IMPACT OF EXCESS CASH ON EARNINGS MANAGEMENT AND FIRM VALUE: EVIDENCE FROM CHINA

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Abstract

This study examines how excess cash drives earnings management and firm value in China. Using a fixed effect panel regression on a sample of 12,629 observations covering 300 firms listed in the Shanghai Stock Exchange, we find that excess cash has a positive impact on firm value confirming pecking order theory. Our results show that earnings management has a negative impact on firm value in China, which supports the efficient earnings management view. We find that managers in Chinese firms are less likely to use excess cash for manipulating earnings. We provide empirical evidence that firms with excess cash seem to use it more for precautionary purpose than earnings management and the excess corporate liquidity of Chinese firms is used for value-enhancing activities. The test of robustness using the Instrumental Variable (IV) model confirms the results of the study. Our study merges two areas of corporate finance by incorporating agency problems concerning earnings management and cash holdings.

Keywords: Earnings Management, Excess Cash, Agency Problem, Firm Value, China

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1. INTRODUCTION

Cash holdings and determination of optimum cash policy is one of the most challenging problems in finance (Myer, 1996). Holding optimal cash enables the firms to meet various activities associated with production and operations and thereby reduce the risk of financing. Excess cash can reduce the rate of return on investment and lead to the self-interest behavior of controlling shareholders. The association between excess cash and earnings management is an exciting and vital aspect in determining the success of firms. Managers engage in earnings management to manipulate the financial statements and show a rosy picture (Healy et al., 1995; Burgstahler & Dichev, 1997; Chen et al., 2011; Duong & Pescetto, 2019; Hill et al., 2019). Earnings management occurs when managers manipulate the company's earnings either to mislead stakeholders or to influence contractual outcomes. Often earnings

management could be misleading the stakeholders, which is an important issue for both practitioners and academicians. Managers generally indulge in earnings management through three techniques. The first is the accrual-based method, where managers manipulate the earnings by using the difference between net income and cash flows. The second is real activities earnings management, where managers use cash flow statements to make operating decisions to arrive at the desired financial results. The third is classification shifting, by which expenses are shifted to the income statement as unique items to increase earnings. Earnings management is not a criminal activity, but often, it is considered as an opportunistic behaviour of managers. Prior studies focus on the impact of earnings management on compensation contracts (Healy, 1985; Watts & Zimmerman, 1986; Jones, 1991), government regulatory considerations (Dechow, Sloan, & Sweeney, 1995), corporate

governance variables like board composition and audit quality (Xie et al., 2003; Garcia-Osma & Noguer, 2007; Siregar & Utama, 2008;) and firm value (Gordon et al., 2003; Kolbeck & Mayhew, 2004; Ryngaert & Thomas, 2007). Some studies investigate whether earnings management leads to the expropriation of minority shareholders in the context of China (Chen et al., 2011) and Hongkong (Ge et al., 2012; Lo et al., 2017). Some authors find that earnings management is value-destroying (Munir & Gul, 2010; Hu et al., 2012) since firms may find earnings management to be advantageous for controlling shareholders than minority shareholders. But the linkage of cash holding to earnings management is unknown and we provide insight into this issue by examining the association between earnings management and excess liquidity in the firm.

Few studies have examined the effect of cash holdings on firm value (Dittmar, 2005; Pinkowitz et al., 2005; Harford, 2009) and firms hold cash for various motives such as precautionary, speculative and transactional motives (Opler et al., 1999; Bates, 2009). Holding excess cash can reduce the agency problem between insiders and outside investors (Jensen, 1986; Wan & Cai, 2012), but managers may use cash reserves for their own needs, which has a negative impact on firm value (Jensen, 1986). In some cases, firms with excess cash may provide finance to their affiliates during financial stress, which may enhance firm value. Myers and Majluf (1985) suggest that information asymmetry between the firm and its external investors can raise the cost of external financing and this may be an incentive for the managers to hold more cash, which is consistent with pecking order theory. According to Jensen (1975), firms hold cash to offset various operational risks and holding of excess cash may also lead to a conflict of interest between the managers and shareholders due to the managerial opportunism. Probably, managers may engage in earnings management due to managerial opportunism which is harmful to the firms. Prior studies (Roychowdhury, 2006; Kothari et al., 2012; Boghdady, 2019) state that earnings management may have a negative impact on firm value since managers will try to make more private benefits as they have fewer incentives to maximize the shareholder's wealth. However, there is no empirical evidence of the impact of excess cash on earnings management and whether it enhances/reduces the firm value. Hence, the primary focus of this study is to explore whether firms with excess cash indulge in earnings management and does it have any impact on firm value in the context of China.

China provides an ideal setting for conducting this study because it is a fast-growing economy and corporate governance is the top priority for firms in China. Security Exchange Commission (SEC) in China amended its law regarding corporate governance in 2008. The amendments include gender diversity on board and various other measures taken by the SEC to increase transparency and reduce corporate fraud (Zhu, 2014). As the majority of the firms are characterized by concentrated ownership, a conflict between majority shareholders and minority shareholders makes a possible expropriation of wealth. Research related to excess cash and earnings management is relatively sparse in China. Due to the

regulatory governance approach in China, regulators rely more on accounting numbers to govern the listed firms and earnings management by controlling shareholders of private firms is higher than that of other countries like the United States of America (USA) and France. Hence, it is worthwhile to examine the impact of excess cash on earnings management in China.

Our empirical findings are based on a sample of all firms listed on the Shanghai stock exchange. Based on fixed effect panel regression, we estimate the excess cash held by the firms and then we find that excess cash has a negative impact on earnings management in China. The results are in line with agency theory and entrenchment effect, which shows that managers use excess cash to meet their expenses rather than to invest in value yielding projects. We also analyze the impact of earnings management on firm value and find that earnings management has a negative effect on the firm value, which confirms the results that firms manage their earnings downwards by reducing their reported profit. We also examine the effect of excess cash on firm value. Empirical results indicate that excess cash has a positive impact on firm value. The positive relationship between excess cash and firm value may due to agency problems because managers want to keep excess cash to reduce risk and to maximize their interest. We also run several tests to check the robustness of our findings.

Our study contributes to the existing literature on excess cash and earnings management in many ways. Firstly, we extend the earnings management literature in the Chinese context. Secondly, we provide new insights into the literature that excess cash holdings encourage the firms to do earnings management and we provide empirical support for the managers' entrenchment and agency theory. To the best of our knowledge, we are the first to study the impact of excess cash on earnings management.

The remainder of this paper is organized as follows: Section 2 provides the theoretical foundation and develops the hypothesis. Section 3 explains the data and methodology. Section 4 discusses the results of the study. Section 5 reports the results of robustness analysis. Section 6 summarizes and concludes the paper and brings out the managerial implications.

2. THEORETICAL FOUNDATION AND HYPOTHESIS DEVELOPMENT

Prior literature focuses on theories about costs and benefits of holdings different levels of cash (Jensen 1986; Opler et al. 1999). Many studies focus on determinants and reasons behind holding cash in a different context (Opler et al., 1999; Dittmer, 2005; Zhou, 2006; Bates, 2009; Cai et al., 2016). The majority of studies on earnings management focus on companies listed in the U.S, Hong Kong and India (Chen et al., 2011; Hu & Li, 2010; Lo et al., 2010). Research on excess cash and its linkage to earnings management in China is limited.

There exist two perspectives about excess cash: one is an opportunity cost (Opler et al., 1999) and the other is private benefits (Jensen, 1986). Using a precautionary level of cash balances, the firms can hedge against future cash flow uncertainty (Mikkelson & Partch, 2003). Growth firms and firms

undertaking risk activities will hold more cash (Opler et al., 1999). The holding of excess cash can decrease the bankruptcy probability of affiliated firms, which leads to the reduction of the precautionary motive for holding cash. Firms can invest in excess cash in value-enhancing projects. Instead of distributing cash to shareholders, many firms prefer to keep cash reserves since it increases the payout and repurchasing of share is possible. Excess cash serves as a tool for the company at the time of financial constraints. Prior studies (Myers & Majluf, 1984; Pinkowitz & Williamson, 2006) suggest that cash holding has a positive impact on firm value because of lower information asymmetry and transaction costs. Excess cash can enhance firm value from the financial constraint point of view and the price of excess cash held by the private organizations is highly visible. Firms with a high growth rate will need funds for future investment and may hold more cash. Therefore, we hypothesize that:

H1: Excess cash holding of firms is positively related to firm value.

There are two types of agency problems cited in the literature (Lee et al., 2014). Agency problem I arises when there is a difference in the goal of managers and shareholders (Jensen & Meckling, 1976). Agency problem II arises when controlling shareholders extract the resources from the minority shareholders (Cheung et al., 2005). Recent studies on earnings management focus on agency problem II (Chung et al., 2005; Cohen et al., 2010; Cao et al., 2013) due to higher expropriation. Earnings management can be both beneficial and harmful to the firm. Managers can use earnings management to report earnings for their benefits, which may have a negative impact on firm value (Jones, 1991; Roychowdhury, 2006; Kothari et al., 2012; Boghdady, 2019). Managers can employ earnings management either opportunistically or efficiently. In order to maximize their own welfare, managers may indulge in opportunistic earnings management. Efficient earnings management improves communicating private information to various parties. Using discretionary accruals, one can check whether earnings management is opportunistic or efficient if earnings management is efficient then discretionary accruals will have a positive relationship with profitability. Many studies (Healy, 1985; DeAngelo, 1986; Li et al., 2011; Walker, 2013) explained earnings management from the opportunistic behaviour of managers. Managers use earnings management to transfer resources for themselves in the form of a compensation plan, bonus issue and to implement a buyout programme. Managers use earnings management to adjust reported earnings to meet market expectations. To test this, we hypothesize that:

H2: Earnings management is negatively related to firm value.

According to pecking order theory, firms avoid external capital due to information asymmetry and managers accumulate excess cash to pursue their own interest. Entrenched managers hold less cash due to their preference for over investment. Earnings management through discretionary accruals reduces cash valuations (Sun et al., 2012; Alhadab et al., 2015). Managers of poorly performing firms will engage in income increasing activity to

meet their objective without considering the negative effect on firm value. From shareholders' point of view, control imposed by managers on high resource allocation leads to concern about whether excess cash invested in a project will increase firm value. The adoption of conservative accounting policies enables firms to mitigate the value of destruction through the efficient use of cash holdings. Managers indulge in earnings management to signal future earnings and to reduce the inefficient use of cash in pursuit of their own interest (Jensen 1986; Faulkender & Wang, 2006). The uncertainty about managers' behaviour in manipulating earnings reflects that excess cash will be used inefficiently. Managerial opportunism is considered one of the reasons for a positive relationship between cash holdings and earnings. Managerial opportunism will be less for firms that are transparent and safeguard shareholder rights. In an emerging economy like China, where there is weak investor protection and corporate governance, there is a possibility that controlling shareholders will use excess cash for their personal benefit by manipulating the financial statements. Managers are using earnings management for signalling purpose and excess cash enables the managers to manipulate the earnings and thereby earn more profits (Kolb, 2006). Hence, we hypothesize that:

H3: Excess cash holding leads to earnings management.

3. DATA AND METHODOLOGY

We draw our sample from all firms listed on the Shanghai stock exchange for the period 2005-2017. We start the sample period from the year 2005 because major changes in the disclosure of financial information stipulated by the Chinese Securities Commission were instituted in the year 2005 and financial data prior to that was in a different format. The data has been collected from Compustat. We use the following data screening process for all the firm-year observations:

• Our original sample includes 500 firms listed on the Shanghai Stock Exchange during the period 2005–2017.

• We exclude financial and utility firms because utility firms may need to carry cash for supervisory regulations and financial firms have much other business involving inventories of marketable securities that are part of the cash.

• We drop the observations with missing data.

• The bottom and top tails of all explanatory variables are winsorized at a 1% level.

The final sample includes 12,629 firm observations covering 300 firms for China. In order to examine the impact of excess cash on earnings management, excess cash is measured as the residual from cash holding regression of Ditttmar and Smith (2007). Authors (Jone, 1991; Dechow et al., 1995) use different measures for earnings management. The popular method is discretionary accruals that are used to measure the manager's discretion in reported earnings. Accrual based earnings management measure has become popular after Healy (1985) paper. This measure is to study the use of an accounting decision to take advantage of managerial compensation. The accrual method was modified by Jones (1991) and Dechow et al.

(1995). Another popular method of earnings management is real activity-based earnings management, where managers can manipulate real activities such as research and development expenses (R&D) and sales. For measuring earnings management, recent studies are using the discretionary accrual model by Dechow et al. (1995) and Francis (1998) which is the modified discretionary accrual model of Jones (1991). We measure earnings management similar to Francis (1998) model in our analysis.

We have also used firm-specific control variables such as firm size, growth, dividend, and ROA (Dittmar & Smith, 2007; Harford et al., 2008) to see whether firms have access to the external market for their investment. We measure firm size as a natural logarithm of total assets, dividend as a ratio of dividend paid to total assets and leverage as a ratio of total borrowings to total assets. Opler et al. (1999) find that dividend-paying firms will keep cash because they can cease dividend payment to preserve cash. Watts and Zimmerman (1986) find that investors view leverage as a substitute for excess cash for their current and future investments. ROA measures the past and future changes in the assets and future changes in the market value of the firm; therefore, we measure ROA as the ratio of net income to total assets.

Using Tobin's Q as a dependent variable, we examine the impact of excess cash and earnings management on firm value. Tobin's Q is a good proxy for firm value, which indicates the market value of future earnings (Reguera-Alvarado, 2017).

Panel data methodology has been used to examine the impact of excess cash on earnings management. Based on the Hausman test, we opted for the fixed-effect model, and we control for industry and year effects to avoid heterogeneity. When we control for the industry and year fixed effects, we are also controlling for time-invariant factors such as financial crisis and other regulatory changes. Equation 1 exhibits the base model for measuring excess cash. Equations 2 and 3 measure the effect of excess cash and earnings management on firm value. Equation 4 determines the impact of excess cash on earnings management.

3.1. Base model

Similar to Dittmar and Smith (2007) we measure firm excess cash by using residuals of the following equation with the changes in cash holding along with the changes in the time period. We used control variables similar to Dittmar and Smith (2007) study. The terms a_i, a_t, and ε_{it} represent the industry fixed effect, the time fixed effect and the error term.

$$Cash\ holdings_{it} = a_0 + \beta_1 MTB_{it} + \beta_{2it} NWC_{it} \\ + \beta_3 Cashflow_{it} + \beta_4 Size_{it} \\ + \beta_5 CAPEX_{it} + a_1 + a_t + \varepsilon_{it} \quad (1)$$

Excess $cash_{it}$ is the residual from Equation 1 because the residuals can explain the future growth in cash balances.

3.2. Impact of excess cash on firm value

$$TQ_{it} = a_0 + \beta_1 ECH_{it} + \beta_2 R\&D_{it} + \beta_3 LEVE_{it} \\ + \beta_4 CAPEX_{it} + \beta_5 Size_{it} + a_i \\ + a_t + \varepsilon_{it} \quad (2)$$

where Tobin's Q *(TQ $_{it}$)* is defined as market value of equity plus book value of debt divided by firm total assets; ECH_{it} is excess cash; Research and development *(R&D$_{it}$)* is the research and development expenses to total assets; Leverage *(LEVE$_{it}$)* is the borrowings by total assets; $CAPEX_{it}$ is measured as the ratio of gross fixed assets to total assets; is natural log of total assets.

3.3. Impact of earnings management on firm value

$$TQ_{it} = a_0 + \beta_1 AQ_{it}^{Dechow} + \beta_2 AQ_{it}^{Kothari} \\ + \beta_3 Aggregate_{it} + \beta_4 R\&D_{it} \\ + \beta_5 LEVE_{it} + \beta_6 DIV_{it} + \beta_7 Size_{it} \\ + a_i + a_t + \varepsilon_{it} \quad (3)$$

where we measure AQ_{it}^{Dechow} and $AQ_{it}^{Kothari}$ similar to Dechow et al. (1995) model and Kothari (2005) model. Aggregate is calculated as the average of the standard value of the above-mentioned proxies. Tobin's Q *(TQ$_{it}$)* is defined as market value of equity plus book value of debt divided by firm total assets; Research and development *(R&D$_{it}$)* is the research and development expenses to total assets; Leverage *(LEVE$_{it}$)* is the borrowings by total assets; Dividend *(DIV$_{it}$)* is measured as the ratio of dividend paid to total assets; $Size_{it}$ is natural log of total assets.

3.4. Impact of excess cash on earnings management

$$EM_{it} = \beta_0 + \beta_1 ECH_{it} + \beta_2 DIV_{it} + \beta_3 GROWTH_{it} \\ + \beta_4 LEV_{it} + \beta_5 Size_{it} + \beta_6 ROA_{it} \\ + a_i + a_t + \varepsilon_{it} \quad (4)$$

where *EM* is measured using Francis (1998) model represented below:

$$TCA_{it} = a_0 + a_1 CFO_{t-1} + a_2 CFO_{it} + a_3 CFO_{t+1} \\ + a_4 \Delta REV_{it} + \varepsilon_{it} \quad (5)$$

The parameters a_1, a_2 and a_3 are computed using the equation given below and the industry-specific parameter estimation will be used to measure the non-discretionary accruals.

$$TCA_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta CASH_{it} + \Delta STDEBT_{it} + \varepsilon_{it} \quad (6)$$

where:
TCA is the total current accrual for the firm;
CFO_{it} is the cash flow from operating activity;
ΔCA_{it} is the change in current assets between year *t* and *t-1* for i-*th* firm;
ΔCL_{it} is the change in current liabilities between year *t* and *t-1* for i-*th* firm;
$\Delta CASH_{it}$ is the change in cash position between year *t* and *t-1* for i-*th* firm;
$\Delta STDEBT_{it}$ is the change in current debt between year *t* and *t-1* for i-*th* firm;
ΔREV_{it} is the change in revenue between year *t* and *t-1* for i-*th* firm;
PRE_{it} is the property plant and equipment for i-*th* firm in year *t*;

ROA is measured as the ratio of net income to total assets.

For robustness, we used Instrumental Variable regression (IV) and we use the instrument that is correlated with excess cash and not correlated with earnings management and we used instrumental variables acquisitions and tangibility for excess cash and for earnings management we used Kothari model (1995).

4. EMPIRICAL RESULTS

4.1. Descriptive statistics and correlation matrix

Table B.1 (see Appendix B) reports the descriptive statistics and correlation matrix of the main variables used in this study. The mean value of excess cash is 0.2173, which is computed by taking the residual from cash holding regression. The mean of the firm value measured by Tobin's Q is 0.84. The average amount of debt to total assets is 17.52 percent but the mean value of dividend 0.65 percent. The correlation matrix shows that excess cash is positively and significantly related to firm value. Earnings management is inversely related to firm value, and it has similar results in case of excess cash also. We observe that excess cash enhances the firm value, whereas it has an inverse relationship with earnings management.

4.2. Impact of excess cash on firm value

The results reported in Table B.2 (see Appendix B) indicate that excess cash is positively related to firm value. This positive relationship may be due to three reasons: first, managers prefer to hold cash to avoid transaction costs and to meet unexpected contingencies. Second, firms don't want to depend on external financers who charge a high rate of interest. Third, managers want to invest in value yielding projects in the future. Companies facing financial constraints, particularly those who are suffering investment opportunity the marginal value of the cash will be higher (Anand et al., 2018). Our results are similar to the cash holding results of Myer and Majluf (1998) and Bates et al. (2009). The holding of cash encourages the manager to decide on value-enhancing investments. Leverage is positively related to firm value. This relationship confirms Modigliani and Miller's (1963) proposition, which states that managers should use debt in their capital structure to get the benefit of tax. Our results are in line with Jensen (1986), suggesting that debts are considered as an effective mechanism to reduce the cash problem between the managers and shareholders. Reduction in agency problem enhances the value of the firm. CAPEX has a positive relationship with the firm value, which states that firms spend more on assets for growth purpose. The coefficient of size is positive and significant, implying that large companies with high investment capacity have a higher firm value than small-sized firms. R&D is one of the means by which companies can get an advantage in the competitive market. There are two accounting treatments for R&D investment i.e., it can be treated as an expense or as intangible assets. In this study, we treat R&D investment as an expense. The coefficient of R&D is negatively and significantly related to firm value

suggesting that sample firms are not investing much in R&D. Overall the findings suggest that when firms hold excess cash, firm value increases, but whether excess cash leads to earnings management is unknown.

4.3. Impact of earnings management on firm value

Table B.3 (see Appendix B) reports the results of the effect of earnings management on firm value. We measure earnings management in three ways: first, AQ_{it}^{Dechow} based on the Dechow et al. (1995) model; second is the $AQ_{it}^{Kothari}$ based on the Kothari et al. (2005) ROA-performance-matched discretionary accrual model and the third is the aggregate which is calculated as the average of standardized value of the aforesaid mentioned proxies. The two proxies of earnings management have a negative impact on firm value similar to Walker (2013). Our results are in line with Myers and Majluf (1984) suggesting that earnings management causes information asymmetry, which makes external capital more expensive for firms and thereby reduces the firm value, which is consistent with agency theory (Jensen, 1986). The perception of investors on the negative relationship between earnings management and firm value is reinforced by several accounting scandals such as Enron and WorldCom. Firm size and leverage are positively related to a firm value indicating that large firms are not engaging in earnings management because of reputation concerns and since an increase in leverage leads to monitoring by the lenders, it might reduce the earnings management behaviour of the managers.

4.4. Impact of excess cash on earnings management

In this section, we examine the impact of excess cash on earnings management and the results in Table B.4 (see Appendix B) show that excess cash is negatively related to earnings management. Large firms are under the scrutiny of regulators and investors and they engage less in earnings management. Growth firms will improve their quality of financial statements to access external finance at the low cost of capital and they find it hard to manipulate earnings. The coefficient of Model 4 shows that firms in China make a dividend decision based on actual earnings rather than managed earnings. ROA in Model 5 shows that firms in China are likely to manage their earnings upwards to meet analyst and investor expectations. In order to receive greater compensation, managers of firms with higher profitability may engage in earnings management (Koh, 2007; Hessayri & Saihi, 2015). Excess cash is negatively and significantly related to earnings management, which states that firms in China are not using excess cash for manipulation; instead, they are using it for some value-enhancing projects. Results are consistent with agency theory and the free cash flow hypothesis. According to the agency theory, less excess cash leads to earnings management, which enables the managers to avail incentives to manipulate the earnings for their advantage. As per the free cash flow hypothesis, managers will invest excess cash in low NPV projects (Jensen, 1986) to reduce earnings management. Thus, the findings suggest that excess cash has a negative impact on earnings management due to the

alignment effect and managers always act to protect the interest of the shareholders rather than engage in opportunistic behavioural activities.

5. ROBUSTNESS ANALYSIS

We conducted a robustness analysis to deal with the endogeneity issue related to excess cash. For robustness, we find the instruments that correlate with excess cash but not associated with earnings management. Based on the variables listed in the cash holdings literature (Bates et al. 2007), we identify acquisitions made by firms as an instrument. The firm acquisition is policy decision and it has an impact on firm performance (Ashquith et al., 1983; Healy, 1992; Harford, 1999). Hence, we include acquisition as one of the instruments for excess cash. Since there is a strong association between firm's tangible assets and cash holdings (Capkun, 2007), asset tangibility may correlate with excess cash, but it does not influence earnings management. Hence, we use tangibility as a proxy for excess cash and measure it similar to Berger et al. (1996). We use the Sargan test for identifying the relationship between the instruments and error term. Using Kothari's (1995) measure of earnings management, we find that the results are robust. We use three-stage least square (3SLS) similar to Coles et al. (2019), to analyze the relationship between excess cash, earnings management and firm value and the results are consistent with our baseline results.

6. CONCLUSION

This study examines the impact of excess cash on earnings management and firm value and the impact of earnings management on firm value using panel data from firms listed on Shanghai stock exchanges from 2005 to 2017. We measure excess cash by using Dittmar and Smith (2007) cash holding regression model and our findings show that excess cash has a positive impact on firm value, implying that firms hold excess cash for a positive purpose. We measure earnings management by using the proxies of Kothari (2005) and Dechow and Dichev model (1995) and find that Chinese firms engaging in earning management results in a decline in firm value similar to other countries. However, firms with excess cash have a negative and significant impact on earnings management, signifying that managers use corporate resources effectively by holding more cash and support pecking order theory and the precautionary motive of holding cash. Thus, excess cash enables firms to reduce information asymmetry and firms with excess cash are less manipulator of earnings and do not use excess cash for earnings management.

Our results offer several insights for practitioners, academicians, and policymakers. The study contributes to the existing literature on cash holdings and earnings management and provides insight into how excess cash affects earnings management and firm value. The findings imply that when the firms use excess cash for productive purposes it may enhance firm value. The findings provide important implications for SEC that Chinese firms who have excess cash do not indulge in earnings management and excess cash held by them is used for value-enhancing activities. Accordingly, SEC may also come out with an optimal cash policy for firms with excess cash.

However, the findings of the study have some limitations since the scope of this study is confined to Chinese firms and the measure of firm value is limited to accounting metrics. Future researchers could investigate if excess cash holding and earnings management linkage varies between state-owned enterprises and private firms and the results can be further validated for firms in other emerging and advanced economies.

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APPENDIX A

Variables	*Definitions*
Cash holdings (CH)	Ratio of cash and marketable securities to total assets
EPS	Ratio of net income to total assets
Networking capital (NWC)	Ratio of current assets minus current liabilities to total assets
Return on assets (ROA)	Earnings before interest and tax to total assets
Capital expenditure (CAPEX)	Ratio of gross fixed additions to total assets
Research and development (R&D)	R&D to total assets
Excess cash (ECH)	Residuals from cash holdings regression
Tobin's Q (TQ)	Market value of equity plus book value of equity to total assets
Size	Natural log of Total assets
Dividend (DIV)	Dividend paid to total assets
Leverage (LEV)	Total borrowings to total assets
Growth (GWTH)	Difference between current and past revenue
Cash flow from operating activity (CFO)	Cash flow from operating activity
Short-term debt (STDEBT)	Changes in short term debt
Revenue (REV)	Changes in revenue
Current assets (CA)	Changes in current asset
Current liabilities (CL)	Changes in current liabilities
Cash	Changes in cash
Plant property and equipment (PPE)	Property plant and equipment for i-*th* firm in year t.

APPENDIX B

Table B.1. Descriptive statistics and correlation matrix

Variables	Obs	Mean	Std. Dev.	TQ	Size	LEVE	CAPEX	R&D	Growth	EPS	ROA	DIVI	AQ Dechow	AQ Kotharri	ECH
TQ	12629	0.8406	0.0985	1											
Size	12629	7.9134	1.4311	0.0530*	1										
LEVE	12629	0.1752	0.1583	0.0627*	0.0336*	1									
CAPEX	12629	0.0527	0.0483	0.0254*	-0.0617*	0.0454*	1								
R&D	12629	0.0120	0.0369	-0.0467*	-0.0670*	-0.1229*	0.0309*	1							
Growth	12629	0.1155	0.4340	0.0476*	0.1859*	0.0215*	-0.0056	0.0126*	1						
EPS	12629	0.0944	0.0687	0.0077	-0.0200*	-0.0226*	0.0257*	0.0351*	0.0654*	1					
ROA	12629	0.0618	0.0587	0.0407*	-0.0795*	-0.0507*	0.0469*	0.0472*	0.0273*	0.0716*	1				
DIVI	12629	0.0065	0.0118	-0.0019	-0.0146*	-0.0109*	-0.0054	0.0265*	0.0550*	0.3097*	0.3111*	1			
AQ Dechow	10543	0.0939	0.0711	-0.036*	-0.0421	-0.0132*	0.0176*	0.0229*	-0.2796	0.1402*	0.1175	0.0331*	1		
AQ Kotharri	10543	0.0961	100453	-0.0229*	0.0226*	0.1564*	0.0264*	-0.0139*	-0.0228*	-0.0542*	-0.0589*	-0.0371*	-0.0282*	1	
ECH	11531	0.2173	0.0408	0.0695*	-0.0637*	-0.0492*	-0.0756*	0.0532*	-0.0421*	0.0636*	0.0346*	0.0104*	-0.0413*	-0.0999*	1

*Note: This table presents the descriptive statistics and correlation matrix for the main variables used in this study. The sample consists of all firms listed in the Shanghai Stock Exchange for 2006-2017. * represents the coefficients are significant at 5% level.*

Table B.2. Impact of excess cash on firm value

Variables	(1) TQ	(2) TQ	(3) TQ	(4) TQ	(5) TQ
Size	0.0655***	0.0637***	0.0636***	0.0635***	0.0749***
	(7.25)	(7.05)	(7.98)	(7.02)	(7.78)
LEVE		0.0451***	0.0443***	0.0443***	0.0561***
		(10.82)	(10.62)	(10.64)	(12.73)
CAPEX			0.0422***	0.0411***	0.0314**
			(4.24)	(4.14)	(2.05)
R&D				-0.0953***	-0.0905***
				(-7.81)	(-8.25)
ECH					0.0329***
					(3.36)
Constant	0.0507***	0.0564***	0.0543***	0.0553***	0.0911***
	(5.14)	(5.98)	(5.54)	(5.76)	(8.22)
No. of Obs.	10531	10531	10531	10531	10531
R-Squared	0.21	0.21	0.21	0.22	0.24
Industry effect	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES

*Note: This table reports the impact of excess cash on firm value. Model 1 to 5 represents the results using Tobin's Q as dependent variable. Detailed variable definitions are provided in Appendix A. All regressions control for industry and year fixed effects. t-statistics are in brackets. ***, **, * denote significance at the 1%, 5%, and 10% significance level, respectively.*

Table B.3. Impact of earnings management on firm value

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
	TQ	*TQ*	*TQ*	*TQ*	*TQ*	*TQ*	*TQ*
Size	0.0655***	0.0637***	0.0643***	0.0642***	0.0641***	0.0634***	0.0634***
	(7.25)	(7.05)	(7.55)	(7.51)	(7.28)	(7.48)	(7.54)
LEVE		0.0451***	0.0408***	0.0412***	0.0412***	0.0513**	0.0515**
		(10.82)	(9.73)	(9.82)	(9.83)	(2.04)	(2.1)
DIVI			-0.0917***	-0.0655***	-0.0658***	-0.0616***	-0.0615***
			(-7.69)	(-6.97)	(-6.98)	(-6.89)	(-6.89)
R&D				-0.0878***	-0.0878***	-0.0848***	-0.0844***
				(-7.17)	(-7.16)	(-6.95)	(-6.91)
AQ Dechow					-0.0451***	-0.0421***	-0.0418***
					(-3.51)	(-3.50)	(-3.02)
AQ Kotharri						-0.0037***	-0.0041***
						(-12.24)	(-11.97)
AQ Dechow*AQ Kotharri							-0.0122**
							(-2.48)
Constant	0.0507***	0.0564***	0.0533***	0.0545***	0.0547***	0.0580***	0.0579***
	(5.14)	(5.98)	(5.49)	(5.71)	(5.68)	(5.33)	(5.32)
No. of Obs.	10543	10543	10543	10543	10543	10543	10543
R-Squared	0.21	0.21	0.22	0.22	0.22	0.22	0.22
Industry Effect	YES	YES	YES	YES	YES	YES	YES
Year Effect	YES	YES	YES	YES	YES	YES	YES

*Note: This table reports the impact of earnings management on firm value. Model 1 to 7 represents the results using Tobin's Q as dependent variable. Detailed variable definitions are provided in Appendix A. All regressions control for industry and year fixed effects, t-statistics are in brackets. ***, **, * denote significance at the 1%, 5%, and 10% significance level, respectively.*

Table B.4. Impact of excess cash on earnings management

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
	EM	*EM*	*EM*	*EM*	*EM*	*EM*
Size	-0.0306***	-0.0859***	-0.0035***	-0.0099***	-0.0387***	-0.044***
	(-9.83)	(-10.51)	(-4.05)	(-4.15)	(-3.62)	(-2.60)
Leve		-0.082***	-0.0578**	-0.0128**	-0.0200*	-0.0112
		(-4.49)	(-2.23)	(-2.06)	(-1.75)	(-1.57)
Growth			0.0012***	0.00122***	0.035***	0.0025***
			(5.44)	(5.44)	(4.51)	(3.39)
DIVI				0.0851	0.0402	0.082
				(1.15)	(1.52)	(1.19)
ROA					0.0367***	0.0767***
					(7.71)	(8.49)
ECH						-0.0132**
						(-2.30)
Constant	-0.0481***	-0.0418***	0.0226***	0.0542***	0.0133**	0.0360***
	(-6.80)	(-7.14)	(4.27)	(4.33)	(2.51)	(3.47)
No. of Obs.	10543	10543	10543	10543	10543	10543
R-Squared	0.21	0.21	0.22	0.22	0.22	0.24
Year Effect	YES	YES	YES	YES	YES	YES
Industry Effect	YES	YES	YES	YES	YES	YES

*Note: This table reports the impact of excess cash on earnings management. Model 1 to 6 represents the results using earnings management as dependent variable. Detailed variable definitions are provided in Appendix A. All regressions control for industry and year fixed effects, t-statistics are in brackets. ***, **, * denote significance at the 1%, 5%, and 10% significance level, respectively.*

Table B.5. Robustness checks impact of excess cash on earnings management

Variables	*Model 1*	*Model 2*
	EM	*EM*
Size	-0.0314***	-0.0481***
	(-6.45)	(-7.23)
Leve	-0.0513***	-0.0801***
	(-6.93)	(-8.78)
Growth	0.0678***	0.076***
	(4.68)	(4.80)
DIVI	0.0657	0.0865
	(1.51)	(1.41)
ROA	0.0612***	0.0357**
	(3.02)	(2.46)
ACQ	-0.0924***	
	(-7.15)	
Tangibility		-0.0875**
		(-1.32)
Constant	0.045	0.0497**
	(0.29)	(2.27)
No. of Obs.	10543	10543
R-Squared	0.24	0.024
Year effect	YES	YES
Industry effect	YES	YES

*Note: This table reports the robustness results of impact of excess cash on earnings management. Models 1 and 2 represent the results using earnings management as dependent variable. Model 1 represents the results of instrumental variable using acquisition and Model 2 represents the results of instrumental variable using tangibility. Detailed variable definitions are provided in Appendix A. All regressions control for industry and year fixed effects, t-statistics are in brackets. ***, **, * denote significance at the 1%, 5%, and 10% significance level, respectively.*