

# The Impact of Excess Cash Holdings on the Relationship between Information Asymmetry and Earnings Management

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# **The Impact of Excess Cash Holdings on the Relationship between Information Asymmetry and Earnings Management**

## **Abstract**

The recent studies provide ample evidence that the average cash holdings of U.S. firms dramatically increased over recent years. This study empirically investigate whether the positive relation between the degree of information asymmetry and the magnitude of earnings management, which is predicted and proved by prior analytical and empirical studies, can be differentiated by the level of firm's excess cash holdings. Using sample from 2004 to 2012, we find that the positive relationship between information asymmetry and earnings management becomes less significant when a firm has higher level of excess cash holdings. Moreover, our additional analysis reveals that this impact of excess cash holdings is more profound in the post-recession period than the pre-recession period.

Keywords: earnings management; information asymmetry; cash holdings

## **1. Introduction**

The purpose of this study is to provide empirical evidence how the level of firm's excess cash holdings affect the relation between earnings management and information asymmetry. Basically, this study grounds on prior analytical model and empirical evidence that managers would have more motivations to engage in earnings management if the higher information asymmetry exists between managers and investors. Many prior analytical and empirical studies support argument that managers often engage in earnings management in practice. Earnings management has been one of the hottest topics in accounting and finance research and a huge amount of prior studies exists on this issue. For example, Richardson (2000) finds that there is a significantly positive relationship between information asymmetry and earnings management.

In the post-financial crisis period, there has been considerable public attention to substantially increased cash reserves in U.S. firms. Recent studies document that the average cash holdings dramatically increased over recent years (Harford et al., 2008; Bates et al., 2009; Pinkowitz et al., 2014). For example, according to Bates et al. (2009), U.S. firms tend to hold more and more cash holdings over the last three decades. They explain that precautionary motive explains much of the rise in cash holdings. Besides, value of the cash holdings held by U.S. firms has increased significantly over the last three decades (Bates et al., 2011). More precisely, Pinkowitz et al. (2014) find that excess cash holdings held by U.S. firms is increased by 87 percent after the financial crisis. However, there is little empirical investigation concerning how the level of excess cash holdings influence on manager's intention to engage in earnings management.

Prior study (Jensen, 1986) shows that firms with higher free cash flow are more likely to have conflicts between management and shareholders since managers may have more discretionary power as the level of firm's free cash flow increases. In a similar vein, managers

could have greater discretionary power when a firm has higher level of excess cash holdings, creating an environment more conducive to opportunistic earnings management especially for the firms that have higher degree of information asymmetry. On the contrary, other previous studies suggest that better corporate governance can play a role to reduce earnings management (Klein, 2002; Xie et al., 2003; Cornett et al., 2009). In addition, recent studies (e.g. Harford et al., 2008) document that firms with strong corporate governance structure tend to have higher level of cash holdings. Thus, it is plausible to expect that firms with higher level of excess cash holdings are more likely to have a lower earnings management-information asymmetry sensitivity than firms with lower level of excess cash holdings.

We therefore hypothesize that the positive relation between the degree of information asymmetry and the magnitude of earnings management can be differentiated by firm's level of excess cash holdings. In addition to our main hypothesis, we further examine whether the impact of excess cash holdings on earnings management-information asymmetry sensitivity has changed significantly after the recession period in late 2000s which was mainly triggered by the sub-prime mortgage and banking crisis. We expect that the effect of firm's level of excess cash holdings on the relationship between earnings management and information asymmetry is more significant in the post-recession period than in the pre-recession period.

Since the degree of information asymmetry among market participants is not directly observable, we use indirect measures as proxies for information asymmetry. We construct these measures to test our hypotheses based on the previous literature (Blackwell et al., 1990; Dierkens, 1991; Welker, 1995; Krishnaswami and Subramaniam, 1999; Richardson, 2000). For example, Dierkens (1991) use the residual variance in daily stock returns as the proxy for information asymmetry and Richardson (2000) use bid-ask spread for the proxies for information asymmetry.

On the basis of these previous studies, we utilize two measurements as proxies for information asymmetry in the current study, residual volatility of stock returns and annual average of daily percentage bid-ask spread. For the measures of earnings management, following prior studies (Dechow et al., 1995; Richardson, 2000; Lobo and Zhou, 2001; Kothari et al., 2005; Yu, 2008), we use two measurements, discretionary accruals from the modified Jones model and performance-augmented discretionary accruals.

In order to test our hypothesis, we collect data from 2004 to 2012 for all firms listed in U.S. stock markets (NYSE, AMEX, and Nasdaq). From regression analysis, we find an evidence that the association between information asymmetry and earnings management is significantly differentiated by the level of excess cash holding. The positive association between information asymmetry and earnings management is less significant when a firm has higher level of excess cash holdings. Moreover, we further find that the impact of excess cash holdings on the association between information asymmetry and earnings management is more profound in the post-recession period than the pre-recession period.

Our study contributes to the literature in several ways. First, our study add empirical evidence on the role of excess cash holdings in firm's corporate governance environment. More specifically, this study sheds lights on the literature about the role of firm's excess cash holding in the dynamics of firm's information environment and earnings management. Our findings suggest that the level of firm's excess cash holding is an important factor related to the quality of corporate governance, indicating that firms with higher excess cash holdings are more likely to have better corporate governance so that less inclinable to engage in earnings management. Second, this study revisits and extend prior literature on earnings management (Richardson, 2002). The findings of this study show that the significant positive association between information asymmetry and

earnings management is mitigated by higher level of firm's excess cash holdings.

The remainder of this study is organized as follows. Section 2 reviews prior literature and develops hypotheses. Section 3 discusses our methodology to obtain variables of our main interest. Section 4 presents empirical results, and Section 5 concludes this study.

## **2. Related Literature and Hypothesis Development**

### *Information Asymmetry and Earnings Management*

Normally, managers are supposed to have more advantages to access to firm's private information including future earnings estimates which shareholders and investors cannot possess. Krishnaswami and Subramaniam (1999) state that information asymmetry is high when managers have a relatively larger amount of value-relevant and firm-specific information not revealed to markets. In other words, information asymmetry between management and shareholders exists when managers have more or better timely information about their firm's operations than current and potential shareholders. Earnings management may occur more easily in the case of higher level of information asymmetry since managers can have more opportunities to satisfy their interests at the shareholders' expense in this situation.

Several previous analytical studies (Trueman and Titman, 1988; Dye, 1988) note that information asymmetry existing between managers and shareholders is a necessary condition for earnings management. Dye (1988) proposes two principal factors generating earnings management – inability of managers to communicate all dimensions of their private information to shareholders, and inability of investors to reveal completely all facets of their managers' compensation schedules to prospective investors. He shows that these inability of managers and investors are necessary and sufficient conditions for internal demand of earnings management,

respectively. Schipper (1989) proposes that information asymmetry would not be alleviated over time since blocked communication cannot be eliminated by changing the contractual arrangements. Some researchers suggest that high information asymmetry between management and shareholders is the evidence that shareholders cannot have sufficient resources to relevant information to monitor management (Warfield et al., 1995; Richardson, 2000). Warfield et al. (1995) and Beatty and Harris (1998) argue that managers are engaging in earnings management to mitigate information asymmetry. By using tax expense, Beatty and Harris show that the existence of greater earnings management in public banks is consistent with greater agency cost or greater information asymmetry. Therefore, where the greater information asymmetry exists between management and shareholders, the less the firm can be monitored effectively. This environment may provide more opportunities to managers to smooth firms' earnings.

In addition, Richardson (2000) empirically investigates the relationship between information asymmetry and earnings management. Consistent with prior analytical studies (Trueman and Titman, 1988; Dye, 1988), he finds that the degree of information asymmetry is positively associated with the magnitude of earnings management. .

#### *Information Asymmetry, Earnings Management, and Excess Cash Holdings*

The recent studies and media document that the average cash holdings of U.S. firms substantially increased over recent years. Under the precautionary demand for cash theory, as idiosyncratic risk has increased in recent years, firms would hoard cash as a buffer to defend themselves from adverse cash flow shocks (Bates et al., 2009; Acharya et al., 2013). Pinkowitz et al. (2014) also document that firms have reserved their cash as expected with the precautionary motive as they exhausted their cash holdings during the financial crisis in late 2000s.

Jensen (1986) shows that firms with higher free cash flow are more likely to have severe conflicts between management and shareholders as the discretionary power of managers is stronger. We extend this argument about cash flow to excess cash holdings. If a firm has more excess cash holdings, managers have higher level of discretionary power, and it results in greater magnitude of earnings management, especially for the firms which have higher degree of information asymmetry.

On the other hand, Hartford et al. (2008) provide evidence that firms are likely to reserve lower level of cash holdings when there is weaker shareholder rights and low insider ownership - lower governance quality. Extending this argument, if firms with better corporate governance tend to have higher level of cash holdings, it is plausible that higher level of firm's excess cash holdings is more likely to alleviate the positive relation between information asymmetry and earnings management. On the basis of given contrasting predictions, we state our hypothesis as follows:

***H1:** The positive relationship between information asymmetry and the level of earnings management is differentiated by the level of a firm's excess cash holdings.*

As noted above, prior studies provide evidence that cash holdings held by U.S. firms has drastically increased over the last three decades (Bates et al., 2009, 2011; Pinkowitz et al., 2014) For example, Bates et al. (2009) show that precautionary motivation explains why firms tend to hold more cash. In addition, Pinkowitz et al. (2014) find that excess cash holdings held by U.S. firms is increased by 87 percent after the financial crisis. This result motivates us to compare the effect of excess cash holdings on the relation between earnings management and information asymmetry in the pre- and post-recession periods. We therefore state our second hypothesis as follows:

*H2: The level of firms' excess cash holdings can have a more significant impact on the relation between earnings management and information asymmetry in the post-recession period than in the pre-recession period.*

### **3. Measures for Information Asymmetry, Earnings Management, and Excess Cash Holdings**

#### **3.1. Information Asymmetry Measures**

As we state in the previous section, information asymmetry occurs when manager has better information than shareholders or investors. The problem of information asymmetry has drawn attention in accounting and finance studies. Prior researchers use proxies to measure information asymmetry because the level of information asymmetry cannot be observed directly. In the current study, we use two different measures of information asymmetry for the empirical test – residual volatility of stock returns, and annual average of percentage bid-ask spread.

*Residual volatility of stock return (stdev\_residual):* Dierkens (1991) examines the relevance of information asymmetry between the managers and the market for the equity issue process and shows that information asymmetry is a significant variable for equity issues. She measures information asymmetry by the residual volatility of the equity of the firm which is the market adjusted standard deviation of the daily stock price abnormal return. Bhagat et al. (1985), Blackwell et al. (1990), and Krishnaswami and Subramaniam (1999) also use the residual volatility in daily stock returns as the variable for information asymmetry. Krishnaswami and Subramaniam suggest that the residual volatility of stock return can capture the information asymmetry between managers and shareholders (investors) if both managers and shareholder (investors) are equally well informed about the economy-wide factors which may affect the firm value. Using this measure, they find that firms engaging in spin-off have higher the degree of information

asymmetry about their value than counterparts and that the degree of information asymmetry decreases after the completion of spin-off. According to these studies, the degree of information asymmetry increases with the residual volatility of the stock returns. Following these studies, we use the residual volatility of the stock returns as our third proxy for information asymmetry.

*Annual average of percentage bid-ask spread (ann\_spread)*: In stock markets, informed traders have a superior information compared to other groups of investors including dealers. Thus, ask and bid prices are determined to compensate dealers for the perceived adverse selection risk. Accordingly, market makers would set the bid-ask spread wider with greater number of potential informed traders in the markets (Glosten and Milgrom, 1985, Easley and O'Hara, 1987, Aker et al., 2002). Following previous literature, our second measure of information asymmetry is percentage bid-ask spread employed by Venkatesh and Chiang (1986). They define the measure as below.

$$\text{Percentage bid-ask spread} = \frac{(\text{Ask price} - \text{Bid price})}{(\text{Ask price} + \text{Bid price}) / 2} \times 100$$

More precisely, we use annual average (for one fiscal year) of daily percentage bid-ask spread as our measure of information asymmetry, where bid and ask prices are daily closing prices.

### **3.2. Earnings Management Measures**

We use the absolute value of discretionary accruals as our proxy for the magnitude of earnings management. This measure, from “the modified Jones’ model,” is suggested by Dechow et al. (1995) based on Jones’ model. Jones (1991) provides a model to discrete discretionary accruals from nondiscretionary accrual. Only difference between the modified Jones model and original Jones model is that the change in revenues is adjusted for the change in receivables. The model shows as following;

$$\frac{TA_{it}}{Asset_{it-1}} = \frac{\alpha_1}{Asset_{it-1}} + \frac{\alpha_2(\Delta Rev_{it} - \Delta Rec_{it-1})}{Asset_{it-1}} + \frac{\alpha_3 PPE_{it}}{Asset_{it-1}} + \varepsilon_{it} \quad (1)$$

where

$TA_{it}$  = total accruals in year  $t$  for firm  $i$

$Asset_{it}$  = total assets at the end of year  $t-1$  for firm  $i$

$\Delta Rev_{it}$  = change in revenues from year  $t$  to  $t - 1$  for firm  $i$

$\Delta Rec_{it}$  = change in receivables form year  $t$  to  $t - 1$  for firm  $i$

$PPE_{it}$  = gross property, plant and equipment in year  $t$  for firm  $i$

$\varepsilon_{it}$  = *i.i.d.* error term in the model

We use the coefficients from equation to estimate the nondiscretionary accruals. Following prior studies (Jones, 1991; Dechow et al., 1995), we calculate the nondiscretionary accruals in the event year (NonDA) as below;

$$NonDA_{it} = \frac{\alpha'_1}{Asset_{it-1}} + \frac{\alpha'_2(\Delta Rev_{it} - \Delta Rec_{it})}{Asset_{it-1}} + \frac{\alpha'_3 PPE_{it}}{Asset_{it-1}} \quad (2)$$

where  $\alpha'_1$ ,  $\alpha'_2$ , and  $\alpha'_3$  are coefficients from Equation (1).

The difference between total accruals and nondiscretionary accruals indicate the discretionary accruals. Since managers can use not only upward income smoothing but downward income smoothing, we employ the absolute values of discretionary accruals to measure the level of earnings management ( $em$ ), as it represents effects of both upward and downward smoothing. As this absolute value becomes higher, there is greater probability of earnings management. In addition to the measure from modified Jones' model, we also use performance-augmented discretionary accruals for the robustness test ( $em2$ ). Following Kothari et al. (2005), we add ROA (return on assets) to the list of variables in modified Jones' model to obtain our second measure for discretionary accrual.

### 3.3. Excess Cash Holdings

We estimate cash equation by Bates, Kahle and Stulz (2009) to obtain a measure of excess cash holdings. We use the regression residuals from this cash equation as our proxy for excess cash holdings (*excash*). More specifically, we run a regression of cash holdings on its potential determinants. These independent variables in the regression are (1) the standard deviation of industry cash flows, (2) the market-to-book ratio, (3) natural log of total assets, (4) cash flow denominated by total assets, (5) net working capital denominated by total assets, (6) capital expenditure denominated by total assets, (7) R&D expenditure denominated by total assets, (8) a dummy variable for dividend payment, and (9) acquisition expense as a proportion of total assets. In our regression models, we include a dummy variable for excess cash holdings (set to unity if excess cash holdings is bigger than zero) to examine its impact on the relationship between information asymmetry and earnings management.<sup>1</sup>

### 4. Empirical Model

To test our main hypothesis, we set up a panel regression model with firm- and year-fixed effects while controlling for the heterogeneity and clustering of standard errors for regression coefficients. Below is the specifications of our empirical models.

$$em_{it} = \alpha_i + \alpha_t + \beta_1 stdev\_residual_{it} + \beta_2 stdev\_residual_{it} \times excash\_dummy_{it} + \beta_3 lnta_{it} + \beta_4 mb_{it} + \beta_5 mdr_{it} + \varepsilon_{it} \quad (3)$$

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<sup>1</sup> The reason why we include a dummy variable for excess cash holdings instead of a continuous variable is potential correlation between earnings management measure and excess cash holdings. As cash holdings is one of the variables which determines the level of earnings management measure in modified Jones' model, we do not include a continuous variable to minimize the potential bias influenced by the violation of *i.i.d.* assumption for error terms in regression models.

$$em_{it} = \alpha_i + \alpha_t + \beta_1 ann\_spread_{it} + \beta_2 ann\_spread_{it} \times excash\_dummy_{it} + \beta_3 lnta_{it} + \beta_4 mb_{it} + \beta_5 mdr_{it} + \varepsilon_{it} \quad (4)$$

For the definitions of variables in the model, please refer Section 3 and Table 1. The variable in our interest is  $\beta_2$ , the coefficient for the interaction term between information asymmetry measure and dummy for excess cash holdings. If  $\beta_2$  is positive, we fail to reject the null hypothesis, which predicts that excess cash holdings would amplify the positive relationship between information asymmetry and earnings management. If the coefficient is negative, we reject the null hypothesis, and conclude that excess cash holdings dampen earnings management-information asymmetry sensitivity.

\*\* Table 1 here \*\*

In addition to the main hypothesis, we also test how the impact of excess cash holdings on earnings management-information asymmetry sensitivity has changed through the previous recession period. To look at this change, we separate our sample into three sub-samples – pre-, in-, and post-recession periods, and compare the sign of the coefficient for the interaction term between information asymmetry measure and excess cash dummy variable ( $\beta_2$  in Equations 1 and 2) for different sub-samples.

## 5. Empirical Results

### 5.1. Descriptive Statistics

\*\* Table 2 here \*\*

Table 2 shows descriptive statistics of variables used in our model specifications. Average of *em* (earnings management measure from modified Jones' model) is 0.145, while *em2* (earnings management measure from performance-augmented discretionary accruals) has an average of 0.142. Other statistics for these two variables are very close to each other, which indicates that the

earnings management measure is not changed significantly by adding ROA to the modified Jones' model to derive discretionary accruals. Information asymmetry measures (*stdev\_residual* and *ann\_spread*) have averages of 0.032 and 0.905, and standard deviations of 0.022 and 2.455. Average natural log of firm size (*lna*) for our sample is 6.226, average market-to-book ratio (*mb*) is 2.039, and average market debt ratio (*mdr*) is 0.187.

**\*\* Table 3 here \*\***

Table 3 shows correlation matrix and is more informative than Table 2. Both earnings management measures (*em* and *em2*) are positively related with information asymmetry measures, suggesting that higher information asymmetry can increase the level of earnings management, which is the main result of Richardson (2000). Additionally, firm size, market-to-book ratio, and debt ratio are all positively correlated with earnings management measures, while excess cash holdings are negatively correlated with them. This result indicate that bigger firm with higher growth opportunity, higher debt ratio, and lower excess cash holdings can do earnings management more actively. Nonetheless, we still need to check this relationship in regression settings to confirm the causality. Thus, we reserve our final conclusion here at this point.

## **5.2. Regression**

Following the regression models introduced in Section 4, we test our main hypothesis, which is to look at the impact of excess cash holdings on the relationship between information asymmetry and earnings management. Tables 4a and 4b shows the results of empirical test for the hypothesis. Every empirical setting is same for both tables except that dependent variable is *em* for Table 4a and *em2* for Table 4b. Columns (1) and (2) in both tables are the results from simple OLS model, and Columns (3) and (4) are for panel regression with firm- and year-fixed effects

included. Standard errors of coefficients are corrected for heteroskedasticity and clustering (serial correlation).

**\*\* Table 4 here \*\***

First, we investigate the relationship between information asymmetry and earnings management in Tables 4a and 4b. As demonstrated in these tables, generally, there is a positive relationship between information asymmetry and earnings management.  $\beta_1$  (coefficients for information asymmetry measures) for three out of four specifications in both Tables 4a and 4b is positive and statistically significant. Especially, when we include firm- and year-fixed effects in our model (Columns 3 and 4), we find a significant and positive coefficients for both information asymmetry measures, confirming positive relationship between information asymmetry and earnings management. This result is consistent with empirical findings of Richardson (2000).

However, our main hypothesis is not about the relationship between information asymmetry and earnings management. To test our main hypothesis, which is to check the impact of excess cash holdings on earnings management-information asymmetry sensitivity, we also include interaction term between information asymmetry measures and dummy variable for excess cash holdings in our model. Dummy for excess cash holdings is set to unity if a firm has a positive level of excess cash holdings, and zero, otherwise. Thus, our main interest for these specifications is not in  $\beta_1$ , but in  $\beta_2$  (coefficient for the interaction term). As we find in the tables,  $\beta_2$  is negative and statistically significant, which proposes that excess cash holdings in all specifications has a negative impact on the relationship between information asymmetry and earnings management. Thus, we conclude that excess cash holdings dampens the information asymmetry-earnings management sensitivity. This result says that the increased discretionary power by managers due to the increase amount of cash holdings is dominated by the increased level of cautious approach

by the firms which holds more excess cash holdings.

**\*\* Table 5 here \*\***

In Tables 5a and 5b, we compare the impact of excess cash holdings on the relationship between earnings management and information asymmetry for pre-, in-, and post-recession periods. Dependent variable is *em* in Table 5a, and *em2* in Table 5b. All specifications are panel regressions with firm- and year-fixed effects included. Standard errors of coefficients are corrected for heteroskedasticity and clustering. In both tables, we find that the impact of excess cash holdings on earnings management-information asymmetry sensitivity becomes significant during the recession period and stays significant in post-recession period. This result has a link to Pinkowitz et al. (2013), as they find that excess cash holdings held by U.S. firms is increased by 87 percent after the financial crisis. The increased amount of excess cash holdings plays an important role in reducing earnings management-information asymmetry.

By demonstrating the increased impact of excess cash holdings on earnings management-information asymmetry sensitivity, we argue that one of the important roles of increased amount of cash holdings after financial crisis is to deter the attempts of earnings management by firms with high level of information asymmetry, as firms need to hold more excess cash holdings to increase their ability to react to a sudden change in macroeconomic environments. This argument has a critical meaning to economy as it shows that firms do morph into the ones with better structure after experiencing a recession period.

## **VI. Conclusion**

In this paper, we examine the impact of excess cash holdings on relationship between earnings management and information asymmetry. We hypothesize that the positive relationship

between earnings management and information asymmetry is dampened by the level of excess cash holdings mainly due to the better governance structure of firms with higher level of cash holdings, and find a supporting empirical evidence for our argument by using modified Jones model to obtain the measure for earnings management. This result is robust when we use performance-augmented discretionary accruals as earnings management measure.

Moreover, we find that this impact of excess cash holdings becomes more significant after financial crisis in last 2000's. Our result is consistent with previous literature in regard to explanation on the magnified value of cash holdings, as the literature shows that firms tend to reserve more cash holdings to prepare for future uncertainty after the crisis and the value of cash has been increase since then. We argue that the increased value of corporate cash holdings in recent years can play more important role to discourage earnings management compared to pre-recession period, especially for the firms with high level of information asymmetry. This argument provides rationale for why firms should reserve more cash holdings than seemingly required amount to manage short-term liquidity.

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Table 1. Variable Description

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Variable	Description
<i>em</i>	Measure for earnings management (absolute value of discretionary accrual) from modified Jones model.
<i>em2</i>	Performance-augmented measure for earnings management (absolute value of discretionary accrual) from Kothari et al. (2005)
<i>stdev_residual</i>	Residual volatility of stock return
<i>ann_spread</i>	Annual average of daily percentage bid-ask spread
<i>lnta</i>	Natural log of total assets ( <i>AT</i> ) deflated into the dollar value as of year 2012
<i>mb</i>	Market-to-book ratio
<i>mdr</i>	Market debt ratio
<i>ex_cash</i>	Excess cash holdings defined as the residuals from Cash Equation by Bates et al. (2009)

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Table 2. Descriptive Statistics

variable	mean	st. dev	min	10th percentile	med	90th percentile	max
<i>em</i>	0.145	0.551	0.000	0.023	0.105	0.288	89.823
<i>em2</i>	0.142	0.553	0.000	0.022	0.103	0.280	90.543
<i>stdev_residual</i>	0.032	0.022	0.006	0.014	0.027	0.056	1.214
<i>ann_spread</i>	0.905	2.455	-5.128	0.032	0.223	2.242	111.183
<i>lnta</i>	6.226	2.122	-1.440	3.486	6.144	9.059	12.826
<i>mb</i>	2.039	2.389	0.144	0.897	1.510	3.543	136.775
<i>mdr</i>	0.187	0.219	0.000	0.000	0.109	0.517	0.999
<i>ex_cash</i>	0.032	0.208	-0.315	-0.171	-0.029	0.349	0.816

Table 3. Correlation Table

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	<i>em</i>	<i>em2</i>	<i>stdev_residual</i>	<i>ann_spread</i>	<i>lnta</i>	<i>mb</i>	<i>mdr</i>	<i>ex_cash</i>
<i>em</i>	1							
<i>em2</i>	0.9998	1						
<i>stdev_residual</i>	0.0171	0.0169	1					
<i>ann_spread</i>	0.0006	0.0007	0.4145	1				
<i>lnta</i>	0.0182	0.0165	-0.4975	-0.3536	1			
<i>mb</i>	0.0491	0.0501	0.0368	-0.0321	-0.184	1		
<i>mdr</i>	0.0468	0.0439	0.1337	0.0716	0.2633	-0.2361	1	
<i>ex_cash</i>	-0.0285	-0.0261	0.1321	-0.0045	-0.1862	0.2258	-0.2308	1

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Table 4a. Impact of Excess Cash Holdings on Earnings Management-Information Asymmetry Sensitivity

VARIABLES	(1) ols	(2) ols	(3) year & firm FE	(4) year & firm FE
<i>stdev_residual</i>	0.9669 (4.79)***		0.8083 (3.62)***	
<i>stdev_residual</i> × <i>ex_cash_dummy</i>	-0.6963 (-4.17)***		-0.4347 (-3.11)***	
<i>ann_spread</i>		0.0027 (1.50)		0.0031 (3.08)***
<i>ann_spread</i> × <i>ex_cash_dummy</i>		-0.0035 (-1.45)		-0.0029 (-2.12)**
<i>lnta</i>	0.0075 (4.06)***	0.0044 (2.64)***	0.0240 (2.23)**	0.0200 (1.88)*
<i>mb</i>	0.0157 (11.50)***	0.0153 (11.20)***	0.0013 (0.36)	0.0013 (0.35)
<i>mdr</i>	0.1160 (7.09)***	0.1427 (9.25)***	-0.0561 (-1.51)	-0.0386 (-1.12)
Observations	30,773	30,773	30,773	30,773
R-squared	0.007	0.006	0.001	0.001

t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4b. Impact of Excess Cash Holdings on Earnings Management-Information Asymmetry Sensitivity: ROA-adjusted Measure for Discretionary Accrual

VARIABLES	(1) ols	(2) ols	(3) year & firm FE	(4) year & firm FE
<i>stdev_residual</i>	0.9326 (4.60)***		0.7962 (3.55)***	
<i>stdev_residual</i> × <i>ex_cash_dummy</i>	-0.6591 (-3.93)***		-0.4145 (-3.02)***	
<i>ann_spread</i>		0.0026 (1.44)		0.0030 (2.98)***
<i>ann_spread</i> × <i>ex_cash_dummy</i>		-0.0034 (-1.39)		-0.0028 (-2.09)**
<i>lnta</i>	0.0072 (3.86)***	0.0042 (2.47)**	0.0227 (2.16)**	0.0186 (1.79)*
<i>mb</i>	0.0158 (11.52)***	0.0154 (11.24)***	0.0014 (0.35)	0.0014 (0.35)
<i>mdr</i>	0.1114 (6.78)***	0.1371 (8.84)***	-0.0598 (-1.62)	-0.0424 (-1.25)
Observations	30,773	30,773	30,773	30,773
R-squared	0.007	0.006	0.001	0.001

t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5a. Recession VS Non-recession: Impact of Excess Cash Holdings on Earnings Management-Information Asymmetry Sensitivity (year & firm FE model)

VARIABLES	pre-recession		recession		post-recession	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>stdev_residual</i>	1.3966 (2.02)**		1.0456 (2.53)**		0.6984 (2.59)***	
<i>stdev_residual</i> × <i>ex_cash_dummy</i>	0.1992 (0.39)		-0.5314 (-1.94)*		-0.5310 (-2.47)**	
<i>ann_spread</i>		0.0087 (0.84)		0.0015 (1.45)		0.0058 (4.20)***
<i>ann_spread</i> × <i>ex_cash_dummy</i>		-0.0036 (-0.65)		-0.0043 (-1.84)*		-0.0086 (-3.59)***
<i>lnta</i>	0.0970 (3.18)***	0.0935 (3.15)***	0.1620 (1.71)*	0.1449 (1.63)	0.0885 (2.37)**	0.0873 (2.30)**
<i>mb</i>	-0.1429 (-1.77)*	-0.1427 (-1.76)*	-0.0157 (-1.04)	-0.0163 (-1.06)	-0.0119 (-2.37)**	-0.0119 (-2.38)**
<i>mdr</i>	-0.4540 (-1.19)	-0.4460 (-1.18)	-0.0508 (-0.66)	-0.0096 (-0.11)	-0.0699 (-2.62)***	-0.0659 (-2.44)**
Observations	11,136	11,136	10,294	10,294	9,343	9,343
R-squared	0.065	0.064	0.055	0.052	0.062	0.062

t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5b. Recession VS Non-recession: Impact of Excess Cash Holdings on Earnings Management-Information Asymmetry Sensitivity (year & firm FE model): ROA-adjusted Measure for Discretionary Accrual

VARIABLES	pre-recession		recession		post-recession	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>stdev_residual</i>	1.3915 (2.02)**		1.0315 (2.60)***		0.7099 (2.67)***	
<i>stdev_residual</i> × <i>ex_cash_dummy</i>	0.2073 (0.41)		-0.5094 (-1.93)*		-0.5325 (-2.51)**	
<i>ann_spread</i>		0.0088 (0.85)		0.0014 (1.39)		0.0057 (4.18)***
<i>ann_spread</i> × <i>ex_cash_dummy</i>		-0.0036 (-0.65)		-0.0042 (-1.85)*		-0.0087 (-3.63)***
<i>lnta</i>	0.0946 (3.13)***	0.0912 (3.09)***	0.1577 (1.75)*	0.1405 (1.66)*	0.0869 (2.42)**	0.0855 (2.34)**
<i>mb</i>	-0.1408 (-1.77)*	-0.1406 (-1.76)*	-0.0154 (-1.06)	-0.0159 (-1.08)	-0.0118 (-2.41)**	-0.0119 (-2.41)**
<i>mdr</i>	-0.4557 (-1.19)	-0.4478 (-1.19)	-0.0551 (-0.75)	-0.0142 (-0.17)	-0.0724 (-2.76)***	-0.0679 (-2.57)**
Observations	11,136	11,136	10,294	10,294	9,343	9,343
R-squared	0.065	0.064	0.055	0.052	0.062	0.062

t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1