The Effect of Government Quality on Corporate Cash Holdings

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Abstract

We use China as a laboratory to test the effect of government quality on cash holdings. We build on, and extend, the existing literature on government expropriation and its interaction with firm-level agency problems by proposing a financial constraint mitigation argument. We find that firms hold less cash when local government quality is high, which is not consistent with the state expropriation argument, but supports the financial constraint mitigation argument. A good government lowers the investment sensitivity to cash flows and cash sensitivity to cash flows, decreases cash holdings more significantly in private firms, and improves access to bank and trade credit financing. We also test and find support for Stulz's (2005) model on the interaction between government and firm agency problems.

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1. Introduction

Government shapes the corporate operating environment and its behaviors affect corporate financial decisions. We examine in this study whether the quality of governments affects corporate cash holdings (CCH). CCH (and liquidity in general) are strategically important because they can crucially affect a firm's ability to maintain liquidity and to realize investment opportunities (Harford 1999; Campello et al., 2011). Cash is vulnerable to extraction by both external parties (e.g., the government, shareholders) and entrenched managers in the company (Myers and Rajan, 1998). It is therefore interesting to see how government quality and its interaction with the insider agency problem affect corporate cash holding decisions. In this paper, we follow Levine (2005) to define a good (or high quality) government as one that protects property rights by effective law and contract enforcement and refrains from expropriation.[1]

Our study stands at the intersection of two literatures, namely, the law and finance literature and the corporate cash holding literature. Prior law and finance literature identifies government as a key institutional factor and reports that a good government promotes macroeconomic growth (Frye and Shleifer, 1997; Shleifer and Vishny, 1998; La Porta, et al., 1999; Beck and Laeven, 2006), and government policy changes affect stock market volatilities (Pástor and Veronesi, 2012). However, there is fairly limited research at the micro level on the role of government quality (and its interaction with managerial incentives) in shaping firm financial policies such as cash holding decisions despite Stulz's (2005) "twin agency" argument.[2] That is, in addition to company insiders' (managers and controlling shareholders) expropriation of outside minority investors (i.e., the insider agency problem), the state also uses

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[1] La Porta et al. (1999) have a broader definition of a good government that protects property rights, keeps regulations and taxes light, is clean and democratic, and provides efficient public services. We follow the narrower version of Levine (2005) as it is more closely linked to corporate cash holdings.

[2] Gao and Yun (2011) reports that provision of public liquidity via the Commercial Paper Funding Facility (CPFF) in the US improves firms' access to finance and helps them take advantage of growth options in the crisis period. Firth et al. (2013) find that local government spending hurts firm performance in China. Using a cross-country sample, Caprio et al. (2013) is the only study focusing on governmental extraction of CCH. Measuring political extraction risk by indexes on corruption, they find a negative relation between political extraction risk and firms' cash holding.

discretionary powers to expropriate firms and their investors (i.e., the state agency problem).

Given the importance of CCH, researchers have long been interested in understanding their economic determinants and implications. In addition to the transactional cost motive and the precautionary motive (see Opler et al. (1999) and Bates et al. (2009) for a review), agency costs of managerial discretion are identified as an important factor affecting the level of CCH. Jensen's (1986) agency argument focuses on the shareholder-manager agency conflicts and predicts that when there is no effective monitoring, managers have incentives to use free cash flow to generate private benefits. As a result, shareholders discount the value of CCH in anticipation of such agency incentives. Some prior studies in the US provide evidence consistent with this argument (e.g., Harford, 1999; Harford et al., 2008; Dittmar and Mahrt-Smit, 2007) although Bates et al. (2009) find that the increase in CCH in recent years is not ascribed to agency problems.

Some researchers use cross-country data to understand how investor protection and related agency problems affect CCH. These studies, however, in general have three limitations. First, they mainly focus on shareholder rights granted by law and as a result, there is little evidence on how enforcement of investor protection affects CCH. This separation is nontrivial given that law on paper and enforcement can deviate significantly in many countries outside the US. Second, even for the effect of on-paper shareholder rights on cash holdings, the extant evidence is mixed. For example, in countries with weak shareholder rights, Dittmar et al. (2003) report that firms tend to hold more cash, and Pinkowitz et al. (2006) document that shareholders discount CCH more significantly. Kalcheva and Lins (2007) find that the same shareholder rights index does not have a significant effect on CCH. Caprio et al. (2013), in contrast, show that it is positively related to CCH when using a UK legal origin dummy as a proxy for strong shareholder rights. On the other hand, Kusnadi and Wei (2011) report that investor protection has a first-order effect on CCH and firms hold less cash in response to cash flow increase when investor protection is strong.

Third, these cross-country studies typically find it difficult to render good control for

firm-level agency problems (i.e., the insider agency problem in the terminology of Stulz (2005)) that are also important in cash holding decisions (Kalcheva and Lins, 2007). For instance, due to data limitation, Dittmar et al. (2003) only use a *country-level* family control to proxy for the insider agency problems. Lacking information on cash flow rights, Kalcheva and Lins (2007) measure firm-level agency problems by managerial control rights, and they are careful to note that this proxy mainly reflects insiders' capability rather than incentive of expropriation. Kusnadi and Wei (2011) do not control for firm-level agency proxies.

Our study takes a different approach to testing the effect of institutional quality on CCH by using a unique intra-country dataset outside the US. Focusing on a single country outside the US is crucial for the purposes of this study. First, we can have a cleaner test of the enforcement-component of investor protection on CCH by effectively holding shareholder rights conferred by law on paper constant (e.g., see Xu, 2011). Second, focusing on a single country outside the US makes it possible to directly test the interaction between the twin agency problems advanced by Stulz (2005) and its effect on corporate financial policies. The US is not an appropriate setting for testing the interaction between the twin agency problems given that in the US government expropriation is not a major issue. Nor a cross-country sample is ideal because it is difficult to come up with good firm-level agency proxies in international studies.

Of course, a potential concern for using single-country data is that there might be limited variations in the quality of government and other institutions. We mitigate this concern by choosing China as a laboratory that is a large and diverse country with substantial disparity in the levels of economic and institutional development across different regions despite the same commercial laws on paper (Cull and Xu, 2005; Lin et al., 2010).

Building on and extending the prior research, we hypothesize that a good government may affect CCH in three ways. First, a good government refrains from expropriating firms, and as a result firms can hold more cash with less fear over government extraction (i.e., the expropriation argument) (Caprio et al., 2013). This predicts a positive relation between government quality and CCH. The reasoning is as follows. Stulz (2005) notes that facing the

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government expropriation risk, corporate insiders are likely to take actions to reduce expropriation by the state. Caprio et al. (2013) argue that one possible action is for firms to hold less liquid assets (i.e., cash and cash equivalents). This is because cash is difficult to trace and easy to convert to private consumption, and as a result, cash is more vulnerable to expropriation than illiquid tangible assets (e.g., property, plant, equipment, and inventory) (Myers and Rajan, 1998). In addition, Svensson (2003) reports that (corrupt) government officials take account of firms' ability to pay when deciding on how much bribery to ask for; as a result, the more a firm can pay, the more it must pay. This factor provides added incentives for firms to keep less cash to reduce government expropriation. Using 30,000 firms across 109 countries, Caprio et al. (2013) find that measures of political corruption are negatively related to corporate cash holdings, but positively related to tangible assets and dividend payouts. Using another sample, Kusnadi and Yang (2010) also find broadly similar results. Therefore, firms appear to shelter assets from state expropriation by keeping fewer liquid assets.

Second, we propose that a good government may help relieve financial constraints facing firms and enable them to hold less cash for precautionary purposes (i.e., the financial constraint mitigation argument), which is largely overlooked by prior studies. Specifically, a good government better protects property rights by enforcing law/business contracts, thereby boosting banks' confidence in lending as the chance of loan repayment and repossessing collateral increases (Ayyagari et al., 2010; Xu, 2011). Similarly, a good government will uphold contracts in business disputes and this enhances the credibility of business entities, thereby allowing local firms to access more trade credit financing. A better access to finance lowers the marginal value of cash, which means firms should keep less precautionary cash (Faulkender and Wang, 2006). Moreover, being less predatory and stricter in enforcing laws and rules, a good government may also help enhance corporate governance and transparency (Stulz, 2005; Desai et al., 2007), which in turn lowers the costs of debt and equity financing.[3] This financial constraint mitigation argument predicts a negative relation between government quality and

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[3] Note this possibility also points to a form of the interaction between the state agency problem and the insider agency problem that we will discuss next.

CCH.

Third, a good government may also indirectly affect CCH through its interaction with the insider agency problem. A large wedge between the voting rights and cash flow rights owned by the ultimate owner generates more incentives for the controlling shareholder to expropriate outside minority investors. To the extent that cash, an anonymous and easy-to-transport liquid asset, is vulnerable to expropriation, a large ownership wedge is expected to lead the company to keep more cash to facilitate extraction (Kalchrva and Lins, 2007). A good government better protects investors via more effective law/contract enforcement, and this increases the cost to corporate insiders of extracting private benefits (e.g., via siphoning cash) from the firms they control. Indeed, state expropriation and insiders' expropriation of private benefits often reinforce each other (Stulz, 2005), which suggests that reducing state expropriation also decreases the extent of insiders' expropriation. We therefore hypothesize that government quality attenuates the positive relation between ownership wedge and CCH.

We empirically test the above predictions with a unique dataset on government quality sourced from a World Bank (2006) Survey in China. Measuring government quality by indexes on property rights protection, cleanliness of a government, tax burden, and an aggregate of these indexes, we find robust evidence that firms hold less cash when there is a better local government. This evidence does not support the state expropriation argument, but is potentially consistent with the financial constraint mitigation argument and the notion of the interaction between the twin agency problems. Importantly, the result is not an artifact of differences in financial market development since we control for the difference in economic and credit market development in our cash holding models.

We then seek to provide direct evidence on whether and how a good government mitigates the financial constraints of local firms. First, we show that government quality reduces the sensitivity of investment to cash flow (Fazzari et al., 1988) and the sensitivity of cash to cash flow (Almeida et al., 2004). Second, we demonstrate that the negative effect of government quality on CCH is more pronounced in private firms than in SOEs because private firms face

more financial constraints than SOEs in China. Third, we explore the possible channels through which a good government helps relieve a local firm's financial constraints and find that government quality improves firms' access to bank loans and trade credit (measured by accounts payable).[4]

As discussed above, the negative relation between government quality and cash holding is also potentially consistent with Stulz's (2005) theory of the interaction between the twin agency problems. We use the wedge between control rights and cash flow rights for the ultimate owner to measure the extent of incentive conflicts between controlling and minority shareholders. We consider this proxy appropriate in a setting such as China where the corporate ownership structure is concentrated (Lin et al., 2011). We find that a large wedge between the control rights and cash flow rights owned by the ultimate owner is associated with more CCH when government quality is below the sample median. The result also provides direct support for Stulz's (2005) argument on the interaction between the twin agency problems by showing that such interaction affects CCH.

Our study makes three contributions. First, in relation to CCH, prior studies have mainly focused on the state expropriation argument, but largely neglected the financial constraint mitigation argument.[5] By showing that a good government helps the indigenous companies relieve financial constraints and enable them to keep less cash, our study sheds light on a new channel through which institutional quality affects CCH. Our finding differs from the positive relation between government quality and CCH reported in Caprio et al. (2013). Using an international sample, they only consider and find support for the state expropriation argument. The difference in results might be because their study is a joint test of the effect of shareholder rights and enforcement on CCH, whereas ours is a test of the law enforcement since we effectively hold the law-granted shareholder rights constant by using single-country data. It is

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[4] Cull et al. (2014) also use bank loans and trade credit as main forms of corporate access to external finance in China.

[5] To our knowledge, Kusnadi and Wei (2011) is the only study that recognizes this channel but their focus is on legal protection of minority shareholders rather than on government quality.

also possible that firms in China rely more heavily on debt financing (and this is typical of many developing countries). The different evidence obtained from China suggests that focusing on a single country outside the US may represent a fruitful exercise and provides a potential to refine the existing theories.

Second, while Kalcheva and Lins (2007) are the first study to test the effect of the interaction between shareholder rights and insiders' agency problem on CCH, our paper is the first to test the effect of the interaction between government quality (and law enforcement) and insiders' agency problem on corporate cash polices. Different from the insignificant effect of shareholder rights on CCH observed in Kalcheva and Lins (2007), we find that government quality has a robust, negative and first-order effect on CCH regardless of the extent of ownership wedge. Third, we enrich the literature (e.g., see Cull and Xu, 2005; Fan et al., 2007; Chen et al., 2008; Lin, Lin and Zou, 2012; Firth et al., 2013; Zou and Adams, 2008; Ayyagari et al., 2010) on corporate finance in China, a large and growing economic power, by providing evidence on the cash holding decisions. Chinese firms are typically excluded from prior cross-country studies on cash holdings. As a result, we know little about this issue in China. Moreover, as noted by Cull et al. (2014), there has been very limited research on financial constraints in developing countries. Our study fills these voids.

2. Institutional background

China represents an appropriate laboratory for the examination of the effect of government quality on corporate cash policy for the following reasons. First, a major stream of the economic reforms in China over the last three decades has been to decentralize administrative rights and to increase local governments' autonomy. Ayyagari et al. (2010) note that local governments in China can implement national laws according to their needs in order to compete against each other to promote regional economic development (Qian and Roland, 1998) or to enable corrupt government officials to extract rents. If a local government is committed to

developing the local economy, it is more likely to protect property rights, enforce laws and contracts, and refrain from expropriating firms (Levine, 2005). However, if a government (and its officials) is more interested in extracting private rents, it can expropriate firms via asking for bribery, imposing various local taxes and levies, and/or being lax in enforcing laws and contracts. This means that government quality could vary significantly between the Chinese cities.

Second, while the country has uniform commercial laws that grant the same shareholder and creditor rights on paper, enforcement often deviates from law on paper and there is substantial disparity in property rights protection among different regions (Cull and Xu, 2005). More importantly, courts are not fully independent of the local government administration (Peerenboom, 2002). This means that government quality crucially determines the extent to which property rights are protected and laws and contracts are enforced. China therefore represents a natural laboratory within which to test the effect of government quality and law enforcement on corporate cash holdings.

Third, corporate cash holding decisions are particularly important in China because there are various regulatory restrictions on the access to stock and bond financing (Xiao and Zou, 2008). Indigenous firms heavily rely on formal or informal debt financing. Cash holding decisions are even more crucial for private firms as they are at a disadvantage in gaining access to formal debt financing provided by state-owned banks. The co-existence of SOEs and private firms enables us to investigate whether government quality has differential effects on firms with different owner identities and hence different financial constraints.

Fourth, companies may use lines of credit and cash as substitutes to manage liquidity (Campello et al., 2011). Neglecting this interaction (as in most prior studies on cash holdings) may lead to biased inferences on cash holdings.[6] In China, firms' access to lines of credit is in

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[6] The failure to control for lines of credit in many cash holding studies is presumably due to the difficulty in

general rare, and this feature allows us to conduct a cleaner test of the cash holding decision. Nevertheless, we control for the hand-collected lines of credit in our cash holding models.

3. Data and variables

3.1. Sample selection

We obtain data on government quality from a World Bank (2006) survey report entitled "Governance, Investment Climate, and Harmonious Society — Competitiveness Enhancements for 120 Cities in China". This survey covers 12,400 firms in 120 major cities in China and provides detailed city-level data on government effectiveness and progress toward a harmonious society, among other characteristics. The 120 cities are distributed across all provinces except Tibet and their combined GDP accounts for about 80% of China's total GDP. The survey questions reflect how firms perceive the quality of the governments in 2004, and firm-level replies are then aggregated into various city-level average indexes. Cull et al. (2014) describe the dataset as large and representative and use it in examining the effect of government connections and firms' financial constraints in China.[7] Cull and Xu (2005), Ayyagari et al. (2010) and Lin et al. (2010) also use a similar but a smaller scale survey (covering 18 cities) conducted by the World Bank in early 2003 in their study of financing and investment of Chinese firms.

As the World Bank Survey was undertaken in 2005 and collected data for 2004, we measure cash ratio, the dependent variable in our analysis for the period 2005 to 2007. Starting from 2005 allows the effect of government quality to show up in future corporate cash holding decisions. Ending in 2007 reflects a balance between the need to have more data for analysis

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obtaining data on lines of credit.

[7] The city-level indexes may arguably represent finer measures of government quality and institutional developments than other levels (e.g., province level) used in other studies (e.g., Kusnadi and Yang, 2010).

and the need to ensure that information on government quality does not become stale. It also has the advantage of avoiding the possible structural break effect of the recent financial crisis on corporate cash holdings.

We exclude from the sample financial firms and firms that are not headquartered in any of the 120 cities covered by the World Bank Survey, and the cities that do not have any listed companies. Following the literature (e.g., Coval and Moskowitz, 2001; Cull and Xu, 2005; Ayyagari et al., 2010; Lin et al., 2010; Becker et al., 2011), we focus on the location of corporate headquarters. This focus is also important in our study for two reasons. First, regional protection is common and strong in China, and a local government invariably discriminates against firms headquartered in other places in allocating scarce resources partly because firms that are headquartered locally need to pay their income tax to the local government treasury (Li et al., 2004). Second, the jurisdiction requirement in China is that the plaintiff (e.g., a bank or a business supplier) can only bring a lawsuit to the court where the defendant is incorporated. This means that the quality of the government where a firm is headquartered matters.[8]

Our final sample consists of a maximum number of 3,074 firm-years across 114 cities from 2005 to 2007, and the exact number of observations may vary according to model specifications due to the missing values on some variables. Accounting and ownership variables are extracted from the China Stock Market and Accounting Research (CSMAR) database that is available from WRDS.

3.2. Government quality measures

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[8] In China it is rare but possible that some large firms' major assets and financing are located outside the place of the firm's headquarter. If so, imprecise mapping may arise. (There is no public data on firms' geographical distribution of assets and financing in China). While this potential imprecise mapping is common in the literature, we note that this possibility should add more noises and work against finding a negative relation between local government quality and the level of corporate cash holdings. Moreover, in unreported tests, we drop firms whose size is in the top median group assuming that large firms are more likely to be geographically diversified and find that our inference is robust.

Levine (2005) argues that a good government can protect property rights by a) facilitating private contracting, and applying laws and rules fairly to everyone; and b) sufficiently constraining itself from expropriation. To measure a), we use a city-level index on property rights protection (*Property rights protection*) by the local government and local court obtained from the World Bank Survey (2006). The index ranges from 0 to 1, with a higher value indicating better property rights protection by law/contract enforcement. Government expropriation in contemporary China can take the forms of tax & levies imposed and corruption. We use two city-level indexes obtained from the World Bank Survey (2006) to measure the extent of government expropriation. The first index (*Lightness of tax burden*) is based on the taxes and fees that a firm pays as a percentage of its sales. This measure includes not only the taxes but also the various fees collected by the government. To be specific, the measure consists of value added tax, income tax, business, resource, land, and real estate taxes, plus miscellaneous administrative levies and charges. All the taxes and fees except for value added tax and part of income tax are directly collected by local governments. Tax and fee collection is considered an important means of government expropriation (Cull and Xu, 2005; Stulz, 2005). Firth et al. (2013) show that in China local governments that spend more on public administration tend to collect more fees from companies and spend less on social welfare and infrastructures. Therefore, a low-quality government can use this tool to extract firms' resources while a good government can use it to foster a more conducive business environment for local firms.

The second measure (*Government cleanliness*) is based on firms' average expenditure on travel and entertainment (scaled by firms' total sales) in a city.[9] Managers of China's listed firms often use such expenditure as "informal payment" to bribe government officials. Caiet al. (2011) use the same variable as a measure of corruption in Chinese firms and find that such expenditure includes both "grease money" that helps firms obtain better government service,

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[9] As the World Bank Survey puts, it is pointless to directly ask on corruption (also see Xu, 2011).

and "protection money" that helps firms reduce government expropriation by taxation. To ease the interpretation of results, we multiply the last two measures by -1 in regressions so that for all measures, a higher value indicates higher government quality.

These measures of government quality are also used in some prior studies. For example, Cull and Xu (2005) and Lin et al. (2010) use a similar property rights protection index in their study of the influence of property rights security on firm reinvestment and R&D investment in China. Fan et al. (2009) use property rights protection and corruption as measures of government quality in studying FDI inflow. Johnson et al. (2000) use taxation, corruption and confidence in court as measures to investigate why firms conduct unofficial activities. Given that these measures of government quality and the data from the World Bank Survey have been used in prior studies, we believe our government quality measures are reasonable and meaningful.

Since these three proxies measure different aspects of a good government, we also construct an aggregate government quality index following Francis et al. (2004). Specifically, we first rank each government quality proxy into decile groups. We then calculate the mean ranking of the three proxies to form an aggregate government quality index. A higher value in the aggregate index indicates higher government quality.[10]

3.3. Dependent and control variables

Following Dittmar et al. (2003) and Harford et al. (2008), we use the logarithm of firms' cash ratio that is defined as the amount of cash and cash equivalents scaled by total assets net of cash and cash equivalents as our dependent variable. In addition to government quality proxies,

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[10] As a robustness check, we also use a principal component analysis to aggregate the three proxies and find consistent results. See the discussion in Section 4.2.

we follow the literature on firms' cash holdings (e.g., Opler et al., 1999; Dittmar and Mahrt-Smith, 2007; Capiro et al., 2013) to include in our models a large number of control variables that have been shown to affect cash holdings. Specifically, we include in the cash model the natural logarithm of total assets, net working capital (net of cash and equivalents)/net assets (NWC), firm leverage, Q, cash flow from operating activities (earnings before extraordinary items and depreciation minus cash dividends) divided by total assets, cash flow volatility, capital expenditure divided by total assets, and a dummy variable on dividend payout.

The main firm-level insider agency problem proxy we use is the ownership wedge that is defined as the ultimate owner's control rights minus its cash flow rights. Using the ownership wedge to proxy for the insider expropriation problem is a common practice when ownership structure is concentrated (e.g., Claessens et al., 2000; Lin et al., 2011). The larger the ownership wedge, the higher the incentives for the controlling shareholder to expropriate minority shareholders. We expect firms with a large ownership wedge to keep more cash to facilitate rent extraction.

We also include firm identity (state-owned or not) in our models to control for the possibility that SOEs and private firms may have different patterns in cash holding decisions.[11] Such differences may arise from their differential access to external finance and different agency problems. Private firms have less access to external finance than SOEs and so may need to hoard more cash to prepare for future adversity. In addition, private firms tend to have more effective monitoring over the management (Zou et al., 2008). If self-interested managers value the flexibility and discretion afforded by cash, private firms are expected to keep less cash because shareholder monitoring is more effective. On the other hand, if self-interested managers value more the private benefit from spending cash, more effective monitoring of

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[11] The ownership identity data are obtained from the China Center for Economic Research (CCER) database compiled by Peking University.

managers in private firms may result in more cash.[12] Therefore, the effect of firm identity on cash holdings is not clear cut ex ante.

Chinese firms, especially SOEs, may sometimes receive direct subsidies from local governments, which could decrease CCH. We thus include government subsidies received by a firm in a year divided by total assets as an additional control variable.

One side of our argument on the effect of government quality on corporate cash holdings focuses on how a good government helps relieve firms' financial constraints and thereby enable them to hold less cash. If a good government helps develop a more sophisticated local banking sector, local firms should have better access to finance and so hold less cash. While this possibility is not inconsistent with our hypothesis, we follow Dittmar et al (2003) and Kalcheva and Lins (2007) to control for financial market development (proxied by the ratio of bank loans to GDP) and economic development (GDP per capita) in our models to show that the effect of a good government on corporate cash holding goes beyond such a possibility. That is, we conjecture that the main channels through which a good government helps mitigate financial constraints are: a good government enhances the credibility of local firms and lowers the credit risk of banks and a firm's trading partners so that local firms can access more bank loans and trade credits.

Although only 20% of Chinese firms have access to lines of credit that is an alternative liquidity source, we include in our model a variable on a firm's available lines of credit scaled by the year-beginning total assets, to ensure that our inference on CCH is not biased by lines of credit as an omitted correlated variable. Information on lines of credit is hand collected from corporate filings and announcements.

Appendix 1 provides detailed definitions of all variables. Except for net working

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[12] See Harford et al. (2008) for a detailed discussion of these different arguments.

capital/net assets, all other control variables are calculated at the beginning of the year to ease the interpretation of results. Non-logged continuous variables are winsorized at 1% at both tails to mitigate the undue effect of extreme values. All of our models also include industry fixed effects as well as year dummies to control for the effect of time related industry patterns and macroeconomic uncertainties (Dittmar, 2008).

3.4. Summary statistics

The descriptive statistics are presented in Table 1. The cash ratio has a mean of 0.199 and a median of 0.138, and both are higher than the figures reported in the cross-country samples used in Dittmar et al. (2003) and Kalcheva and Lins (2007). This is consistent with our argument that cash holding decisions are important for Chinese companies that often face financial constraints. In addition, our sample firms have a mean total debt ratio of 54.2%, a mean Q of 1.179, and a mean chance of paying a cash dividend of about 50%.

The government quality measures show reasonable variance across different cities. Unreported correlation coefficients suggest that the cash ratio is negatively related to the proxies of government quality, which provides preliminary support for our financial constraint mitigation hypothesis and/or the interaction between the twin agency problems rather than the government expropriation argument.

[Insert Table 1 here]

4. Empirical results

4.1. Government quality and cash holdings

We first report the firm-level results from regressing the logged cash ratio on government quality measures in Table 2. As our key independent variables on government quality are measured at the city level, firm-level regression errors are correlated within cities (see Moulton, 1986). We therefore report robust standard errors clustered at the city level to account for the within-city correlation among firms.[13]

We include one government quality proxy at a time. The results show that all the government quality proxies and their aggregate are loaded negatively and significantly. Therefore, firms hold less cash when government quality is higher. This finding does not support the state expropriation argument that predicts a positive relation between government quality and corporate cash holdings (see Caprio et al., 2013).[14] Instead, the result is consistent with the argument that a good government helps relieve local firms' financial constraints and thereby enable them to hold less cash and/or that a good government constrains the insider agency problem. This leads us to conduct further tests later on to ascertain the exact channels that underpin this negative relation. The effect of government quality on cash holdings also appears economically significant, for example, when the property rights protection index increases by one standard deviation, a firm's cash holding lowers by about 2 percentage points, which is about 10% of the sample mean of the cash ratio. In unreported tests, we find that the negative relation between government quality and cash holding is not due to the possibility that investors force firms to disgorge more cash as payouts in places where government quality is high (e.g., see Dittmar et al., 2003).

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[13] We thank an anonymous reviewer for suggesting this.

[14] One may argue that facing the risk of government expropriation, firms may need to hold a minimum amount of cash to pay government expropriation. This reasoning suggest that under the state expropriation argument, firms' cash holdings may have a fixed component but overall cash holding should increase with government quality, or it is possible that the effect of government quality on cash holdings could first decrease and then increase with government quality. Based on our data, we find no evidence consistent with these possibilities. We thank an anonymous reviewer for bringing this argument to our attention.

Regarding the control variables, consistent with Dittmar et al. (2003), we find that firms with more growth opportunities (as measured by a higher Q value) and/or more operational cash flow tend to hold more cash. As in Kalcheva and Lins (2007) and Capiro et al. (2013), firms with more working capital, higher leverage, and larger capital expenditure tend to hold less cash. Similar to the finding of Opler et al. (1999) and consistent with the argument of Dittmar (2008), firms with more volatile cash flows choose to hold more cash. Also we find that firms paying dividends in the previous year hold more cash in the current period. While this is different from the finding in Opler et al. (1999), it is possible that Chinese firms want to keep sufficient cash to maintain a "sticky" dividend payout.

In addition, we find that private firms have more cash holdings than SOEs. This is consistent with the notion that private firms have limited access to finance and need to hoard more cash to prepare for future adversity than SOEs. Alternatively, it may reflect that the possibility that the more effective monitoring of managers in private firms reduces managers' waste of cash in overinvestments. Other control variables do not have a significant effect on cash holdings.

[Insert Table 2 here]

4.2. Robustness of results

4.2.1. City-level regression

Since each city has a different number of firms in our sample, a concern is whether the above results are driven by a few cities with a large number of firms. To mitigate this concern, we follow Caprio et al. (2013) to run a city-level regression in which firm-level controls are averaged across all sample firms in a city in a year. The results, presented in Table 3, are generally similar to those obtained from the firm-level analysis reported in Table 2: government

quality is negatively related to cash holdings though the significance of lightness of tax burden is on the margin.

[Insert Table 3 here]

4.2.2. Alternative government quality measures at the city-industry level

Since our government quality measures are constructed from firms' perceptions averaged within the city level, there might be some unobserved industry characteristics that are correlated with both firms' perceptions and cash holdings. In the baseline regression, we have used city-level government quality measures and controlled for industry fixed effects. As an alternative way, we explicitly allow firms' perceptions of government quality to vary with industries by measuring government quality as city-industry means of firm perceptions.[15] Correspondingly, we cluster standard errors at both city and industry level to account for the correlation within an industry-city pair.   It is worth noting that the World Bank Survey (2006) only covers manufacturing firms and so the sample size drops by about one-third in models using city-industry-level government quality proxies.[16] The results are reported in Table 4.

As shown in Table 4, the results on government proxies are robust to the use of industry-city-level government quality proxies. In addition, the results on almost all firm-level control variables remain similar even with these smaller samples.

[Insert Table 4 here]

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[15] Long (2010) also uses city-industry mean of firm perceptions as a measure in the study of court effectiveness.

[16] In addition, the proxy on property rights protection has an even smaller sample size because of missing values due to some firms' non-responses in some small industries.

4.2.3. Other robustness checks

In addition, we conduct several other robustness checks as follows. Since cash ratio (the dependent variable) is measured over the period 2005-2007 while government quality (the key explanatory variable) is taken from the World Bank Survey that reflects the situation in 2004, one may wonder how sensitive our results are to the choice of the measurement years. In unreported results, we run a regression using the cash ratio and other independent variables for year 2005 only and another regression using the cash ratio and other independent variables averaged over the period 2005-2007. Our key finding is not altered qualitatively by either of the alternatives.

Our current aggregate government quality measure is the mean decile ranking of each government quality measure. As a robustness check, we construct the aggregate measure of government quality by a principal component analysis and regress cash holdings on this aggregate measure. The untabulated results show that this variable also has a significant and negative relation with cash holdings.

Given a certain level of liquidity demand, a firm may choose between holding cash and lines of credit (Campello et al., 2011). Compared with cash, funds available in the form of lines of credit are subject to bank monitoring and they are also harder to be expropriated by the government. Therefore, in unreported results we also regress cash/(cash + lines of credit) on the aggregate government quality measure and ownership wedge of the ultimate owner. We, however, did not find any significant result on the government quality measure and ownership wedge. This, however, may not be surprising given that less than 20% of our sample firms have access to lines of credit so that the dependent variable is very close to one for most firms. This lack of variation in the dependent variable means that our test has very limited power.

4.3. Evidence on good governments relieving financial constraints

In this section, we seek to provide direct evidence on whether a good government mitigates the financial constraints of local firms.

4.3.1. The effect of government quality on the investment sensitivity to cash flow and cash sensitivity to cash flow

We employ the investment-cash sensitivity model from Fazzari et al. (1988):[17]

Investment = f(CF, Government quality, CF*Government quality, lagged Q, Controls)   (1)

where *Investment* is defined as capital expenditure/year-beginning total assets, *CF* is cash flow (i.e., earnings before extraordinary items and depreciation minus dividends/year-beginning total assets), and *Q* for investment opportunity.

Fazzari et al. (1988) argue that since external financing is more costly than internal financing, firms rely more on internal financing when they face serious financial constraints. As a result, most capital expenditure should be financed by internally generated cash flow. Therefore, the coefficient of *CF* is expected to be significantly positive and its value can be regarded as a measure of the degree of financial constraint.

We introduce a government quality measure into the model and interact it with cash flow. If a good government does help relieve financial constraints, the coefficient for *CF*Government quality* is expected to be significantly negative. The results reported in Table 5 confirm our financial constraint mitigation hypothesis. In all the four government quality proxies, the coefficient of the interaction term is negatively significant, indicating that a good government does help reduce financial constraints, and thus reduce cash holdings in local

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[17] This model is also used in McLean et al. (2011) on the investment sensitivity to cash flow and Q.

firms.[18]

[Insert Table 5 here]

We also conduct city-level analyses on the role of government quality in reducing financial constraints. Following McLean et al. (2011), we first regress capital expenditure/year-beginning total assets on cash flow from operations/year-beginning total assets (*CF*) and lagged *Q* using all sample firms within a city to obtain the coefficient of *CF* (i.e., the sensitivity of investment to cash flow in a city).[19] We then regress Ln(1+ coefficient of *CF*) on government quality measures controlling for GDP per capita and firm characteristics averaged across the sample firms within a city. The regression coefficients of government quality measures can then be interpreted to be the marginal impacts of government quality on the financial constraints measured as the sensitivity of investment to cash flow.

The results from the second stage regressions (unreported for brevity) show that all local government quality measures are significantly and negatively related to the financial constraint measure (the dependent variable), suggesting that a good government does help reduce firms' financial constraints.

However, whether investment-cash flow sensitivity is a good indicator of financial constraint is not without controversy in the literature (e.g., Kaplan and Zingales, 1997, 2000).[20] We thus use an alternative measure of financial constraints, i.e., cash flow sensitivity of cash

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[18] Note that the coefficient of *CF* is only significantly positive in two models. In another specification, we follow Jaccard et al. (1990) to de-mean both *CF* and government quality measures and to use them in regression and in constructing the interaction term. The results on the interactions are robust and the coefficient of *CF* is positive and significant in all models.

[19] When we estimate *CF* coefficients for each city, we require each city to have at least ten usable firm-years and only 88 cities meet this requirement.

[20] Two recent studies (Moshirian and Vadilyev, 2013; Cull et al., 2014) confirm that investment-cash flow sensitivity is a valid measure of financial constraints, particularly in developing countries.

posited in Almeida et al. (2004). The intuition of this measure is that if firms are more financially constrained, they tend to save more cash flow as cash to prepare for future adversity. To be specific, we employ the following model:

$$\Delta Cash\ ratio\ =\ f(Cash\ flow,\ Government\ quality,\ Cash\ flow*Government\ quality,$$
$$Controls) \tag{2}$$

Following Almeida et al. (2004), the controls in Equation 2 include firm size, Q, investment, change in non-cash net working capital (ΔNWC), and change in short-term debt. Appendix 1 provides detailed definitions of these variables. We expect the coefficient for the interaction term between cash flow and government quality to be significantly negative. This is indeed what we find in Table 6. The results on the control variables are consistent with those in Almedia et al. (2004). Therefore, we find some direct evidence that government quality helps local firms relieve their financial constraints (measured by both investment sensitivity to cash flow and cash sensitivity to cash flow).

[Insert Table 6 here]

4.3.2. Differential impacts of government quality on cash holdings of firms with different financial constraints

As discussed earlier, compared with SOEs, private firms are often disadvantaged in transition economies including China. For example, they have less access to external formal finance (Firth et al., 2008; Ayyagari et al., 2010), are subject to more unfavorable government regulations, or pay more "extralegal" fees (Johnson et al., 2000; McMillan and Woodruff, 2002). Private firms therefore face more financial constraints. In contrast, SOEs in China may have soft-budget constraints, i.e., when an SOE faces financial hardship, the government may come to rescue it especially when the SOE is large (Qian and Roland, 1998). As a result, SOEs do not

need to hoard much cash. If the financial constraint mitigation argument is at work, the negative relation between government quality and cash holding should be more pronounced in private firms. This possibility is examined in Table 7. We first create an interaction term between the *Private* dummy (which equals one if the ultimate owner is not a state-owned entity and zero otherwise) and aggregate government quality. We expect the coefficient of the interaction term to be negatively significant. The results reported in Table 7 provide some support for the argument that the financial constraint mitigation effect of a good government is more beneficial to private firms than to SOEs.

[Insert Table 7 here]

The results from our above three tests provide direct support for the financial constraint mitigation hypothesis that is predicated on the argument that better property rights protection and contract enforcement by a good government improves firms' access to finance. Importantly, these results are not an artifact of differences in financial market development since we control for the difference in economic and credit market development in our cash holding models.[21]

4.4. The channels through which a good government relieves financial constraints

Thus far, we have found that higher government quality leads to less corporate cash holdings and the result is due to good governments helping relieve the financial constraints that local firms face. A natural follow-up question is through what channels a good government achieves this.

We consider two possibilities. First, as we have discussed in the introduction part and

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[21] Private credit/GDP does not always enter the model significantly. Kusnadi and Wei (2011) also find that once legal protection of investors is controlled for, financial market development has no incremental impact on firms' cash management policies.

hypotheses, Chinese firms rely heavily on bank debt financing. Since a good government protects property rights by enforcing law/business contracts, the chance for banks to secure loan repayments and to repossess collateral in the event of a default will be higher. Banks are therefore more willing to lend to companies in cities where government quality is higher and this increases firms' access to bank loans. Second, a good government provides better legal and administrative systems, which improves the trust among business entities and enhances contract enforcement. As a result, it is possible for firms to use more trade credit such as accounts payable as a source of short-term finance (Wu et al., 2014). Cull et al. (2014) also use bank loans and trade credit as proxies for access to external finance in China.

We test these arguments by regressing firms' access to bank loans (proxied by the sum of short-term and long-term loans that the company borrows from banks scaled by total assets) and firms' accounts payable divided by total net assets on government quality. To save space, we focus on the aggregate government quality measure and the result shown in column 1 of Table 8 suggests that government quality is positively related to firms' access to bank loans. The negative coefficient of Q is consistent with the argument that high-growth firms may need to use more equity to finance their growth in order to lower the agency cost of debt that arises from the more information asymmetry and/or high risk in a high-Q firm. To examine whether government quality helps high-Q firms to obtain bank loans, we interact Q and government quality in column 2. The coefficient on the interaction term is positive and significant at the 0.10 level, thereby providing some weak support for the argument that better property rights protection via law/contract enforcement afforded by a good government helps mitigate banks' concern over the credit risk of lending to more opaque high-Q firms and facilitates their access to bank loans. In column 3, we also find that a good government facilitates trade credit financing as measured by accounts payable.

Taking the above results together, we conclude that a good government relieves firms' financial constraints, which reduces corporate cash holdings. We note that this only speaks of

the dominating effect of a good government perceived by corporate insiders and we cannot rule out the possibility of government expropriation that might coexist and exert an opposite influence on firms' cash holding decisions.

[Insert Table 8 here]

4.5. The interaction between the state agency problem and insider agency problem

As discussed earlier, a negative relation between government quality and cash holding is also potentially consistent with the argument concerning the interaction between the twin agency problems as advanced by Stulz (2005). Specifically, we hypothesize in the introduction part that a large ownership wedge is expected to lead the company to keep more cash to facilitate extraction (Kalcheva and Lins, 2007), and a good government mitigates the insider agency problem since it increases the cost for insiders to appropriate cash from the firm. We examine these possibilities in this section. The results are reported in Table 9.

[Insert Table 9 here]

In column 1, we define a dummy for high aggregate government quality (AGQ) that equals one if AGQ is above the sample median, and interact it with ownership wedge. The high AGQ dummy has a negative coefficient and the interaction term is also loaded negatively. This suggests that the effect of government quality on corporate cash holdings is strictly negative, reaffirming the financial constraint mitigation argument. The negative and significant coefficient of the interaction term indicates that a good government attenuates the positive relation between ownership wedge and cash holdings because it increases the cost to corporate insiders of extracting private benefits (e.g., cash) from the firms they control. It is also

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consistent with Stulz's (2005) argument that state expropriation and insiders' expropriation of private benefits often reinforce each other.

The standalone coefficient of ownership wedge is positive and significant. Therefore, in cities with a lower-than-sample-median government quality index, a large ownership wedge is associated with more corporate cash holdings. In contrast, in cities with a higher-than-sample-median government quality index, ownership wedge has a coefficient of -0.411 (= 0.631 − 1.042), and a Wald test suggests that it is not statistically significant. Therefore, the insider agency problem is more pronounced when government quality is low. Overall, we conclude that the quality of external institutions such as the government appears to have a first-order effect on corporate cash holdings. In column 2, we further control for city-level financial and economic development, and the results are weaker but qualitatively similar.

4.6. Discussions

Compared with studies that regress a firm-level variable on other firm-level variables, endogeneity in our study should be less of a concern given that our dependent variable is at the firm level and government quality is at the city level. However, since our government quality measures are constructed from firms' perceptions averaged at the city level, we cannot rule out the possibility that these government quality measures are subject to a feedback effect running from firms' financial situation (e.g., cash holdings). Xu (2011, p.313) in reviewing research using data on World Bank investment climate surveys notes the special difficulty in identifying appropriate instruments given the cross-sectional nature of the World Bank data. As a result, he concludes "… most research using the investment climate data cannot establish causality convincingly. …The results should therefore be interpreted as a collection of correlations. To the extent that the results are robust across similar contexts, or consistent with plausible theories, the

conclusions are more credible." Our results are subject to the same limitation. However, it has been well established in the literature that private firms are more financially constrained than SOEs in China due largely to SOEs' privileged access to loan credits provided by state-owned banks. In this connection, our conclusion that high government quality mitigates financial constraints and enables firms to hold less cash is more credible. This is because we rely on institutions to identify (private) firms facing financial constraints (as in Cull et al., 2014; Hoshi et al., 1991) and find that private firms hold more cash than do SOEs, and the negative effect of government quality on corporate cash holdings is more pronounced in private firms. We are also able to provide an analysis on the channels through which government quality mitigates financial constraints and the related evidence concerning firms' access to bank loans and trade credits makes our story more compelling. Nevertheless, we advise readers to interpret our results with some cautions.

5. Conclusion

We investigate the role of government quality in firms' cash holding decisions. Our study also aims to provide a cleaner test of the effect of law enforcement on cash holdings by effectively holding shareholder rights conferred by law on paper constant. We achieve these aims by using China as a natural laboratory that has uniform laws, and large disparity in law enforcement, economic and institutional developments among different regions, and a corporate sector with heavy reliance on debt financing (and this financing feature is typical of many emerging markets).

We hypothesize that on the one hand, a good government refrains from expropriating firms and enables firms to hold more cash. On the other hand, a good government may help relieve financial constraints and enable firms to hold less cash – a new channel that has been largely neglected by extant studies. A good government may also indirectly affect corporate cash

holdings through its effect on insider agency problems.

Using a unique dataset from the World Bank covering 120 Chinese cities on local government quality, we find that local government quality has a negative effect on corporate cash holdings, which does not support the state expropriation argument. In support of the financial constraint mitigation argument, we find a good government lowers the investment sensitivity to cash flows and the sensitivity of cash to cash flows, decreases cash holdings more significantly in private firms than in SOEs, and improves access to bank loans and trade credit financing. Since firms' access to finance has a crucial effect on economic growth, we think this result has important policy implications for economic growth and development. We also report evidence that the negative relation between government quality and cash holdings reflects the interaction between the twin agency problems (Stulz, 2005).

Our study represents a refined test of the effect of the enforcement-component of investor protection and firm-level governance on corporate cash holdings, thereby adding to the cash holding literature that contains mixed evidence regarding the effect of investor protection on cash holdings. It also contributes to the limited research on how government quality shapes firm financial policies, and firms' financial constraints in emerging markets.

Our above evidence addresses the question of how government quality affects firms' cash holdings. A related question is how government quality affects the marginal value of cash. On the one hand, firms in regions with a good government should have a lower marginal value of cash holdings if they face less financial constraints and have easier access to finance (Faulkender and Wang, 2006). On the other hand, firms in regions with a good government can have a higher marginal value of cash since better law and contract enforcement constrains the insider agency problem (Dittmar and Mahrt-Smith, 2007) and the risk of state expropriation is lower (Caprio et al., 2013). Therefore, ex ante the predicted effect of government quality on the marginal value of cash is unclear. More importantly, our sample (2005-2007) period is

unsuitable for conducting a reliable analysis on the marginal value due to the frequent and lengthy stock trading suspensions and the very volatile price movements during the split share-structure reform that coincided with our sample period. The reform started in 2005 affects all listed firms and aims to make large blocks of non-publicly traded shares publicly tradable upon negotiations among shareholders. As such, we do not examine the effect of government quality on the marginal value of cash in the current study. Future studies could benefit from testing how government quality affects the marginal value of cash in China when more data are available. They should also test the financial constraint mitigation argument using data from other individual countries.

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Appendix 1
Variable Definition.

Variables	Definition
Proxies for government quality	
Property rights protection	The city-level index (ranges between 0 and 1) measures the likelihood that the responding firms' property and contract rights would be protected and enforced in business disputes in 2004 (Source: the World Bank Survey 2006)
Lightness of tax burden	Firms' taxation and miscellaneous administrative fees/sales*100, averaged in a city and in 2004, and the measure is multiplied by -1 in regressions (Source: the World Bank Survey 2006)
Government cleanliness	Firms' travel and entertainment costs/sales*1000, averaged in a city and in 2004, and the measure is multiplied by -1 in regressions (Source: the World Bank Survey 2006) (we multiple the ratio by 1000 to make the magnitude of the variable's regression coefficients more presentable)
Aggregate government quality	Mean decile ranking of the above three government quality measures
Firm-level financial characteristics	
Cash ratio	The ratio of cash and cash equivalents to net assets, where net assets = total assets - cash and cash equivalents
Cash flow	Earnings before extraordinary items and depreciation minus cash dividends, scaled by total assets
Q	Proxied by market to book ratio of the firm
Firm size	Natural logarithm of book value of total assets
Leverage	Total debt divided by total assets
Cash flow risk	Standard deviation of cash flow (defined above) over the past 12 quarters
Short-term debt	(total liabilities - long-term liabilities)/total assets
Bank loan	The sum of all short-term and long-term loans that the company borrows from banks, scaled by total assets
Accounts payable	The ratio of accounts payable to net assets
NWC	(Net working capital - cash and cash equivalents)/net assets
Capex	Capital expenditure/total assets
Dividend payout (0/1)	A dummy that equals one if a firm paid a cash dividend in a year and zero otherwise
Subsidy	Subsidies provided by the local government to the firm scaled by total assets in a year
Lines of credit	Available lines of credit divided by the beginning total assets
Firm-level governance characteristics	
Private (0/1)	Equals one if the ultimate controlling shareholder is not a state-owned entity and zero otherwise.
Ownership wedge	Proportion of control rights of the ultimate owner – proportion of cash flow rights of the ultimate owner
City-level characteristics	
Private credit/GDP	Bank loans/GDP in the province in which the firm is located
GDP per capita	GDP per capita
GDP growth	A city's $GDP_t/GDP_{t-1}-1$

(Note: All non-logged continuous variables are winsorized at 1% at both tails).

Table 1 Descriptive statistics

This table reports summary statistics of the main variables defined in Appendix 1 and used in subsequent analyses. City-level government quality proxies are for the 114 cities that meet our sample selection criteria (see Section 2.1). These proxies are taken from the World Bank Survey (2006). Except for firms' ultimate owner identity that is from the CCER database, firm characteristics are for the pooled firm-years for the 114 cities and are extracted from the CSMAR database.

Variable	N	Mean	sd	Min	P50	Max
City-level government quality proxies						
Property rights protection	114	0.634	0.165	0.269	0.661	0.982
Lightness of tax burden	114	4.945	1.390	1.100	5.000	8.700
Government cleanliness	114	0.124	0.050	0.030	0.120	0.270
Aggregate government quality	114	3.060	1.828	0.100	2.600	6.133
Firm characteristics						
Cash ratio	3073	0.199	0.211	0.001	0.138	1.453
NWC	3073	-0.118	0.330	-1.917	-0.087	0.502
Firm size	3074	21.250	1.064	18.005	21.160	25.528
Leverage	3074	0.542	0.315	0.064	0.524	2.669
Q	3074	1.179	0.466	0.773	1.069	7.287
Capex	3061	0.065	0.074	0.001	0.043	0.413
Cash flow risk	3074	0.050	0.025	0.010	0.046	0.127
Cash flow	3072	0.032	0.114	-0.730	0.046	0.224
Dividend payout (0/1)	3074	0.503	0.500	0.000	1.000	1.000
Short-term debt	3073	0.494	0.329	0.060	0.458	2.546
Ownership wedge	3001	0.092	0.120	0.000	0.000	0.522
Bank loan	3073	0.243	0.183	0.000	0.228	1.106
Accounts payable	3073	0.111	0.094	0.001	0.085	0.474
Subsidy	3074	0.002	0.005	0.000	0.000	0.036
Private (0/1)	3074	0.328	0.470	0.000	0.000	1.000
Lines of credit	3074	0.045	0.164	0.000	0.000	2.482
Other control variables						
Private credit/GDP	3074	1.443	0.381	0.642	1.408	2.400
GDP per capita	3074	9.731	0.656	8.189	9.737	10.921

Table 2 Corporate cash holdings and government quality: Firm-level regressions

The table reports results from regressing logged cash ratio on government quality at the firm level. The other variables are defined in Appendix 1. Robust standard errors (clustered at the city level) are used in computing *p*-value (in parentheses). *, **, ***: statistically significantly different from zero at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

Y=Ln(cash ratio)	1	2	3	4
Property rights protection	-0.114***			
	(0.000)			
Lightness of tax burden		-0.722***		
		(0.000)		
Government cleanliness			-0.142**	
			(0.020)	
Aggregate government quality				-0.085***
				(0.000)
NWC	-0.579***	-0.584***	-0.589***	-0.582***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm size	0.013	0.015	0.017	0.014
	(0.723)	(0.677)	(0.655)	(0.701)
Leverage	-1.271***	-1.313***	-1.309***	-1.282***
	(0.000)	(0.000)	(0.000)	(0.000)
Q	0.208***	0.223***	0.218***	0.219***
	(0.001)	(0.000)	(0.001)	(0.000)
Capex	-0.759***	-0.743**	-0.743**	-0.734**
	(0.024)	(0.030)	(0.030)	(0.032)
Cash flow risk	6.060***	6.123***	6.119***	6.120***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash flow	1.277***	1.222***	1.246***	1.273***
	(0.000)	(0.000)	(0.000)	(0.000)
Dividend payout (0/1)	0.345***	0.325***	0.330***	0.337***
	(0.000)	(0.000)	(0.000)	(0.000)
Subsidy	1.337	2.122	1.556	1.644
	(0.772)	(0.647)	(0.739)	(0.722)
Ownership wedge	0.120	0.290	0.297	0.215
	(0.621)	(0.246)	(0.232)	(0.379)
Private (0/1)	0.150**	0.115*	0.115*	0.130**
	(0.017)	(0.070)	(0.071)	(0.039)
Lines of credit	0.078	0.113	0.076	0.104
	(0.398)	(0.220)	(0.402)	(0.258)
Private credit/GDP	0.079	0.004	0.064	0.021
	(0.436)	(0.980)	(0.686)	(0.884)
GDP per capita	0.045	0.166***	0.128*	0.109
	(0.502)	(0.008)	(0.072)	(0.146)
Industry & year dummies	Yes	Yes	Yes	Yes
N	3,001	3,001	3,001	3,001
Adj.R^2	0.274	0.257	0.253	0.268

Table 3 Corporate cash holdings and government quality: City-level regressions

The table reports results from regressing logged cash ratio on government quality at the city level. The Variables are defined in Appendix 1. Firm-level controls are averaged across all sample firms in a city in a year. Robust standard errors (clustered at the city level) are used in computing *p*-value (in parentheses). *, **, ***: statistically significantly at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

Y=Ln(cash ratio)	1	2	3	4
Property rights protection	-0.169***			
	(0.000)			
Lightness of tax burden		-0.877		
		(0.125)		
Government cleanliness			-0.297**	
			(0.015)	
Aggregate government quality				-0.130***
				(0.002)
NWC	0.287	0.352	0.308	0.310
	(0.521)	(0.450)	(0.504)	(0.494)
Firm size	0.018	0.010	0.035	-0.004
	(0.903)	(0.950)	(0.802)	(0.980)
Leverage	-0.236	-0.351	-0.207	-0.275
	(0.617)	(0.478)	(0.670)	(0.564)
Q	0.207	0.211	0.223	0.220
	(0.344)	(0.335)	(0.318)	(0.307)
Capex	-1.601	-1.776	-1.606	-1.517
	(0.146)	(0.131)	(0.158)	(0.191)
Cash flow risk	11.212**	12.875**	12.183**	11.551**
	(0.036)	(0.016)	(0.022)	(0.033)
Cash flow	1.560*	1.425*	1.606*	1.503*
	(0.054)	(0.089)	(0.062)	(0.072)
Dividend payout (0/1)	0.381*	0.329	0.410*	0.364
	(0.082)	(0.145)	(0.066)	(0.103)
Subsidy	52.017**	58.609**	57.552**	56.034**
	(0.033)	(0.015)	(0.016)	(0.015)
Ownership wedge	-0.551	0.012	0.169	-0.515
	(0.618)	(0.992)	(0.888)	(0.648)
Private (0/1)	0.133	0.019	0.008	0.092
	(0.640)	(0.947)	(0.978)	(0.745)
Lines of credit	0.969	0.965	0.788	0.940
	(0.314)	(0.376)	(0.439)	(0.345)
Private credit/GDP	-0.047	-0.425**	-0.347*	-0.255
	(0.802)	(0.037)	(0.095)	(0.195)
GDP per capita	0.060	0.151	0.103	0.156
	(0.685)	(0.353)	(0.501)	(0.313)
Industry & year dummies	Yes	Yes	Yes	Yes
N	324	324	324	324
Adj.R^2	0.269	0.207	0.217	0.245

Table 4 City-Industry Level Government quality and cash holdings

The table presents results from regressing logged cash ratio on alternative government quality measures that are constructed from means of firm perceptions within an industry in a city. The other variables are defined in Appendix 1. Robust standard errors (clustered at the city and industry level) are used in computing p-value (in parentheses). The World Bank Survey (2006) only covers manufacturing firms and so the sample sizes in the table are smaller. *, **, ***: statistically significantly different from zero at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

Y=Ln(cash ratio)	1	2	3	4
City-industry level average of Property rights protection	-0.006*** (0.000)			
City-industry level average of Lightness of tax burden		-0.010** (0.047)		
City-industry level average of Government cleanliness			-7.338*** (0.003)	
City-industry level average of Aggregate government quality				-0.069*** (0.000)
NWC	-0.419***	-0.404***	-0.412***	-0.425***
	(0.005)	(0.005)	(0.004)	(0.005)
Firm size	0.021	0.011	0.012	0.018
	(0.631)	(0.789)	(0.766)	(0.691)
Leverage	-1.260***	-1.281***	-1.305***	-1.298***
	(0.000)	(0.000)	(0.000)	(0.000)
Q	0.274**	0.285**	0.285**	0.301**
	(0.028)	(0.021)	(0.019)	(0.010)
Capex	-1.425***	-1.418***	-1.355***	-1.366***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash flow risk	5.625***	5.718***	5.966***	5.976***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash flow	0.901***	0.873***	0.866***	0.891***
	(0.002)	(0.002)	(0.002)	(0.001)
Dividend payout (0/1)	0.317***	0.303***	0.299***	0.309***
	(0.000)	(0.000)	(0.000)	(0.000)
Subsidy	5.731	5.114	5.096	4.981
	(0.288)	(0.332)	(0.335)	(0.338)
Ownership wedge	0.167	0.328	0.286	0.159
	(0.680)	(0.380)	(0.428)	(0.670)
Private (0/1)	0.228***	0.198**	0.195**	0.222**
	(0.009)	(0.017)	(0.020)	(0.012)
Lines of credit	0.153	0.172*	0.155	0.160
	(0.118)	(0.096)	(0.140)	(0.115)
Private credit/GDP	0.092	0.094	0.107	0.092
	(0.367)	(0.503)	(0.443)	(0.449)
GDP per capita	0.036	0.086	0.089	0.075
	(0.566)	(0.176)	(0.198)	(0.286)
Industry & year dummies	Yes	Yes	Yes	Yes
N	1,980	2,004	2,004	1,980
Adj.R^2	0.208	0.193	0.196	0.209

Table 5
Government quality and financial constraints: investment sensitivity to cash flow

The table shows how government quality lowers the investment sensitivity to cash flow. The dependent variable is capital expenditure/year-beginning assets. The other variables are defined in Appendix 1. Robust standard errors (clustered at the city level) are used in computing *p*-value (in parentheses). *, **, ***: statistically significantly different from zero at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

$Y = Capx_t/assets_{t-1}$	1	2	3	4
Cash flow	0.290***	-0.004	0.049	0.182***
	(0.000)	(0.924)	(0.183)	(0.000)
Property rights protection	0.002*			
	(0.056)			
Lightness of tax burden		0.012		
		(0.178)		
Government cleanliness			0.004	
			(0.176)	
Aggregate government quality				0.001*
				(0.056)
Property rights protection * Cash flow	-0.031***			
	(0.000)			
Lightness of tax burden * Cash flow		-0.208**		
		(0.017)		
Government cleanliness *Cash flow			-0.037*	
			(0.099)	
Aggregate government quality * Cash flow				-0.016***
				(0.001)
Q	0.019***	0.019***	0.019***	0.019***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm size	0.012***	0.012***	0.012***	0.012***
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.003	-0.002	-0.002	-0.003
	(0.483)	(0.730)	(0.663)	(0.541)
Lines of credit	0.025***	0.025***	0.025***	0.025***
	(0.001)	(0.001)	(0.001)	(0.001)
Industry & year dummies	Yes	Yes	Yes	Yes
N	3,060	3,060	3,060	3,060
Adj.R^2	0.171	0.169	0.168	0.170

Table 6
An alternative measure of financial constraints: cash sensitivity to cash flow

The table shows how government quality mitigates financial constraints measured by the sensitivity of cash to cash flows. The dependent variable is change in cash ratio. The other variables are defined in Appendix 1. Robust standard errors (clustered at the city level) are used in computing *p*-value (in parentheses). *, **, ***: statistically significantly different from zero at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

Y = Δcash ratio	1	2	3	4
Cash flow	0.605***	-0.153	0.153**	0.342***
	(0.000)	(0.103)	(0.049)	(0.000)
Property rights protection*Cash flow	-0.086***			
	(0.000)			
Lightness of tax burden*Cash flow		-0.446**		
		(0.032)		
Government cleanliness*Cash flow			-0.172***	
			(0.006)	
Aggregate government quality*Cash flow				-0.051***
				(0.000)
Property rights protection	-0.003**			
	(0.028)			
Lightness of tax burden		-0.020*		
		(0.077)		
Government cleanliness			-0.005	
			(0.239)	
Aggregate government quality				-0.002**
				(0.039)
Firm size	0.010***	0.011***	0.011***	0.010***
	(0.001)	(0.000)	(0.000)	(0.000)
Q	0.013***	0.013***	0.014***	0.013***
	(0.000)	(0.000)	(0.000)	(0.000)
Capex	-0.338***	-0.332***	-0.331***	-0.335***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔNWC	-0.425***	-0.420***	-0.425***	-0.425***
	(0.000)	(0.000)	(0.000)	(0.000)
Short-term debt	-0.276***	-0.261***	-0.267***	-0.272***
	(0.000)	(0.000)	(0.000)	(0.000)
Industry and year dummies	Yes	Yes	Yes	Yes
N	3,060	3,060	3,060	3,060
Adj.R^2	0.227	0.214	0.218	0.225

Table 7 Corporate cash holdings and government quality: SOEs vs. Private firms
The table shows how the effect of government quality measures on firms' cash holdings differs in SOEs and private firms (based on ultimate ownership). The dependent variable is logged cash ratio. All variables are defined in Appendix 1. Robust standard errors (clustered at the city level) are used in computing *p*-value (in parentheses). *, **, ***: statistically significantly different from zero at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

Y=Ln(cash ratio)	1	2
Aggregate government quality	-0.051***	-0.043***
	(0.004)	(0.002)
Aggregate government quality*Private	-0.041*	-0.040*
	(0.099)	(0.094)
Private (0/1)	0.335*	0.344**
	(0.086)	(0.013)
NWC		-0.593***
		(0.000)
Firm size		0.016
		(0.670)
Leverage		-1.294***
		(0.000)
Q		0.223***
		(0.000)
Capex		-0.707**
		(0.035)
Cash flow risk		6.127***
		(0.000)
Cash flow		1.253***
		(0.000)
Dividend payout (0/1)		0.336***
		(0.000)
Subsidy		1.555
		(0.734)
Ownership wedge		0.159
		(0.496)
Lines of credit		0.108
		(0.253)
Private credit/GDP		0.027
		(0.852)
GDP per capita		0.112
		(0.135)
Industry & year dummies	Yes	Yes
N	3,073	3,001
Adj.R^2	0.081	0.266

Table 8
Government quality and financing channels

This table reports the results from regressing access to finance (bank loan and accounts payable) on government quality. All variables are defined in Appendix 1. Robust standard errors (clustered at the city level) are used in computing *p*-value (in parentheses). *, **, ***: statistically significantly different from zero at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

Y=	Bank Loan	Bank Loan	Accounts payable
Aggregate government quality	0.004**	-0.001	0.002***
	(0.012)	(0.859)	(0.007)
Q	-0.009**	-0.019**	-0.001
	(0.046)	(0.034)	(0.822)
Agg. government quality*Q		0.003*	
		(0.090)	
Firm size	0.005	0.005	0.007*
	(0.101)	(0.101)	(0.093)
Industry median leverage	0.376**	0.375**	0.085**
	(0.027)	(0.030)	(0.042)
Cash flow	-0.214***	-0.213***	0.127***
	(0.000)	(0.000)	(0.000)
GDP growth	-0.004	-0.004	0.010**
	(0.478)	(0.489)	(0.024)
Private credit/GDP	-0.002	-0.002	-0.003
	(0.862)	(0.889)	(0.843)
Industry & year dummies	Yes	Yes	Yes
N	3,073	3,073	3,073
Adj.R^2	0.592	0.593	0.308

Table 9
Testing "the twin agency problem"

This table reports the regression results regarding the impact of "the twin agency problem" on cash holdings. The dependent variable is logged cash ratio. The variables are defined in Appendix 1. Robust standard errors (clustered at the city level) are used in computing *p*-value (in parentheses). *, **, ***: statistically significantly different from zero at the 0.10, 0.05 and 0.01 level (two-tailed), respectively. The coefficients of the constant, year and industry dummies are omitted for brevity.

Y=Ln(cash ratio)	1	2
Ownership wedge	0.631*	0.524*
	(0.071)	(0.085)
AGQ>sample median (0/1) (High AGQ)	-0.144*	-0.153*
	(0.073)	(0.086)
High AGQ * Ownership wedge	-1.042**	-0.814*
	(0.037)	(0.092)
NWC	-0.623***	-0.614***
	(0.000)	(0.000)
Firm size	0.025	0.014
	(0.492)	(0.712)
Leverage	-1.343***	-1.324***
	(0.000)	(0.000)
Q	0.229***	0.215***
	(0.001)	(0.001)
Capex	-0.710**	-0.688**
	(0.033)	(0.039)
Cash flow risk	6.158***	6.037***
	(0.000)	(0.000)
Cash flow	1.239***	1.229***
	(0.000)	(0.000)
Dividend payout (0/1)	0.340***	0.324***
	(0.000)	(0.000)
Subsidy	2.323	1.549
	(0.618)	(0.757)
Private (0/1)	0.130**	0.134**
	(0.045)	(0.018)
Line of Credit	0.105	0.099
	(0.265)	(0.329)
Private credit/GDP		0.022
		(0.855)
GDP per capita		0.087
		(0.217)
Industry & year dummies	Yes	Yes
N	3,001	3,001
Adj.R^2	0.256	0.260