Financial Crisis, Corporate Governance and the Value of Cash Holdings

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External Financing, Corporate Governance and the Value of Cash Holdings

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Abstract

We study how corporate governance impacts the deployment of internal capital when external financing is costly. Using the 2008 financial crisis as a quasi-natural experiment and difference-in-difference estimation strategy, we show that the propensity to invest out of pre-crisis cash reserves is highest for weakly-governed firms. Weakly-governed firms finance additional investment using short-term debt and allocate a higher fraction of post-crisis excess cash towards building up cash balances. Contrastingly, well-governed firms have a higher propensity to allocate excess cash towards increasing the value of pledgeable assets and use accumulated cash balances to reduce short-term debt financing. Well-governed firms trade-off the cost of cash holdings against the benefit of minimizing future demand for costly external financing; effectively hedging against foregoing profitable future investment opportunities.

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1 Introduction

What is the role of corporate governance in the deployment of internal resources when access to credit is hampered and external financing is costly? Under the pecking order hypothesis of capital structure a firm should prefer using internal resources such as cash to using external resources such as issuing equity when financing a project (Myers and Majluf 1984). The use of internal resources mitigates information asymmetry that might arise during the course of financing. But in the face of separation of ownership and control (Jensen and Meckling 1976, Jensen 1986); entrenched managers might extract private benefits and inefficiently allocate internal corporate resources. Managerial discretion is particularly a concern given the recent well-documented rise in cash holdings amongst U.S. firms (Bates, Kahle and Stulz, 2009).

However, in the presence of significant market frictions firms might maintain large cash reserves to meet unexpected contigencies. Large cash reserves serve as a buffer against unexpected rise in external cost of financing (Duchin, Ozbas and Sensoy 2010). To this end, we might expect a prudent manager to trade-off the benefit of cash holdings against the agency cost of cash holdings. This trade-off implies that there exists a deterministic optimal level of cash holdings, yet the average U.S firm's actual cash holdings is greater than the predicted value.[1] Managers accumulate excess cash in part to protect themselves against market disciplinary forces.[2]

The 2008 financial crisis serve as a disciplinary shock. The crisis was marked by tightening in borrowing standards and sudden increase in external cost of financing (Ivashina and Scharfstein 2010, Kwan 2010). The crisis also disrupted the networks of dealers leading to sharp rise in spreads (Maggio, Kermani and Song 2016). Due to this sudden unexpected rise in the cost of external financing, firms were unable to obtain short-term to medium-term liquidity on demand and had to utilize internal resources to meet shortfalls. In this paper, we address the following question: What is the role of

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[1]See: Opler, Pinkowitz, Stulz, and Williamson 1999, Kim, Mauer and Sherman 1998 Dittmar and Marht-Smith 2007

[2]Easterbrook 1984, Harford, Mansi and Maxwell 2008, Dittmar and Mahrt-Smith 2007

corporate governance in deployment of internal resources when access to credit is hampered and external financing is costly? This is an important question to practitioners, since CFOs consider decisions about corporate liquidity to be one of the most important decisions they make (Graham and Harvey, 2001, Almeida, Campello, Cunha and Weisbach, 2014). And it is important to policymakers since maintaining sufficient liquidity is vital to the smooth functioning of capital markets. Nevertheless, variation in corporate governance structure can create moral hazard problems that limit pledgeability of cash flows to shareholders and can lead to suboptimal deployment of internal capital. The 2008 financial crisis magnified the importance of liquidity management and the role of internal resources. While Duchin et al. (2010) examine the supply side effects and particularly how level of cash mitigates the effect of credit crisis on corporate investment; in this paper we study how governance structure affects liquidity management. In particular, the effects of governance on the allocation and deployment of pre-crisis cash reserves and unexpected post-crisis excess cash. This paper also study how managerial discretion over excess cash in the face of costly external financing affects the value of pledgeable assets.

All things considered, excess cash would be most vulnerable to managerial discretion. How firms allocate, deploy and manage excess cash during periods of significant external shocks is essential in understanding and establishing agency cost of cash holdings. Under "Flexibility Hypothesis" entrenched managers highly value and place significant weight on the flexibility that is accorded by larger cash reserves (Hartford et al. 2008). As a result, we might expect self-interested managers to allocate a higher fraction of unexpected excess cash towards building up cash balances. On the other hand, under the "Spending Hypothesis", we would expect that as the crisis unfolds, self-interested managers would partially act in the best interest of the firm and optimally deploy internal resources to mitigate the effects of the financial crisis.[3] In this paper, we provide evidence that for weakly governed firms, managerial interests supersede shareholders' interests. The evidence reconcile the "Flexibility" and "Spending" hypotheses of cash holdings by showing that in the face of

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[3]Entrenched managers have an incentive to ensure the short-term survival of the firm, as it affects their reputation and outside market value/career option(s).

costly external financing weakly-governed firms have a higher propensity to over-invest out of pre-crisis cash reserves but also a higher propensity to accumulate and hoard post-crisis excess cash.

Conversely, in the case of well-governed firms, strong shareholders' rights ensure that managers act in the best interest of shareholders. Since the immediate aftermath of the crisis was marked by changing investment environment, we might expect well-governed firms to allocate excess cash towards increasing the value of pledgeable assets; thus reducing the future cost of external financing. This is because increasing the value of pledgeable assets mitigate contractibility problems (Almeida and Campello, 2007) as it increases the value of creditors' claim during distress and bankruptcy resolution (Shleifer and Vishny, 1992). Increasing the value of pledgeable assets is particularly important since the 2008 financial crisis weakened firms' fundamentals and elevated default risk. Firms were faced with the risk of having to rollover debt at a time when external financing is costly. As a result, well-governed firms are less likely to use short-term debt financing as this might expose such firms to refinancing risk and reduce firm value (Leland and Toft 1996, DeMarzo and He, 2016). Consistent with this hypothesis, we find that well-governed firms optimally respond to increase in the cost of external financing by reducing demand for short-term debt financing; effectively hedging against the future cost of financing by increasing the value of pledgeable assets. Constrastingly, we also find that weakly-governed firms re-finance post-crisis investment using short-term debt.

To demonstrate the effects of corporate governance on cash accumulation, investment and asset growth; this paper employ difference-in-difference estimation strategy by comparing the deployment of internal capital before and after the great financial crisis conditional on corporate governance. Governance is measured using both Gompers, Ishii and Metrics (GIM) index and Bebchuk, Cohen and Ferrell (2009) Entrenchment (E-Index) Index. Firms are sorted on both governance metrics and size of cash reserves at the end of 2006. This is, in part, to ensure that firms' financial position and governance effects are independent of potential crisis' anticipation. This is done to not only minimize forward looking bias but

to also ensure that changes in firm's financial position are not correlated with unobserved changes in firm's real financial decisions as the finanical crisis comes into effect.

In establishing the agency cost of cash holdings, we first follow Duchin et al .(2010) and consistent with their supply-side driven results, we find that cash reserves mitigate decline in investment. We then demonstrate that once the demand-side of the crisis took effect; corporate governance becomes critical in the deployment of internal resources. Firms are first sorted into terciles by cash reserves at the end of 2006. We find a positive relationship between pre-crisis cash reserves and post-crisis investment for weakly-governed firms. Firms are then double sorted on both governance metrics and size of cash reserves at the end of 2006. We find that the propensity to invest out of cash reserves is highest for weakly-governed firms in the low cash reserves tercile and is lowest for well-governed firms in the high cash reserves tercile. The results suggest inefficient over-investment on the part of weakly-governed firms. And the result for well-governed firms reflects changing investment environment and willingness to forego otherwise profitable investment opportunities due to costly external financing (Campello, Graham and Harvey 2009).

Second, we estimate excess cash as residuals from Dittmar and Mahrt-Smith (2007) and Opler et al. (1999) models of normal cash holdings and we find that while well-governed firms have a higher level of total cash holdings, weakly-governed firms have higher level of post-crisis excess cash. We also find that well-governed firms have a higher propensity to allocate excess cash towards asset growth; thus increasing the value of pledgeable assets. In contrast, weakly-governed firms are more likely to finance post-crisis investment using costly short-term debt and have a higher proclivity to deploy excess cash towards building up cash balances. The later result is consistent with a variant of Harford et al. (2008) "Flexibility Hypothesis" under which entrenched managers value excess cash and stockpile it by building up larger cash balances. The results demonstrate that while entrenched managers initially acted in the best interest of the firm and deploy pre-crisis cash reserves to mitigate the effects of the crisis, they also use post-crisis excess cash to quickly build up cash balances. These results are consistent with Jiang and Lie (2016) findings that entrenched managers

are reluctant to disburse excess cash unless subjected to external pressure. Overall, this paper bridge an important gap in cash holdings literature. While extant literature has examine the level of cash holdings and find evidence to support the "Spending hypothesis" of cash holdings (Hartford et al 2008); this paper provides direct empirical evidence on the "Flexibility hypothesis" of cash holdings. We demonstrate that, in the face of costly external financing, weakly-governed firms have higher level of excess cash and a higher propensity to stockpile it.

This paper contributes to the literature on liquidity management and corporate cash holdings amongst U.S firms. While extant literature has established agency cost of cash holdings in international settings (Dittmar et al. 2003, Dyck and Zingales 2002, Pinkowitz et al. 2004, Lins and Warnock 2004, Erkens, Huang and Matos 2012, Almeida and Wolfenzon 2004); the strong shareholders' rights and legal system in the U.S. has enabled shareholders to mitigate the effects of agency conflicts (Harford et al. 2008). As a result, early evidence on agency problems in investment-cash flow relationship amongst U.S. firms has yield mixed results (Carpenter 1993, Devereux and Schiantarelli 1990, Oliner and Rudebusch 1992, Vogt 1994). This paper exploits the rise in cost of external financing following the 2008 financial crisis and establishes a channel amongst U.S. firms via which agency conflicts might arise. We provide evidence that the documented "bright side" or precautionary saving motive of cash holdings against crisis' induced credit supply shocks might be limited to the early period or supply-side of the crisis. We show that the post-crisis period for weakly-governed firms is characterised by deployment of excess cash towards building up cash balances, amplifying free cash flows problem. This paper also provides evidence that well-governed firms mitigate and hedge against future cost of external financing by deploying excess cash towards increasing the value of pledgeable assets.

The rest of the paper is organized as follows. Section 2 describes the data and our identification strategy. Section 3 presents our main empirical results. Specifically, we document the association between corporate governance, cash holdings, excess cash, pledgeable assets and leverage. Sections 4 and 5 contain some sensitivity tests to determine the robustness of

our main results. A summary and conclusion is provided in section 6.

2 Data and Identification Strategy

2.1 Data

The main data consists of Compustat annual data from 2004 to 2016.[4]. We end our sample in 2016 so as to take into account not only the immediate short-term effect but to also take into account the medium to long- term effects on firms' real decisions due to the long-lasting right tail of the crisis. We eliminate firm-years for which market capitalization is less than $10 million and for which Q is either negative or greater than 11. Firms whose sales growth is greater than 100% are also excluded. The first criteria eliminates small firms whose access to the market might be severely hampered (such as penny stocks) while the later two criteria eliminate large firms and firms that might have experience unusually large jumps in their business fundamentals. We also exclude financial services firms (SIC codes 4900-4949) since assessing their liquidity level is difficult and firms in the utility sector (SIC 6000-6999) since their activities and governance structure are highly impacted by regulations.

To measure the degree of entrenchment; and similar to Harford et al (2008), we use both Gompers, Ishii and Metrick (2003) index (GIM index henceforth) and Bebchuk, Cohen and Ferrel (2009) index (E-Index henceforth). Both indices are constructed from Investor Responsibility Research Centre (IRRC) data and use the number of anti-take over provisions in a firm's charter and in the legal codes of the state in which a firm is incorporated to measure degree of managerial entrenchment. Higher provisions are associated with poor governance and weak shareholder's rights. Firms whose GIM index is less than or equal to five are considered "Democratic" while firms whose GIM is greater than or equal to 9 are considered "poorly governed". The E-Index can be viewed as a subset of GIM index but uses only

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[4]Our sample selection approach is roughly similar to Duchin et al (2010) . In general quarterly data might be subjected to secular and potential 4th quarter earnings manipulation (Shin and Kim 2002). Using Annual data would potentially smooth out such effects

six provisions that Bebchuk et al (2009) considered to have the strongest impacts on firm's value. Firms whose E-Index falls below 2 are considered "Least Entrenched" while firms whose E-Index is greater than or equal to 4 are considered "Highy Entrenched".

We then merge Compustat annual data with the two corporate governance indices; the final sample consist of 1,599 unique firms with 14,899 firm-year observations. Table 1 provides summary statistics for the sample. And Figure 1 illustrates the average cash holding conditional on GIM index for the 2004-2016 period.

[INSERT TABLE 1 & 2, & FIGURE 1 ABOUT HERE]

2.2 Identification Strategy

In determining the impact of corporate governance on allocation of internal capital, particularly cash and excess cash; we apply difference-in-difference estimation strategy to "Tobin Q-Cashflow Sensitivity Model" and compare firms' real financial decisions (Investment, Asset Growth and Cash Accumulation) before and after the 2008 financial crisis.[5]. By most account 2008 is when the demand-side of the crisis took effect (Puri, Rocholl, and Steffen 2011, Kahle and Stulz 2013) The Business Cycle Dating Committee at the NBER estimated that the U.S. economy was at a peak in December 2007 and the economy went into a recession beginning first quarter of 2008.[6]

Given this timeline, the dummy variable "After" takes a value of "1" if the year is after 2008 and takes a value of "0" if otherwise. Our coefficient of interest is the interaction term between cash reserves and the "After" dummy. Cash reserves is cash and short-term investment adjusted by total asset and is measured at the end of 2006, this is in part to address concerns regarding the supply-side effects of the crisis which might have started as early as August 2007 and the concerns that changes in a firm's financial position might be correlated with unobserved changes in investment opportunities during the crisis (Duchin,

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[5]Specifically, a variant of Fazzari, Hubbard and Petersen (1988) Tobin Q-Cashflow Sensitivity Model

[6]The committee determined that "...a peak in December 2007 and has declined every month since then ... that the decline in economic activity in 2008 met the standard for a recession" http://www.nber.org/cycles/dec2008.html

Sensoy and Ozbas 2010, Tong and Wei 2008). Effectively, cash reserves serve as an instrument for pre-crisis cash holdings and is not correlated with unobserved within-firm changes in investment opportunities[7]. Our difference-indifference estimation strategy is as follows:

$$\textbf{Investment}_{\textbf{it}} = \beta_0 + \beta_1 \textbf{After} + \beta_2\{\textbf{AfterXCashreserve}\} + \beta_3\textbf{Q}_{\textbf{it}} + \beta_4\textbf{Cashflow}_{\textbf{it}} + \eta_{\textbf{i}} + \zeta_{\textbf{jt}} + \epsilon_{\textbf{it}}$$

(1)

Where "Investment" is estimated as capital expenditure scaled by total assets, Tobin Q is estimated as ratio of market value of assets to book value of assets. cash flow is measured as operation income before depreciation adjusted by total assets. We include firm (η_i) and and industry-year fixed effects (ζ_{jt}) to control for time-invariant differences across firms and industries. All standard errors (ϵ_{it}) are clustered at the firm-level to correct for potential cross-sectional and serial correlations.

3 Empirical Results

3.1 Size, Governance and Investment

Does the size of pre-crisis cash reserves matter in mitigating the effects of financial crisis on corporate investment? To address this question, we first sort firms into terciles based on the level of cash holdings at the end of 2006.[8] Cash reserves serve as an instrument for the firm level of pre-crisis cash position. Cash is estimated as cash plus short-term investment adjusted by total asset. The average cash holdings by terciles are 5%, 23%, 32% for low, medium and high terciles respectively. This level of cash holdings at the end of 2006 is the firm's cash reserves before the onset of the financial crisis. Note that measuring cash reserves at the end of 2006 ensures that firms' cash holdings decisions are independent of crisis' anticipation.

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[7]Our identificatition strategy meets parallel trend assumption- See Duchin et al. 2010 for a similar argument and identification strategy

[8]Our estimation strategy is consistent with extant literature and ensures that year-before financial positions are not correlated with unobserved firm-level changes during the crisis: Duchin et al. (2010)

Table 3 (A) demonstrates that firms on average significantly reduce investment after the financial crisis and that firms in the low cash reserves tercile (column 2) experienced the most decline in investment. Interestingly, these firms also gained the most per dollar of cash reserves after the financial crisis. The coefficient of the interaction term (0.278) is significantly greater than for firms in high cash reserves tercile (-0.0013) in column 4. Economically, a one standard deviation (0.185) increase in cash reserves is associated with mitigating the decline in investment by about 5% for firms in low cash reserves tercile. Similarly, a one standard deviation increase is associated with mitigating the decline in investment by about 1% for firms in the middle tercile. These results are consistent with Duchin et al (2010) and support the precautionary motive of cash holdings. The effects of cash reserves on investment of firms in the high cash reserves tercile is statistically insignificant. Since Figure [1] suggests that well-governed firms on average have higher cash holdings than poor-governed firms; a logical step and our main contribution is to examine whether the results in Table 3(A) are largely driven by differences in corporate governance structure across firms.

[INSERT TABLE 3A ABOUT HERE]

In Table 3(B) firms are sorted on corporate governance metrics. Consistent with extant literature, firms whose E-Index is greater than or equal to 4 are classified as "Highly Entrenched". While firms whose E-Index is below 2 are classified as "Least Entrenched". Firms whose GIM index is above 9 are classified as "Poorly Governed" while firms whose GIM index is less than or equal to 5 are classified as "Democratic". Henceforth, "Least Entrenched" firms and "Democratic" firms will be jointly referred to as "Well-governed" firms while "Poorly governed" and "Highly Entrenched" firms will be jointly referred to as "Weakly-governed" firms.

The results reported in Table 3(B) demonstrate that, on average, investment declined across all sortings by corporate governance metrics after the 2008 financial crisis. And that the overall decline is greater for weakly-governed firms (column 2 and 3). On average, weakly-governed firms gained the most per dollar of pre-crisis cash reserves. Table 3(B) column 2 suggests that, on average, an increase of one standard deviation in cash reserves is associated

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with mitigating the decline in investment by about 30 basis point for highly entrenched firms (column 2) and by about 20 basis points for poorly governed firms (column 3). Interestingly, cash reserves is associated with a decline in investment for least entrenched firms (column 4) and not statistically significant for democratic firms (column 5). These results demonstrate that on average weakly-governed firms benefit the most per additional dollar of pre-crisis cash reserves. Observe that the coefficient of the "After" term is larger for weakly-governed firms than for well-governed firms. Effectively, while well-governed firms trade of current period's investments against foregoing potentially positive NPV projects in future states, weakly-governed firms deploy internal capital to mitigate the adverse impact of the crisis on their current period investments. This is an important results, as it empirically demonstrate that well-governed firms behave very differently with pre-crisis cash reserves when compared to their weakly-governend counterparts.

[INSERT TABLE 3B ABOUT HERE]

Table 3(C) establishes a channel via which agency conflict might arise amongst U.S firms. In Table Table 3(C) firms are double sorted on both pre-crisis cash reserves and corporate governance metrics at the end of 2006. The results demonstrate that investment declined significantly for weakly-governed firms in the low cash reserves tercile. Columns 2 and 3 present estimates for weakly-governed firms in the low cash reserves tercile. The results indicate a statistically significant positive relationship between pre-crisis cash reserves and post-crisis investment for this set of firms. Since the aftermath of the crisis is marked by changing investment environment, the results demonstrate an over-investment out of cash reserves for this set of firms, particularly during an economic downturn.

The opposite is true for well-governed firms in the high cash reserves tercile. Columns 4 and 5 illustrate that, on average, marginal increase in cash reserves is associated with decline in investment after the financial crisis for well-governed firms in the high cash reserves tercile. These results illustrate changing investment opportunities in which well-governed firms accumulate cash post crisis instead of investing. Well-governed firms trade-off the cost of cash holdings against the benefit of minimizing future demand for

costly external financing, which is consistent with the results in Table 3(B). That is, well-governed firms opt to carry forward their cash balances so as to relax financial constraints when valuable investment opportunities arise in the future states (Acharya et al. 2007) while weakly-governed firms over-invest out of pre-crisis cash reserves; reflecting myopic investment decisions. The diametrically opposed nature of these results suggests an agency cost to cash holdings.

[INSERT TABLE 3C ABOUT HERE]

3.2   Cash Accumulation and Corporate Governance

The results in Table 3(C) suggest that corporate governance matters in the deployment of cash reserves. In particular, the results demonstrate that there is a negative relationship between pre-crisis cash reserves and post-crisis investment for well-governed firms. A logical step is to examine how well-governed firms allocate pre-crisis cash reserves after the financial crisis. We provide some evidence to the effect that due to unfavorable and changing investment environment after the 2008 financial crisis, well-governed firms stockpile cash reserves. Table 4 investigates the relationship between pre-crisis cash reserves and cash accumulation. Regressions in Table 4 control for all determinants of cash holdings including cash flow, firm size, a dummy of acquisiton activities, market-to-book ratio which proxy for growth opportunities and is on average positively associated with external financing (Baker and Wurgler 2002) while profitability proxy for internal resources available for funding (Leary 2006, Myers 1984) and tangibility proxy for demand for future investments (Rajan and Zingales 1995).

   Table 4, column 1 suggests that on average cash reserves is positively correlated with cash accumulation (i.e cash hoarding) after the financial crisis for Least-Entrenched firms. Specifically, a one standard deviation increase in cash reserves is associated with a 2% increase in cash accumulation after the 2008 financial crisis. Column 2 reports similar results for "Democratic" firms- using GIM index as the measure of corporate governance. Column 4 suggests that on average a one standard deviation in cash reserves is associated

with 1% increase in cash accumulation. The results for weakly-governed firms are statistically insignificant when we only examined Highly-entrenched firms in column 3.

In this regard, Table 4 demonstrates that while the average firm increase its cash balances after the crisis (column 5); the results are stronger and mostly driven by well-governed firms. Observe that the coeffients of the interaction term for well-governed firms in columns 1 and 2, are significantly higher than for weakly-governed firms in column 3 and 4. These results seem to explain the sharp increase in cash holdings after the 2008 financial crisis as illustrated in Figure 1. And supports the notion that firms accumulate cash when they do not have good investment opportunities (Jensen, 1986). Since the demand shocks of the financial crisis were still in effect, these results could also be interpreted as firms hoarding cash to protect themselves against potential future adverse cash flow shocks.

Overall, Table 4 supports the precautionary motive- essentially, firms that have better investment opportunities hold more cash since adverse macroeconomic shocks would be more costly (Bates et al. 2009). The estimates in column 1 of Table 4 indicate that Least-Entrenched firms, on average, use cash reserves to significantly increase cash balances relative to highly-entrenched firms (column 3). The results for weakly-governed firms potentially allude to agency problems in cash holding and are consistent with those reported in Table 3(C).

[INSERT TABLE 4 ABOUT HERE]

All things considered, we would expect that firms that face higher costs in raising external financing would accumulate more cash in anticipation of better future investment opportunities (Myers and Majluf 1984, Dittmar and Mahrt-Smith 2007, Duchin et al. 2010). The immediate post-crisis period was marked by tightening in lending standards and rise in cost of external financing (Greenlaw 2008, Gordon 2008). As a result, some firms might accumulate cash in anticipation of shocks to cash flow and as a hedge against the rise in cost of borrowing. To this end, we examine whether firms deploy post-crisis excess cash so as to build-up cash balances.

Excess cash is estimated as cash above a firm "normal" cash holdings level. To compute excess cash, we use Dittmar and Mahrt-Smith (2007) model of normal cash holdings. The model predicts firm optimal cash holdings conditional on a set of controls. These controls include firm size since on average larger firms hold more cash for transaction purposes (Keynes 1936, Frazer 1964), net working capital which isa potential substitute and proxy for non-cash liquid assets. The model also controls for cash flow, R&D and market-to-book ratio to proxy for investment opportunities. Industry sigma is measured as the average two-digit industry SIC codes standard deviation of free cashflow scaled by total assets over the previous 10-years. Excess cash holding is then computed as the residuals that cannot be explained by Dittmar and Mahrt-Smith (2007) model of normal cash holdings.

$$Ln(\frac{Cash_{it}}{NetAsset_{it}}) = \beta_0 + \beta_1 Ln(NetAsset_{it})$$
$$+ \beta_2(\frac{FCF_{it}}{NetAsset_{it}}) + \beta_3(\frac{NWC_{it}}{NetAsset_{it}}) + \beta_4(Industrysigma)_{it}$$
$$+ \beta_5(\frac{MB_{it}}{NetAsset_{it}}) + \beta_6(\frac{R\&D_{it}}{NetAsset_{it}})$$
$$+ YearDummies + \eta_i + \epsilon_{it}$$

$$(2)$$

Figure 2 illustrates the time series evolution of average excess cash conditional on corporate governance measure, specifically on Bebchuk et al. (2009) Entrenchment Index (E-Index).[9] We test whether well-governed firms accumulate cash (financial slacks) in the face of rising cost of borrowing.

Table 5 presents estimates that support our hypothesis. Column 1 presents estimates for "Least-Entrenched firms", column 2 presents estimates for "Democratic firms"; the coefficient of the interaction term between post crisis period and excess cash is positive and statistically significant. On average, a one standard increase in excess cash is associated with 4.9% increase in cash accumulation for both "Least-Entrenched" firms as measured by E-Index and "Democratic" firms as measured by GIM index. Note that while the results

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[9]Note that using Opler et al (1999) model of cash holdings yields similar and consistent results to Dittmar et al (2007) model of normal cash holdings.

are also significant for weakly-governed firms (column 3 and 4); they are stronger for well-governed firms. The coefficient of interaction term of post crisis and excess cash for "Democratic" firms (0.0992) is strictly greater than for Poorly-governed firms (0.0673). Additionally, the cofficient for Least-Entrenched firms (0.0991) is strictly greater than the coefficient for Highly-Entrenched firms (0.0606). Overall, the results suggest that well-governed firms allocate a higher fraction of excess cash towards increasing cash balances relative to weakly-governed firms. These results support our hypothesis that excess cash is positively associated with increase in cash acumulation (i.e cash hoarding) and negatively associated with investment.

[INSERT TABLE 5 & FIGURE 2 ABOUT HERE]

3.3 Excess Cash, Asset Growth and Leverage

What is the relationship between excess cash and changes in the value of pledgeable assets? The extant literature has established that there is a positive relationship between external financing and the value of pledgeable assets (Almeida et al. 2004). In this section, we test the hypothesis that in the presence of costly external finance, well-governed firms are more likely to allocate excess cash towards increasing the value of pledgeable assets since pledgeable assets mitigate contractibility problems that might arise during financial distress or bankruptcy.

Table 6 investigates the relationship between asset growth and excess cash. Asset growth is estimated as change in total assets scaled by lagged total assets. Asset growth is a proxy for changes in the value of pledgeable assets. Column 2 of Table 6 presents the estimates for the Least-Entrenched firms. The coefficient (0.0724) of the interaction term between excess cash and post-crisis period is positive and statistically significant at the 1% level. A one standard deviation increase in excess cash is associated with 3.6% increase in asset growth. Column 4 presents estimates for "Democratic firms". A firm is classified as "Democratic" if its GIM index score is either equal to or less than 5. The results suggest that there is a positive relationship between excess cash and asset growth for this set of firms.

Contrastingly, the coefficient estimate of the interaction between the post-crisis period and excess cash is negative and statistically insignificant for both poor governed firms (-0.0168) in column 5 and highly entrenched firms (-0.0178) in column 3. The evidence support the hypothesis that on average well-governed firms deploy excess cash to increase asset growth during the post-crisis period. Increase in value of pledgeable assets mitigates contractibility problems and reduce cost of future external financing.

[INSERT TABLE 6 ABOUT HERE]

The post crisis period was marked by a low correlation between cash flow and investment opportunities. Investment opportunities are proxy by market-to-book ratio. The correlation between cashflow and investment opportunity in our the data is about 5% during the post crisis period. Note that under the hedging motive of cash holdings, we would expect that firms utilize accumulated cash balances to mitigate the rising costs of external borrowing (Acharya et al 2007, Froot et al. 1993). Firms might substitute away from costly short-term debt financing towards some cheaper form of financing. Table 7 presents estimates on the effects of cash balances on changes in firms' demand for leverage. Column 1 presents estimates with change in total debt as the dependent variable; the coefficient estimates of the interaction term between the post-crisis period and cash accumulation is negative and statistically significant at the 1% level. A one standard deviation increase in cash accumulation is associated with a reduction of 0.4 basis points in total debt. Column 3 presents the estimates with change in short-term debt as the dependent variable. Firms on average significantly reduce short-term debt after the crisis and a one standard deviation change in cash accumulation post crisis is associated with a reduction of 0.3 basis points.

In column 4, our measure of short-term debt includes the proportion of long-term debt that mature within one year and the proportion of long-term debt that mature within two years. The coefficient of the interaction term is negative and statistically significant; a one standard deviation increase in cash accumulation is associated with a reduction of 0.70 basis point in short-term debt including the proportion of long-term debt that matures in the next two years. Note that column 2 suggest that while the average firm increase long-term

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debt- the coefficient of "After" in column 2 is positive and statistically significant (0.00792)-
but the interaction term is negative and statistically insignificant. The results in Table 7
support the notion that as the cost of external financing rises, firms shift away from the using
costly short-term debt and instead increase the fraction of long-term debt in their capital
structure. Additionally, accumulated cash balances play a hedging role and ameliorate the
cost of external financing. The evidence supports the notion that firms boost cash balances
so as to reduce demand for external financing; particularly during periods when cost of
borrowing is rising and access to external market is costly (Acharya et al. 2007).

[INSERT TABLE 7 ABOUT HERE]

As a result, we would expect that well-governed firms substitute away from costly form
of financing such as short-term debt in the face of tightening access to credit and rise in
costs of borrowing. Table 8 investigates the relationship between investment and short-term
debt. Column 1, 2 and 3 use investment level- estimated as capital expenditure adjusted
by book asset- as the dependent variable. Column 1 presents the estimates for all firms;
short-term debt is associated with decline in investment after the financial crisis. Column 2
presents estimates for the least-entrenched firms and column 3 presents estimates for Poorly-
governed firms. On average investment decline significantly per dollar of borrowing amongst
poorly-governed firms signalling to the higher cost in debt financing after the financial crisis.
In column 6 changes in investment are positively correlated with changes in short term
borrowing for poorly-governed firms. The results indicate that poorly-governed firms are on
average willing to finance additional investment post-crisis using short-term debt. Poorly-
governed firms are on average willing to borrow in the face of rising cost. Column 5, presents
estimates for Least-Entrenched firms and show that these firms on average reduce investment
and that changes in short-term debt are negatively associated with changes in investment
during the post crisis period. Changes in both long term debt and total debt are statistically
insignificant.

[INSERT TABLE 8 ABOUT HERE]

17

When the correlation between cashflows and investment opportunities is low; we would expect that firms would borrow and use short-term liquidity to increase the value of firm's pledgeable assets. Increasing the value of pledgeable capital mitigates contractibility problems that arise during financial distress or bankruptcy (Kiyotaki and Moore 1997, Almeida and Campello 2007). Leverage serves as disciplinary tool against managerial abuse such as extraction of private benefits and disgorging of liquid assets (Moeller et al 2004, Gompers et al 2003). On average, we rationally expect that prudent manager or well-governed firms would increase the value of their pledgeable assets during the post-crisis period so as to mitigate contractibility problems.

Table 9 investigates the relationship between leverage and asset growth. The coefficient of the "After" term is negative and statistically significant across all four models; indicating a decline in asset growth post-crisis. Column 1 suggests that changes in short-term debt are positively associated with asset growth after the crisis. A one standard deviation increase in short-term debt is associated with an increase of 2.1 percentage point in asset growth. In column 3, changes in long-term debt are positively associated with asset growth. Economically, a one standard deviation change in long term debt (0.1001) is associated with 3.6 percentage point change in asset growth. In column 4, changes in total debt post crisis is associated with increase in asset growth. The results in Tbale 9 shows that access to debt financing during periods of significant external shocks has positive effects on pledgeable assets.

[INSERT TABLE 9 ABOUT HERE]

Table 10 investigates the relationship between short-term debt and asset growth across governance measures. The dependent variable is asset growth which is estimated as the change in total asset scaled by the lagged-total assets (Tang, 2009). Column 2 presents the estimates for Least-Entrenched firms (E-Index)and shows that changes in short-term debt are associated with increase in asset growth post crisis. A one standard deviation (0.0624) change in short-term debt is associated with 5.3 percentage point change in asset growth. Column 3 presents the estimates for "Democratic" firms and show that changes in

short-term debt are positively associated with asset growth. Economically, an increase of one standard deviation in change in short-term debt is associated with an increase of 3.6 per centage points in asset growth. Column 4 presents the estimates for highly-entrenched firms and column 5 presents the results for Poorly-governed firms; the coefficient of the interaction term is statistically insignificant. Overall, short-term debt has a statistically and economically significant effect on asset growth for well-governed firms. The evidence presented in Table 7- that firms on average reduce short-term borrowing after the crisis-combined with the evidence in Table 10 suggests that well-governed firms use any additional short-term debt to grow and increase the value of pledgeable assets.

[INSERT TABLE 10 ABOUT HERE]

4 Robustness Tests

4.1 Financial Constraints: KZ Index, Size, Payout Ratio

In the presence of costly external financing; constrained firms are more likely to build up cash balances as precautionary measure against cash flow volatility. This is because financial constraints create an intertemporal trade-off between current and future investments (Han and Qiu 2007). Additionally, there is some evidence in the extant literature that financially constrained firms have a stronger propensity to save cash out of cash flow (Almeida et al 2004, Faulkender and Wang, 2005). To this end, we test whether financially constrained firms allocate a higher fraction of excess cash towards building up cash balances.

Table 11 examines the relationship between excess cash and cash accumulation based on commonly used measures of financial constraints: Kaplan-Zingales (1997) Index (KZ Index), Size and Payout Ratio. Firms are sorted by constraints measures at the end of 2006. Consistent with prior literature (Duchin et al 2010), firms are sorted into low or high constraint conditional on whether they are below or above the median level of the constraint measure in question. Column 1 and 2 present the estimates for below-median and above-median firms as measured by the KZ index respectively. Firms that fall above-median

KZ index are considered financially constrained. Column 3 presents estimate below-median (small firms) and column 4 present estimates for above-median (large firms). Column 5 presents estimates for below-median payout (constrained) and column 6 presents estimates for above-median payout (unconstrained). The coefficient of the interaction term across all measures of constraints is positive and statistically significant. But it is stronger for constrained firms than for unconstrained firms. The results demonstrate and confirm our hypothesis that after the 2008 financial crisis constrained firms allocate a higher fraction of excess cash towards building up cash balances than their unconstrained counterparts.

[INSERT TABLE 11 ABOUT HERE]

4.1.1 Effects of Excess Cash on Cash Accumulation Conditional on Financial Constraints (KZ Index) and Governance

Table 12(A) investigates the relationship between excess cash and cash accumulation conditional on both constraint measure and corporate governance. Kaplan-Zingales (1997) index (KZ) is used as the measure of financial constraint. Consistent with prior literature, a firm is considered financially constrained (unconstrained) if it falls (below) above median KZ index. In Table 12a both the coefficient of "after" and the coefficient of interaction of excess cash with post-crisis period are positive and statistically significant. Column 1 presents estimates for financially unconstrained firms, the coefficient of interaction of after and excess cash is positive (0.0699) and statistically significant. Column 2 presents estimate for financially constraint firms, the coefficient of interaction term is positive and statistically significant. The results are robust when sorted on governance a well. Column 3(4) presents the estimates for least (high) entrenched firms, in both cases the coefficient of the interaction term is positive and statistically significant. The coefficient for Least-Entrenched firms (0.144) is greater than the coefficient (0.0663) for Highly-Entrenched firms. Column 5(6) presents the estimates for democratic (Poorly) governed and in both cases the coefficient of interaction is positive and statistically significant. The magnitude of coefficient (0.0898) for democratic firms is strictly greater

than for poorly-governed firms (0.071). Overall, the results in Table 12A suggests that while excess cash is positively associated with cash accumulation across governance measure, nevertheless well-governed constrained firms accumulated cash at a higher rate than poorly-governed firms.

[INSERT TABLE 12A ABOUT HERE]

Table 12(B) investigates the relationship between excess cash post crisis and cash accumulation for financially unconstrained firms as measured by KZ index. Column 1 indicates that the coefficient of interaction between excess cash and post crisis period is positive and statistically significant for unconstrained firms. Column 3(4) presents the estimates for financially unconstrained with least (high) level of entrenchment. In both columns, the coefficient of interaction term is positive and statistically significant. Column 5(6) presents the estimates for democratic (poorly) governed firms, the coefficient of interaction terms in both cases is positive and statistically significant. Note that the coefficients in well governed firms (3 and 5) are strictly greater than coefficients in weakly governed firms (4 and 6); suggesting that at margin well-governed firms use excess cash to build-up level of cash balances at a higher rate than weakly-governed firms.

[INSERT TABLE 12B ABOUT HERE]

4.1.2 Effects of Excess Cash on Investment Conditional on Financial Constraints and Governance

Table 13A investigates the relationship between excess cash post-crisis and investment conditional on governance measure for constrained firms as measured by Kaplan-Zingales (1997) index. A firm is considered constrained if its financial constraint measure (KZ index) at the end of 2006 falls above sample median. Column 2 presents the estimates for financially constrained firms and the coefficient of interaction term between excess cash and statistically significant is negative but statistically significant. Column 3(5) presents the result for Least entrenched firms (democratic) firms, the coefficient of interaction term

is negative and statistically significant. Column 4(5) presents the results for Highly-Entrenched (Poorly-governed) firms and the coefficient of interaction is statistically insignificant.

The results in Table 13A suggests that on average there is a negative relationship between post-crisis period and excess cash for well-governed firms. These results also indicate that financially constrained well-governed firms accumulate cash balances as a hedge against rise in cost of external borrowing. And in part reduced their current period investment-coefficient of after is negative and statistically significant. And increase their cash balances in anticipation of future profitable investment opportunities. These results are also consistent with Foote et al (1993) observation that in the face of increase in cost and variability in the amount raised externally, the value of the firm can be increased if hedging can reduce variability in cash flows. Future variability in cash flows in the face of rising cost of borrowing can perturb- at a great cost-both investment and financial plans. Table 13a suggests that well-governed firms reduce their investment after the crisis and allocate additional resources (excess cash) to building cash balances, in part, to hedge against future variability in cash flows.

[INSERT TABLE 13A ABOUT HERE]

Table 13B investigates the relationship between excess cash holding and investment for financially unconstrained firms measured using KZ index. Column 1 presents estimates for unconstrained firms. The coefficiient of interaction term (-0.00637) is negative and statistically significant. Suggesting that there is a negative association between excess cash and investment post-crisis. Column 3(5) presents the results for Least Entrenched (Democratic) firms, the coefficient of interaction term is negative and statistically significant. These results suggest a strong negative relationship between excess cash and post-crisis period investment for financially unconstrained well-governed firms. Similarly, column 4(6) presents results for highly entrenched (poor governed) firms; the coefficient of interaction term is negative and statistically significant. Note that the coefficient of the interaction term for Least-Entrenched firm is greater than the coefficient for

Highly-Entrenched firms and the coefficientt for Democratic firms greater than the coefficient of poorly-governed firms. This result suggests that the relationship between investment and excess cash after the crisis period is stronger for financially unconstrained and well-governed firms. The evidence in Table 13[A&B] demonstrates the hedging role of cash and support the precautionary motive of cash holding (Duchin et al. 2010, Acharya et al. 2007).

[INSERT TABLE 13B ABOUT HERE]

4.2 Effects on Other Measures Corporate Spending: Inventory and R&D

Table 14 investigates the relationship between excess cash and other commonly used measures of corporate spending such as inventories (Kayshap et al 1994) and R&D both measures are adjusted by current period total asset. On average, during the post crisis period, excess cash is negatively associated with both R&D and inventory holding across all measures of governance. The effect is much stronger for weakly-governed firms. Observe that the coefficients of "After" and the interaction term are both negative and statistically significant in both column 3 (Highly Entrenched) and column 5 poorly governed. In column 5 Panel A presents the regression estimates for poorly governed firms. The coefficient of interaction and the post-crisis period is -0.0139 (t-stats= -13.04); indicating that one standard deviation increase in excess cash post crisis is associated with 0.69 percentage point decline in inventory. Column 3, presents the estimates for highly entrenched firms. The coefficient of interaction term is -0.0138 (t-stat= -8.36) indicating that a one standard deviation increase in excess cash is associated with a decline of 0.68 percentage point in inventory. In panel B, the dependent variable is R&D expense. Similar to inventory, the coefficient of interaction between the post-crisis period and excess cash is negative across all measures of governance.

[INSERT TABLE 14 ABOUT HERE]

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4.3   Liquidity Risk and Role of Excess Cash in Hedging

Han and Qiu (2007) model demonstrates that there is a positive relationship between risk and level of cash holdings. Acharya et al (2012) argue that in the presence of financial constraints, riskier firms optimally choose to maintain higher cash reserves as a buffer against possible cash flow shortfalls in the future states. They find that cash holding increases sharply with credit risk and that safe firms (AAA & AA) have high balance sheet liquidity and above average cash holdings. In sum cash holding is U-shaped in firm's credit quality. An extension of their model with respect to excess cash reserves would be that on average high risk firms would allocate higher percentage of excess cash toward cash accumulation. In effect, we expect to observe a U-shape pattern in the relationship between excess cash and credit risk.

Similar to Acharya et al (2012), we use interest coverage ratio- defined as earning before interest divided by interest expense- as a proxy measure of credit risk. Interest coverage ratio proxy the ability of a firm to pay off its interest expense. Also in a similar spirit to Duchin et al (2010), at the end of 2006 firms are sorted into quintiles by their credit risk level. Firms with high credit risk are allocated into 1st quintile and firms with low credit risk are allocated into the 5th quintile. Table 15 presents the estimates by quintile. Column 1 presents the estimates for high risky firms and column 5 presents the estimates for "safe" firms. The coefficient of the interaction term is positive and statistically significant across quintiles. Observe that the magnitude of the coefficient has a u-shaped pattern; demonstrating that risky firms allocate higher proportion of excess cash toward building up their cash balances. This supports the hypothesis that under precautionary motive for saving cash- particularly in the face of external rise in cost of borrowing- riskier firms would accumulate higher cash balances. When we examine the high risky firms -first quintile- by corporate governance measures, the results suggest that on average risky well-governed firms allocate a higher proportion of excess cash towards building cash balances. The results on governance supports agency motive of cash holdings; in which well-governed firms accumulate higher cash balance to hedge against foregoing profitable future investment opportunities.

[INSERT TABLE 15 ABOUT HERE]

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5 Conclusion

In this paper, we address the following question: What is the role of corporate governance in the deployment of internal resources when access to credit is hampered and external financing is costly? We use the 2008 financial crisis as a quasi-natural experiment and examine how firms conditional on corporate governance structure allocate pre-crisis cash reserves and post-crisis excess cash. Using difference-in-difference estimation strategy, we first examine the effects of pre-crisis cash reserves on post-crisis investment. Firms are sorted into terciles based on pre-crisis cash reserves. We find that the marginal effect of cash reserves is positive for the average firm which support a precautionary motive of cash holdings. We then double sort firms on corporate governance metrics and size of cash reserves and find that the propensity to invest out of cash reserves is highest for weakly-governed firms. Our results indicate that agency conflict in cash holdings among the U.S. firms lies in the intersection of low cash reserves and weak corporate governance.

Additionally, we find that weakly-governed firms finance additional investment using costly short-term debt and allocate a higher fraction of post crisis excess cash towards building up cash balances. The results demonstrate that entrenched managers value the flexibility that comes with higher cash holdings and would rather utilize costly external financing than internal excess cash. Entrenched managers place a greater weight on the private benefits that accrue from this cash induced flexibility at the expense of firm's shareholders. The evidence reconciles the "Flexibility" and "Spending" hypotheses of cash holdings by showing that in the face of costly external financing, weakly-governed firms have a higher propensity to over-invest out of cash reserves and a higher propensity to accumulate excess cash.

Contrastingly, well-governed firms have a higher propensity to allocate excess cash towards increasing the value of pledgeable assets. Increasing the value of pledgeable assets mitigates contractibility problems that might arise during financial distress or bankruptcy and it also increases the probability of borrowing at favorable rates in future states. Well-governed firms use accumulated cash balances to reduce demand for costly short-term

debt financing. The documented positive relationship between asset growth and cash accumulation partially explains why well-governed firms hold larger than normal cash balances. The results demonstrate that optimal amount of internal capital increases with the cost of external financing. Well governed firms hold larger cash balances, in part, to hedge against rising cost of external financing.

6 References

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Figure 1: ***Mean Cash Holding Conditional on GIM Governance Metrics:***

GIM Index is extracted from Gompers, Ishii & Metrics (2003). Gim Index 5 & below: Democratic GIM 9 & Above: Poorly Governed
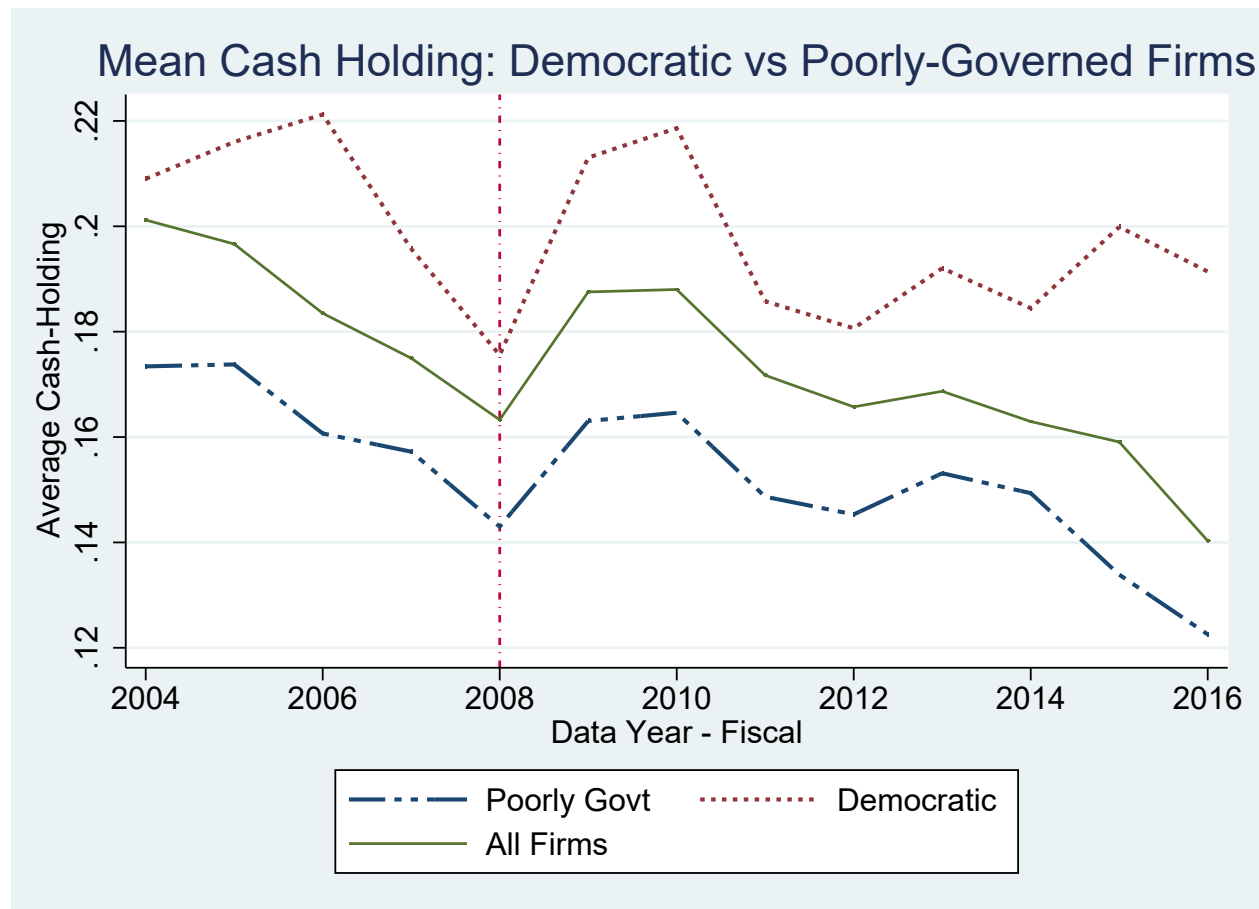
*Figure 2: **Mean Excess Cash Conditional on Entrenchment Index:***

Entrencment Index (E-Index) is extracted from Bebchuk, Cohen &Ferrel (2009). E-Index below 2 (Least Entrenched) E-Index 4& Above (Highly Entrenched)
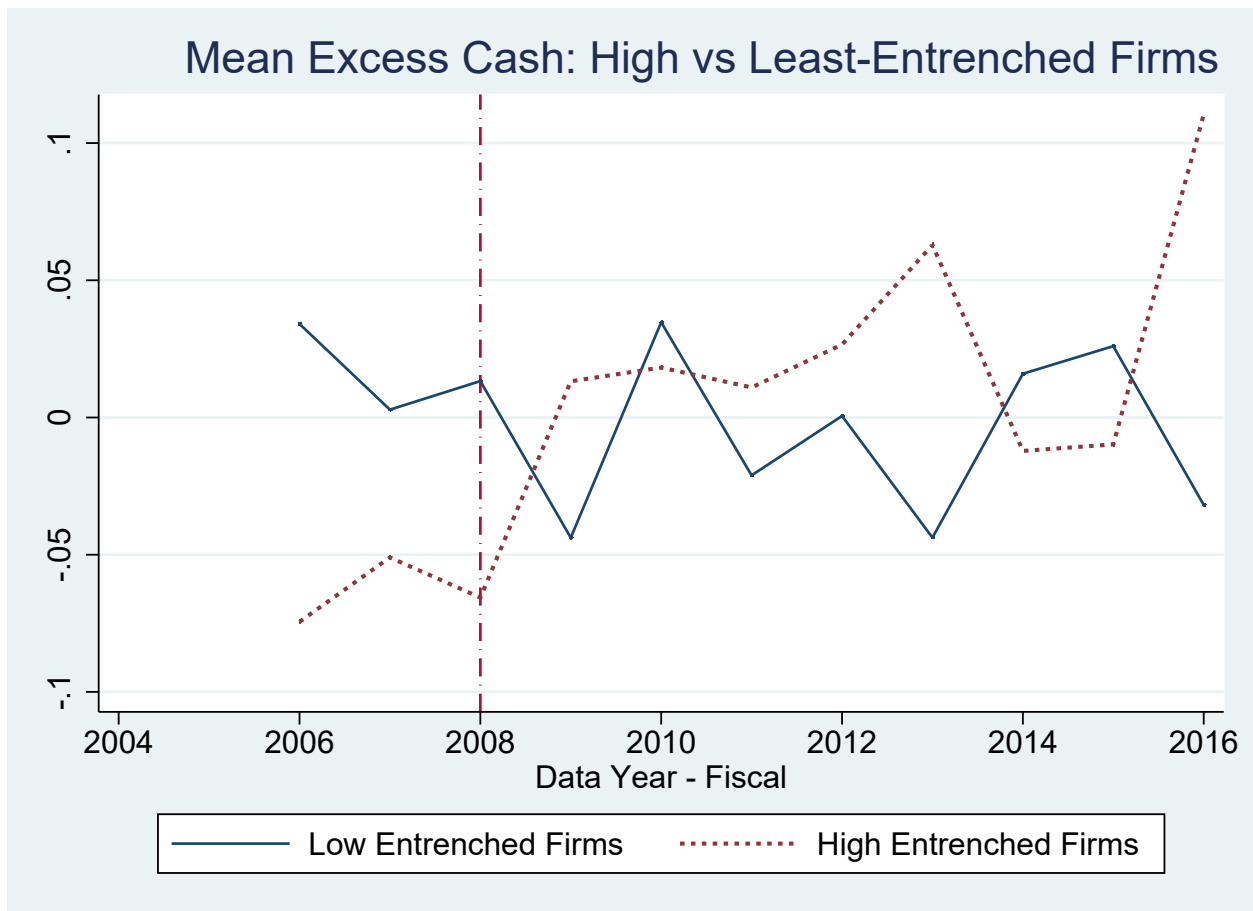
Table 1: Summary Statistics

This table reports summary statistics for the period 2004 to 2016. Investment is Capx scaled by Total Assets. Tobin Q is measured as ratio of market value of assets to book value of assets. Cash flow is measured as operating income before depreciation and amortization scaled by total assets. Cash is estimated as cash and cash equivalents adjusted by total assets. Market-to-Book is market value of assets scaled by book value of assets. Short-term debt is debt in current liabilities scaled by total assets. Long-term debt is long ter mdebt scaled by total assets. Data is extracted from North America Annual COMPUSTAT.

	Mean	Median	St.Dev	25th	75th
Investment	0.0490	0.0317	0.0585	0.0169	0.0594
Cash	0.1764	0.1121	0.1849	0.0418	0.2474
Cashflow	0.1160	0.1266	0.1548	0.0815	0.1752
Tobin Q	1.9614	1.6111	1.1840	1.2379	2.2589
Short-term Debt	0.0278	0.0057	0.0653	0.0000	0.0305
Long-term Debt	0.2044	0.1710	0.2105	0.0183	0.3019
Ln(Assets)	7.4811	7.4459	1.7691	6.3624	8.5865
Tangibility	0.2537	0.17867	0.2223	0.0845	0.3663
Market-to-Book	1.415	1.0844	1.2709	0.6602	1.7419
Profitability	0.0263	0.0506	0.2300	0.0121	0.08866
Market Capitalization($)	9116.61	1738.75	29647.95	610.26	5613.31

Table 2: Corporate Governance: Summary Statistics

This table reports summary number of firms and observations conditional on corporate governance for the period 2004 to 2016. Firms are sorted by cash reserves tercile at the end of 2006. GIM Index is extracted from Gompers, Ishii & Metrics (2003). And the Entrencment Index (E-Index) is extracted from Bebchuk, Cohen & Ferrel (2009).

	Firms	**Obs**
Category:	**Cash Reserves Tercile**	
Low Cash reserve (2006)	424	4612
Medium Cash reserve (2006)	418	4589
High Cash reserve (2006)	455	4600
	Corporate Governance Measure	
Democratic (GIM 5 & below)	266	1659
Poorly-Governed (GIM 9 & above)	930	7787
Least Entrenched (E-Index below 2)	527	3664
Highly Entrenched (E-Index 4 & above)	505	4029
GIM Index	1599	14899
E-Index	1599	14899

TABLE 3A: CASH RESERVES, SIZE & INVESTMENT

This table examines the relationship between cash reserves and investment post 2008 financial crisis. The dependent variable is Investment estimated as capx/total assets. Cash reserves measure cash holding position at the end of 2006. Q is for Tobin Q and is estimated as ratio of market value of asset to book value of asset. Cash flow is measured as operation income before depeciation/total asset. Firms are sorted by size (terciles) of cash holding position at the end of 2006. "After" is a dummy variable equals 1 for years after 2008 financial crisis and zero otherwise. Column [1] presents estimates for all firm-year observations. Column [2, 3 & 4] presents estimates for low, medium and high cash reserves as measured at the end of 2006. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)
	Investment	Investment	Investment	Investment
	ALL	Low	Medium	High
After	-0.0108***	-0.0167***	-0.0155***	-0.00735***
	(-14.36)	(-8.85)	(-5.89)	(-3.17)
AfterxCashreserve	0.00683**	0.278***	0.0464**	-0.00129
	(2.31)	(4.06)	(2.08)	(-0.24)
Q	0.00340***	0.00748***	0.00483***	0.00207***
	(8.96)	(6.91)	(5.77)	(4.63)
Cash flow	0.0148***	0.0419***	0.0207***	0.00375
	(4.73)	(5.43)	(2.76)	(1.01)
Constant	0.0448***	0.0460***	0.0414***	0.0370***
	(51.03)	(23.05)	(23.75)	(28.77)
Firm F.E	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes
N	13791	4611	4584	4596
R^2	0.708	0.783	0.626	0.621

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 3B: CORPORATE GOVERNANCE & INVESTMENT

This table examines the relationship betweencorporate governance and firm-level investment after the 2008 financial crisis.The dependent variable is Investment measured as (capx/total assets). Cash reserves measure cash holdings position at the end of 2006. Q is measured as ratio of market value of assets to book value of assets. Cash flow is measured as operation income before depeciation/total asset. Firms are sorted into terciles by size of cash holdings position at the end of 2006. "After" is a dummy variable equals "1" for years after the 2008 financial crisis and zero otherwise. Firms are also sorted by corporate governance metrics at the end of 2006. Column [1] presents estimates for all firm-year observations. Columns [2, 3, 4 & 5] presents estimates for highly entrenched firms (E-Index atleast 4), Poorly governed firms (GIM index atleast 9), least entrenched firms (E-Index less than 3) and Democratic firms (GIM less or equal 5). All regressions include firm fixed and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)
	Investment	Investment	Investment	Investment	Investment
Govt. Metric	ALL	E-Index>= 4	GIM>= 9	E-Index<= 2	GIM<= 5
After	-0.0108***	-0.0107***	-0.0110***	-0.00854***	-0.00873***
	(-14.36)	(-8.57)	(-10.76)	(-5.35)	(-3.61)
AfterxCashreserve	0.00683**	0.0165***	0.0105**	-0.0107*	0.00963
	(2.31)	(2.78)	(2.34)	(-1.89)	(1.16)
Q	0.00340***	0.00585***	0.00435***	0.00220***	0.00124
	(8.96)	(7.60)	(7.84)	(3.02)	(0.98)
Cash flow	0.0148***	0.0276***	0.0110**	0.0332***	0.0491***
	(4.73)	(3.71)	(2.20)	(5.65)	(5.48)
Constant	0.0448***	0.0381***	0.0431***	0.0449***	0.0441***
	(51.03)	(23.90)	(33.09)	(24.88)	(16.87)
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	13791	3723	7240	3390	1519
R^2	0.708	0.725	0.688	0.741	0.787

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 3C: CASH RESERVES , INVESTMENT & GOVERNANCE

This table examines the relationship between investment and cash reserves after the 2008 financial crisis conditional on corporate governance metrics and size of cash reserves. The dependent variable is Investment (Capx/Total Assets). Cash reserve measures cash holdings position at the end of 2006. Q is measured as ratio of market value of asset to book value of asset. Cash flow is measured as operation income before depeciation/total asset. Firms are sorted by corproate governance metrics and are also sorted into terciles based on cash reserves position at the end of 2006. "After" is a dummy equals "1" for years after the 2008 financial crisis and zero otherwise. Column [1] presents estimates for all firm-year observations. Columns [2,3] for weakly governend firms with low cash reserves. Columns [4,5] for well-governed firms with high cash reserves. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)
	Investment	Investment	Investment	Investment	Investment
After	-0.0108***	-0.0150***	-0.0159***	0.000601	0.00956
	(-14.36)	(-5.12)	(-6.35)	(0.11)	(1.24)
AfterxCashreserve	0.00683**	0.240**	0.279***	-0.0305**	-0.0313*
	(2.31)	(2.14)	(3.10)	(-2.45)	(-1.75)
Q	0.00340***	0.00453***	0.00788***	0.000619	0.000500
	(8.96)	(2.60)	(5.45)	(0.62)	(0.30)
Cash flow	0.0148***	0.0649***	0.0211**	0.0129*	0.0377***
	(4.73)	(4.51)	(2.06)	(1.69)	(3.42)
Constant	0.0448***	0.0404***	0.0471***	0.0432***	0.0391***
	(51.03)	(12.36)	(17.14)	(14.81)	(9.40)
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	13791	1531	2763	1319	636
R^2	0.708	0.773	0.767	0.688	0.769

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 4: Effects of Pre-Crisis Cash Reserve on Post-Crisis Cash Accumulation Conditional on Corporate Governance Metrics

This table examines the relationship between cash reserves and cash accumulation after the 2008 financial crisis. The dependent variable is cash accumulation estimated as change in cash holdings scaled by lagged total asset. Cash reserve measures cash holding position at the end of 2006. Regressions estimates are carried out by subsamples based on corporate governance metrics. Columns [1]: reports estimates for least entrenched firms. Column 2: reports estimates for Democratic firms. Column 3: reports estimates for Highly entrenched firms. Column 4: reports estimates for Poorly governed firms. & Column 5: reports estimates for All firms in the sample. All regressions include firm-level and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)
	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum
After	0.0221**	0.0246*	0.0323***	0.0203***	0.0262***
	(2.19)	(1.81)	(4.14)	(4.34)	(6.14)
AfterxCashreserve	0.110***	0.0911**	-0.0319	0.0494**	0.0459***
	(3.23)	(2.06)	(-0.88)	(2.47)	(2.90)
Constant	0.414***	0.353***	0.593***	0.411***	0.463***
	(6.25)	(4.54)	(9.77)	(11.44)	(15.58)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	3030	1105	2136	6107	11152
R^2	0.539	0.154	0.205	0.234	0.305

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 5: Effects of Excess Cash on Post-Crisis Cash Accumulation Conditional on Corporate Governance Metrics

This table examines the relationship between cash reserves and cash accumulation. Dependent variable is cash accumulation (Δ cash holding scaled by lagged total asset). Estimates are conditional on corporate governance measure. Columns (1): Least entrenched, columns (2): Democratic firms, columns (3): Highly Entrenched Firms (4): Poorly governed firms and column (5) All firms. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)
	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum
After	0.0762***	0.0759***	0.0336***	0.0385***	0.0537***
	(6.50)	(4.73)	(4.61)	(7.64)	(11.74)
AfterxExcesscash	0.0991***	0.0894***	0.0606***	0.0673***	0.0880***
	(7.52)	(6.07)	(8.06)	(12.40)	(17.22)
Constant	0.927***	0.356***	0.468***	0.504***	0.699***
	(8.58)	(2.71)	(5.50)	(8.89)	(15.02)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std. Errors	Yes	Yes	Yes	Yes	Yes
N	1762	642	1314	3673	6550
R^2	0.283	0.372	0.199	0.339	0.271

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 6: Effects of Excess Cash on Asset Growth Conditional on Corporate Governance Metrics

This table examines the relationship between excess cash and asset growth. Dependent variable is asset growth (Δ total asset scaled by lagged total asset). Excess cash is computed as residuals of Dittmar & Mahrt-Smith (2007) of normal cash holding. Estimates are carried out by subsamples based on corporate governance measures. Columns: (1) All firms. (2): Least entrenched (3): Highly Entrenched Firms (4): Democratic firms (5): Poorly governed firms. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)
	Asset Growth	Asset Growth	Asset Growth	Asset Growth	Asset Growth
After	-0.0396***	-0.0598***	-0.0344	-0.0319	-0.0501***
	(-3.83)	(-3.25)	(-1.58)	(-1.11)	(-3.47)
AfterxExcessCash	0.0172	0.0724***	-0.0178	0.196***	-0.0168
	(1.38)	(3.49)	(-0.70)	(7.67)	(-0.99)
Constant	-0.482***	-0.396***	-0.591***	-0.162***	-0.554***
	(-21.88)	(-10.16)	(-12.23)	(-3.16)	(-17.43)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	4292	1164	843	413	2391
R^2	0.581	0.782	0.567	0.791	0.566

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 7: *Effects of Cash Accumulation on Firms' Debt Financing*

This table examines the relationship between cash accumulation and change in leverage. The dependent variable is change in leverage. Cash accumulation computation is based on Tang (2009). The measures of dependent variable is leverage define as: column 1: Change total debt column, 2: change in long term debt, column 3: change in short-term debt, 4: change in short-term debt including the portion of long-term debt maturing in period t & t+1.

	(1) $\Delta Totaldebt_{t-1,t}$	(2) $\Delta Ltdebt_{t-1,t}$	(3) $\Delta Stdebt_{t-1,t}$	(4) $\Delta Stdebtinc_{t-1,t}$
After	0.00564***	0.00792***	-0.00228*	-0.00226
	(2.66)	(3.43)	(-1.82)	(-0.90)
AfterxCashaccum	-0.0230***	-0.00472	-0.0182***	-0.0436***
	(-2.78)	(-0.52)	(-3.71)	(-4.46)
Constant	-0.0769***	-0.0660***	-0.0109***	-0.0246***
	(-16.58)	(-13.07)	(-3.95)	(-4.50)
Firm Controls	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes
N	7683	7684	7717	6608
R^2	0.313	0.275	0.151	0.219

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 8: Effects of Cash Accumulation on Firms' Debt Financing

This table examines the relationship between Investment and short-term debt conditional on governance after the 2008 financial crisis. The dependent variable is Investment in columns [1, 2, 3] and change in investment in columns [4, 5, 6]. Columns [1 & 4] presents estimates for all firms. Columns [2 & 5] presents estimates for well-governed firms. And columns [3 & 6] presents estimates for weakly governed firms. All regressions include firm and industry-year fixed effects. All standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment	Investment	Investment	$\Delta Invest_{t-1,t}$	$\Delta Invest_{t-1,t}$	$\Delta Invest_{t-1,t}$
After	-0.00898***	-0.00971***	-0.00866***	-0.00304***	-0.00212	-0.00337***
	(-14.08)	(-8.31)	(-9.66)	(-3.98)	(-1.60)	(-3.23)
AfterXStdebt	-0.0360***	-0.0337**	-0.0420***			
	(-5.37)	(-2.36)	(-4.98)			
Q	0.00338***	0.00273***	0.00470***	0.00161***	0.00173*	0.00280***
	(8.36)	(4.02)	(7.84)	(3.03)	(1.96)	(3.58)
Cash flow	0.00563*	0.0237***	0.00303	0.000199	0.0303***	0.00148
	(1.77)	(4.79)	(0.57)	(0.05)	(4.65)	(0.24)
AfterX$\Delta Stdebt_{t-1,t}$				0.0345***	-0.0282**	0.0704***
				(4.63)	(-2.19)	(7.18)
Constant	0.0474***	0.0454***	0.0453***	-0.00229*	-0.00658***	-0.00446**
	(49.58)	(26.17)	(31.77)	(-1.89)	(-3.05)	(-2.50)
Firm F.E	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes	Yes
N	14886	3659	7783	13283	3255	6972
R^2	0.687	0.746	0.672	0.105	0.086	0.171

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 9: *Leverage, Asset Growth and Cash holdings*

This table examines the relationship between Leverage and Asset growth. Dependent variable is asset growth estimated as change in total asset adjusted by lagged total asset (based on Tang, 2009). The coefficent of interest is the interaction term between the "After" dummy and changes in leverage measure(s). Column [1] presents estimates for which leverage measure is the change in short-term debt. In column [2] measure include changes in short-term debt including the portion of long-term debt that that mature in period t & t+1. Column [3] presents estimates in which changes in leverage are long-term debt. Column [4] presents estimates for which the measure of leverage is change in total debt. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)
	Asset Growth	Asset Growth	Asset Growth	Asset Growth
After	-0.0167**	-0.0130	-0.0210**	-0.0220***
	(-2.01)	(-1.52)	(-2.51)	(-2.65)
Afterx$\Delta Stdebt_{t-1,t}$	0.338***			
	(3.43)			
Afterx$\Delta Stdebtinc_{t-1,t}$		0.0826		
		(1.49)		
Afterx$\Delta Ltdebt_{t-1,t}$			0.361***	
			(6.41)	
Afterx$\Delta Totdebt_{t-1,t}$				0.483***
				(8.50)
Constant	0.0953***	0.0885***	0.0970***	0.0975***
	(15.12)	(13.69)	(15.32)	(15.43)
Firm Controls	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes
N	7784	6697	7727	7727
R^2	0.346	0.305	0.350	0.353

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 10: Effects of Leverage on Asset Growth Conditional on Governance Metrics

This table examines the relationship between Leverage and Asset growth after the 2008 financial crisis. The dependent variable is asset growth estimated as change in total asset scaled by lagged total asset. Asset growth computation is based on Tang (2009). The coefficient of interest is the interaction term between "After" and change in our leverage measure: short-term debt. Firms are sorted by corporate governance measure at the end of 2006. Column [1] presents estimates for "All firms". Column [2] presents estimates for Least-Entrenched Firms. Column [3] presents estimates for Democratic Firms. Column [4] presents estimates for Highly Entrenched Firms. Column [5] presents estimates for Poorly governed firms. All regressions included firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

| | (1) | (2) | (3) | (4) | (5) |
	Asset Growth	Asset Growth	Asset Growth	Asset Growth	Asset Growth
After	-0.0127	0.0141	-0.00820	-0.0323	-0.0187
	(-1.52)	(0.78)	(-0.33)	(-1.54)	(-1.61)
Afterx$\Delta Stdebt_{t-1,t}$	0.318***	0.863***	0.601**	0.367	0.161
	(3.19)	(3.76)	(2.09)	(1.46)	(1.17)
Constant	0.0951***	0.0753***	0.0833***	0.107***	0.0985***
	(14.94)	(5.51)	(4.42)	(6.74)	(11.17)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	7784	2110	776	1505	4308
R^2	0.333	0.492	0.334	0.214	0.248

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 11: Excess Cash & Cash Accumulation Conditional on Financial Constraint Measures

This table examines the effects of excess cash on cash accumulational conditional on financial constraint measures after the 2008 financial crisis.The dependent variable is cash accumulation estimated as change in cash holdings scaled by lagged total asset. Excess cash is estimated as residuals from Dittmar & Marht-Smith (2007) model of normal cash holdings. The coefficent of interest is interaction the interaction term between "After" 2008 dummy and excess cash. Financial constraints are: KZ Index, Size and Payout ratio estimated at the end of 2006. Firms are sorted on whether they are Above[A] or Below [B] median. Firms whose KZ index is above (below) median are assumed to be constrained (unconstrained) in column 2(1). Firms whose payout ratio is below (above) median are assumed to be constrained (unconstrained) are in columns 5(6). All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum
Constraint Measure:	KZ(B)	KZ(A)	Size(B)	Size(A)	Payout(B)	Payout(A)
After	0.0388***	0.0627***	0.0733***	0.0220***	0.0547***	0.0470***
	(6.90)	(8.61)	(8.93)	(5.98)	(7.21)	(8.33)
AfterxExcessCash	0.0699***	0.105***	0.107***	0.0640***	0.103***	0.0762***
	(10.65)	(13.61)	(11.26)	(16.40)	(11.74)	(12.65)
Constant	0.512***	0.882***	0.824***	0.372***	0.711***	0.678***
	(8.59)	(13.83)	(13.48)	(8.43)	(11.59)	(10.91)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes	Yes
N	3294	3256	3186	3364	2738	3812
R^2	0.219	0.310	0.267	0.407	0.237	0.318

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 12a: Financially Constrained Firms: Excess Cash & Cash Accumulation Conditional Conditional on Corpoate Governance Metrics

This table examines the effects of excess cash on Cash accumulation conditional on KZ Index and corporate governance after the 2008 financial crisis. The dependent variable is cash accumulation measured as changes in cash holdings scaled by lagged total assets. Excess cash is estimated as residuals from Dittmar & Marht-Smith (2007) model of normal cash holdings. The coefficient of interest is the interaction term between "After" 2008 and excess cash. Firms are doubled sorted on both corporate governance & KZ index. Column [1] presents estimates for unconstrained firms, column [2] presents estimates for constrained firms. Column [3] presents estimates for unconstrained & Least Entrenched firms. Column [4] presents estimates for unconstrained & Highly Entrenched firms. Column [5] presents estimates for unconstrained and Democratic firms. Column [6] presents estimates for unconstrained & poorly governed firms. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum
After	0.0388***	0.0627***	0.0963***	0.0467***	0.0406	0.0396***
	(6.90)	(8.61)	(5.09)	(3.47)	(1.64)	(5.75)
AfterxExcessCash	0.0699***	0.105***	0.144***	0.0663***	0.0898***	0.0710***
	(10.65)	(13.61)	(7.40)	(5.24)	(3.35)	(9.78)
Constant	0.512***	0.882***	1.421***	0.680***	0.553***	0.534***
	(8.59)	(13.83)	(8.64)	(5.50)	(2.91)	(8.39)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes	Yes
N	3294	3256	773	624	258	1836
R^2	0.219	0.310	0.341	0.222	0.534	0.372

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 12b:Financially Unconstrained Firms: Excess Cash & Cash Accumulation Conditional on Corporate Governance Metrics

This table examines the effects of excess cash on Cash accumulation conditional on KZ Index and corporate governance after the 2008 financial crisis. The dependent variable is cash accumulation measured as change in cash holding scaled by lagged total assets. Excess cash is estimated as residuals from Dittmar & Marht-Smith (2007) model of normal cash holdings. The coefficient of interest is the interaction term between "After" 2008 and excess cash. Firms are doubled sorted on both corporate governance & KZ index. Column [1] presents estimates for unconstrained firms, column [2] presents estimates for constrained firms. Column [3] presents estimates for unconstrained & Least Entrenched firms. Column [4] presents estimates for unconstrained & Highly Entrenched firms. Column [5] presents estimates for unconstrained and Democratic firms. Column [6] presents estimates for unconstrained & poorly governed firms. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

| | (1) | (2) | (3) | (4) | (5) | (6) |
	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum
After	0.0388***	0.0627***	0.0582***	0.0169**	0.0850***	0.0261***
	(6.90)	(8.61)	(3.99)	(2.35)	(4.00)	(3.62)
AfterxExcessCash2	0.0699***	0.105***	0.0617***	0.0607***	0.0790***	0.0632***
	(10.65)	(13.61)	(3.60)	(7.42)	(3.85)	(8.10)
Constant	0.512***	0.882***	0.591***	0.262***	0.378*	0.478***
	(8.59)	(13.83)	(4.21)	(3.12)	(1.96)	(5.72)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes	Yes
N	3294	3256	989	690	384	1837
R^2	0.219	0.310	0.249	0.211	0.215	0.349

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 13a: *Financially Constrained Firms: Excess Cash & Investment Conditional on Corpoate Governance Metrics*

This table examines the effects of excess cash on Investment conditional on KZ Index and corporate governance measures after the 2008 financial crisis.The dependent variable is Investment measured as capital expenditure scaled by total asset. Excess cash is estimated as residuals from Dittmar & Marht-Smith (2007) model of normal cash holdings. The Coefficent of interest is the interaction term between "After" and excess cash. Firms are sorted by the median based on KZ Index. Governance measure are based on Gompers et al. (2003) Index & Bebchuk et al. (2009) index. Firms are doubled sorted on both corporate governance & KZ index. Column [1] presents estimates for unconstrained firms, column [2] presents estimates for constrained firms. Column [3] presents estimates for Constrained & Least Entrenched. Column [4] presents estimates for constrained & Highly Entrenched firms. Column [5] presents estimates for constrained and Democratic firms. Column [6] presents estimates for constrained & Poorly governed. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment	Investment	Investment	Investment	Investment	Investment
After	-0.00734***	-0.0126***	-0.0132***	-0.0169***	-0.00849**	-0.0133***
	(-9.41)	(-11.91)	(-6.78)	(-6.66)	(-2.19)	(-8.46)
AfterxExcessCash	-0.00637***	-0.00117	-0.00426**	-0.00180	-0.00808*	0.00222
	(-6.64)	(-1.03)	(-2.05)	(-0.71)	(-1.96)	(1.30)
Q	0.00147***	0.00230***	0.00144	0.00298*	0.000274	0.00130
	(2.60)	(3.79)	(1.36)	(1.88)	(0.12)	(1.36)
Cash flow	0.0384***	0.000142	0.00364	0.0111	-0.00195	0.0254**
	(7.84)	(0.03)	(0.55)	(0.82)	(-0.17)	(2.32)
Constant	0.0359***	0.0449***	0.0445***	0.0517***	0.0416***	0.0458***
	(28.61)	(29.65)	(15.45)	(14.36)	(6.67)	(19.51)
Firm F.E	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes	Yes
N	3485	3595	802	895	305	1984
R^2	0.757	0.642	0.692	0.675	0.755	0.598

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 13b: Financially Unconstrained Firms: Excess Cash & Investment Conditional on Corporate Governance Metrics

This table examines the effects of excess cash on corporate Investment conditional on KZ Index and corporate governance measures after the 2008 financial crisis.The dependent variable is Investment measured as capital expenditure scaled by total asset. Excess cash is estimated as residuals from Dittmar & Marht-Smith (2007) model of normal cash holdings. The coefficent of interest is the interaction term between the "After" dummy and excess cash. Firms are sorted by the median based on KZ Index. Governance measure are based on Gompers et al. (2003) Index & Bebchuk et al. (2009) index. Firms are doubled sorted on both corporate governance & KZ index. Column [1] presents estimates for unconstrained firms, column [2] presents estimates for constrained firms. Column [3] presents estimates for unconstrained & Least Entrenched firms Column [4] presents estimates for unconstrained & Highly Entrenched firms. Column [5] presents estimates for Unconstrained and Democratic firms. Column [6] presents estimates for unconstrained & poorly governed firms. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment	Investment	Investment	Investment	Investment	Investment
After	-0.00734***	-0.0126***	-0.00884***	-0.00545***	-0.00407	-0.00710***
	(-9.41)	(-11.91)	(-4.34)	(-4.48)	(-1.35)	(-8.52)
AfterxExcessCash	-0.00637***	-0.00117	-0.00952***	-0.00454***	-0.0101***	-0.00498***
	(-6.64)	(-1.03)	(-3.73)	(-3.20)	(-3.37)	(-5.27)
Q	0.00147***	0.00230***	0.000388	0.00432***	0.00543**	0.00282***
	(2.60)	(3.79)	(0.30)	(3.54)	(2.49)	(4.10)
Cash flow	0.0384***	0.000142	0.0403***	0.0665***	0.0292***	0.0387***
	(7.84)	(0.03)	(4.05)	(6.03)	(2.80)	(5.67)
Constant	0.0359***	0.0449***	0.0422***	0.0268***	0.0330***	0.0320***
	(28.61)	(29.65)	(13.90)	(12.03)	(7.16)	(20.64)
Firm F.E	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes	Yes
N	3485	3595	991	877	423	1909
R^2	0.757	0.642	0.781	0.752	0.876	0.753

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 14: Excess Cash, Inventory & Investment Conditional on Corpoate Governance Metrics

This table investigates the relationship between excess cash and other measures of corporate spending. The data per column are: Columns [1]: All firms, columns [2]: Least entrenched firms, columns [3] Highly Entrenched firms, column [4]: Democratic firms and column [5]: Poorly governed firms.

Panel A	(1)	(2)	(3)	(4)	(5)
	Inventory	Inventory	Inventory	Inventory	Inventory
After	-0.00569***	-0.00150	-0.00873***	-0.00278	-0.00657***
	(-8.28)	(-1.11)	(-5.69)	(-1.30)	(-6.86)
AfterxExcessCash	-0.0128***	-0.0132***	-0.0138***	-0.0120***	-0.0139***
	(-16.20)	(-8.29)	(-8.36)	(-5.29)	(-13.04)
Q	0.00173***	0.000744	0.00345***	0.00221*	0.00143**
	(3.97)	(0.96)	(3.00)	(1.69)	(2.15)
Cash flow	0.0000633*	-0.00000817	0.000246**	-0.000127**	0.000390***
	(1.86)	(-0.15)	(2.47)	(-1.97)	(5.44)
Constant	0.120***	0.121***	0.133***	0.131***	0.118***
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	7067	1787	1772	725	3889
R^2	0.053	0.047	0.072	0.058	0.075
Panel B	R&D	R&D	R&D	R&D	R&D
After	-0.00254**	0.000866	-0.00135	0.000498	-0.00383***
	(-2.06)	(0.28)	(-0.84)	(0.08)	(-3.45)
AfterxExcessCash	-0.00670***	-0.00902**	-0.00288*	-0.00699	-0.00293**
	(-4.74)	(-2.50)	(-1.67)	(-1.09)	(-2.37)
Q	0.00876***	0.00450**	0.0107***	-0.00372	0.00521***
	(11.25)	(2.53)	(8.94)	(-0.98)	(6.73)
Cash flow	-0.00168***	-0.00163***	-0.00210***	-0.00266***	-0.000979***
	(-27.58)	(-13.24)	(-20.27)	(-14.11)	(-11.74)
Constant	0.0622***	0.0769***	0.0491***	0.108***	0.0528***
	(33.62)	(16.71)	(19.42)	(11.51)	(28.76)
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	7080	1793	1772	728	3893
R^2	0.122	0.117	0.230	0.263	0.048

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01

TABLE 15: Liquidity Risk, Excess Cash and Cash Accumulation

This table examines the effects of excess cash on cash accumulation after the 2008 financial crisis. The dependent variable is cash accumulation. Excess cash is estimated as residuals from Dittmar & Marht-Smith (2007) model of normal cash holdings. Coefficent of interest is the interaction term between "After" dummy and excess cash. Firms are sorted into quintile by interest coverage ratio (at the end of 2006). Interest coverage ratio is computed as EBIT scaled by Interest Expense. Column [1] present estimates for the "riskiest" firms and column [5] presents estimates for "safe" firms. Riskiness decline smonotonically from column [1] to column [5]. Observe the U-shape in the coefficient of interaction. "Safe" firms and risky firms on average have a higher propensity to allocate cash tobuildiing up cash balances. All regressions include firm and industry-year fixed effects. Standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)
	Cash Accum	Cash Accum	Cash Accum	Cash Accum	Cash Accum
After	0.0523***	0.0159***	0.0135***	0.0298***	0.0365***
	(2.76)	(3.04)	(2.63)	(5.05)	(4.57)
Afterx ExcessCash	0.138***	0.0587***	0.0638***	0.0728***	0.102***
	(6.12)	(10.00)	(11.06)	(11.79)	(11.21)
Constant	1.358***	0.447***	0.299***	0.438***	0.483***
	(9.15)	(6.96)	(5.05)	(6.95)	(6.53)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Firm F.E	Yes	Yes	Yes	Yes	Yes
Industry-Year F.E	Yes	Yes	Yes	Yes	Yes
Clustered Std Errors	Yes	Yes	Yes	Yes	Yes
N	1094	982	1136	1246	1172
R^2	0.315	0.227	0.206	0.296	0.267

NOTE: t-statistics in parentheses * p: 0.10, ** p:0.05, *** p:0.01