



Institutional development, state ownership, and corporate cash holdings: Evidence from China[☆]



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ABSTRACT

This study examines how institutional development and state ownership influence corporate cash holdings among Chinese firms. The empirical results reveal that firms in provinces with more developed institutions (non-state-controlled firms) hold more (less) cash reserves than those in provinces with less developed institutions (state-controlled firms). Moreover, the positive effect between institutional development and cash holdings is more prominent for non-state-controlled firms. These findings are consistent with the hypothesis that more developed institutions mitigate the threat of political extraction for non-state-controlled firms, resulting in larger cash holdings among these firms. Subsequent analyses demonstrate that the impact of institutional development on cash holdings is weakened for non-state-controlled firms which have established political connections. Therefore, this study identifies one vital channel through which political connections are beneficial for non-state-controlled firms in terms of mitigating the threat of political extraction.

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1. Introduction

Despite the rapid growth and development of China's economy in the past two decades, the legal environment in China is still far from ideal (Allen, Qian, & Qian, 2005; Yao & Yueh, 2009). The weak enforcement of property rights has given rise to rampant rent-seeking activities by government bureaucrats, as highlighted by a large body of anecdotal evidence and academic studies in recent years (Fan, Rui, & Zhao, 2008; Chen, Li, Su, & Sun, 2011; Chen, Sun, Tang, & Wu, 2011). Moreover, prior studies indicate the existence of regulatory discrimination between state-owned and non-state-controlled firms, to the extent that the private sector is often the subject of state predation (Brandt & Li, 2003; Johnson, Kaufmann, McMillan, & Woodruff, 2000). This problem

is exacerbated by the variation in economic and legal institutions across different provinces in China.

In spite of the work of researchers in this field, very little is known about managerial actions taken to protect their firm's assets from the threat of political extraction by government officials in China. Cash and cash equivalents is the most liquid asset and thus is arguably most vulnerable to political extraction (Myers & Rajan, 1998). The first objective of this study is to investigate which of the two competing theories—the political extraction or the precautionary motive hypothesis—can better explain the pattern of cash holdings for Chinese firms. This study employs three provincial indices from Fan, Wang, & Zhu (2011) and the Central Bureau of Statistics which have been widely used as proxies for the institutional development in China (e.g., Jian & Wong, 2010; Li, Meng, Wang, & Zhou, 2008; Wang, Wong, & Xia, 2008), and a dummy variable representing non-state-controlled firms. The main findings are that firms in provinces with more developed institutions (non-state-controlled firms) hold more (less) cash reserves than those in provinces with less developed institutions (state-controlled firms). Furthermore, the positive relationship between institutional development and cash holdings is more prominent for non-state-controlled firms. The results are consistent with the political extraction theory and suggest that non-state-controlled firms hold less cash reserves (and invest more) as a strategic response to counter the threat of political extraction and that the presence of developed institutions mitigates the threat of political extraction for these firms.

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The second objective of this study is to examine the role of political connections as another channel in mitigating the threat of political extraction for non-state-controlled firms in China. The finding is that the impact of institutional development on the cash holdings of non-state-controlled firms is also attenuated as these firms become politically connected.

This study provides two contributions to the existing literature. First, this paper shows that the threat of political extraction lowers firms' incentives to hold cash, which complements recent findings on the determinants of cash holdings (Chen & Chuang, 2009; Dittmar, Mahrt-Smith, & Servaes, 2003; Harford, Mansi, & Maxwell, 2008; Kalcheva & Lins, 2007; Kuan, Li, & Chu, 2011; Opler, Pinkowitz, Stulz, & Williamson, 1999) and in particular the political extraction hypothesis proposed in the cross-country study by Caprio, Faccio, & McConnell (2013). The single-country setting in this study offers advantages over Caprio et al. (2013) as is relatively free from the omitted variable problem often encountered in cross-country studies. Moreover, the co-existence of state-controlled and non-state-controlled firms and the importance of political-connections to Chinese firms facilitate interesting extensions to merely investigating how economic and legal institutions affect corporate cash holdings in China. Neither issue is examined previously in Caprio et al. (2013).

Second, this study also advances the understanding of the economic role of political connections in China. Prior studies have shown that firms around the world have incentives to build political connections and that political connections bring various benefits to connected firms such as preferential access to capital, government bailouts in the event of financial distress, and lighter taxation (Faccio, Masulis, & McConnell, 2006; Fan et al., 2008). More importantly, this study complements the studies of Chen, Sun, Tang, & Wu (2011) and Wu, Wu, & Rui (2012) in demonstrating that the benefits derived from political connections are largely concentrated in non-state-controlled firms. In particular, political connections help non-state-controlled firms mitigate the threat of political extraction and thus to maintain cash reserves at a relatively efficient level to support future investment opportunities.

Our findings on the association between institutional development and corporate cash holdings are consistent with the findings of Caprio et al. (2013). However, our findings appear to be opposite from those of a concurrent working paper by Chen, Li, Xiao, & Zou (2012). Chen et al. (2012) find that the presence of good government reduces cash holding for Chinese firms, which is consistent with the financial constraint mitigation (instead of the political extraction) hypothesis. The differences between the findings in the two studies could be attributed to two aspects. First, the proxies for government quality in Chen et al. (2012) are city-level indices which are obtained from companies' subjective responses to the World Bank (2006), while the measures of institutional development in this study are provincial-level indices. The majority of published papers in the accounting and finance journals examining listed companies in China use provincial-level data. Examples include Wang et al. (2008), Chen, Firth, & Xu (2009), Firth, Lin, Liu, & Wong (2009), Jian & Wong (2010), Chen, Li, Su, & Sun (2011), and Wu et al. (2012). So far, only two papers use city-level data similar to Chen et al. (2012), Cull & Xu (2005) and Lin, Lin, & Song (2010). Cull & Xu (2005) examine the effect of regional institutional factors on the profit-reinvestment decision by non-listed, small private firms (as opposed to large, listed companies) in China. Therefore, the evidences provided in the existing literature demonstrate that provincial-level institutional development could be more appropriate than city-level measures in examining the economic impact of institutional development on listed company behavior. Second, the sample in Chen et al. (2012) contains only listed companies headquartered in those cities covered by the World Bank Survey and in the period from 2005 to 2007, while this study includes all non-financial listed companies from 1999 to 2007.

The remainder of the paper is organized as follows. Section 2 reviews the related literature and develops testable hypotheses. Section 3

describes the source of data and defines the variables. Section 4 presents the main empirical results. Section 5 concludes the paper.

2. Literature review and hypothesis development

2.1. Institutional development, state ownership, and cash holdings

Opler et al. (1999) conduct a comprehensive analysis of the costs and benefits of cash holdings. The cost of holding cash is the low rate of return earned by these assets. On the other hand, holding cash brings two main benefits to the firm. First, the firm saves on transaction costs that would otherwise be incurred in raising funds and does not have to liquidate assets to make payments. Second, the firm can use cash to finance its investment activities if other sources of funding are not available or are very costly.

The above discussion assumes no divergence in the interests of managers and shareholders. However, managers may take actions that benefit themselves at the expense of shareholders. For example, managers may divert cash for personal consumption or overinvest in pet projects. More recent studies focus on the association between cash holdings and corporate governance (Chen & Chuang, 2009; Dittmar et al., 2003; Harford et al., 2008; Kalcheva & Lins, 2007; Kuan et al., 2011).

Myers & Rajan (1998) and Caprio et al. (2013) identify another potential cost of holding cash: cash is the most liquid asset and thus is the asset most susceptible to extraction by politicians. At the same time, politicians incur no costs in converting cash for personal consumption. Therefore, to protect their firm's assets from being extracted by politicians, managers may have incentives to reduce the firm's cash holdings (and increase investments in fixed assets which are harder to be extracted). This incentive should be stronger for firms that are more vulnerable to political extraction.

Using country-level corruption indices to measure the threat of political extraction, Caprio et al. (2013) find that firms in countries where the corruption level (and the threat of extraction) is high tend to hold less cash and divert the cash to investments in fixed assets than firms in countries where the corruption level is low. Prior research finds that there is a great disparity in the development of institutions across regions in China (Fan, Wong, & Zhang, 2007). Anecdotal evidences further suggest that because of the variation in local institutions, the degree of expropriation differs to a great extent across Chinese provinces. Following the argument by Caprio et al. (2013), firms located in provinces with more developed institutions face a lower threat of extraction and these firms could afford to hold more cash. Hence, under the political extraction hypothesis, the first part of the first hypothesis is stated as follows:

H1a. Firms in provinces with more developed institutions have *larger* cash holdings than firms in provinces with less developed institutions.

In addition, China hosts both firms controlled by the government and those controlled by private entrepreneurs. Non-state-controlled firms are also more likely to be the subject of political extraction than are state-controlled firms. For example, Johnson et al. (2000) and Brandt & Li (2003) document that non-state-controlled firms are often disadvantaged by higher tax rates and their inability to obtain bank loans. Based on the above arguments, non-state-controlled firms have more of an incentive to hold lower cash reserves than state-controlled firms as a means of protecting their assets from being extracted. The second part of the first hypothesis is stated as follows:

H1b. Non-state-controlled firms have *smaller* cash holdings than state-controlled firms.

Combining these two sub-hypotheses, the effect of institutional development on cash holdings will be expected to vary across the sample of state-controlled and non-state-controlled firms. In particular, since

the threat of political extraction is lower when the institutional environment is more business-friendly, this benefit is likely to favor non-state-controlled firms to a larger extent. Therefore, the positive relationship between institutional development and cash holdings is expected to be more pronounced for non-state-controlled firms. The third part of the first hypothesis is thus stated as follows:

H1c. The positive effect between institutional development and cash holdings is *more prominent* for non-state-controlled firms than for state-controlled firms.

Although institutional development and non-state control are expected to determine corporate cash holdings through their impacts on the threat of political extraction, these factors may also be correlated with the precautionary motive for holding cash. Prior studies show that Chinese non-state-controlled firms are discriminated against in formal financing channels (Allen et al., 2005; Brandt & Li, 2003). In addition, financing frictions faced by non-state-controlled firms ease with the development of institutions (Wang et al., 2008). Non-state-controlled firms may also have more investment opportunities than state-controlled firms because their managers are often more talented and more willing to expend greater efforts to secure business contracts than their state counterparts.

Findings from the literature suggest that the precautionary motive for holding cash is more important for firms with greater financing frictions or more investment opportunities (Opler et al., 1999). As non-state-controlled firms are more sensitive to financing frictions, any change in institutional development should have a stronger or more prominent impact on the cash holdings of non-state-controlled firms than on state-controlled firms. Therefore, under the precautionary motive hypothesis, an alternative version of the first hypothesis is stated as follows:

H1Aa. Firm in provinces with more developed institutions have *smaller* cash holdings than firms in provinces with less developed institutions.

H1Ab. Non-state-controlled firms have *larger* cash holdings than state-controlled firms.

H1Ac. The negative effect of institutional development on cash holdings is *more prominent* for non-state-controlled firms than for state-controlled firms.

2.2. The role of political connections

A recent stream of literature has examined the value of political connections to connected companies around the world. This literature finds that political connections can be either beneficial or harmful to public companies. Politically connected firms enjoy benefits in various forms such as favorable regulatory treatment, preferential access to capital, and lighter taxation.

Because the Chinese government exercises tight control over business activities, political connections are found to be of great benefit to connected companies in China. Fan et al. (2007) document that more than one-quarter of the CEOs of newly partially privatized Chinese firms are either currently serving or have previously served as government officials. Zhou (2009) proposes that non-state-controlled firms in China invest in political capital (by becoming legislative members of the Chinese government) to overcome the problems they experience in obtaining bank loans.

Faccio (2006) suggests that one potential benefit brought by political connections is a lower risk of asset extraction by politicians. From this perspective, non-state-controlled firms with connections to politicians may hold more cash than their non-connected counterparts. This leads to the first part of the second hypothesis as follows:

H2a. Non-state-controlled firms with political connections have *higher* cash holdings than their non-connected counterparts.

Prior research finds that political connections are more common in countries in which the government is more corrupt or imposes more restrictions on economic activity (Faccio, 2006), suggesting that the value of political connections varies with the strength of political and economic institutions. Similarly, Chen, Li, Su, & Sun (2011) find that establishing connections is more imperative for Chinese non-state-controlled firms located in provinces with less developed institutions. Wu et al. (2012) further show that the benefits of political connections accrue only to non-state-controlled firms, resulting in higher firm values for these firms.

To the extent that the mitigating effect of institutional development on the degree of political extraction is expected to be less pronounced for politically-connected firms, differences in cash holdings between non-state-controlled firms in provinces with more developed institutions and those in provinces with less developed institutions should also be smaller when the firms are politically-connected. The second part of the second hypothesis is stated as follows:

H2b. The positive effect of institutional development on cash holdings is *less prominent* for politically-connected firms.

3. Sample and data

This study employs data on Chinese non-financial firms listed on the Shanghai and Shenzhen stock exchanges in China. The data on ultimate controlling shareholder is obtained from the China Stock Market and Accounting Research (CSMAR) database. The data about the political connectedness of non-state-controlled firms is obtained from their annual reports. Firms with certain firm-level financial ratios (cash holdings and leverage) that are negative or above 1 are also excluded to minimize the data error problem. Finally, all the control variables are winsorized at the 1st and 99th percentiles to ensure that the results are not attributable to outliers in the dataset.

Overall, the sample consists of 9743 firm-year observations for firms located in 29 provinces in China. The sample period is from 1999 to 2007. The provinces with the largest number of observations are Shanghai and Guangdong and those with the lowest number of observations are Ningxia and Qinghai.

This study employs three institutional indices that are widely used in existing studies as measures of the extent of economic development, the level of government intervention and the degree of property rights protection for each of the provinces in China. Table 1 presents the mean values for these institutional variables across the sample period, by province. The indices are standardized to range from 0 to 1. Provinces with higher values on the institutional variables are regarded as having more developed markets and as offering more protection from the expropriation of property rights. Therefore, firms located in these provinces face a lower risk of political extraction by government bureaucrats.

The first institutional index is *Decentr*, the government decentralization index compiled by the National Economic Research Institute (NERI) (Fan et al., 2011) to measure the extent of government intervention in the economy for each province in each year. This index is constructed using the following information: provincial government spending as a percentage of provincial GDP; tax rates in the province; time spent by entrepreneurs dealing with bureaucracy; time needed for firm registration and to obtain various licenses. *Decentr* has a mean of 0.56 and a standard deviation of 0.27. Qinghai (Jiangsu) has the lowest (highest) *Decentr* value.

The second index is *Mkt1*, the NERI index of marketization used extensively in prior research as a measure of market development (Wang et al., 2008) for each province in each year. This index captures the following aspects of regional market development: the relationship

Table 1
Provincial-level statistics.

Province	N	Decentr	Mkt1	Mkt2	Cash	Non_State	Connected
Anhui	286	0.77	0.43	0.43	0.15	0.13	0.17
Beijing	579	0.81	0.74	0.49	0.20	0.12	0.38
Fujian	357	0.92	0.82	0.86	0.13	0.39	0.64
Gansu	141	0.36	0.11	0.00	0.12	0.15	0.58
Guangdong	1091	0.98	0.99	0.94	0.14	0.27	0.64
Guangxi	163	0.83	0.34	0.30	0.13	0.25	0.25
Guizhou	116	0.36	0.13	0.02	0.19	0.13	0.53
Hainan	170	0.74	0.40	0.65	0.10	0.47	0.63
Hebei	246	0.69	0.45	0.78	0.11	0.13	0.64
Heilongjiang	255	0.31	0.26	0.30	0.12	0.31	0.73
Henan	239	0.53	0.35	0.62	0.15	0.17	0.67
Hubei	465	0.56	0.41	0.39	0.13	0.26	0.56
Hunan	309	0.48	0.37	0.63	0.15	0.28	0.59
Inner Mongolia	157	0.21	0.26	0.40	0.15	0.20	0.42
Jiangsu	615	1.00	0.82	0.70	0.19	0.35	0.49
Jiangxi	169	0.46	0.36	0.41	0.16	0.05	1.00
Jilin	271	0.32	0.33	0.36	0.09	0.27	0.54
Liaoning	397	0.53	0.61	0.54	0.13	0.26	0.28
Ningxia	82	0.22	0.17	0.15	0.10	0.10	N/A
Qinghai	72	0.00	0.00	0.22	0.11	0.38	0.27
Shaanxi	186	0.52	0.20	0.01	0.14	0.24	1.00
Shandong	552	0.63	0.64	0.79	0.14	0.23	0.32
Shanghai	1083	0.98	1.00	0.91	0.15	0.21	0.30
Shanxi	170	0.26	0.26	0.13	0.15	0.06	1.00
Sichuan	520	0.70	0.48	0.67	0.14	0.34	0.54
Tianjin	173	0.55	0.71	1.00	0.16	0.05	0.00
Xinjiang	183	0.17	0.20	0.65	0.12	0.30	0.34
Yunnan	163	0.49	0.24	0.07	0.18	0.17	1.00
Zhejiang	533	0.93	0.98	0.93	0.17	0.46	0.56
Mean		0.56	0.45	0.49	0.14	0.23	0.52
Std dev		0.27	0.28	0.31	0.03	0.12	0.25

Note: This table presents the means of the three institutional indices (*Decentr*, *Mkt1*, and *Mkt2*), *Cash*, *Non_State*, and *Connected* by province.

between the government and the market; development of non-state business; development of product markets; development of factor markets; development of market intermediaries and legal environment. *Mkt1* has a mean of 0.45 and a standard deviation of 0.28. Qinghai (Shanghai) has the lowest (highest) value of *Mkt1*.

The third index is *Mkt2*, the market index formulated by Li et al. (2008). It is measured as the proportion of total fixed investment in a province that comes from private enterprises in each year, from the China's Bureau of Statistics. According to Li et al. (2008), a low level of private sector involvement in fixed investment is indicative of more intervention and regulation on the part of the local government. *Mkt2* has a mean of 0.49 and a standard deviation of 0.31. Gansu (Tianjin) has the lowest (highest) value of *Mkt2*. An additional index (*Average*) which is calculated as the average value of the three indices is used in the regressions later.

Two dummy variables are constructed to represent the main firm-level corporate governance attributes. A firm is classified to be non-state-controlled firms (*Non_State*) if its ultimate controlling shareholders are shareholders who are families or individuals. Consistent with previous studies (Fan et al., 2007), a non-state-controlled firm is identified as having political connections (*Connected*) if its CEO or chairman is (was) a member of the national or local People's Congress or the Chinese People's Political Consultative Conference (CPPCC), or holds (held) a position in the central or local government. In addition, an ownership variable, *Largest*, is calculated as the percentage of shares owned by the largest shareholder.

Among the financial variables, a firm's cash holdings ratio (*Cash*) is calculated as cash and cash equivalents divided by total assets at the end of year *t*. *Invest* is the investment ratio and is calculated as the sum of net capital expenditures, change in inventory, and dividends divided by sales at the end of year *t*. *Lev* is the leverage ratio and is calculated as total debt divided by total assets at the end of year *t*. *Capx* is the fixed asset investment ratio calculated as capital expenditure divided by

total assets at the end of year *t*. *Q* is Tobin's *Q*, a measure of investment opportunity calculated as the market value of equity plus the book value of liabilities divided by the book value of total assets. *CF* is the cash flow ratio calculated as cash flows from operations divided by total assets at the end of year *t*. *Change_NWC* is the change in the net working capital ratio calculated as the change in current assets minus current liabilities from year *t* – 1 to year *t* divided by total assets at the end of year *t*. *Dividend* is a dummy variable which equals 1 for dividend paying firms, or 0 otherwise. *Size* is the natural logarithm of the book value of total assets in millions of yuan at the end of year *t* and is taken as a proxy for firm size. *FirmAge* is the number of years since the incorporation of the firm. Finally, *GDP* is the gross domestic product of the province a firm is located in.

Table 2 presents the descriptive statistics for the various sub-samples. Panel A presents the mean (median) values for each variable as partitioned into *Low* and *High* (using the median value of the *Average* institutional index) institutional development sub-samples. The mean (median) *Cash* is 14% (11%) for firms in the *Low* sub-sample, which is smaller than the corresponding value (16% for mean and 13% for median) for firms in the *High* sub-sample. The difference in the mean (median) is significant as highlighted by the *t* (*z*)-statistic. Among the other control variables, firms in provinces with *Low* institutional development have larger values of *Invest* and *Largest*; and smaller values of *Size*, *Dividend*, and *FirmAge*.

Panels B and C present the mean (median) values for each variable as partitioned into *State* and *Non-State* controlled firms as well as *Non-Connected* and *Connected* firms, respectively. 25% of the firms in the sample are classified as non-state-controlled firms. In terms of political connectedness, 53% percent of the non-state-controlled firms are connected to politicians. The univariate analysis reveals that there is no significant difference in the mean (median) values of *Cash* between the *State* and *Non-State* controlled firms as well as between the *Connected* and *Non-Connected* firms. Because the levels of cash holdings are determined by many other factors, formal tests via multivariate regressions will be used to draw inferences. For the other control variables, *State* controlled firms have larger values of *Largest*, *CF*, *Size*, and *Dividend*; and smaller values of *Q*, *Lev*, and *FirmAge*. Meanwhile, *Connected* firms have larger values of *CF*, *Size*, *Capx*, and *Dividend*; and smaller values of *Q* and *FirmAge*.

4. Main analysis

4.1. Institutional development, state ownership, and cash holdings

The first empirical task is to examine the role of institutional development and state ownership on firms' cash holdings. The general model for Eq. (1) is estimated using ordinary least squares (OLS) regressions for the pooled sample as follows:

$$Cash_{i,t} = a_0 + b_1 Institutional_i + b_2 Non_State_i + b_3 (Institutional_i \times Non_State_i) + \sum c_n Controls_{n,t} + \sum d_t Year_t + \sum e_k Industry_k + u_{i,t}, \quad (1)$$

where the dependent variable is firm *i*'s cash holdings (*Cash*) in year *t*. *Institutional* is one of the four provincial-level institutional indices: *Decentr*, *Mkt1*, *Mkt2*, and *Average*. *Non_State* is a dummy variable that represents firms controlled by private entrepreneurs. Industry and year dummies are also included in all regressions to control for the corresponding fixed effects. Specifically, the industry dummies are based on the 13-industry classification assigned by the China Securities Regulatory Commission (CSRC), excluding firms in the financial industry (Gul, Kim, & Qiu, 2010). $u_{i,t}$ is an error term assumed to be independent of the explanatory variables. The estimated standard errors are corrected for heteroskedasticity and cross-correlations using the Huber–White estimator, clustered by firm. In addition, other firm-specific control variables that previous studies have found to be important determinants of cash holdings are also included in Eq. (1).

Table 2
Descriptive statistics.

Panel A: low vs high institutional development						
	Mean		t-Test	Median		z-Test
	Low	High		Low	High	
Cash	0.137	0.157	−9.02***	0.112	0.131	−10.32***
Invest	0.165	0.130	8.18***	0.083	0.058	10.96***
Largest	0.419	0.406	3.82***	0.404	0.386	4.07***
Q	2.327	2.380	−1.77*	1.865	1.904	−2.22**
Lev	0.479	0.484	−1.35	0.479	0.495	−2.16**
CF	0.049	0.049	0.02	0.046	0.050	−1.09
Size	7.299	7.481	−9.52***	7.191	7.408	−10.41***
Change_NWC	−0.015	−0.015	0.32	−0.009	−0.009	0.13
Capx	0.080	0.076	1.82*	0.067	0.064	1.98**
Dividend	0.470	0.548	−7.69***			
FirmAge	5.706	6.758	−15.38***	5.000	7.000	−13.51***
N	5227	4516		5227	4516	
Panel B: state vs non-state controlled firms						
	Mean		t-Test	Median		z-Test
	State	Non-State		State	Non-State	
Cash	0.145	0.147	−0.75	0.121	0.120	1.02
Invest	0.147	0.152	−1.04	0.073	0.072	1.69*
Largest	0.443	0.321	32.61***	0.437	0.290	31.83***
Q	2.281	2.560	−8.22***	1.860	1.965	−4.42***
Lev	0.472	0.508	−8.38***	0.477	0.518	−8.03***
CF	0.053	0.040	6.78***	0.050	0.040	6.34***
Size	7.484	7.086	18.29***	7.373	7.053	16.96***
Change_NWC	−0.015	−0.015	0.12	−0.009	−0.010	−0.87
Capx	0.077	0.081	−1.57	0.065	0.068	−1.15
Dividend	0.537	0.416	10.43***			
FirmAge	6.060	6.591	−6.67***	6.000	6.000	−6.50***
N	7295	2448		7295	2448	
Panel C: non-connected vs connected firms						
	Mean		t-Test	Median		z-Test
	Non-Connected	Connected		Non-Connected	Connected	
Cash	0.136	0.141	−1.01	0.110	0.118	−1.45
Invest	0.164	0.156	0.64	0.065	0.071	−0.63
Largest	0.314	0.314	−0.08	0.285	0.289	−0.05
Q	2.681	2.411	2.99***	1.982	1.797	2.53**
Lev	0.527	0.522	0.55	0.536	0.540	0.49
CF	0.032	0.042	−2.16**	0.032	0.043	−2.49**
Size	6.949	7.118	−3.93***	6.937	7.066	−3.63***
Change_NWC	−0.012	−0.014	0.49	−0.006	−0.009	1.03
Capx	0.074	0.086	−2.32**	0.061	0.073	−2.20**
Dividend	0.365	0.408	−2.13**			
FirmAge	6.930	6.434	2.89***	7.000	6.000	2.66***
N	761	866		761	866	

The table presents the descriptive statistics for the firm-specific variables according to different sub-samples. Panel A presents the mean and median values for the *Low* (below median value of *Average* institutional index) vs *high* (above the median value of *Average* institutional index) institutional development sub-samples. Panel B presents the mean and median values for the *State* vs *Non-State* controlled sub-samples. Panel C presents the mean and median values for the *Non-Connected* vs *Connected* sub-samples. *t*-test (*z*-test) measures the *t* (*z*)-statistics for the difference in the mean (median) values between the two sub-samples. *N* is the number of observations.

** $p < 0.05$.

* $p < 0.10$.

*** $p < 0.01$.

Models (1) to (4) of Table 3 present the regression results of *Cash* on *Institutional* and other control variables. The findings from Models (1) to (4) are consistent with the prediction of H1a as the coefficient of *Institutional* is positive and statistically significant in three out of the four specifications. Firms located in provinces with more developed institutions typically face a smaller threat of political extraction and can therefore afford to hold more cash than their counterparts located in provinces with less developed institutions.

Meanwhile, Model (5) presents the regression results of *Cash* on *Non_State* and other control variables and provides evidence that non-state controlled firms are more likely to decrease their cash holdings as the coefficient of *Non_State* is negative and significant at least at the 10% level. One interpretation is that non-state-controlled firms suffer from higher threats of political extraction, which is also consistent

with the prediction of H1b. Therefore, after controlling for other determinants of cash holdings, one viable strategy that non-state-controlled firms can adopt to prevent being politically extracted by government bureaucrats is to structure their assets such that they hold less cash.

Finally, the combined effects of *Institutional* (using *Average*) and *Non_State* are presented in Model (6). While the coefficients of both *Institutional* and *Non_State* remain significant, the additional finding is that the coefficient of the interaction term (*Institutional* × *Non_State*) is positive and statistically significant. This implies that the positive relationship between institutional development and cash holdings is more prominent for non-state-controlled firms, which is supportive of H1c. Overall, the findings in Table 3 are consistent with the predictions of the political extraction rather than the precautionary motive story. In other words, more developed institutions mitigate the threat of political

Table 3
The effect of ownership structure and institutional development on cash holdings.

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Decentr</i>	<i>Mkt1</i>	<i>Mkt2</i>	<i>Average</i>	<i>Non_State</i>	<i>Average</i>
<i>Institutional</i>	0.03*** [5.81]	0.02*** [4.20]	0.01 [1.16]	0.02*** [3.63]		0.01** [2.15]
<i>Non_State</i>					−0.01* [−1.68]	−0.02*** [−3.19]
<i>Institutional × Non_State</i>						0.02*** [2.89]
<i>Control variables</i>						
<i>Largest</i>	−0.02*** [−3.16]	−0.02*** [−3.08]	−0.02*** [−3.24]	−0.02*** [−3.12]	−0.02*** [−3.15]	−0.02*** [−3.55]
<i>Q</i>	0.01*** [2.71]	0.01*** [2.75]	0.01*** [2.82]	0.01*** [2.74]	0.01*** [2.78]	0.01*** [2.92]
<i>Lev</i>	−0.16*** [−23.77]	−0.16*** [−23.81]	−0.16*** [−23.85]	−0.16*** [−23.83]	−0.16*** [−23.77]	−0.16*** [−23.90]
<i>CF</i>	0.15*** [9.46]	0.16*** [9.49]	0.16*** [9.53]	0.16*** [9.49]	0.16*** [9.50]	0.16*** [9.53]
<i>Change_NWC</i>	−0.06*** [−4.51]	−0.07*** [−4.53]	−0.07*** [−4.56]	−0.07*** [−4.53]	−0.07*** [−4.52]	−0.06*** [−4.49]
<i>Capx</i>	−0.07*** [−6.03]	−0.07*** [−6.07]	−0.07*** [−6.17]	−0.07*** [−6.07]	−0.07*** [−6.08]	−0.08*** [−6.19]
<i>Dividend</i>	0.03*** [13.00]	0.03*** [13.16]	0.03*** [13.44]	0.03*** [13.22]	0.03*** [13.22]	0.03*** [13.19]
<i>Size</i>	0.01 [1.14]	0.01 [1.16]	0.01 [1.37]	0.01 [1.18]	0.01 [1.17]	0.01 [1.23]
<i>GDP</i>	0.01*** [6.52]	0.01*** [4.95]	0.02*** [6.64]	0.01*** [5.92]	0.02*** [7.16]	0.01*** [5.98]
<i>FirmAge</i>	−0.01*** [−12.73]	−0.01*** [−12.65]	−0.01*** [−12.59]	−0.01*** [−12.65]	−0.01*** [−12.56]	−0.01*** [−13.01]
<i>Constant</i>	0.15*** [9.95]	0.15*** [10.23]	0.16*** [10.61]	0.15*** [10.37]	0.15*** [10.14]	0.16*** [10.56]
<i>Year dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adjusted R-square</i>	0.21	0.21	0.21	0.21	0.21	0.21
<i>N</i>	9743	9743	9743	9743	9743	9743

Notes: *t*-statistics in parenthesis; ****p* < 0.01, ***p* < 0.05, **p* < 0.10.

The table presents the coefficient estimates of ordinary least-squares regressions with *Cash* as the dependent variable. *Non_State* is a dummy variable that is equal to 1 for non-state-controlled firms; or 0 otherwise. *Institutional* is one of the four provincial-level institutional indices: *Decentr*, *Mkt1*, *Mkt2*, or *Average*. The estimated standard errors are corrected for heteroskedasticity and cross-correlations using the Huber–White estimator, clustered by firm.

extraction for non-state-controlled firms, resulting in larger cash holdings among these firms.

The economic significance of the result is quite substantial. Holding other variables constant, the difference in cash holdings between state-controlled firms in provinces with strong institutional development (such as Zhejiang, with an *Average* index of 0.95) and those in provinces with weak institutional development (such as Xinjiang, with an *Average* index of 0.34) is about 0.6%. However, the corresponding difference in cash holdings for non-state-controlled firms is about 1.8%, which is three times higher.

Most of other control variables are significantly correlated to cash holdings in line with expectations. In particular, firms with lower ownership concentration, lower leverage, lower capital investment, a smaller change in net working capital, and younger firms as well as those with larger cash flows and greater investment opportunities are found to hold more cash. These findings also are consistent with that of prior studies such as Kalcheva & Lins (2007) and Caprio et al. (2013).

4.2. Political connections, institutions, and cash holdings

This sub-section investigates the implications of political connections on corporate cash holdings in China, especially among non-state-controlled firms. The general model for Eq. (2) is estimated using OLS regressions for the sample of non-state-controlled firms only as follows:

$$Cash_{i,t} = a_0 + b_1 Institutional_i + b_2 Connected_{i,t} + b_3 (Institutional_i \times Connected_{i,t}) + \sum c_n Controls_{n,t} + \sum d_t Year_t + \sum e_k Industry_k + u_{i,t} \quad (2)$$

where *Connected* is a dummy variable that represents non-state-controlled firms with politically connected executives or directors. All other variables are as defined earlier.

Among the non-state-controlled firms, 821 firm-year observations have missing political connections data. Therefore, the number of firm-year observations in the non-state-controlled firms subsample in tests involving political connections is 1627.

Similar to Table 3, the regression results of *Cash* on *Institutional* and other control variables are presented in Models (1) to (4) of Table 4. The coefficient of *Institutional* remains positive and highly significant in all four specifications, consistent with the results in Table 3. While Model (5) presents the regression results of *Cash* on *Connected* and other control variables, Model (6) presents the regression results of the full model of Eq. (2). The coefficient of *Connected* is found to be positive but insignificant in Model (5), which is not supportive of H2a. However, the stand-alone coefficients of *Institutional* and *Connected* as well as the interaction coefficient between *Connected* and *Institutional* (also using the *Average* index) are found to be statistically significant, with the expected signs in Model (6). In other words, the mitigating effect of institutional development on the threat of political extraction is found to be weaker among politically-connected firms, which is supportive of H2b.

In terms of economic magnitude, holding other variables constant, the difference in cash holdings between non-connected firms in Zhejiang and Xinjiang is about 3.7%. However, the corresponding difference in cash holdings for connected firms is much smaller, at about 1.2%. Therefore, the empirical findings identify one important channel through which political connections can potentially serve as an

Table 4
Political connections and cash holdings.

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Decentr</i>	<i>Mkt1</i>	<i>Mkt2</i>	<i>Average</i>	<i>Connected</i>	<i>Average</i>
<i>Institutional</i>	0.05*** [5.25]	0.04*** [4.86]	0.04*** [4.34]	0.04*** [4.75]		0.06*** [5.67]
<i>Connected</i>					0.01 [1.00]	0.03** [2.56]
<i>Connected × Institutional</i>						−0.04*** [−2.79]
<i>Control variables</i>						
<i>Largest</i>	0.01 [0.42]	0.01 [0.61]	0.01 [0.64]	0.01 [0.58]	0.01 [0.60]	0.01 [0.24]
<i>Q</i>	0.01* [1.90]	0.01* [1.81]	0.01* [1.66]	0.01* [1.80]	0.01* [1.87]	0.01* [1.81]
<i>Lev</i>	−0.13*** [−8.87]	−0.13*** [−8.90]	−0.13*** [−8.75]	−0.13*** [−8.82]	−0.13*** [−8.77]	−0.13*** [−8.66]
<i>CF</i>	0.08** [2.56]	0.08** [2.62]	0.08** [2.60]	0.08** [2.60]	0.08** [2.61]	0.08** [2.57]
<i>Delta_NWC</i>	−0.05** [−2.21]	−0.05** [−2.21]	−0.05** [−2.24]	−0.05** [−2.21]	−0.05** [−2.20]	−0.05** [−2.21]
<i>Capx</i>	−0.07*** [−2.87]	−0.06*** [−2.77]	−0.06*** [−2.67]	−0.06*** [−2.77]	−0.06*** [−2.78]	−0.06*** [−2.69]
<i>Dividend</i>	0.02*** [4.36]	0.02*** [4.44]	0.02*** [4.56]	0.02*** [4.45]	0.02*** [4.45]	0.02*** [4.48]
<i>Size</i>	0.01*** [4.71]	0.01*** [4.53]	0.01*** [4.30]	0.01*** [4.54]	0.01*** [4.59]	0.01*** [4.74]
<i>GDP</i>	0.01** [2.51]	0.01 [1.12]	0.01** [2.16]	0.01* [1.84]	0.02*** [3.11]	0.01 [1.64]
<i>FirmAge</i>	−0.01*** [−8.09]	−0.01*** [−7.89]	−0.01*** [−8.05]	−0.01*** [−8.00]	−0.01*** [−7.89]	−0.01*** [−8.04]
<i>Constant</i>	−0.09*** [−3.21]	−0.08*** [−2.93]	−0.08*** [−2.79]	−0.08*** [−2.90]	−0.10*** [−3.51]	−0.10*** [−3.45]
<i>Year dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adjusted R-square</i>	0.27	0.27	0.26	0.26	0.26	0.26
<i>N</i>	1627	1627	1627	1627	1627	1627

Notes: *t*-statistics in parenthesis; ****p* < 0.01, ***p* < 0.05, **p* < 0.10.

The table presents the coefficient estimates of ordinary least-squares regressions with *Cash* as the dependent variable. *Connected* is a dummy variable which equals 1 if a non-state-controlled firm is politically connected; or 0 otherwise. *Institutional* is one of the four provincial-level institutional indices: *Decentr*, *Mkt1*, *Mkt2*, or *Average*. The estimated standard errors are corrected for heteroskedasticity and cross-correlations using the Huber–White estimator, clustered by firm.

important factor driving the higher valuations among non-state-controlled firms, in terms of mitigating the threat of political extraction.

4.3. Robustness tests

4.3.1. Alternative samples and explanations

Several sensitivity analyses are performed to ensure that the main findings are robust. Panels A (for the role of institutional development and non-state-control) and B (for the role of political connections) of Table 5 displays the results when the average *Institutional* index is used in the regression specification. The results (untabulated) are qualitatively and quantitatively similar for the other three institutional indices.

One potential alternative explanation for the findings is that non-state-controlled firms are more efficient in managing cash and therefore maintain smaller cash reserves than state-controlled firms. To address the concern that the variation in cash holdings is caused by a difference in operating efficiency between non-state-controlled and state-controlled firms, the sample is first divided into two based on the sample median *AstTurn* (asset turnover, a measure of asset efficiency calculated as total sales divided by total assets). The underlying assumption is that firms in the high *AstTurn* subsample have a high level of operating efficiency. If this assumption holds, there should be no difference in cash holdings between non-state-controlled and state-controlled firms in this subsample after controlling for other determinants of cash holdings. Subsequently, Eqs. (1) and (2) are re-estimated for the subsample of firms with high *AstTurn*. The results in Model (1) of Panels A and B

generally show that the main findings remain unaltered, which rules out the potential alternative explanation.

Models (2) to (4) of Panel A display the regression results with *Invest* as the dependent variable to investigate what happens to the cash, especially for non-state-controlled firms. Consistent with Caprio et al. (2013), the findings suggest that non-state-controlled firms hold less cash as the cash is deployed in the investments in fixed assets and payment of dividends to shareholders, as a strategy to protect their assets from being expropriated.

4.3.2. Endogeneity issues

The findings may also be driven by endogenous relationships between the dependent and independent variables. For example, the low cash holdings in non-state-controlled firms could be a consequence of extraction rather than due to a strategy to avoid extraction.

As noted by Caprio et al. (2013), if low cash holdings are the consequence of political extraction, *ex-ante* non-state-controlled firms and firms located in provinces with weaker institutions should reserve more cash both to cater for their normal operations and for payoffs to politicians if the amount and timing of such expenses are highly uncertain, implying a negative (positive) relationship between *Institutional* (*Non_State*) and *Cash*. *Ex-post*, after payoffs have been made, no relationship should be expected between these variables. However, these predictions conflict with the results in Table 3.

In testing the role played by political connections in mitigating the effects of political extraction, the connection variable is assumed to be exogenous. *Ex-ante*, firms more likely to suffer from extraction have stronger incentives to build connections with politicians. In this respect,

Table 5
Robustness tests.

Panel A				
	(1)	(2)	(3)	(4)
	High <i>AstTurn</i>	<i>Invest</i>	<i>Invest</i>	<i>Invest</i>
<i>Institutional</i>	−0.01 [−0.33]	−0.04*** [−3.15]		−0.04** [−2.37]
<i>Non_State</i>	−0.02* [−1.91]		0.03*** [4.84]	0.06*** [3.15]
<i>Institutional × Non_State</i>	0.03** [2.20]			−0.04* [−1.82]
<i>Control variables</i>				
<i>Largest</i>	−0.04*** [−4.54]	−0.09*** [−6.51]	−0.09*** [−6.57]	−0.07*** [−4.92]
<i>Q</i>	0.01*** [4.75]	0.01 [0.12]	0.01 [0.08]	−0.01 [−0.24]
<i>Lev</i>	−0.15*** [−14.67]	−0.06*** [−4.28]	−0.05*** [−3.52]	−0.06*** [−4.62]
<i>CF</i>	0.10*** [4.24]	0.11*** [3.87]	0.11*** [3.82]	0.11*** [3.83]
<i>Change_NWC</i>	−0.15*** [−6.49]	0.07*** [2.66]	0.07*** [2.70]	0.07** [2.53]
<i>Capx</i>	−0.19*** [−10.56]			
<i>Dividend</i>	0.03*** [8.78]			
<i>Size</i>	0.01 [1.14]	0.01*** [5.30]	0.02*** [6.00]	0.02*** [5.95]
<i>GDP</i>	0.01*** [4.92]	−0.02*** [−4.23]	−0.02*** [−4.42]	−0.02*** [−4.16]
<i>FirmAge</i>	−0.01*** [−12.08]	−0.01*** [−11.00]	−0.01*** [−10.01]	−0.01*** [−10.63]
<i>Constant</i>	0.19*** [9.02]	0.17*** [5.68]	0.19*** [6.25]	0.15*** [4.79]
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Adjusted R-square	0.22	0.14	0.14	0.14
N	4871	9743	9743	9743
Panel B				
	(1)	(2)		
	High <i>AstTurn</i>	2SLS		
<i>Institutional</i>	0.06*** [4.64]	0.04*** [5.04]		
<i>Connected</i>	0.04*** [2.67]	0.01** [2.51]		
<i>Institutional × Connected</i>	−0.06** [−2.57]	−0.01*** [−2.72]		
<i>Control variables</i>				
<i>Largest</i>	−0.01 [−0.03]	0.01 [0.27]		
<i>Q</i>	0.01*** [3.38]	0.01* [1.80]		
<i>Lev</i>	−0.14*** [−5.96]	−0.13*** [−8.64]		
<i>CF</i>	0.03 [0.78]	0.08** [2.53]		
<i>Change_NWC</i>	−0.11*** [−2.73]	−0.05** [−2.20]		
<i>Capx</i>	−0.11*** [−3.25]	−0.06*** [−2.70]		
<i>Dividend</i>	0.02** [2.51]	0.02*** [4.46]		
<i>Size</i>	0.01*** [3.79]	0.01*** [4.77]		
<i>GDP</i>	0.02** [2.47]	0.01* [1.84]		
<i>FirmAge</i>	−0.01*** [−7.39]	−0.01*** [−7.93]		
<i>Constant</i>	−0.11** [−2.23]	−0.09*** [−3.00]		
Year dummies	Yes	Yes		

Table 5 (continued)

Panel B	(1)	(2)
	High <i>AstTurn</i>	2SLS
Industry dummies	Yes	Yes
Adjusted R-square	0.28	0.26
N	813	1627

Notes: *t*-statistics in parenthesis; ****p* < 0.01, ***p* < 0.05, **p* < 0.10.

The table presents the coefficient estimates of ordinary least-squares regressions with *Cash* (Model (1)) of Panel (A) and all Models of Panel B) and *Invest* (Models (2) to (4) of Panel A) as the dependent variables. *Non_State* is a dummy variable that is equal to 1 for non-state-controlled firms; or 0 otherwise. *Connected* is a dummy variable which equals 1 if a non-state-controlled firm is politically connected; or 0 otherwise. *Institutional* is the average of three provincial-level institutional indices: *Decentr*, *Mkt1*, or *Mkt2*. The estimated standard errors are corrected for heteroskedasticity and cross-correlations using the Huber–White estimator, clustered by firm.

a two-stage least-squares approach (2SLS) is estimated. In the first-stage regression, two variables are used as instruments in the firm's decision to build political connections: the proportion of politically-connected firms within a specific industry (Houston, Jiang, Lin, & Ma, 2014) and the geographic distance between firms' headquarter and Beijing (China's political center). Other variables which prior studies find to be important determinants of political connections are also controlled in the first-stage regression. In the second-stage regression, the predicted value of *Connected* is used as an independent variable in estimating Eq. (2). Again, the results in Model (2) of Panel B verify that the main findings are unchanged.

Following Larcker & Rusticus (2010), the following tests are conducted to verify the validity of the two instruments. First, the *p*-value of each instrument's partial *F*-test for the first stage regression is 0.00, which indicates high correlations between the instruments and the endogenous variable (*Connected*). Second, the *p*-value of the over-identification test is 0.35, which indicates low correlations between the instruments and the correlated omitted variable. These tests suggest that the instruments are valid.

5. Conclusions

This study examines how institutional development and non-state control influence firms' cash holdings in China. The first main result reveals that firms in provinces with more developed institutions (non-state-controlled firms) hold larger (smaller) cash reserves than those in provinces with less developed institutions (state-controlled firms). The positive effect between institutional development and cash holdings is also more prominent for non-state-controlled firms. These findings are largely consistent with the hypothesis that the threat of political extraction may cause firms to adopt corporate policies that are not necessarily the most optimal and efficient.

Furthermore, non-state-controlled firms in China are incentivized to divert scarce resources to building and maintaining political connections. The second main result establishes that the positive impact of institutional development on cash holdings is weakened for connected firms. Hence, this study identifies one important channel through which political connections are beneficial for non-state-controlled firms in terms of mitigating the threat of political extraction.

Overall, the empirical findings of this study calls for Chinese regulators to initiate reforms not only in legal systems, but also in corporate disclosure and transparency in order to minimize the problem of political extraction so that capital allocation decisions become more efficient.

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