash reserves are more valuable in reducing underinvestment after restatements, supporting the precautionary savings hypothesis. In contrast, the results do not support the shareholder control hypothesis.

Panel B reveals that the increase in the sensitivity of dividend payout (*DIVPAY*) to excess cash after the restatements is not significantly different for the irregularity firms than for the control firms ($p = .882$). In contrast, Panel C reveals a greater increase in the sensitivity of *REPURCHASE* to excess cash for the irregularity firms than for the control firms ($p = .033$). These results jointly suggest that irregularity firms attempt to reduce investor concerns about agency problems by increasing the distribution of excess cash but do so in a way that avoids future payout commitments (Harford et al., 2008).

Overall, the results suggest that the economic forces that incent firms to reduce their cash holdings become stronger after restatements. However, these forces are weaker than the increase in precautionary savings benefits, resulting in a net increase in cash.

Irregularity Restatements and the Market Value of Cash Holdings

Faulkender and Wang (2006) find that the value of cash holdings is greater for firms with tighter external financing constraints. Because accounting restatements magnify external financing constraints, we should observe an increase in the market value of cash holdings after restatements. However, investors may not place a higher value on cash holdings after restatements because restatements reveal agency problems, and Dittmar and Mahrt-Smith (2007) find that cash holdings have a lower market value when agency problems are more severe. Although internal governance and external discipline improve after restatements, it is not clear whether this is sufficient to offset the negative effect of perceived agency problems. Keeping this caveat in mind, we estimate the following regressions separately for the irregularity firms and the control firms.

$$R_{i,t} - R^{B}_{i,t} = \eta_0 + \eta_1 POST_{i,t} + \eta_2 \Delta CASH_{i,t} + \eta_3 \Delta CASH_{i,t} \times POST_{i,t} + CONTROL + \varepsilon_{i,t}, \quad (3)$$

where $R_{i,t}$ is the compound return of firm i over the fiscal year t, and $R^{B}_{i,t}$ is the compound return of the benchmark portfolio over the same period. We use the 25 Fama and French portfolios formed on size and book-to-market as the benchmark. $\Delta CASH_{i,t}$ is the change in cash and short-term investment from year $t - 1$ to year t, scaled by the market value of common shares outstanding at the end of year $t - 1$. We include the following control

Table 7. Irregularity Restatements and the Financial Decisions.

	Irregularity firms [1]	Control firms [2]	Difference ([1] − [2]) [*p* value]
Panel A: *CAPXACQ*			
$CAPXACQ_{i,t} = \alpha_i + \beta_1 EXCASH_{i,t-1} + \beta_2 POST_{i,t} + \beta_3 POST_{i,t} \times EXCASH_{i,t-1} + CONTROL + e_{i,t}$.			
$POST_{i,t} \times EXCASH_{i,t-1}$	0.092	−0.062	**0.154***
	(1.48)	(−1.23)	[.057]
Control variables and firm fixed effects	Yes	Yes	
Panel B: Dividend			
$DIVPAY_{i,t} = \alpha_i + \beta_1 EXCASH_{i,t-1} + \beta_2 POST_{i,t} + \beta_3 POST_{i,t} \times EXCASH_{i,t-1} + CONTROL + e_{i,t.}$			
$POST_{i,t} \times EXCASH_{i,t-1}$	0.001	0.003	−0.002
	(0.30)	(0.39)	[.882]
Control variables and firm fixed effects	Yes	Yes	
Panel C: Repurchase			
$REPURCHASE_{i,t} = \alpha_i + \beta_1 EXCASH_{i,t-1} + \beta_2 POST_{i,t} + \beta_3 POST_{i,t} \times EXCASH_{i,t-1} + CONTROL + e_{i,t}$.			
$POST_{i,t} \times EXCASH_{i,t-1}$	**0.053*****	−0.007	**0.060****
	(2.91)	(−0.30)	[.033]
Control variables and firm fixed effects	Yes	Yes	

Note. CAPXACQ is net capital expenditure plus acquisition (*#CAPX – #SPPE + #AQC*) scaled by lagged total assets (*#AT*). *DIVPAY* is cash dividends (*#DV*) scaled by lagged total assets. *REPURCHASE* is repurchase (*#PRSTKC*) scaled by lagged total assets. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. Control variables (*CONTROL*) include Tobin's *Q* (*Q*), the natural logarithm of total asset (*SIZE*), operating cash flow scaled by lagged total assets (*CF*), and the sum of long-term and short-term debts scaled by total assets (*LEV*). *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. *EXCASH* is the residual value of annual regressions of *CASH* on *Q, SIZE, CF, NWC, LEV, SIGMA, NSEG, AGE* (see the note to Table 3 for definition) and industry fixed effects using all nonfinancial firms in Compustat. The *t* statistics (in parentheses) and *p* values (in brackets) are based on standard errors adjusted for clustering at both the matched pair and year levels, with the regressions of the restatement and control samples estimated simultaneously.
*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

variables (*CONTROL*): the change in earnings before extraordinary items plus interest, deferred tax credits, and investment tax credits ($\Delta E_{i,t}$), change in noncash assets ($\Delta NA_{i,t}$), change in *R&D* expenditures ($\Delta RD_{i,t}$), change in interest expense ($\Delta I_{i,t}$), change in total dividends ($\Delta D_{i,t}$), net external financing ($NF_{i,t}$), lagged total cash ($lagCASH_{i,t}$), and total debt ($L_{i,t}$). We scale all control variables by the lagged market value of equity ($MV_{i,t-1}$). Following Faulkender and Wang (2006), we also include the interaction between $\Delta CASH_{i,t}$ and lagged cash ($CASH_{i,t-1}$), and the interaction between $\Delta CASH_{i,t}$ and total debt ($L_{i,t}$).

As seen in Table 8, the coefficient on $\Delta CASH \times POST$ for the irregularity firms is significantly greater than that for the matched control firms (0.855; $p = .002$). Because prior studies about the relation between internal control weaknesses and the value of cash holdings present mixed evidence (Gao & Jia, 2016; Huang, Guo, Ma, & Zhang, 2015), we delete observations with material internal control weaknesses in their Sarbanes–Oxley Act Section 404 report. The results, reported in columns 3 and 4, are essentially the same, and are consistent with the precautionary savings hypothesis.

Table 8. Change in the Market Value of Cash Holdings After Irregularity Restatements.

	Including all observations				Excluding observations identified as having material weaknesses in internal control system			
	Irregularity firms [1]		Control firms [2]		Irregularity firms [3]		Control firms [4]	
Variable	Coefficient	*t* stat	Coefficient	*t* stat	Coefficient	*t* stat	Coefficient	*t* stat
POST	0.015	(0.44)	−0.04	(−1.59)	0.017	(0.46)	−0.04	(−1.56)
Δ*CASH*	2.301***	(3.98)	1.826***	−(5.84)	2.514***	(5.25)	1.793***	(5.62)
Δ*CASH* × *POST*	0.397	(1.57)	**−0.458***	(−1.67)	**0.476***	(1.65)	−0.415	(−1.36)
Test of difference in the coefficient of Δ*CASH* × *POST*								
			[1] − [2]				[3] − [4]	
Coefficient difference			**0.855*****				**0.891*****	
[*p* value]			[.002]				[.003]	
Control variables								
Δ*E*	0.539***	(4.16)	0.826***	(5.06)	0.514***	(3.87)	0.824***	(5.06)
Δ*NA*	0.172***	(2.64)	0.231***	(3.59)	0.152**	(2.38)	0.225***	(3.47)
Δ*RD*	0.187	(0.15)	−0.585	(−1.63)	0.259	(0.22)	−0.515	(−1.44)
Δ*I*	−3.426***	(−3.76)	−2.317***	(−3.54)	−3.437***	(−3.23)	−2.216***	(−3.36)
Δ*D*	−3.526	(−1.09)	1.973	(0.65)	−2.258	(−0.62)	1.827	(0.57)
NF	−0.211*	(−1.92)	−0.132	(−1.29)	−0.251**	(−2.29)	−0.131	(−1.26)
lagCASH	0.766***	(6.42)	0.448***	(3.31)	0.779***	−(6.77)	0.489***	(3.70)
L	−0.403***	(−3.00)	−0.383***	(−3.87)	−0.397***	(−2.76)	−0.387***	(−3.86)
Δ*CASH* × *lagCASH*	−0.846*	(−1.95)	−0.371	(−0.97)	−1.063***	(−2.63)	−0.196	(−0.57)
Δ*CASH* × *L*	−2.344***	(−3.77)	−2.153***	(−3.61)	−2.474***	(−4.44)	−2.200***	(−3.78)
Adjusted R^2	.244		.194		.249		.195	
n	1,095		1,309		991		1,281	

Note. The dependent variable is $R - R^B$, where R is stock return over the fiscal year, and R^B is the benchmark portfolio return over the same period. We use the 25 Fama and French portfolios formed on size and book-to-market as the benchmark portfolio. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. Δ*CASH* is the change in cash and short-term investment. Δ*E* is the change in earnings, where earnings is defined as earnings before extraordinary items (#*IB*) plus interest expense (#*XINT*), deferred taxes (#*TXDI*) and investment tax credit (#*ITCI*). Δ*NA* is the change in noncash assets (#*AT* − #*CHE*). Δ*RD* is the change in *R&D* expenditures (#*XRD*), Δ*I* is the change in interest expenses (#*XINT*), Δ*D* is the change in dividends (#*DVC*). *L* is total debt, defined as the sum of long-term debt (#*DLTT*) and short-term debt (#*DLC*). *NF* is net external financing, defined as total equity issuance (*SSTK*), minus repurchases (*PRSTKC*), plus debt issuance (*DLTIS*), minus debt redemption (*DLTR*). *lagCASH* is lagged cash scaled by market value of equity. All the above independent variables are scaled by the lagged market value of equity. *POST* is a dummy variable that equals 1 for the post-restatement period, and 0 otherwise. The *t* statistics (in parentheses) and *p* values (in brackets) are based on standard errors adjusted for clustering at both the matched pair and year levels, with the regressions of the restatement and control samples estimated simultaneously.

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Conclusion

Using a difference-in-differences approach, we find that firms increase their cash holdings after announcements of accounting restatements. The effect is concentrated in restatements related to accounting irregularities rather than accounting errors. The effect of irregularity restatements on the cash holdings of firms is more pronounced when firms have a higher demand for precautionary savings, and the effect is less pronounced when firms experience a greater decrease in CEO option compensation or a greater decrease in overinvestment. We also find a smaller increase in cash holdings for firms that replace their CEO/CFO. Our analyses related to financial decisions reveal that irregularity firms' investments and repurchases become more sensitive to excess cash after restatements.

Overall, our results suggest that restatements affect cash holdings through two channels. On one hand, firms increase cash holdings after the restatements due to a higher demand for precautionary savings. On the other hand, strengthened shareholder control after restatements forces managers to disgorge excess cash and reduce cash holdings. The effect of precautionary savings dominates the effect of strengthened shareholder control, so we observe a net increase in cash. Finally, we find a higher market value of cash holdings after restatements. Our study contributes to the literature on the effect of financial reporting credibility on real corporate decisions.

Appendix

Propensity Score Matching

We first estimate the following probit model:

$$Pr(RESTATE) = B_1X_1 + B_2X_2 + B_3X_3 + industry\ fixed\ effects + year\ fixed\ effects + \varepsilon,$$

where *RESTATE* is an indicator variable that equals 1 for the restatement firms and 0 for the non-restatement firms. We review the prior literature on cash holdings and restatements to select the covariates included in the propensity score model. X_1 includes the variables associated with corporate cash holdings (Opler, Pinkowitz, Stulz, & Wiliamson, 1999): firm size (*SIZE*), Tobin's *Q* (*Q*), operating cash flows (*CF*), leverage (*LEV*), net working capital (*NWC*), industry volatility of operating cash flows (*SIGMA*), number of business segments (*NSEG*), firm age (*AGE*), capital expenditure (*CAPX*), *R&D* expenditure (*R&D*), acquisition (*ACQUISITION*), and dividend (*DIV*). Prior studies that study economic consequence of restatements typically match firm size, age, and performance. Other studies that examine the economic determinants of restatements usually control for industry membership, firm size, firm age, market valuation, growth, financing and investing activities, performance, accruals, auditor quality, leverage, and default risk. Some firm characteristics overlap with those that affect cash holdings. Thus, X_2 includes the following additional variables that may affect the restatements: sales growth rate (*SGRW*), net amount of external financing (*FINANCE*), change in net working capital (ΔNWC), an indicator of loss (*LOSS*), Altman's (1968) *Z*-score (*Z-SCORE*), and an indicator of a Big-*N* auditor (*BigN*). We also include the level of and the change in cash holdings (*CASH* and $\Delta CASH$) in the regression (X_3) to control for the trends in the cash holdings before the restatements (Roberts & Whited, 2013). The industry fixed effects are based on Fama and French's (1997) 48-industry classification. For the restatement firms, we only include the

Table A1. Comparison of Firm Characteristics Between the Restatement Firms and the Non-Restatement Firms Before and After Matching.

	Mean value before matching			Mean value after matching			Probit regression of *RESTATE*			
							Before matching		After matching	
Variable	Restatement firms [1]	Control firms [2]	*t* stat for [1] − [2]	Restatement firms [3]	Control firms [4]	*t* stat for [3] − [4]	Coeff.	*t* stat	Coeff.	*t* stat
PSCORE	0.093	0.044	33.75***	0.092	0.090	0.79				
SIZE	5.849	4.811	20.79***	5.855	5.839	0.20	0.172***	−11.41	0.025	−1.10
Q	2.080	2.398	−5.52***	2.065	2.101	−0.55	0.029**	−1.97	0.000	0.00
CF	0.052	0.008	7.84***	0.054	0.064	−1.86*	0.713***	−3.16	−0.376	−0.75
NWC	0.116	0.126	−1.69*	0.118	0.124	−0.69	0.385**	−2.34	−0.115	−0.39
LEV	0.232	0.205	3.96***	0.232	0.215	1.79*	−0.265**	−2.49	0.208	−1.11
SIGMA	0.062	0.064	−1.97**	0.063	0.062	0.60	0.410	−0.24	3.681	−1.28
NSEG	5.000	3.741	11.38***	5.048	5.105	−0.28	0.016***	−3.03	−0.002	−0.21
AGE	2.690	2.510	8.34***	2.691	2.704	−0.44	−0.026	−0.79	0.008	−0.14
CAPX	0.062	0.060	1.08	0.062	0.060	0.84	−0.122	−0.30	0.689	−0.88
ACQUISITION	0.028	0.026	1.40	0.028	0.027	0.61	−0.643	−1.47	0.228	−0.27
R&D	0.188	0.471	−4.85***	0.150	0.158	−0.19	−0.015	−0.90	−0.027	−0.62
DIV	0.005	0.005	−0.11	0.005	0.005	−1.32	−4.620***	−2.77	−2.829	−1.01
SGRW	0.151	0.197	−3.78***	0.154	0.145	0.69	−0.051	−0.78	0.020	−0.15
FINANCE	0.052	0.096	−7.96***	0.050	0.040	1.74*	0.593***	−2.82	0.266	−0.55
$\Delta N\Omega X$	−0.009	−0.004	−3.19***	−0.009	−0.009	−0.21	−1.569***	−3.96	−0.316	−0.37
LOSS	0.354	0.413	−4.44***	0.350	0.325	1.44	0.108*	−1.76	0.000	0.00
Z-SCORE	7.232	9.723	−7.14***	7.238	7.913	−1.89*	−0.009***	−3.02	−0.002	−0.32
BigN	0.840	0.823	1.42	0.840	0.868	−1.76*	−0.082	−1.57	−0.177*	−1.87
CASH	0.167	0.239	−9.13***	0.163	0.168	−0.69	−0.225	−1.51	−0.144	−0.50
$\Delta CASH$	−0.006	−0.001	−2.31**	−0.006	−0.004	−0.70	−1.787***	−6.27	−0.206	−0.32
Industry and year fixed effects							Yes		Yes	
p value of the model							.000		1.000	
Pseudo R^2							.101		.007	
n	984	20,217		949	949		21,201		1,898	

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

observations in the year of the announcement of the restatement (i.e., year 0). The non-restatement firms are those that did not announce accounting restatements during our sample period. We include all annual observations of the non-restatement firms during our sample period. All independent variables are measured as the mean value over the previous years. That is, for observations of firm i in year t, all independent variables are measured over year $t - 3$ to $t - 1$.

For each restatement firm, we select as the matched control firm a non-restatement firm that operates in the same industry based on the Fama and French (1997) 48-industry classification and has the closest propensity score in the year of the restatement announcement (i.e., year 0). Note that the propensity score is estimated based on average firm characteristics over years -3 to -1. If more than one restatement firm matches the same control firm, we select the pair with the smallest difference in the propensity score. We then repeat the above matching procedure after eliminating the selected control firm from the control firm pool (i.e., matching without replacement).

The first six columns of Table A1 present the univariate comparison of firm characteristics between the restatement firms and the non-restatement firms before and after matching. We find that before matching, the restatement firms and the control firms differ systematically in a number of characteristics. After matching, the restatement firms and the matched control firms do not show significant differences in most of these firm characteristics. There are only a few exceptions in which the difference is significant at the 10% level based on a t test. The last four columns of Table A1 present the results of the probit regression before and after matching. Before matching, 11 of 20 independent variables have coefficients that are significant at the 5% or 1% level. After matching, none of the independent variables have a coefficient that is significant at the 5% or 1% level. Only the coefficient of the indicator of a Big-N auditor is significant at the 10% level. In addition, the p value of the probit model before matching is less than 0.1%, showing joint significance of the independent variables. The p value of the probit model after matching is almost 1, suggesting that the independent variables do not have joint explanatory power for the selection. In general, the diagnostics suggest that the propensity score matching is reasonably well implemented.

Authors' Note

All remaining errors are the responsibility of the authors.

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Notes

1. The level of cash holdings in the pre-restatement period is 0.166 for the irregularity firms and 0.167 for the control firms (see Table 2). Thus, the increase in cash holdings over the pre-restatement level is 27.7% (0.046/0.166) for the irregularity firms and 7.2% (0.012/0.167) for the control firms.
2. Consistent with this prediction, extant empirical studies find that firms operating in industries with more volatile operating cash flows and investment opportunities hold more cash (Duchin, 2010; Opler, Pinkowitz, Stulz, & Wiliamson, 1999). In addition, Duchin (2010) finds that diversified firms hold less cash, and the smaller cash holdings correspond to a higher cross-division correlation between investment opportunities and operating cash flows. Finally, Acharya, Almeida, and Campello (2007) find that financially constrained firms save more cash from their operating cash flows when the correlation between operating cash flows and investment opportunities is lower.
3. We use the Fama and French 48-industry classification to define industries.
4. *OPTION_PER* is measured as the ratio of Black−Scholes value of the option grant scaled by total compensation. We collect CEO compensation data from Execcomp and supplement this with hand-collected data from proxy statements.
5. We thank an anonymous reviewer for raising this point.
6. See the notes to Table 6 for details.

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