EMPIRICAL ESSAYS ON GOVERNMENT INVOLVEMENT IN CHINESE LISTED FIRMS

by

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ABSTRACT

This thesis investigates the impact of government involvement on firm value and financial policies in China. We focus on three aspects of government involvement: government control, political corruption and political connections. First, we examine how government control affects firm value through cash holdings. We find that ultimate control by the government reduces investors' valuation of cash. Further analysis suggests that the negative relationship is due to the high agency costs associated with government control rather than the low financial constraints. The results also show that the impact of government control on the value of cash varies with regional institutional development. Second, we investigate the impact of political corruption on corporate cash holdings using the recent Chinese anti-corruption campaign, which serves as an exogenous shock reducing the threat of political corruption. We find that firms increase cash holdings significantly in the post-campaign period. Further evidence shows that the increase in cash is greater in firms located in regions with higher political rent-seeking incentives. The findings support that the campaign removed political corruption threat, and firms, therefore, reduce their liquidity shielding incentives and adjust their cash holdings upward to an optimal level. Finally, we analyse the association between political connections and stock return volatility in non-state-controlled firms. We find that political connections increase total return volatility and idiosyncratic volatility. The positive association is more pronounced for firms in regions with poor market quality and low political uncertainty. The evidence indicates that political connections increase information asymmetry problems and thus lead to more volatile stock returns.

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CHAPTER 1 INTRODUCTION

The debate over the roles of government involvement in financial markets has been recently reopened because of worldwide government intervention in the years following the 2008 global financial crisis (Borisova *et al.*, 2012; Beuselinck *et al.*, 2017; Nash, 2017; Boubakri *et al.*, 2018). This thesis consists of three empirical essays regarding the impact of government involvement in terms of government control, political corruption and political connections on firm value and financial policies in China. In this chapter, we first provide an institutional background of the Chinese market, especially three important features pertaining to government involvement in Chinese listed firms. We then discuss the motivation and objectives of this thesis. Finally, the structure and the scope of the thesis are presented.

1.1 Institutional background in China

1.1.1 Overview on the Chinese market

The modern financial system in China is dominated by the banking sector, especially the 'Big Four' state-owned banks: the Agricultural Bank of China (ABC), the Bank of China (BOC), the Construction Bank of China (CBC) and the Industrial and Commercial Bank of China (ICBC), which constitute approximately two-thirds of total deposits and loans in China (Ayyagari, Demirgüç-Kunt and Maksimovic, 2010; Wu, Rui and Wu, 2012). These four state-owned banks are firmly under the control of the central government even though

they individually went public in the 2000s. It is not surprising that the state-owned banks need to carry political burdens and their decision-making process is largely influenced by political considerations. As stated by the International Monetary Funds (IMF), as of 2017, non-performing loans (NPLs) in China account for 1.7% of total gross loans, which is higher than many developed economies, such as Canada (0.5%), the UK (0.8%) and the US (1.1%), and other developing economies like Malaysia (1.5%) and Philippines (1.6%).

The Chinese mainland has two stock exchanges, the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE), which were established on 19 December 1990 and 3 July 1991, respectively. Even though the two stock exchanges were initially established in order to help state-owned enterprises (SOEs) raise capital and improve performance, the opening of the two stock exchanges is widely considered as the most significant step from a centrally-planned market to a market-oriented market in China. Over the last three decades, the two stock exchanges have grown rapidly, and both have become major stock exchanges in the world. At the end of April 2018, the SSE was ranked as the fourth largest stock exchange in the world, following the New York Stock Exchange (NYSE), the Nasdaq Stock Market (NASDAQ) and the Japan Exchange Group (JPE). The SZSE, with a smaller market capitalisation, was ranked the eighth largest stock exchange in the world.[1] The SSE has one main board. The SZSE has three boards: a main board, a small and medium-sized Enterprise (SME) board (launched in May 2004), and a board to attract innovative and fast-growing enterprises, known as the ChiNext board (inaugurated in October 2009).[2] At the end of 2016, there were 3,052 firms listed on the two exchanges with 1,182 firms listed on the SSE and

[1] The ten largest stock exchanges in the world ranked by market capitalisation on 30th April 2018 are reported in Appendix 1.A.

[2] ChiNext is also called Growth Enterprise Market (GEM) in certain circumstances.

1,870 firms listed on the SZSE, respectively.[3] Although the SZSE has a higher number of listed firms than the SSE, the firms listed on the SSE, on average, are larger than those listed on the SZSE.

The shares issued by Chinese listed firms are classified into A and B shares. The former are denominated in the domestic currency (RMB) and the latter are denominated in the foreign currencies (USD on the SSE and HKD on the SZSE). A and B shares have the same rights in terms of voting and cash flow. As of 2016, there were 2,952 firms issuing A shares only, 18 firms issuing B shares only and 82 firms issuing both A and B shares. Firms can also cross-list shares in Hong Kong (issuing H shares), New York (N shares), Singapore (S shares) and London (L shares).

In the Chinese stock markets, the majority shares of listed firms have been tradable only in the last decade. At the opening of the two stock exchanges, shares were divided into non-tradable shares and tradable shares, forming the so-called split share structure. When firms initially went public, controlling shareholders held non-tradable shares, such as state shares and legal person shares, which were not allowed to be freely traded in the secondary market. State shares are owned by central and local governments, while legal person shares are owned by wholly or partially state-owned enterprises and private institutions. Tradable shares were held by individual investors and allowed to be freely traded in the market. The objective of the split share structure was to allow both the state to maintain control over firms and the market to exert discipline over firms. However, the split share structure created a severe problem - the conflict of interests between tradable and non-tradable shareholders since the latter could not sell their ownership to realise wealth. In the absence of effective

[3] The number of firms listed on the two stock exchanges from 2000 to 2016 is reported in Appendix 1.B.

external and internal monitoring, non-tradable shareholders (usually controlling shareholders) could transfer resources out of the listed firms at the expense of tradable shareholders (minority shareholders). Realizing the problem, the Chinese government managed to reform the split share structure in April 2005. 'Since 2005, non-tradable shares are now called restricted shares to convey the fact that they will eventually become tradable' (Jiang and Kim, 2015).

The bond market in China is dominated by government bonds. The corporate bond market has been growing exponentially in the past few decades. However, compared with the loan and stock markets, the corporate bond market is still severely underdeveloped.

Table 1.1 presents the relative size of Chinese stock, corporate bond and loan markets from 2000 to 2016. The time trends of the three markets are illustrated in Figure 1.1. For example, the stock market had a market capitalisation of RMB 50,769 billion in 2016, more than ten times its size in 2000. The corporate bond market has grown rapidly from RMB 86 billion in 2000 to RMB 17,518 in 2016 (more than 200 times). Most importantly, there were RMB 106,604 trillion loans outstanding in 2016, more than twice the size of the stock market, and six times the size of the corporate bond market. The evidence supports the view that Chinese firms still rely primarily on loans from banks and other financial institutions, despite the rapid growth in stock and corporate bond markets.

[Insert Table 1.1 around here]

1.1.2 Government involvement in the Chinese market

One unique feature of the Chinese market is great government participation. In this thesis, we identify three important aspects relevant to the government involvement in the Chinese market, including government ownership and control, political corruption and the recent anti-corruption campaign and political connections in the private sector.

1.1.2.1 Government ownership and control

Prior to 1978, firms in China were completely owned by the government. Following the economic reform programme, the government divested a number of corporate stakes. As mentioned in the previous section, the establishment of the Chinese stock exchanges is to help SOEs raise capital and improve performance. Most listed firms in China are former SOEs that were privatised through share offering (i.e. share-issue privatised (SIP) firms). The Chinese government gradually sold its ownership of listed firms to the private sector. In our sample, the percentage of shares owned by the government decreases from 36.4% to 2.8% from 2003 to 2015. However, despite much effort devoted during the privatisation, the government remains as an influential shareholder in many Chinese companies and often leverage their voting power associated with their investments by pyramiding. A number of listed firms in China are directly or indirectly controlled by the government. For instance, still, 37.5% of listed firms in our sample were ultimately controlled by the government in 2015.

In addition, during privatisation, the central government transferred the control rights of many state-owned firms to local governments in order to encourage the development of local economies (Wu, Wu and Rui, 2012). Government ownership and control are exercised by

many state agencies, including state asset management bureaus (SAMBs) and SOEs affiliated to different levels of governments. For example, Chen, Firth and Xu (2009) show that during 1999-2004, approximately 50% of listed firms are controlled by SOEs affiliated to local governments and around 20% are controlled by private investors. The rest are controlled by SAMBs (16%) and SOEs affiliated to the central government (14%). In our sample, during 2003-2015, 37.1% of listed firms are ultimately controlled by local governments, while 15.3% of listed firms are ultimately controlled by the central government.

Even though most Chinese listed firms are controlled by local governments, the central government strongly retains control over top firms in strategic industries. For example, the central government, through the China National Petroleum Corporation and the Sinopec Group, indirectly controls the PetroChina Company Limited and the China Petroleum and Chemical Corporation, the two largest oil and gas companies in China. The largest civil engineering company in China, the China State Construction Engineering Corporation is also indirectly controlled by the central government via the China State Construction Group. The largest transportation equipment manufacturing company in China, the CRRC Corporation Limited, is controlled by the central government through the China Railway Engineering Group.

1.1.2.2 Political corruption and the recent anti-corruption campaign

China has become one of the most important economies in the world. Despite its rapid growth and development, the Chinese economy is characterised by a severely corrupt environment. The government plays a key role in allocating scarce resources, such as granting rights of land use, setting energy prices, controlling access to financial capital, and

intervening in judicial and regulatory decisions at its discretion (Chen *et al.*, 2011a). With weak legal enforcement and poor property rights protection, it is unsurprising that such an institutional background leads to a severely corrupt environment (Allen, Qian and Qian, 2005). Although the government's effort in combating corruption has never stopped, China is still ranked 76 out of 176 countries on the Corruption Perception Index in 2016, according to the Transparency International Survey, where a higher ranking implies a higher public perception of corruption.

As corruption has become one of the major impediments to Chinese economic growth, Xi Jinping, soon after taking office in November 2012, launched an influential anti-corruption campaign, aiming to reduce corruption in government officials. The campaign determines to crack down on 'tigers and flies', i.e. high- and low-ranking officials. The anti-graft effort is being carried out by the Central Commission for Discipline Inspection (CCDI). Since 2013, the CCDI has started dispatching central inspection teams to selected regions to carry out initial inspections. After spending around two months at the region targeted, the central inspection teams send their results to the CCDI to enact formal investigation procedures. By the end of September 2014, the central inspection teams had conducted four rounds of inspection, covering all provinces, municipalities, and autonomous regions. With the deepening of the recent anti-corruption campaign, the CCDI and central inspection teams have exerted stricter supervision, amidst the public and social media involved in monitoring. The cost of punishment also increases significantly. This leads to an increase in discipline inspections of officials and a decrease in the likelihood of being bribed. According to the official records of the CCDI, in 2016, there were over four million cases under investigation and people punished by the Communist Party law, including over 40 leaders at province

level and above implicated in corruption. The campaign has now continued for more than five years and there is no sign of it ceasing.

1.1.2.3 Political connections in the private sector[4]

The first public privately owned company was listed on the SSE in 1998 (Zhang, 2004). Thereafter, an increasing number of privately owned firms, including family firms, have subsequently listed on the two stock exchanges. The SZSE's SME board and ChiNext board greatly facilitated the listing of private firms. For example, in our sample, the percentage of privately owned firms increased from 25.0% in 2003 to 62.5% in 2015.

The Chinese business environment depends largely on its political climate. The government continues to exert substantial control over the economy in terms of controlling many listed firms and allocating scarce resources. Therefore, despite rapid development, private firms still suffer from political and social discrimination, compared with comparable government-owned firms (Li *et al.*, 2008). In addition, social networks (*Guanxi*, in Chinese) are of great importance in China, which can substitute for formal contracts and facilitate doing businesses (Xin and Pearce, 1996; Allen, Qian and Qian, 2005). Among the various types of social networks, political connections are the most helpful one. To compete with government-owned firms and overcome institutional disadvantages, firms in the private sector have strong incentives to foster good connections with politicians and bureaucrats. One effective way is to hire current or retired government officials as directors because their previous working experience in the government provides them with close ties with politicians and bureaucrats (Lu, Pan and Zhang, 2015). Meanwhile, on the supply side, many

[4] In this thesis, the private sector means the non-state-controlled sector. Private firms refer to the listed firms controlled by private owners rather than unlisted firms.

government officials are willing to serve as directors and enjoy high compensation and perks in private firms, since civil service posts are usually characterised by low salaries and fierce competition. It has been found that a large number of government officials have exchanged their political careers for managerial positions in private firms since the late 1990s (Cao *et al.*, 2017).

On 9 October 2013, however, 'Rule 18' was introduced by the Communist Party of China (CPC) as a part of the recent anti-corruption campaign to curb political corruption that may arise from corporate links with government officials. In particular, the regulation officially forbids existing and recently retired government and party officials from serving as directors for listed firms on either part-time or full-time basis. Since the enactment of 'Rule 18', many directors with political connections have been forced to resign from their positions (Hope, Yue and Zhong, 2018). Taking our sample as an example, the percentage of politically connected directors was relatively constant during 2008-2013, and then sharply decreased from 99.96% in 2013 to 85.27% in 2014 and 73.43% in 2015.

Based on the fundamental features of government involvement in the Chinese market as discussed above, we conducted three empirical studies based on government control, political corruption, and political connections.

1.2 Motivation and objectives

Despite the large wave of privatisation across the globe since the 1990s, government ownership in listed firms is still pervasive in the world (Bortolotti and Faccio, 2009; Borisova *et al.*, 2015). As an influential shareholder, the government can use its voting rights

to influence corporate financial policies, which can be value-destroying for several reasons. First, the government is likely to direct listed firms under their control to achieve political and social objectives, such as maintaining high employment, promoting regional development, preserving social stability, etc. (Boycko, Shleifer and Vishny, 1996; Shleifer and Vishny, 1997). Those sub-optimal socio-economic objectives can be inconsistent with economic efficiency and shareholders' wealth maximisation. In addition, managers in SOEs, in the absence of effective monitoring mechanisms, may syphon SOE resources to pursue personal advantages. It is unlikely that other investors have enough incentives and power to monitor managers in SOEs. Further, since the government provides an implicit bailout guarantee and soft budget constraints to SOEs, SOEs are less subject to the discipline by market participants and the threat of financial distress (Megginson and Netter, 2001; Kornai, Maskin and Roland, 2003; Faccio, Masulis and McConnell, 2006). In contrast, under certain circumstances, the government as a shareholder can be helpful. As argued by the soft budget constraints theory (Kornai, Maskin and Roland, 2003), the government can deploy fiscal means, credits and indirect supports to soften financial constraints in government-owned firms. Government ownership can also lessen corporate default risk since government-owned firms are more likely to be the beneficiary of government-sponsored bailouts during the period of financial distress (Borisova and Megginson, 2011; Borisova *et al.*, 2015). These benefits of government ownership associated with soft budget constraints and implicit bailout support may ultimately be value-enhancing.

There are many empirical studies on the impact of government ownership on firm value and performance. The evidence, however, is mixed. Supporting the inefficiency of government ownership, significant performance and governance improvements have been observed following privatisation (Megginson and Netter, 2001; Boubakri, Cosset and Guedhami,

2005, 2008). In contrast, Beuselinck *et al.* (2017) find that the reduction in firm value during the financial crisis is smaller in firms with government ownership than in firms without, supporting the benefits of government ownership. Boubakri *et al.* (2018) focus on ultimate ownership by the government and observe a non-linear relationship between government control and firm value. In terms of Chinese context, Chen, Firth and Xu (2009) contend that private control is not necessarily superior to government control. They find that firms controlled by SOEs affiliated to the central government perform the best, followed by firms controlled by SOEs affiliated to local governments. Privately and state asset management bureau-controlled firms are reported to perform the worst.

In the first empirical study of this thesis, we attempt to add to the above debate by investigating how government control affects firm value through one important corporate assets – cash holdings. Cash holdings are the most liquid assets in firms and account for a large portion of firm assets across countries (Dittmar, Mahrt-Smith and Servaes, 2003; Bates, Kahle and Stulz, 2009; Chen *et al.*, 2012). Cash holdings are valuable since they enable firms to finance profitable investment without resorting to external finance, especially during financially constrained periods (Opler *et al.*, 1999; Almeida, Campello and Weisbach, 2004). However, cash holdings can also be costly. Compared with hard assets, liquid assets can be easily diverted by corporate insiders with little scrutiny for private benefits at the expense of outside shareholders (Jensen, 1986; Myers and Rajan, 1998). Consequently, how market participants value corporate cash holdings reflects the perceived use of this type of asset, which largely depends on the degree of corporate financial constraints and agency costs (Faulkender and Wang, 2006; Pinkowitz, Stulz and Williamson, 2006; Dittmar and Mahrt-Smith, 2007; Kalcheva and Lins, 2007; Denis and Sibilkov, 2009). We choose to consider ultimate control rights by the government since the recent evidence shows that ultimate

control by the government can better describe the role of the government than direct ownership, in the presence of pyramiding and multiple control chains (Bortolotti and Faccio, 2009; Boubakri *et al.*, 2018). Government control and private control can differ in terms of agency costs and financing frictions, and thus can lead to different investors' valuation of cash holdings.

The government can influence firm value and outcomes, even though they do not own any stakes in firms. Politicians and bureaucrats can use their power to extract resources from firms at the expense of shareholders' wealth (Stulz, 2005), i.e. political corruption. Though the impact of political corruption on macroeconomic and public choice variables are extensively documented in the extant literature (Shleifer and Vishny, 1993; Mauro, 1995; Tanzi and Davoodi, 1998), the literature on how firms respond to political corruption is inconclusive. On the one hand, empirical evidence shows that firms adopt different strategies to avoid political extraction and protect shareholder rights (Choi and Thum, 2005; Stulz, 2005; Beneish *et al.*, 2008; Durnev and Fauver, 2008). On the other hand, a number of studies document that firms can take bribe opportunities and purchase political favours to benefit in the presence of a corrupt environment (Claessens, Feijen and Laeven, 2008; Goldman, Rocholl and So, 2009; Blau, Brough and Thomas, 2013).

Our second empirical study aims to contribute to the above debate by investigating how firms manage their policy of liquid assets under the circumstance of political corruption, based on a quasi-experiment of the recent anti-corruption campaign in China. Compared with property, plant, equipment (PPE) and inventory, cash holdings are easier to access and are considered one of the primary targets for political extraction (Myers and Rajan, 1998; Caprio, Faccio and McConnell, 2013). Moreover, liquid assets enable firms to exploit

randomly arising bribing opportunities (Smith, 2016). Therefore, firm managers with incentives to either shield liquid assets against political extraction or accumulate cash for political favours. The literature on political corruption and cash holdings is limited and mixed. Based on a cross-country sample, Caprio, Faccio and McConnell (2013) find that firms hold smaller cash holdings in order to reduce their ability to pay for political officials in countries with a high potential for political extraction. Similar results are also found in the US (Smith, 2016). In contrast, Chen (2011) finds that corporate cash reserves are higher in countries with low control of corruption, suggesting that firms hold high liquidity to meet bribery needs in a corrupt environment. The recent anti-corruption campaign, launched in late 2012, has been by far the most important effort made by Chinese leaders to reduce political corruption by government officials (Xu and Yano, 2016; Pan and Tian, 2017; Zhang, 2018). The campaign, serving as an exogenous shock reducing the threat of political corruption, can eliminate the endogenous concern over the relationship between political corruption and corporate cash holdings. The single-country study can also eliminate the endogeneity associated with cross-country studies.

The third aspect of government involvement discussed in this thesis is the corporate political connections with government officials. Firms are found to benefit from political connections in many studies. For example, Fisman (2001) finds that in Indonesia, stock prices closely related to President Suharto declined significantly around the announcement of the president's illness. The evidence suggests that a large proportion of firm value is attributable to political connections. Using a cross-country sample, Faccio (2006) documents a significant increase in firm value when a firm's businessperson enters politics. Similar results are found in the US (Goldman, Rocholl and So, 2009; Cooper, Gulen and Ovtchinnikov, 2010), Denmark (Amore and Bennedsen, 2013), Brazil (Claessens, Feijen

and Laeven, 2008) and China (Li *et al.*, 2008). In addition, many papers investigate the mechanisms through which political connections benefit firms. Firms with political connections are found to have easier access to capital (Khwaja and Mian, 2005; Claessens, Feijen and Laeven, 2008; Li *et al.*, 2008; Francis, Hasan and Sun, 2009), enjoy more government contracts, subsidies and tax benefits (Agrawal and Knoeber, 2001; Johnson and Mitton, 2003; Adhikari, Derashid and Zhang, 2006), have lax regulatory enforcement (Berkman, Cole and Fu, 2009; Yu and Yu, 2011), and are more likely to receive government investment and bailout in times of financial distress (Faccio, Masulis and McConnell, 2006; Duchin and Sosyura, 2012) than their comparable peers without political connections.

In contrast, prior evidence also indicates that agency and governance issues pertaining to political connections can have an adverse impact on firm value. For example, Shleifer and Vishny (1994) argue and document that firms with political connections employ more workers and pay them higher wages than firms without. That is, politicians may extract at least some of the rents when they offer connected firms benefits. Fan, Wong and Zhang (2007) and Boubakri, Cosset and Saffar (2008) find politically connected newly privatised firms tend to underperform compared with their unconnected peers, supporting the argument that firms with political connections suffer from political extraction. Other costs of political connections are associated with tunnelling by corporate insiders (Qian, Pan and Yeung, 2011; Tu, Lin and Liu, 2013), entrenched executives (You and Du, 2012; Cao *et al.*, 2017) and lower investment efficiency (Chen *et al.*, 2011b; Wu *et al.*, 2012). In addition, political connections can deteriorate the information environment and increase the risk of information asymmetry between investors and managers. For example, Leuz and Oberholzer-Gee (2006) find that politically connected firms are less likely to cross-list, suggesting that high levels of transparency and increased scrutiny may expose the political benefits of ambiguous

legality. Chen, Ding and Kim (2010) find that firms with political connections have less accurate analyst forecasts about earnings, suggesting more information asymmetry problems in these firms. Chaney, Faccio and Parsley (2011) further find that politically connected firms are more opaque since they enjoy better access to debts and have a lesser need to improve accounting information quality.

While a large strand of literature examines the implications of political connections on firm value and financial policies, one issue that remains largely unexplored is the implications of political connections on the volatility of stock returns. It is important to understand both the *level* and the *variability* of stock returns. A high level of stock return volatility can increase a firm's perceived riskiness and proxy for asymmetric information problems (Lang and Lundholm, 1993; Krishnaswami and Subramaniam, 1999; Bushee and Noe, 2000). In addition, systematic volatility is important to the cost of capital and idiosyncratic volatility matters for investors, arbitrageurs and to managers (Rajgopal and Venkatachalam, 2011). In the third empirical study, we narrow this gap in the literature and investigate the relationship between political connections and stock return volatility.

1.3 Structure and scope of the thesis

This thesis consists of five chapters, including an introduction, three stand-alone empirical chapters and a conclusion. The rest of the thesis proceeds as follows.

Chapter 2 presents the first empirical work of this thesis. It investigates how the ultimate control by the government affects firm value through cash holdings. We propose two hypotheses: the agency costs hypothesis and the financial constraints hypothesis. According

to the agency costs hypothesis, managers in government-controlled firms are more likely to deploy cash holdings in efforts to pursue political objectives and personal interests at the expense of minority shareholders, leading the market to discount the value of cash holdings in those firms. Based on the financial constraints hypothesis, government control can help firms improve the access to external capital and lower financing frictions, and therefore internal finance in firms with government control is not as valuable as that in those with private control. Both hypotheses lead to a negative impact of government control on the value of cash. Based on the marginal value of cash model akin to Faulkender and Wang (2006), we obtain strong evidence that government control decreases the value of cash holdings. The result is robust to different measures of government control, alternative measures of the expected change in cash, the inclusion of additional control variables and the consideration of endogeneity issues. Further analysis suggests that the negative impact of government control on the value of cash is consistent with the agency costs hypothesis. Specifically, we find that government-controlled firms invest more cash in investments with low efficiency than privately controlled firms; government control exerts no significant impact on financial constraints measured by the cash-flow sensitivity of cash or external financing channels measured by gross equity issuances and net debt issuances. Finally, the evidence indicates that the relationship between government control and the value of cash varies with province-level institutional development. The findings, taken together, support the agency costs hypothesis that investors perceive higher agency costs in firms with government control due to political objectives and poor governance mechanisms, and therefore discount the value of cash in those firms.

Chapter 3 investigates the impact of political corruption on corporate cash holdings based on the recent anti-corruption campaign in China. The previous literature on political

corruption and cash holdings suggests two hypotheses: the shielding hypothesis and the liquidity hypothesis (Smith, 2016). The former argues that firms tend to maintain low levels of cash holdings to avoid political extraction, while the latter suggests that firms hold large holdings of cash to buy political favours. The anti-corruption campaign serves as an exogenous shock reducing the threat of political corruption faced by Chinese listed firms. We find that firms increase cash holdings significantly in the post-campaign period, after controlling for operational, investment and financing factors. The result is valid when alternative measures of key variables are used and additional controls are included. Importantly, we show that the result remains when controlling for stock return volatility and political uncertainty, suggesting that the increase in cash is not a result of the increase in uncertainty that firms confront following the campaign. In the extended analysis, it appears that the increase in cash is more evident in firms located in regions with high political rent-seeking incentives. The rent-seeking incentives by local government officials are captured from the following four aspects: market development, government quality, fiscal status and economic conditions. In addition, our further analyses reveal that the anti-corruption campaign significantly increases the value of cash holdings. The reduction in political corruption is associated with more cash holdings invested in capital expenditures and higher investment efficiency. Financial leverage significantly decreases following the anti-corruption campaign. The increase in cash holdings after the campaign is greater in firms with poorer governance mechanisms. Overall, our findings support that political corruption is a key determinant of corporate cash holdings. The recent anti-corruption campaign has reduced the threat of political extraction and allowed firms to move cash holdings upward to their optimal levels.

Chapter 4 investigates the impact of political connections on the volatility of stock returns. Political connections can influence stock return volatility in several possible ways. First, political connections provide firms with easier access to capital, more subsidies and tax benefits, and implicit bailout support. As a consequence, market competition matters less and the overall exposure to the market-wide volatility is lower for politically connected firms. This suggests a lower level of systematic volatility. Second, political connections are associated with poor corporate governance and severe agency costs due to the expropriation by politicians and corporate insiders. Since weak governance mechanisms are found to be associated with systematic volatility and the cost of equity (Chen, Chen and Wei, 2009; Boubakri, Guedhami and Mishra, 2010), political connections can lead to higher systematic volatility. Third, firms with political connections are more likely to report poor accounting quality and deteriorating financial information, due to a lesser need to attract external finance and a greater incentive to hide the benefits from political connections (Chaney, Faccio and Parsley, 2011; Boubakri *et al.*, 2012). This suggests a severe problem of asymmetric information and higher levels of idiosyncratic volatility and total return volatility (Lang and Lundholm, 1993; Krishnaswami and Subramaniam, 1999; Rajgopal and Venkatachalam, 2011). Using a sample of Chinese privately controlled firms during the period 2008-2016, we provide empirical evidence that firms with more politically connected directors have higher stock return volatility. When decomposing stock return volatility into systematic and idiosyncratic volatility, the evidence suggests the positive relationship is concentrated in idiosyncratic volatility rather than systematic volatility. The results are robust to alternative measures of key variables and additional control variables. We address the potential endogenous problem associated with political connections using a matched sample approach and instrumental variable estimation. In additional analyses, we find that the impact of

political connections on stock return volatility is more pronounced in regions where market quality is poor and political uncertainty is low. Overall, our findings are consistent with the view that the costs of political connections related to poor financial reporting quality and asymmetric information problems lead to higher stock return volatility, especially idiosyncratic volatility.

Chapter 5 concludes the thesis. It summarises the key findings of the three empirical chapters and their respective contributions. We further identify the limitations of the research in this thesis and propose promising ideas for future work.

Table 1.1 Overview of the Chinese financial market by year

Year	Stock market cap. (RMB billion)	Corporate bonds (RMB billion)	Loans (RMB billion)	GDP (RMB billion)	Inflation (%)
2000	4,809	86	9,937	10,028	0.4%
2001	4,352	101	11,231	11,086	0.7%
2002	3,833	133	13,129	12,172	0.8%
2003	4,246	169	15,900	13,742	1.2%
2004	3,706	202	17,820	16,184	3.9%
2005	3,243	402	19,469	18,732	1.8%
2006	8,940	553	22,535	21,944	1.5%
2007	32,714	768	26,169	27,023	4.8%
2008	12,137	1,325	30,339	31,952	5.9%
2009	24,394	2,554	39,968	34,908	-0.7%
2010	26,542	3,632	47,920	41,303	3.3%
2011	21,476	4,910	54,795	48,930	5.4%
2012	23,036	7,771	62,991	54,037	2.6%
2013	23,908	9,324	71,896	59,524	2.6%
2014	37,255	11,621	81,677	64,397	2.0%
2015	53,146	14,433	93,951	68,905	1.4%
2016	50,769	17,518	106,604	74,413	2.0%

The table presents summary statistics of the Chinese financial markets during 2000-2016, including stock market capitalisation, corporate bonds, loans from financial institutions, gross domestic product and inflation. The inflation rate is measured as the percentage change in the consumer price index (CPI). Stock market capitalisation, gross domestic product (GDP) and inflation are from the Statistical Yearbook of China (the Statistical Bureau of China). Corporate bonds and financial institution loans are from the China Financial Stability Report (the People's Bank of China).

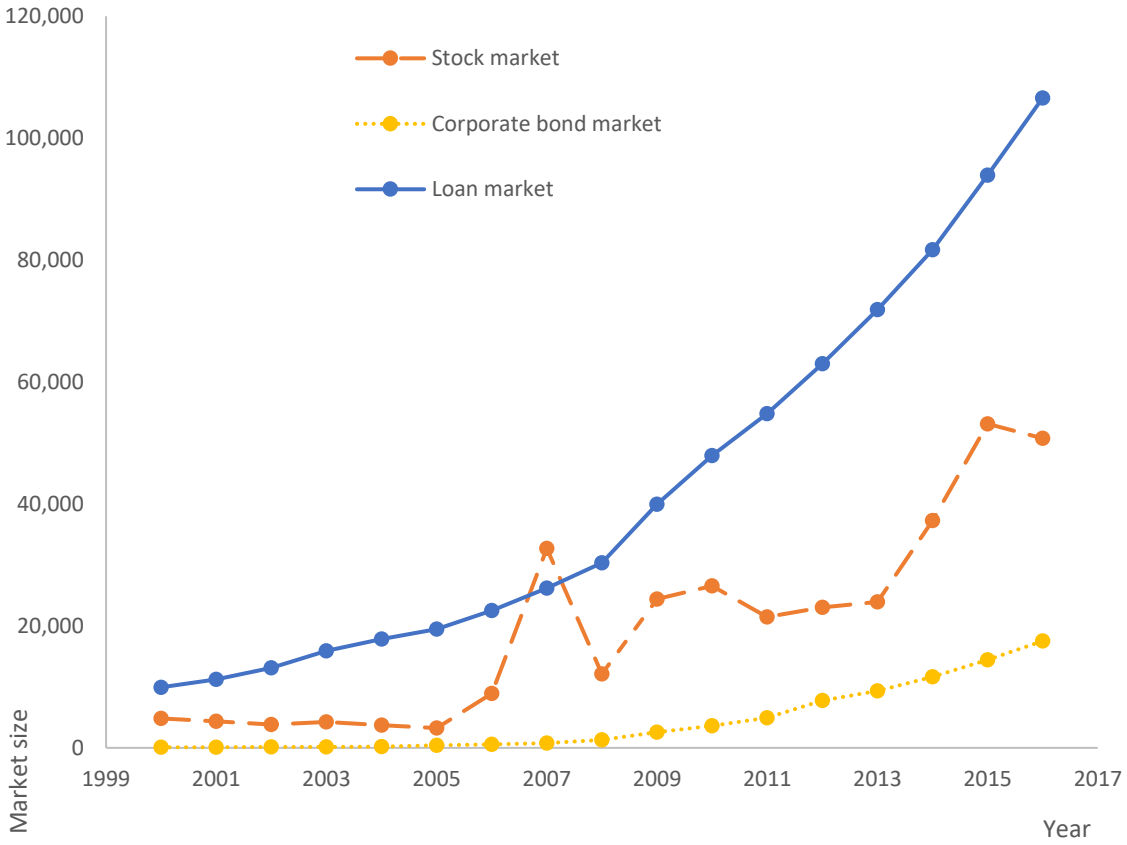


Figure 1.1 The relative size of stock market, corporate bond market and loan market in China over the period 2000-2016

Appendix 1.A The top ten largest stock exchanges in the world on 30 April 2018

Ranking	Stock Exchange	Country/Region	Market Capitalisation (USD billions)
1	New York Stock Exchange	US	23,139
2	Nasdaq Stock Market	US	10,376
3	Japan Exchange Group	Japan	6,288
4	Shanghai Stock Exchange	China	5,023
5	Euronext	EU	4,649
6	London Stock Exchange Group	UK, Italy	4,596
7	Hong Kong Stock Exchange	Hong Kong	4,443
8	Shenzhen Stock Exchange	China	3,547
9	Deutsche Börse AG	Germany	2,339
10	Bombay Stock Exchange	India	2,298

This table reports the summary statistics of the top ten largest stock exchanges in the world as of 30 April 2018, including the ranking, country/region and market capitalisation. The source of information is the Monthly Reports of World Federation of Exchanges (WFE).

Appendix 1.B Listed firms in China by year

Year	Total	SSE	SZSE				A share listed firms	B share listed firms	AH shares listed firms	AB shares listed firms
				Main Board	SME	Chi-Next				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2000	1,088	572	516				1,060	114	19	86
2001	1,160	646	514				1,140	112	23	92
2002	1,224	715	509				1,213	111	28	100
2003	1,287	780	507				1,277	111	30	101
2004	1,377	837	540				1,363	110	31	96
2005	1,381	834	547				1,358	109	32	86
2006	1,434	842	592				1,411	109	38	86
2007	1,550	860	690				1,527	109	52	86
2008	1,625	864	761				1,602	109	57	86
2009	1,718	870	848				1,696	108	61	86
2010	2,063	894	1,169	485	531	153	2,041	108	65	86
2011	2,342	931	1,411	484	646	281	2,320	108	72	86
2012	2,494	954	1,540	484	701	355	2,472	107		85
2013	2,489	953	1,536	480	701	355	2,468	106		85
2014	2,613	995	1,618	480	732	406	2,592	104		83
2015	2,827	1,081	1,746	478	776	492	2,808	101		82
2016	3,052	1,182	1,870	478	822	570	3,034	100		82

The table reports the number of listed firms in China during 2000-2016. The total number of listed firms by year is in column 1. The numbers of firms listed on SSE and SZSE (Main board, SME and ChiNext) by year are in columns 2-6. The numbers of listed firms issuing A share, B share, AH shares and AB shares by year are in columns 7-10. The data is collected from the Statistical Yearbook of China (the Statistical Bureau of China) and the SZSE official website (http://www.szse.cn/main/en/). According to the statistical classification by the China Securities Regulatory Commission (CSRC), firms issuing A shares include those issuing A shares only, both A and B shares and both A and H shares. Similarly, firms issuing B shares include those issuing B shares only and both A and B shares. Therefore, the number of firms issuing A shares only is the number of firms issuing A shares minus the number of firms issuing A and B shares and the number of firms issuing A and H shares. The number of firms issuing B shares only is the number of firms issuing B shares minus the number of firms issuing A and B shares.

CHAPTER 2 GOVERNMENT CONTROL AND THE VALUE OF CASH

2.1 Introduction

Despite the large-scale privatisation that started in the UK in the 1980s and then spread across the world in the 1990s, government control over listed firms is still pervasive, especially in the emerging markets in general and the Chinese market in particular. The recent 2008 financial crisis, associated with worldwide government intervention, has reopened the debate over government ownership in firms' business decisions. Two competing views of government ownership have emerged. Government ownership can be detrimental to firm value due to its political objectives and poor governance mechanisms (Boycko, Shleifer and Vishny, 1996; Shleifer and Vishny, 1997). However, government connections may bring benefits to firms under its control, for example, implicit bailout guarantees, preferential access to credit, government-related contracts, etc. (Kornai, Maskin and Roland, 2003; Faccio, Masulis and McConnell, 2006; Borisova and Megginson, 2011). Based on the theoretical upsides and downsides of government ownership, it is unsurprising that there is large conflicting evidence in the literature on the relationship between government ownership and firm value (Boubakri, Cosset and Guedhami, 2005; Chen, Firth and Xu, 2009; Liu, Uchida and Yang, 2012; Beuselinck *et al.*, 2017; Boubakri *et al.*, 2018).

In this chapter, we aim to add to the above debate by investigating how government control influences firm value through its impact on the cash held by firms within the context of

China, the world's largest emerging economy. Cash holdings account for a large part of firm assets and are one of the most important corporate resources. Cash holdings enable firms to finance profitable investment without resorting to external finance, which is especially valuable during financially constrained periods (Opler *et al.*, 1999; Almeida, Campello and Weisbach, 2004; Denis and Sibilkov, 2009). However, compared with PPE and inventories, cash reserves can be easily syphoned by corporate insiders with little scrutiny for private benefits that come at a cost to outside shareholders (Jensen, 1986; Myers and Rajan, 1998). Consequently, how the market evaluates cash holdings held by firms reflects their perceived use, which largely depends on corporate financing frictions and agency costs (Faulkender and Wang, 2006; Pinkowitz, Stulz and Williamson, 2006; Dittmar and Mahrt-Smith, 2007; Kalcheva and Lins, 2007; Denis and Sibilkov, 2009). Government control can increase corporate agency costs and/or decrease financing frictions, and further lower investors' valuation of cash, compared with private control.

We are particularly interested in China as it provides an ideal setting for studying this topic for three reasons. First, China has rich data for this analysis. The Chinese stock market is characterised by government control, with many listed firms being directly or indirectly controlled by the state and state agencies (Chen, Firth and Xu, 2009; Firth *et al.*, 2012). The government can direct listed firms under their control to achieve political interests and social motives. In addition, due to the ambiguous property rights and weak legal protection in China, managers have high incentives to extract resources from firms at the expense of shareholders. This managerial agency problem can be particularly severe in government-controlled firms due to the absence of monitoring by large shareholders and active investors in the market. Second, the financial system in China is dominated by state-owned banks. The state can provide easier access to credits and alleviate financing frictions of firms under its

control (Cull and Xu, 2003; Gordon and Li, 2003; Guariglia, Liu and Song, 2011). Third, market institutions and government quality vary significantly across regions in China (Chen *et al.*, 2011a; Wang, Fan and Yu, 2017), creating a good setting to study the impact of institutional development on the relationship between government control and the value of cash holdings within a single country.

We focus on ultimate control by the government, which is believed to better describe the degree of government power in firms than direct ownership (Bortolotti and Faccio, 2009; Boubakri *et al.*, 2018). Our first empirical result shows that government control reduces the value of cash. Economically, an extra unit (RMB) of cash held in a government-controlled firm is, on average, valued at RMB 0.25 less than that which is held in a privately controlled firm. The result is robust to a battery of robustness tests, including year, firm and industry fixed effects, alternative measures of government control and the expected change in cash, as well as controlling for corporate governance variables. We focus on the coefficient on the interaction term between government control and the change in cash only to alleviate, to some extent, the concern of endogeneity. More importantly, the result also holds using approaches including the lagged value of government control, a propensity-score matched sample, and analysis of the change in government control.

Moreover, our evidence suggests that the channel through which government control lowers the value of cash is the agency costs and overinvestment problems. Specifically, we find that firms with government control disgorge more cash via investment than firms with private owners do. In addition, our results reveal that cash is used less for research and development (R&D) and investment is less associated with growth opportunities in firms controlled by the government than those controlled by private owners. Together, the results appear to

support the agency costs hypothesis in that cash is more likely to be depleted in investment projects that have no growth opportunities in firms under government control, and the market, therefore, discounts the value of cash in these firms. In addition, we find no evidence supporting that government control mitigates financial constraints or enhances external financing abilities, which is contrary to the financial constraints hypothesis.

Lastly, our results suggest that the extent to which government control has a negative impact on the value of cash depends on province-level institutional quality. We find that the negative relationship is especially weak in regions with low market development and poor government quality. We argue that there can be two possible reasons behind this. First, unlike the cross-country setting, the governments of less developed regions of China have much political pressure to increase economic development and tackle regional disparity (Chen and Zheng, 2008). In these regions, governments are likely to discipline firms, especially government-controlled firms, to invest effectively and improve performance. Second, in regions with weak investor protection, governments with coercive political power, as controlling shareholders, can better protect minority shareholders compared with private owners (Qian, 2001; Wu, Xu and Yuan, 2009). Therefore, the relative disadvantage of government control perceived by investors diminishes in regions with weak institutional quality.

Our study contributes to the literature in several ways. First, our findings add to the recent debate over the effect of government ownership on firm value (Liu, Uchida and Yang, 2012; Beuselinck *et al.,* 2017; Boubakri *et al.,* 2018). Our evidence suggests that government control has a negative impact on firm value through its effect on liquid assets. More importantly, our study helps facilitate a better understanding of the mechanisms that underlie

the relationship between government control and the value of cash; especially, the value-destroying effect is mainly due to the agency costs of government expropriation. We find no evidence that government control helps firms to enhance their external financing channels or lower their financial constraints in Chinese listed firms. Our results are consistent with the recent evidence that government ownership does not necessarily decrease the cost of capital or enhance corporate financing ability (Ben-Nasr, Boubakri and Cosset, 2012; Firth *et al.*, 2012; Borisova *et al.*, 2015; Jaslowitzer, Megginson and Rapp, 2016).

Second, our results also contribute to the literature on agency theory and corporate cash holdings. According to the free cash flow theory, self-interested managers have incentives to hold excess cash reserves at the expense of shareholders, suggesting a positive relationship between agency costs and cash holdings. However, the empirical evidence on how agency costs affect the *level* of cash is mixed and inconclusive. Opler *et al.* (1999) and Bates, Kahle and Stulz (2009) find no such evidence. Dittmar, Mahrt-Smith and Servaes (2003) and Gao, Harford and Li (2013) find that firms with weak investor protection maintain high levels of cash holdings, supporting the free cash flow theory. On the other hand, Harford, Mansi and Maxwell (2008) argue that entrenched managers prefer spending excess cash flows quickly for private benefits rather than accumulating large cash holdings. They find firms with more agency costs hold less cash, supporting the spending hypothesis. From a different perspective, Dittmar and Mahrt-Smith (2007) and Pinkowitz, Stulz and Williamson (2006) investigate how agency costs affect the *value* of cash reserves, which reflects the perceived use of cash by investors. Consistent with agency theory, they find the value of cash holdings is discounted for firms where minority investor protection is weak and insider monitoring pressure is limited. Our findings provide additional evidence that the agency costs associated

with government control destroy firm value through cash holdings. Our study shows that government control increases the ineffective use of cash and thus decreases the value of cash.

Finally, our work adds to the literature relating to institutional quality and government ownership. Prior cross-country evidence suggests that the costs of government ownership are higher in regions with poorer investor protection and government quality (Guedhami, Pittman and Saffar, 2009; Beuselinck *et al.*, 2017; Boubakri *et al.*, 2018). Our results suggest that government control across regions in a single country can play a different role: with the political pressure to improve regional development and the political power to protect minority investors, the relative costs of government control perceived by the market are weaker in less developed regions in China.

Our study relates to the work of Megginson, Ullah and Wei (2014), who examine the impact of state ownership on the level, as well as the value of cash for Chinese firms and cross-country firms, respectively. They document that the value of cash decreases with state ownership. We differ from and extend beyond Megginson, Ullah and Wei (2014) in several aspects. First, we chase the identity of the ultimate owner and focus on ultimate control by the government (as opposed to direct ownership), which provides a better picture of the extent of state power on firms under its control (Bortolotti and Faccio, 2009). Second, we empirically explore the channels through which government control influences the value of cash. In particular, we hypothesize that government control can affect the value of cash through both agency costs and financial constraints channels and distinguish between the two channels. Third, we investigate whether regional institutional development may

influence the relationship between government control and the value of cash across regions in China.[5]

The remainder of the chapter is organised as follows. Section 2.2 reviews the relevant literature and develops testable hypotheses. The sample, key variables, and the methodology are described in Section 2.3, followed by the empirical results in Section 2.4. Section 2.5 concludes the chapter.

2.2 Hypothesis development

2.2.1 The value of cash holdings

Cash is an important asset to firms, especially when other sources of finance, such as cash flows, debts and equity issuances, are insufficient to finance profitable investment. Liquid assets enable firms to hedge against the changes in growth opportunities and negative cash flow shocks (Opler *et al.*, 1999; Almeida, Campello and Weisbach, 2004; Acharya, Almeida and Campello, 2007). The importance of cash holdings is greater for constrained firms, as cash holdings help constrained firms to undertake profitable projects that might otherwise be bypassed. Faulkender and Wang (2006) and Denis and Sibilkov (2009) provide empirical evidence that cash holdings are valuable for financially constrained firms with hedging

[5] Our study is also related to a recent study by Chen *et al.* (2018), which investigates state ownership and cash holdings using a sample of newly privatised firms from 59 countries. In particular, they examine the effect of institutions on the relationship between state ownership and the value of cash, by regressing Tobin's Q on institutional factors, state ownership and cash holdings and find as state ownership increases, the value of cash holdings decreases more in countries with weaker institutions. Using the marginal value of cash model, our findings show that the value of cash decreases less with government control in regions with weaker institutions in China.

needs, because cash holdings are employed in value-increasing projects, in line with the precautionary motive.

However, one severe cost of cash holdings is related to agency problems. Although many assets can be turned into private benefits by corporate insiders, cash holdings are especially vulnerable. Compared with hard assets such as PPE and inventories, cash holdings can be easily extracted by self-interested managers and controlling shareholders with little scrutiny to pursue their personal benefits at the expense of minority shareholders' interests (Jensen and Meckling, 1976; Myers and Rajan, 1998). When minority shareholders anticipate that corporate insiders use cash holdings for private benefits, they attach a lower value to cash holdings in these firms. Consequently, a substantial source of value destruction pertaining to agency problems seems to materialise through investors' markdown of cash reserves. In line with the argument, Pinkowitz, Stulz and Williamson (2006) find that cash is worth much less in countries with lower investor protection. Similarly, Kalcheva and Lins (2007) find when the external investor protection is weak, firms values are lower when controlling managers hold more cash. Dittmar and Mahrt-Smith (2007) show that the marginal value of cash, as well as the value of excess cash, is higher in well-governed firms than those in poorly governed firms.

Against this backdrop, we examine the effects of government control on the value of cash and argue that government control can affect corporate agency costs and financing frictions, which leads to different perceived usages and market valuation of cash holdings.

2.2.2 Government control

In an agency theory setting, government ownership is associated with political intervention and inefficiency. The government may divert SOEs resources in efforts to achieve political or social welfare rather than shareholders wealth maximisation. Typical political objectives and social welfare include maintaining high employment, promoting regional development and preserving social stability (Boycko, Shleifer and Vishny, 1996; Shleifer and Vishny, 1997). In addition, the agency costs of government control may exist in another way because managers of government-controlled firms are typically entrenched and can exploit their positions and expropriate corporate resources for their own personal agendas and political advantages (Shleifer and Vishny, 1994; Shleifer, 1998). It is unlikely that there are individual shareholders with enough incentives to actively monitor managers (Vickers and Yarrow, 1991). Also, government-controlled firms are less subject to the threat of financial distress due to the implicit government support and the discipline imposed by market investors due to the soft budget constraints (Megginson and Netter, 2001). Therefore, governance mechanisms are poor and the agency costs of managers are severe in government-controlled firms. In line with this view, empirical studies find that government ownership leads to investment inefficiency and poor performance in the cross-country setting (Megginson and Netter, 2001; Boubakri, Cosset and Guedhami, 2005, 2008; Jaslowitzer, Megginson and Rapp, 2016; Chen *et al.*, 2017b) and in China (Chen *et al.*, 2008; Chen *et al.*, 2011b; Firth *et al.*, 2012).

In contrast, many studies discuss the benefits of government control. For example, government control provides firms with soft-budget constraints and implicit government guarantees (Kornai, Maskin and Roland, 2003; Faccio, Masulis and McConnell, 2006).

Specifically, a government can deploy fiscal means, credits, and indirect supports whenever a SOE falls into financial distress. Compared with private owners, the government provides firms under its control with preferential access to credits, especially bank loans from state-owned banks. Empirical studies find that firms with more government ownership receive a disproportionally large share of credit and low cost of capital (Charumilind, Kali and Wiwattanakantang, 2006; Borisova and Megginson, 2011). However, recent evidence in the literature casts doubt on the benefits of government ownership on corporate financing ability. For example, Ben-Nasr, Boubakri and Cosset (2012) argue and find that government ownership increases the cost of equity due to a higher agency risk. Similarly, Borisova *et al.* (2015) document that the cost of debt increases with government ownership in normal periods, consistent with the view of state-induced investment distortions. Jaslowitzer, Megginson and Rapp (2016) further show that government ownership does not mitigate firms' financial constraints. In terms of China, the earlier literature documents that unlisted SOEs receive a disproportionally large share of credits (Cull and Xu, 2003; Gordon and Li, 2003) and face a lower degree of financial constraints than non-state-owned firms (Poncet, Steingress and Vandenbussche, 2010), while the recent literature finds no such evidence in listed government-controlled firms (Firth *et al.*, 2012; Lin and Bo, 2012).

Based on the discussion above, we hypothesize that managers in government-controlled firms are more likely to use cash holdings to achieve political objectives and managerial benefits at the expense of minority investors, leading to a lower value of cash holdings. We refer to this agency costs hypothesis. In addition, based on the traditional view of better financing ability and fewer financing constraints associated with government ownership, cash holdings should be less valuable in government-controlled firms than those in privately

controlled firms, due to the precautionary motive. This is referred to as the financial constraint hypothesis. More formally:

H1: *The value of cash is lower in firms controlled by the government than in firms controlled by private owners.*

2.2.3 The role of institutional development

The quality of institutional development has long been shown to affect government ownership (La Porta, Lopez-de-Silanes and Shleifer, 1999; La Porta *et al.*, 2002) and its impacts on corporate policies (Guedhami, Pittman and Saffar, 2009; Borisova *et al.*, 2012; Beuselinck *et al.*, 2017; Boubakri *et al.*, 2018) in the cross-country context. For example, Borisova *et al.* (2012) show that government ownership improves (deteriorates) corporate governance in common-law (civil-law) countries, suggesting the relative benefits of government ownership in regions with better investor protection. Boubakri *et al.* (2018) provide more direct evidence that government ownership increases firm value more in countries with better institutions and government quality, suggesting the benefits of government ownership outweigh the costs in those areas.

How government control affects firm value across different regions in China may be different from cross-country evidence. Fiscal decentralisation from central to local governments since 1978 has created marked differences in institutional quality across 31 provinces, autonomous regions and municipalities in China. Different regions in China are moving towards a market-oriented economy at different speeds. For example, the economic and market development of the coastal provinces is more advanced than that of interior provinces in China (Firth, Fung and Rui, 2006). In less developed regions, governments are

subject to much political pressure to improve regional development and reduce regional differences (Chen and Zheng, 2008). To achieve these goals, governments in less developed regions are highly likely to discipline firms, especially government-controlled firms to invest effectively and improve performance. In addition, although laws are centrally legislated in China, legal enforcement varies considerably across regions. In regions with weak investor protection, the government, as controlling shareholders, can use coercive political power to better protect minority investors that private owners (Qian, 2001). Similarly, Wu, Xu and Yuan (2009) argue that the government can exploit the political power and serve as a substitute for formal legal investor protection in protecting property rights. As a substitute for formal legal investor protection, the government can monitor the usage of liquid assets in firms under their control. Therefore, due to political pressure and investor protection, the net costs of government control in terms of cash usage perceived by investors can be lower in regions with less developed institutions, leading to a weaker relationship between government ownership and the value of cash. On the other hand, investors in more developed regions easily observe the misuse of cash holdings and significantly discount the valuation of cash holdings held by firms with government control. The second hypothesis is stated as follows:

H2: *The negative impact of government control on the value of cash is weaker in regions with less developed institutions.*

2.3 Research design

2.3.1 Sample

Our sample includes all A-share firms listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange during the period 2003-2015. The sample period starts in 2003, which is the year when Chinese listed firms were required to disclose their controlling shareholders in annual reports, the information required to identify whether a firm is controlled by the government or by private owners. Financial data is extracted from the China Stock Market and Accounting Research (CSMAR) database. Following the literature, we first exclude firms in the financial industries and then delete firm-year observations with missing stock returns and negative equities and net assets (i.e., total assets minus cash and cash equivalents). Furthermore, all firms included in the sample should have an ultimate controlling shareholder, either the government or a private owner. Firm-year observations with no or multiple types of ultimate controlling shareholders are excluded.[6] Finally, an included firm is required to have at least two consecutive years of data. Our final unbalanced panel consists of 19,340 firm-year observations for 2,430 unique firms.

2.3.2 Measurement of government control[7]

Prior literature focuses mostly on direct government ownership, which is the percentage of shares directly owned by the government and SOEs. This measurement is problematic for

[6] There are 268 firm-year observations excluded due to no or multiple types of ultimate controlling shareholders.

[7] Appendix 2.A provides an example of ultimate control versus direct ownership, illustrating why the percentage of state shares cannot capture the degree of government involvement.

several reasons. First, since the government can leverage their control over firms via pyramiding and multiple controlling chains, direct ownership underestimates the power of government influence on firms' financial decisions (Bortolotti and Faccio, 2009). Second, according to China's corporate laws, a listed firm has mainly six types of shares: state, legal person, foreign, management, employee and individual shares (Chen, Firth and Xu, 2009; Wu, Wu and Rui, 2012). The first five were not allowed tradable, and only individual shares could be traded freely in the secondary market. State shares are controlled by the state and state agencies. Legal person shares can be owned by both SOEs and privately controlled firms. Using the percentage of state shares fails to capture the effect of the government via SOEs. The split share structure reform in 2005, which allows all types of shares tradable, makes the problem more complex. After the reform, the government and SOEs can control a listed firm through all type of shares. It is of great importance to determine the real identity of shareholders rather than using the legal definitions of shares. Third, government ownership in China is scattered among various types of state agencies, ranging from central to local governments. Central government, subject to strict monitoring, aims to retain strong control over strategic industries and assure the safety of the national economy; local governments, with the aim to improve local economic condition, have more opportunities to intervene and expropriate local SOEs (Chen, Firth and Xu, 2009; Cheung, Rau and Stouraitis, 2010; Wu, Wu and Rui, 2012). Since the motivations and behaviours vary from central to local governments, the combination of state ownership by different state agencies is not appropriate.

Taking the above reasons into account, we measure the involvement of government based on its ultimate control. For each firm-year, the type and the control rights of the ultimate controller are carefully identified by tracing corporate control chains from annual reports. A

firm is classified as government-controlled if it is ultimately controlled by the government or a government institution, such as a state asset management bureau or a state-owned enterprise. Otherwise, it is classified as a firm controlled by private owners. Privately controlled firms include a few firms controlled by foreign investors. We define a dummy variable, *GOV*, which is equal to one for government-controlled firms, and zero for privately controlled firms. In the robustness test, we further define three alternative measures of government control. First, to further determine the effective control of the government at the ultimate level, the first and second alternative measures, *GOV1* and *GOV2*, are defined as dummy variables taking the value of one if the government's ultimate control right is greater than 10% and 20%, respectively, and zero otherwise. Third, following Boubakri *et al.* (2018), a continuous measure, *GOV_cont*, is defined as the government's ultimate control rights in government-controlled firms, which is determined by the weakest link along the control chain, and zero for privately controlled firms. We also attempt to distinguish between the central government and local governments, since the previous literature suggests the central and local governments may differ in motivations and monitoring, and, therefore, behave in different ways (Chen, Firth and Xu, 2009; Cheung, Rau and Stouraitis, 2010). *Central* (*Local*) is defined as a dummy variable taking the value of one if a firm is ultimately controlled by a central (local) government institution, and zero otherwise.

2.3.3 Model specification

We investigate the effect of government control on the value of cash based on an extended model of Faulkender and Wang (2006).[8]

$$
\begin{aligned}
r_{i,t} - R^{B}{}_{i,t} = {} & \beta_0 + \beta_1 \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} + \beta_2 \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} \times GOV_{i,t} + \beta_3 \frac{\Delta EBIT_{i,t}}{MVE_{i,t-1}} \\
& + \beta_4 \frac{\Delta NA_{i,t}}{MVE_{i,t-1}} + \beta_5 \frac{\Delta INT_{i,t}}{MVE_{i,t-1}} + \beta_6 \frac{\Delta DIV_{i,t}}{MVE_{i,t-1}} + \beta_7 \frac{CASH_{i,t-1}}{MVE_{i,t-1}} \\
& + \beta_8 MLEV_{i,t} + \beta_9 \frac{NF_{i,t}}{MVE_{i,t-1}} + \beta_{10} \frac{CASH_{i,t-1}}{MVE_{i,t-1}} \times \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} \\
& + \beta_{11} MLEV_{i,t} \times \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} + \beta_{12} GOV_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{2.1}
$$

where the dependent variable (r - R^B) is the change in firm value, measured by excess stock return, calculated as the stock return minus the value-weighted return of the corresponding benchmark portfolio over the same year. The benchmark portfolios are 25 Fama and French portfolios formed on size and book-to-market ratio. Since there are no Fama and French portfolios available for Chinese stock markets, we follow Fama and French (1993) and classify firms into one of 25 portfolios based on the intersections between the market value of equity and book-to-market ratio quintiles independently at the beginning of each year.

ΔX refers to the *unexpected* change in X. *CASH* is cash and cash equivalents. Since the benchmark return already captures the impact of expected change in cash, excess stock return should only respond to unexpected change in cash. Similar to Faulkender and Wang (2006), we first use the realised change in cash, on the assumption that the expected change is zero.

[8] Faulkender and Wang (2006) also control for the change in R&D expenses. However, due to missing R&D data in the early sample period, this variable is excluded from the equation in this study.

Three alternative definitions of the expected change in cash are used in the subsequent robustness test. *GOV* represents government control. Control variables include earnings before interest and taxes (*EBIT*), net assets (*NA*), interest expenses (*INT*), common dividends paid (*DIV*), total debts divided by the market value of equity (*MLEV*) and net equity and debt financing (*NF*). All variables except for *GOV* and *MLEV* are deflated by the one-year lagged market value of equity (*MVE*). Since both excess stock return and the change in cash are divided by the previous year's market value of equity, the coefficient on $\Delta CASH$ (β_1) measures the change in shareholder value following one change in cash held by the firm (i.e. the marginal value of cash).

Our variable of interest is the change in cash ($\Delta CASH$) and its interaction with government control ($\Delta CASH \times GOV$). The effect of government control on the value of cash is determined by the coefficient on the interaction term $\Delta CASH \times GOV$ (β_2). According to our first hypothesis (***H1***), an extra unit of cash added to the firm will result in a smaller increase in market value if the firm is controlled by the government, which predicts a negative β_2.

The definitions of all variables are summarised in Table 2.1. All continuous financial variables are winsorized at the top and bottom 1% level to minimise the effect of outliers. We include industry and year fixed effects to control for industry heterogeneity and macroeconomic uncertainty. The regression is estimated based on robust standard errors clustered at the firm level to account for heteroscedasticity and autocorrelation.

[Insert Table 2.1 around here]

2.4 Empirical results

2.4.1 Descriptive statistics

Table 2.2 reports the sample distribution of control type over time. On average, 52.4% of listed firms are ultimately controlled by the government in our sample. The figure is much lower than that is reported in prior studies. For example, Chen *et al.* (2011b) and Firth *et al.* (2012) report 74.4% and 80.1% of sample observations are controlled by government institutions during 2001-2006 and 1999-2008, respectively. The difference is primarily due to the marked increase in the number of newly listed privately controlled firms over years, especially from 2008 onwards. For instance, the percentage of listed firms controlled by private owners is only 25.0% in 2003, while the figure increases significantly to 62.5% in 2015. The central and local governments control 15.3% and 37.1% of listed firms, respectively.

[Insert Table 2.2 around here]

Table 2.3 reports the summary statistics of key model variables for the full sample in Panel A, and the subsamples splitting firms into those controlled by the government and by private owners in Panel B. The t- and Wilcoxon-tests are employed to compare the mean and median differences of each variable between the two groups.

The distributional characteristics of the dependent and control variables in our model are similar to those in the US-based studies (Faulkender and Wang, 2006; Dittmar and Mahrt-Smith, 2007; Liu and Mauer, 2011) and other China-based studies (Megginson, Ullah and Wei, 2014; Xu *et al.*, 2016). In addition, government-controlled firms, on average, have a

relatively higher figure than privately controlled firms for control variables, including change in cash, change in profitability, change in interest expenses, and market leverage.

[Insert Table 2.3 around here]

2.4.2 Main results

Table 2.4 reports the main regression results in Panel A and the calculation of the marginal value of cash for an average firm in Panel B.[9] The baseline regression, similar to Faulkender and Wang (2006), without government control included, is reported in column 1 of Panel A. The coefficient estimates show that an extra unit (RMB) of cash increases shareholder wealth by RMB 1.62 if a firm has no cash holdings or debts. As reported in column 1 of Panel B, on average, the value of an additional RMB of cash holdings to shareholders in the mean firm is RMB 1.00. Our result is very similar to that found by Faulkender and Wang (2006) who report a slightly lower marginal value of cash to shareholders of $0.94. One potential reason for the difference is that firms in China, as in many emerging countries, regard financial constraints as one of their primary obstacles to funding profitable investments given the country's high speed of development (Cull *et al.*, 2015). Therefore, cash holdings are more valuable to shareholders in China than in the US, due to operational considerations and precautionary motive (Faulkender and Wang, 2006; Denis and Sibilkov, 2009).

[9] Panel B of Table 2.4 uses the coefficients from Panel A to calculate the marginal value of cash for an average firm in our sample. Specifically, the marginal value of cash for an average firm is equal to the coefficient on the change in cash plus the sample means of all variables that interact with the change in cash times the corresponding interaction coefficients. For example, in the basic regression, the mean firm has cash holdings of 19.8% of lagged market equity and market leverage of 13.9%. The marginal value of cash is calculated as 1.618 - 1.472 × 0.198 - 2.353 × 0.139 = 1.00.

All of the control variables are significant with expected signs, consistent with the literature (Faulkender and Wang, 2006; Dittmar and Mahrt-Smith, 2007; Liu and Mauer, 2011). Specifically, we find that excess stock return is positively correlated with the change in profitability, the change in net assets, the change in interest expenses, the change in dividends, and lagged cash holdings; and negatively associated with market leverage. The coefficients on $\Delta CASH \times CASH$ and $\Delta CASH \times MLEV$ are significantly negative, supporting the view that the value of cash decreases as a firm holds more cash and debts. The results are plausible, since firms with little or no cash reserves tend to have costly access to external finance, thereby benefiting most from additional liquid assets. Similarly, the likelihood of default increases with the level of debts, and so does the value of cash.

In column 2 of Table 2.4, government control, as measured by government dummy, and its interaction with the change in cash are included. The coefficient on the interaction term $\Delta CASH \times GOV$ is negative and statistically significant. Economically, an extra unit (RMB) of cash held in an average firm controlled by the government is valued RMB 0.25 less than that is held in a privately controlled firm. To address the concern of time-specific and time-invariant firm- or industry- level factors, we run the fixed-effects regression, controlling for year, industry or firm heterogeneity. The results are reported in Columns 3 and 4 of Table 2.4 and indicate clearly that our main finding of the negative impact of government control on the value of cash continues to hold.

We then partition our sample into government-controlled and privately controlled firms and conduct a subsample analysis as a comparison. The regression results and the difference between government- and privately controlled firms are shown in columns 5-7 of Table 2.4. The coefficient on $\Delta CASH$ is 1.48 in firms controlled by the government, and 1.91 in firms

controlled by private owners. The difference of -0.43 is significant at the 5% level. As reported in columns 2 and 3 in Panel B, the marginal values of cash for the average government- and privately controlled firms are RMB 0.95 and RMB 1.24, respectively. Moreover, we find that the significance and magnitude of the control variables vary across the two subsamples. Specifically, firm value, measured as excess stock return, is less positively affected by a change in profitability or change in net assets and is more positively affected by a change in dividends and cash holdings in government-controlled firms compared to privately controlled ones. The negative effect of market leverage on excess stock return is weaker in government-controlled firms than in privately controlled firms. Interestingly, the value of cash decreases less as market leverage increases in government-controlled firms than in privately controlled firms. This seems plausible since government-controlled firms with high leverage are less likely to default due to the implicit government guarantee and low default risk.

Overall, the evidence presented in this section is in line with our hypothesis that investors in the market discount the value of cash held by government-controlled firms.

[Insert Table 2.4 around here]

2.4.3 Robustness tests

2.4.3.1 Endogeneity concern

We attempted to mitigate some endogeneity concern associated with omitted variable bias using fixed effect regressions, by controlling for year, industry or firm heterogeneity as shown in Table 2.4. In addition, although government control itself is included in the

regression, we focus only on the coefficient on the interaction between government control and the change in cash. While cash holdings change substantially over time, the type of ultimate control does not. As advised by Dittmar and Mahrt-Smith (2007), if endogeneity exists, it tends to affect the coefficient on government control rather than its interaction with the change in cash. We also conduct several additional analyses to further address the possible endogeneity concern as shown below.

First, we use the lagged government control variable. It is not likely that the lagged government control is endogenously determined with the current excess stock return. As shown in column 1 of Table 2.5, the main result that government control reduces the value of cash remains qualitatively unchanged. Our result is also robust using two- and three-year lagged government control.

To further control for observable differences in firm and industry attributes, we next perform an analysis based on a propensity-score matched sample. The procedures are as follows. We first run a logit model regressing the likelihood of a given firm to be controlled by the government on firm size, firm age, book-to-market ratio, leverage, return on assets, year and industry effects (Chen *et al.*, 2017b; Boubakri *et al.*, 2018). Then the likelihood (i.e. the propensity score) that a firm is government-controlled is estimated. Each observation in the government-controlled group is matched to an observation in the privately controlled group based on the nearest neighbour technique. We allow for replacement and require the difference in the propensity scores for each pair to be within 0.1% in absolute value. The resulting matched sample consists of 19,594 firm-year observations (i.e. 9,797 firm-years controlled by the government and 9,797 firm-years controlled by private owners). The result

using the matched sample is shown in column 2 of Table 2.5. The negative impact of government control on the value of cash continues to hold.

Finally, we perform an analysis focusing on firms that have undergone changes in their type of ultimate controllers from the government to a private owner during the sample period, since such shift is associated with a decrease in agency costs (or an increase in financial constraints) that may increase the value of cash. During our sample period, there are a total of 187 firms experienced the transformation from government control into private hands. To validate our findings reported earlier, we expect to observe a positive impact of such a move on the value of cash. A dummy variable, *Transfer*, defined as one if firms experienced such change and zero otherwise, is constructed. In Eq. (2.1), Government control and its interaction with the change in cash, *GOV* and *ΔCASH*×*GOV*, are replaced by *Transfer* and *ΔCASH* × *Transfer*. A positive coefficient on the interaction, *ΔCASH* × *Transfer*, is expected. The result in column 3 of Table 2.5 shows a significant increase in the value of cash following the transformation, verifying our previous finding that government control reduces the value of cash.

[Insert Table 2.5 around here]

2.4.3.2 Alternative measures of government control and the expected change in cash

To evaluate the sensitivity of our main results, we re-estimate the Eq. (2.1) using three alternative measures of government control. As mentioned above, we use 10% and 20% as cut-offs to guarantee ultimate control by the government, *GOV1* and *GOV2* are constructed as two alternative measures of government control. A third alternative measure is a

continuous measure of government control, *GOV_cont*. The results of three alternative measures of government control are reported in columns 1-3 in Table 2.6. We find that our main predictions related to government control remain unaffected: the coefficient on the interaction term $\Delta CASH \times GOV$ is negative in all three columns and is statistically significant at the 1% level for *GOV1* and *GOV2* and the 10% level for *GOV_cont*. In column 4 of Table 2.6, we distinguish between central and local government control and investigate their impacts on the value of cash. The coefficients on both interaction terms $\Delta CASH \times Central$ and $\Delta CASH \times Local$ are negative and significant at the 10% and 5% level, respectively. The difference between the two coefficients is not statistically significant. This suggests that government control at the central and local levels exert similarly value-destroying roles in corporate cash holdings.[10]

[Insert Table 2.6 around here]

The change in cash, our key dependent variable, is the unexpected change in cash holdings. The results reported thus far assume that expected change in cash to be equal to zero. Consistent with Faulkender and Wang (2006), we now conduct robustness checks using three alternative definitions of the expected change in cash. The first measure of expected change in cash is the average change in cash of the corresponding benchmark portfolio over the year (Portf. Ave). The unexpected change in cash is the actual change in cash minus the average change in cash of the benchmark portfolio. The second and third measures of

[10] We also examine the impact of government direct ownership on the value of cash as a robustness test. *State* is defined as the percentage of state-owned shares. Government control and its interaction with the change in cash, *GOV* and $\Delta CASH \times GOV$, are replaced by *State* and $\Delta CASH \times State$ in Eq. (2.1). The results with different sets of fixed effects are reported in Appendix 2.B. Government direct ownership is found to have no significant impact on the value of cash. The evidence is consistent with the argument that direct ownership understates the power of the government compared with ultimate control.

expected change in cash are estimated from two models of Almeida, Campello and Weisbach (2004). In both cases, the change in cash is regressed on factors that represent sources and uses of cash as well as industry fixed effects. The unexpected change in cash is measured as the difference between the actual change in cash and predicted change in cash from the models (i.e., residuals). The first model, ACW (1), is as follows:

$$\Delta CASH_{i,t} = \alpha_0 + \alpha_1 CF_{i,t-1} + \alpha_2 MB_{i,t-1} + \alpha_3 SIZE_{i,t-1} + \varepsilon_{i,t} \quad (2.2)$$

where $\Delta CASH$ is the change in cash and cash equivalents, *CF* is cash flow, *MB* is market-to-book ratio and *SIZE* is firm size. All variables are deflated by the lagged market value of equity (*MVE*), except for the market-to-book ratio (*MB*) and firm size (*SIZE*).

The second model, ACW (2), adds capital expenditures *(CAPEX)*, change in net working capital (ΔNWC) and change in short-term debt (ΔSTD), all lagged deflated by the lagged market value of equity (*MVE*), as additional explanatory variables. The extended model is shown below:

$$\Delta CASH_{i,t} = \alpha_0 + \alpha_1 CF_{i,t-1} + \alpha_2 MB_{i,t-1} + \alpha_3 SIZE_{i,t-1} + \alpha_4 CAPEX_{i,t-1} + \alpha_5 \Delta NWC_{i,t-1} + \alpha_6 \Delta STD_{i,t-1} + \varepsilon_{i,t} \quad (2.3)$$

The results with alternative measures of the expected change in cash are shown in columns 5-7 of Table 2.6. The expected change in cash is measured as the portfolio average in column 5, the predicted value from ACW (1) in column 6 and the predicted value from ACW (2) in column 7, respectively. Overall, using different measurements for the expected change in cash generate similar results in Table 2.4. The results are robust and consistent with our main finding, supporting the hypothesis that government control reduces investors' valuation of cash held by firms.

2.4.3.3 Controlling for corporate governance[11]

We examine whether our results are sensitive to corporate governance variables to reduce the concern about potential correlated omitted variables. We use four proxies of corporate governance from the aspects of the excess control rights of the ultimate controlling shareholder, managerial ownership, institutional ownership, and analyst coverage. First, to measure excess control rights (*EXCESS*), we use the ratio of control rights to cash-flow rights by the ultimate controllers (Lemmon and Lins, 2003; Xu *et al.*, 2016). We use 10% as the cut-off point to determine effective control at the ultimate level (Claessens *et al.*, 2002). Large control rights entrench the controlling shareholders and give them the ability to tunnel, while small cash-flow rights limit controlling shareholders' wealth losses from the tunnelling. Firms with more excess control rights are worse governed. Second, we measure managerial ownership (*MOWN*) as the percentage of shares owned by managers. On the one hand, the existence of manager-owners may help to solve the agency conflicts between firm managers and shareholders (Jensen and Meckling, 1976) – the alignment effect. On the other hand, managers can be empowered and become entrenched within firms when they own a large portion of the firm's shares. Entrenched managers may pursue private benefits and destroy shareholders' wealth – the entrenchment effect. The inverse U-shaped impact of managerial ownership on firm value and governance has been found in many studies (Morck, Shleifer and Vishny, 1988; McConnell and Servaes, 1990; Kim and Lu, 2011). Third, following Firth *et al.* (2016), we focus on domestic mutual funds and qualified foreign institutional investors (QFII) and define institutional ownership (*INST*) as the percentage of

[11] We also find that the impact of corporate governance on the value of cash differs significantly between government-controlled firms and privately controlled firms, suggesting that government control plays an important role in shaping the effectiveness of different governance mechanisms. The results are reported in Appendix 2.C.

shares owned by domestic mutual funds and QFII. Compared with other passive institutional investors, such as banks, insurance and securities companies, domestic mutual funds and QFII pose a higher exit threat and are more active and effective in monitoring. Finally, analyst coverage (*ANACOV*) is measured as the natural logarithm of one plus the number of analyst following the firm (Feng, Hu and Johansson, 2016). Analysts coverage plays an important monitoring role in decreasing earnings management and managerial expropriation (Yu, 2008; Chen, Harford and Lin, 2015). Firms with more institutional ownership and more analyst coverage are considered better governed. We add each of the four governance variables and their interactions with the change in cash into Eq. (2.1). For managerial ownership, we further add the squared term of *MOWN* and their interactions with the change in cash to capture the nonlinear impact of managerial ownership. The results are reported in columns 7-9 of Table 2.6. Consistent with the prior literature (Pinkowitz, Stulz and Williamson, 2006; Dittmar and Mahrt-Smith, 2007), we find well-governed firms have a higher value of cash than poorly governed firms. Specifically, excess control rights have a negative impact on the value of cash. Managerial ownership increases (decreases) the value of cash at a low (high) level. Institutional ownership and analyst coverage are positively associated with the value of cash. Importantly, the negative impact of government control on the value of cash is above and beyond the impact of corporate governance.

2.4.3.4 The split share structure reform and the anti-corruption campaign

During our sample period, 2003-2015, there are two important exogenous events occurring in China which may influence our empirical results. The first event is the split share structure reform in 2005. The split share structure reform converted formerly non-tradable shares tradable, removing significant market friction. After the reform, controlling shareholders are

concerned about stock prices and the interests between controlling and minority shareholders are greatly aligned (Hou, Kuo and Lee, 2012; Chen *et al.*, 2016; Hou *et al.*, 2016). The second event is the recent anti-corruption campaign. Shortly after Xi Jinping, the new President of China took office in November 2012, he launched a far-reaching anti-corruption campaign, vowing to maintain 'zero-tolerance attitude toward corruption' and to 'look into every case involving corruption' (Hope, Yue and Zhong, 2018). The campaign is taking its effect in lowering the level of corruption which, in turn, improves corporate governance in China (Xu and Yano, 2016; Hope, Yue and Zhong, 2018; Zhang, 2018).

In this section, we examine whether our main results are robust taking into account the impacts of the two events. The split share structure reform, *Reform*, is defined as a dummy variable which is one if a firm has completed the reform in the fiscal year and zero otherwise. The anti-corruption campaign, *Campaign*, is defined as a dummy variable equal to one if a firm is located in a region which has experienced corruption inspection in the fiscal year and zero otherwise. The two event dummies (*Reform* and *Campaign*) and their interactions with the change in cash ($\Delta CASH \times Reform$ and $\Delta CASH \times Campaign$) are included to Eq. (2.1). Since the two events alleviated agency costs and improved corporate governance, we expect to observe increases in the value of cash holdings after the two events. Positive coefficients on the interactions between the event dummies and the change in cash are predicted.

The results are reported in Table 2.7. Columns 1 and 2 show the impacts of the reform and campaign separately, and column 3 presents the joint impacts of the two events. The coefficients on the interactions $\Delta CASH \times Reform$ and $\Delta CASH \times Campaign$ are positive and significant in three columns. The results support that the two events reduced agency costs and increased the value of cash. In column 4, we further investigate whether the two events

affect the relationship between government control and the value of cash. The three-way interactions (*ΔCASH × GOV ×Reform* and *ΔCASH × GOV ×Campaign*) are included. The coefficient on the interaction *ΔCASH × GOV ×Campaign* is negative and significant at the 5% level, suggesting that the increase in the value of cash following the campaign is weaker for government-controlled firms. This evidence is consistent with recent literature that government-controlled firms benefit less from the anti-corruption effort due to their complex connections to the government, compared with privately controlled firms (Xu and Yano, 2016; Zhang, 2018). Most importantly, the coefficient on government control interacted with the change in cash (*ΔCASH × GOV*) is negative and highly significant in all columns. The negative impact of government control on the value of cash still holds.

[Insert Table 2.7 around here]

2.4.4 Agency costs hypothesis or financial constraints hypothesis

2.4.4.1 Government control and dissipation of cash holdings

In this section, we try to distinguish between the agency costs hypothesis and the financial constraints hypothesis, by examining the dissipation of cash holdings in the subsequent investment policy. According to the agency costs hypothesis, the government tend to overinvest in projects in accordance with political considerations rather than project merits. Cash holdings may be employed in overinvestment. Also, under poor monitoring, managers in government-controlled firms may use free cash flows to overinvest in empire building (Jensen and Meckling, 1976). Thus, the agency costs hypothesis predicts that government control increases the use of cash in subsequent investment and decreases investment efficiency (Jaslowitzer, Megginson and Rapp, 2016; Chen *et al.*, 2017b). In contrast, if the

financial constraints hypothesis holds, government-controlled firms face a lower degree of financial constraints and thus are less likely to use cash holdings in investment (Denis and Sibilkov, 2009), since they have plenty of other resources of financing, such as bank loans. Government control decreases the use of cash holdings in subsequent investment.

We follow Gao, Harford and Li (2013) and estimate a logit regression to test how firms disgorge their cash in investment policy. The dependent variable, increase in investment (*INCR_INV*), is defined as a dummy variable, which takes the value of one if a firm increases investment in the next year, and zero otherwise. The independent variable of interest is the interaction term between cash holdings and government control (*CASH* × *GOV*). If the agency costs hypothesis is valid, then we should observe a positive coefficient on the above interaction term. Otherwise, if the financial constraints hypothesis holds, then a negative coefficient on the interaction term is predicted. The controlling variables include Tobin's q (*Q*), firm size (*SIZE*), cash flow (*CF*), book leverage (*BLEV*), dividend dummy (*DIV*), sales growth (*SG*) and return on asset (*ROA*). The results are shown in columns 1 and 2 of Table 2.8. Investment is measured as capital expenditure in column 1, and the sum of capital expenditure and acquisitions in column 2. The coefficient on the interaction *CASH* × *GOV* is positive and statistically significant at the 1% level in both columns, supporting the view that firms with government control disgorge more cash via investment than firms with private control.

To examine the quality of investment, we further investigate whether firms with government control use cash holdings to increase corporate innovation, R&D.[12] A dummy variable, increase in R&D (*INCR_RD*) is defined set to one if a firm increases R&D in the next year,

[12] Since R&D data is only available from 2007, observations in column 3 of Table 2.8 reduce to 12,532.

and zero otherwise. If firms with government control invest in projects for political objectives, we should observe a decrease in the use of cash for R&D. Consistently, we find a negative coefficient on the interaction *CASH* × *GOV* in column 3 of Table 2.8, confirming our conjecture that firms under government control are less likely to disgorge cash via R&D. Moreover, we test the impact of government control on investment efficiency, measured by the relationship between investment and Tobin's q (Chen *et al.*, 2011b). Investment is measured as capital expenditure in column 4, and the sum of capital expenditure and acquisitions in column 5 of Table 2.8. We find a negative coefficient on the interaction *CASH* × *GOV* significant at the 1% level, supporting the proposition that investment efficiency is lower in firms controlled by the government, compared to those controlled by private owners.

Taken together, the results reported in Table 2.8 support the agency costs hypothesis in that the government uses corporate cash holdings under its control to invest in projects that mainly achieve political objectives and/or managerial benefits, without concern on investment efficiency, and therefore investors discount the value of cash held by government-controlled firms.

[Insert Table 2.8 around here]

2.4.4.2 Financial constraints and external financing ability

The above section supports that government control decreases the value of cash through the agency costs hypothesis. We now directly test whether government control decreases firms' financial constraints and enhances external financing ability. Specifically, we test for the financial constraints using two models of the cash flow sensitivity of cash developed by

Almeida, Campello and Weisbach (2004).[13] Compared with traditional investment-cash flow sensitivity, cash flow sensitivity of cash can mitigate the concern of noisy measure of Tobin's q (Almeida, Campello and Weisbach, 2004; Acharya, Almeida and Campello, 2007). Besides, we investigate the external financing using gross equity issued and net debt issued based on the model adopted by Firth *et al.* (2012). Gross equity issued, *GEI* is defined as the amount of proceeds from equity issues. Net debt issued, *NDI*, is defined as the amount of cash received from issuing bonds or obtaining bank loans minus repayments. In addition to government control (*GOV*), we further control for the market-to-book ratio (*MB*), firm size (*SIZE*), return on assets (*ROA*), book leverage (*BLEV*), and firm age (*AGE*). The results are reported in Table 2.9. The results for the cash flow sensitivity of cash are presented in columns 1 and 2, which clearly indicates that the coefficients on the interaction term, *GOV* × *CF* are negative but insignificant, suggesting no significant impact of government control on financial constraints. In terms of external financing as shown in column 3 for gross equity issued and column 4 for net debt issued, the coefficients on *GOV* are negative and significant, indicating that government control has, in fact, a negative impact on external financing. Our results are consistent with the recent evidence that due to severe agency risk, government control does not necessarily enhance their financing ability or lower their financial constraints (Ben-Nasr, Boubakri and Cosset, 2012; Firth *et al.*, 2012; Borisova *et al.*, 2015; Jaslowitzer, Megginson and Rapp, 2016).

[Insert Table 2.9 around here]

[13] The two models of the cash flow sensitivity of cash are similar to Eq. (2.2) and Eq. (2.3). The only difference is that variables except for market-to-book ratio (*MB*) and firm size (*SIZE*) are divided by total assets rather than lagged market value of equity (*MVE*)

Based on the analyses conducted in this section, we conclude that government control lowers the value of cash due to the severe agency costs and overinvestment problems.

2.4.5 The role of institutional development

The quality of institutional development in China varies markedly across regions. We explore the role of institutional quality, in particular, using several measures to proxy for market development and local government condition that may affect the relationship between government control and the value of cash. We expect that the negative impact of government control on the value of cash is mitigated in regions with low market development and poor government conditions, where government control also helps due to more development pressure and better investor protection (Qian, 2001; Wu, Xu and Yuan, 2009).

We use a number of indices to measure province-level institutional development, which are widely used in the prior literature (Firth *et al.*, 2009; Chen *et al.*, 2011a). First, three measures of market development include the overall market development (*MKT*), the liberalisation of banking sector (*BANK*), and the government decentralisation in the economy (*GOVT*), which are relative ranking indices compiled from the National Economic Research Institute (NERI) under the auspices of the China Reform Foundation (Fan, Wang and Zhu, 2011; Wang, Fan and Yu, 2017). The indices for the period 2003-2007 are collected from the NERI 2011 report (Fan, Wang and Zhu, 2011), and the indices for the period 2008-2015 are extracted from the NERI 2016 report (Wang, Fan and Yu, 2017).[14] Since the indices from the two

[14] The NERI 2011 report covers the period 1997-2011, while the NERI 2016 report covers the period 2008-2014. Since the ranking of provinces changes slowly, the data for 2015 is assumed the same as that in 2014 in this study. There are a few differences between the two reports. For example, the base years used are different. Some sub-indices are constructed differently. More details can be found in the NERI 2016 report (Wang, Fan and Yu, 2017)

reports are calculated based on different base years (base years are 1997 and 2008 for the NERI 2011 report and the NERI 2016 report, respectively), we cannot use the values of the four indices directly. Instead, we focus on the ranking of provinces by each of the indices in each year.

In addition, the three measurements of local government conditions include the government overall fiscal condition (*FISC*), the government non-arbitrary revenue (*NADM*) and the conditions of employment (*EMP*). *FISC* is the ratio of local government revenue to expense, and *NADM* is the percentage of local government non-administrative revenue. *EMP* is one minus the unemployment rate. The data is extracted from the National Bureau of Statistics (NBS) of China. As Chen *et al.* (2011a) and Cheung, Rau and Stouraitis (2010) argue, regions where local governments have more fiscal deficits and arbitrary revenues and the unemployment rate is higher are less developed.

For each year, we divide our sample firms into two groups according to the median ranking or value of each institutional variable (i.e. firms with low and high institutional development) and re-estimate our baseline model Eq. (2.1). To control for regional differences, we add the gross regional product (*GRP*) and its growth rate (*GRPGTH*) into the equation. The results are reported in Table 2.10. The impact of government control on the value of cash is negative and highly significant in regions with high market development as shown in columns 2, 4, and 6, and in regions with good government condition as displayed in columns 8, 10, and 12. In areas that are less developed, the influence of government control on the value of cash is negative but not statistically significant, in five out of six cases. We interpret this finding as being due to the agency conflicts between the government and minority shareholders in less developed areas being mitigated to some extent. Therefore, it appears that the benefits

of government control associated with development pressure and investor protection lower the agency costs concerns in these regions.

[Insert Table 2.10 around here]

2.5 Conclusions

In this chapter, we investigate the relationship between government control and the value of cash held by firms. By tracing the identity of ultimate controllers, we focus on the ultimate control right by the government, which can better capture the degree of government control than direct ownership. We propose two hypotheses – the agency costs hypothesis and the financial constraints hypothesis – through which government control can differ from private control in investors' valuation of cash holdings.

Using a large panel of listed firms in China during the period 2003-2015, we find consistent evidence that government control results in a lower value of cash held by firms. Our result is robust to alternative model specifications, different measures of key variables, and the inclusion of additional control variables. The negative impact of government control on the value of cash remains valid after the endogeneity concerns are addressed carefully using the lagged government control variable, a propensity-score matching sample, and the change analysis of ownership from government to private control.

We further explore the agency costs and financial constraints hypotheses. Our results appear to support the agency costs hypothesis in that cash is associated with more investment in capital expenditures and acquisitions and less in R&D expenditure in firms with government control. We also find that investment efficiency is lower for government-controlled firms

than for privately controlled firms. On the other hand, we find no evidence that government control reduces the cash flow sensitivity of cash, the proxy for financial constraints. In addition, government control is not found to increase gross equity issuances or net debt issuances.

In the extended analysis, we find the negative relationship between government control and the value of cash depends on regional institutional quality. Our subsample analyses show that the negative impact is mitigated in less developed regions, suggesting investors care less about the usage of cash in government-controlled firms due to economic development pressure and investor rights protection in those areas. In contrast, the negative impact of government control on the value of cash is still significant in developed regions, where investors perceive severe agency costs of government control and discount the value of cash in government-controlled firms.

All the findings broaden our understanding of how government control influences the value of cash assigned by outside investors. Our study contributes to the literature on government control and finds cash holdings to be an important channel through which government control can destroy firm value. Moreover, no evidence is found to support the view that government control mitigates firms' financial constraints or enhances external financing abilities. In addition, our study adds a further dimension to the literature on cash management, in particular, investors' valuation and subsequent disgorging of cash holdings, in emerging countries. Finally, our findings show that the agency costs of government control reduce in less developed regions in a single country, which differs from the evidence in cross-country studies.

In addition to theoretical implications, this study provides suggestions for practitioners and policymakers. In emerging countries characterised by weak investor protection and government intervention, policymakers should continue to reduce the degree of government control and increase the incentive mechanisms for managers in government-controlled firms. For domestic and international investors, the findings in this chapter enhance our understanding of the Chinese stock market and government control. Investors should be aware of the additional incentive problem involved in government control, which has a value-destroying effect.

Table 2.1 Definition of main variables in Chapter 2

Variable	Source	Definition
GOV	Annual reports	A dummy variable set to one if the ultimate controller is a government institution, and zero otherwise
$r - R^B$	CSMAR	Excess stock return, where r is stock return and R^B is the corresponding benchmark portfolio return in the same year
CASH	CSMAR	Cash and cash equivalents
EBIT	CSMAR	Earnings before interest and taxes
NA	CSMAR	Net assets, defined as total assets minus cash and cash equivalents
INT	CSMAR	Interest expenses
DIV	CSMAR	Cash dividends
MLEV	CSMAR	Market leverage, defined as total debts divided by the market value of assets
NF	CSMAR	Net financing, defined as the sum of net proceeds from equity and debt issuance
MVE	CSMAR	The market value of equity
Transfer	Annual reports	A dummy variable set to one for firm years after a formerly government-controlled firm transfers into a privately controlled firm, and zero otherwise
GOV1	Annual reports	A dummy variable set to one if a government institution ultimately controls the firm at above 10% control rights, and zero otherwise
GOV2	Annual reports	A dummy variable set to one if a government institution ultimately controls the firm at above 20% control rights, and zero otherwise
GOV_cont	Annual reports	Government's ultimate control rights in government-controlled firms, and zero in privately controlled firms
Central	Annual reports	A dummy variable set to one if the ultimate controller is central government and related agencies, and zero otherwise
Local	Annual reports	A dummy variable set to one if the ultimate controller is local government and related agencies, and zero otherwise
EXCESS	CSMAR	The ratio of control rights to cash-flow rights by the ultimate controllers
MOWN	CSMAR	The percentage of shares owned by managers
INST	CSMAR	The percentage of shares owned by domestic mutual funds and QFII
ANACOV	CSMAR	The natural logarithm of one plus the number of analysts following the firm
Reform	CSMAR	The split share structure reform, defined as a dummy variable, which is one if a firm has completed the reform in the fiscal year and zero otherwise.
Campaign	CCDI website	The recent anti-corruption campaign, defined as a dummy variable equal to one if a firm is located in a region which has experienced corruption inspection in the fiscal year and zero otherwise.
INCR_INV	CSMAR	Increase in investment, defined as a dummy variable set to one if a firm increases investment in the next year, and zero otherwise; Investment is measured by capital expenditure or the sum of capital expenditure and acquisitions

INCR_RD	CSMAR	Increase in R&D, defined as a dummy variable set to one if a firm increases research and development expenses in the next year, and zero otherwise
Q	CSMAR	Tobin's q, defined as the market value of equity plus liabilities divided by total assets minus intangible assets and goodwill
SIZE	CSMAR	The natural logarithm of total assets adjusted using the CPI deflator
CF	CSMAR	Operating cash flow, defined as net cash flow from operating activities
BLEV	CSMAR	Book leverage, defined as total debts divided by the book value of total assets
DIV	CSMAR	A dummy variable set to one if the firm pays out dividends, and zero otherwise
SG	CSMAR	The growth rate of sales
ROA	CSMAR	Earnings before interest and taxes divided by total assets
GEI	CSMAR	Gross equity issued, defined as the amount of proceeds from equity issues
NDI	CSMAR	Net debt issued, defined as the amount of cash received from issuing bonds or obtaining bank loans minus repayments
MB	CSMAR	Market to book ratio, defined as the market value of equity plus total liabilities divided by the book value of assets
CAPEX	CSMAR	Capital expenditures, defined as cash paid to acquire and construct fixed assets, intangible assets and other long-term assets minus the cash received from the disposals of fixed assets, intangible assets and other long-term assets
NWC	CSMAR	Net working capital, defined as current assets minus cash and cash equivalents minus current liabilities
STD	CSMAR	Short-term debts
AGE	CSMAR	The natural logarithm of one plus the number of years after the initial public offering
MKT	NERI reports	The composite NERI index of marketisation at the province level
BANK	NERI reports	The NERI index of banking liberalisation at the province level
GOVT	NERI reports	The NERI index of government decentralisation in the economy at the province level
FISC	NBS	The government fiscal condition, measured by local government fiscal revenue divided fiscal expenditure at the province level
NADM	NBS	The government non-arbitrary revenue, measured by the percentage of local government non-administrative revenue at the province level
EMP	NBS	The condition of employment, measured by the employment rate at the province level
GRP	NBS	The natural logarithm of gross regional product at the province level
GRPGTH	NBS	The growth rate of gross regional product at the province level
State	CSMAR	The percentage of legally defined state-owned shares

Table 2.2 Sample distribution of control type by year

Year	Obs.	Government-controlled		Central government-controlled		Local government-controlled		Privately controlled	
		Obs.	%	Obs.	%	Obs.	%	Obs.	%
2003	1,014	761	75.0%	156	15.4%	605	59.7%	253	25.0%
2004	1,067	761	71.3%	182	17.1%	579	54.3%	306	28.7%
2005	1,134	790	69.7%	200	17.6%	590	52.0%	344	30.3%
2006	1,105	735	66.5%	199	18.0%	536	48.5%	370	33.5%
2007	1,115	724	64.9%	193	17.3%	531	47.6%	391	35.1%
2008	1,236	773	62.5%	216	17.5%	557	45.1%	463	37.5%
2009	1,320	777	58.9%	240	18.2%	537	40.7%	543	41.1%
2010	1,408	788	56.0%	259	18.4%	529	37.6%	620	44.0%
2011	1,732	811	46.8%	268	15.5%	543	31.4%	921	53.2%
2012	2,008	819	40.8%	263	13.1%	556	27.7%	1,189	59.2%
2013	2,129	830	39.0%	266	12.5%	564	26.5%	1,299	61.0%
2014	2,031	799	39.3%	264	13.0%	535	26.3%	1,232	60.7%
2015	2,041	766	37.5%	258	12.6%	508	24.9%	1,275	62.5%
Total	19,340	10,134	52.4%	2,964	15.3%	7,170	37.1%	9,206	47.6%

This table provides the sample distribution of control during 2003-2015, including the total number of firms, the number and the percentage of government-controlled firms, the number and the percentage of central government-controlled firms, the number and the percentage of local government-controlled firms, and the number and percentage of privately controlled firms.

Table 2.3 Descriptive statistics of main variables

Panel A: Full sample

Variable	Obs.	Mean	p25	p50	p75	SD
GOV	19,340	0.524	0.000	1.000	1.000	0.499
$r - R^B$	19,340	-0.010	-0.284	-0.081	0.150	0.563
ΔCASH	19,340	0.014	-0.038	0.003	0.048	0.117
CASH	19,340	0.198	0.079	0.153	0.276	0.159
ΔEBIT	19,340	0.010	-0.012	0.005	0.026	0.072
ΔNA	19,340	0.161	0.012	0.090	0.227	0.298
ΔINT	19,340	0.002	-0.002	0.001	0.005	0.010
ΔDIV	19,340	0.001	-0.001	0.000	0.003	0.013
MLEV	19,340	0.139	0.027	0.107	0.219	0.129
NF	19,340	0.050	-0.014	0.010	0.092	0.168

Panel B: Government- and privately controlled firms

Variable	Government-controlled		Privately controlled		t-value	Wilcoxon Z-value
	Mean	Median	Mean	Median		
$r - R^B$	-0.024	-0.077	0.005	-0.086	-3.67***	-0.78
ΔCASH	0.023	0.008	0.005	-0.003	10.79***	14.42***
CASH	0.194	0.150	0.202	0.158	-3.32***	-3.13***
ΔEBIT	0.012	0.006	0.009	0.005	2.75***	3.27***
ΔNA	0.161	0.083	0.160	0.098	0.12	-6.04***
ΔINT	0.003	0.001	0.002	0.001	7.36***	5.60***
ΔDIV	0.001	0.000	0.001	0.000	2.11**	0.93
MLEV	0.164	0.139	0.110	0.077	29.84***	29.31***
NF	0.054	0.012	0.044	0.009	4.17***	1.61

This table provides summary statistics of key variables for the full sample in Panel A and for the government- and privately controlled firms separately in Panel B. Δ indicates the change from the previous year. All variables except *GOV* and *MLE*V are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. The t- and Wilcoxon- tests are employed to compare the mean and median difference of each variable between government-controlled firms and privately controlled firms in Panel B. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 2.4 Government control and the value of cash: Main results

Panel A: Regression results							
Variable	Full sample				Government-controlled	Privately controlled	Diff (5)-(6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔCASH	1.618***	1.727***	1.845***	1.884***	1.478***	1.913***	-0.435**
	(16.86)	(16.27)	(17.07)	(16.39)	(11.16)	(13.86)	
ΔCASH × GOV		-0.253***	-0.268***	-0.239***			
		(-3.13)	(-3.30)	(-2.81)			
ΔEBIT	1.338***	1.338***	1.430***	1.299***	1.146***	1.812***	-0.666***
	(16.88)	(16.91)	(17.58)	(16.14)	(11.79)	(13.12)	
ΔNA	0.443***	0.443***	0.465***	0.451***	0.403***	0.538***	-0.135***
	(17.84)	(17.80)	(18.31)	(16.86)	(12.89)	(12.65)	
ΔINT	1.053**	1.034*	1.055*	1.678***	0.793	0.791	0.002
	(1.97)	(1.93)	(1.90)	(2.96)	(1.18)	(0.84)	
ΔDIV	2.905***	2.916***	2.753***	2.414***	3.410***	2.049***	1.361**
	(8.67)	(8.68)	(8.12)	(7.08)	(7.14)	(4.30)	
CASH	0.130***	0.137***	0.169***	0.450***	0.227***	0.113***	0.114**
	(4.97)	(5.23)	(6.21)	(10.56)	(6.11)	(2.59)	
MLEV	-0.522***	-0.511***	-0.606***	-1.160***	-0.504***	-0.737***	0.233***
	(-18.41)	(-17.91)	(-20.74)	(-18.85)	(-13.70)	(-14.31)	
NF	-0.034	-0.037	-0.022	-0.025	-0.050	0.002	-0.052
	(-0.87)	(-0.93)	(-0.54)	(-0.56)	(-0.98)	(0.02)	
ΔCASH × CASH	-1.472***	-1.417***	-1.396***	-1.231***	-1.153***	-1.602***	0.449
	(-6.60)	(-6.48)	(-6.42)	(-5.46)	(-3.78)	(-5.09)	
ΔCASH × MLEV	-2.352***	-2.277***	-2.450***	-2.424***	-1.856***	-3.156***	0.130**
	(-8.55)	(-8.36)	(-8.97)	(-8.34)	(-4.89)	(-7.75)	
GOV		-0.018**	-0.015**	-0.020			
		(-2.49)	(-2.01)	(-0.82)			

Constant	-0.068***	-0.060***	-0.043*	0.014	-0.093***	-0.013	-0.080*
	(-9.17)	(-7.22)	(-1.81)	(0.64)	(-2.82)	(-0.38)	
Year effect	No	No	Yes	Yes	Yes	Yes	
Industry effect	No	No	Yes	No	Yes	Yes	
Firm effect	No	No	No	Yes	No	No	
R-squared	0.19	0.19	0.21	0.21	0.21	0.24	
Observations	19,340	19,341	19,341	19,341	10,134	9,206	

Panel B: The marginal value of cash for the average firm

		Full sample	Government-controlled	Privately controlled
		(1)	(2)	(3)
Sample means for cash value computation	*CASH*	0.198	0.194	0.202
	MLEV	0.139	0.164	0.110
The marginal value of RMB 1.00 (average firm)		1.00	0.95	1.24

The table reports the regression results of government control and the value of cash in Panel A and the marginal value of cash for the average firm in Panel B. In Panel A. column 1 presents the result of the baseline regression by Faulkender and Wang (2006). Columns 2-4 report the results of Eq. (2.1) with different sets of year, industry and firm effects. Column 5 and 6 re-estimate column 1 with the year and industry effects for government- and privately controlled firms, respectively. Column 7 reports the difference in the coefficients for columns 5 and 6. The dependent variable is excess stock returns ($r - R^B$). In Panel B, the marginal value of cash for the average firm is calculated based on the coefficients of the regression result in column 1, the government-controlled sample result in column 2, and the privately controlled sample result in column 3, respectively. Δ indicates the change from the previous year. All variables except *GOV* and *MLEV* are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 2.5 Addressing endogenous concerns

	Lagged government control	Matched sample	Change of ownership
	(1)	(2)	(3)
ΔCASH	1.892***	1.770***	1.291***
	(17.18)	(10.04)	(4.67)
ΔCASH × GOV	-0.285***	-0.403***	
	(-3.37)	(-3.51)	
ΔCASH× Transfer			0.639***
			(3.24)
ΔEBIT	1.451***	1.348***	1.074***
	(17.00)	(10.72)	(5.63)
ΔNA	0.471***	0.430***	0.498***
	(17.98)	(9.86)	(6.92)
ΔINT	0.983*	0.324	-0.647
	(1.72)	(0.31)	(-0.38)
ΔDIV	2.867***	2.426***	2.275**
	(7.98)	(3.85)	(2.30)
CASH	0.181***	0.059	0.135
	(6.39)	(1.30)	(1.57)
MLEV	-0.616***	-0.555***	-0.683***
	(-20.05)	(-11.59)	(-7.69)
NF	-0.024	0.041	0.010
	(-0.59)	(0.64)	(0.08)
ΔCASH × CASH	-1.436***	-1.292***	-2.029***
	(-6.47)	(-3.99)	(-4.40)
ΔCASH × MLEV	-2.450***	-1.856***	-2.582***
	(-8.52)	(-3.81)	(-3.48)
GOV	-0.016**	-0.042***	
	(-1.98)	(-3.88)	
Transfer			0.048**
			(2.03)
Constant	-0.021	-0.078**	-0.045*
	(-0.81)	(-2.44)	(-1.66)
Year effect	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes
R-squared	0.22	0.27	0.25
Observations	18,285	19,594	2,208

The table reports the results of addressing endogeneity concerns. Column 1 uses the lagged government control variable. Column 2 considers the propensity-score matched sample. Column 3 uses the change analysis, where government control and its interaction are replaced by transfer and its interaction in Eq. (2.1). The dependent variable is excess stock returns ($r - R^B$). Δ indicates the change from the previous year. All variables except *GOV*, *Transfer* and *MLEV* are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 2.6 Robustness checks: alternative measures and additional control variables

Variable	Alternative measures of government control				Alternative measures of change in cash			Controlling for corporate governance			
	GOV1	*GOV2*	*GOV_cont*	*Central Local*	Portf.Ave	ACW (1)	ACW (2)	*EXCESS*	*MOWN*	*INST*	*ANACOV*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ΔCASH	1.843***	1.824***	1.793***	1.843***	1.773***	1.765***	1.743***	2.103***	1.732***	1.737***	1.684***
	(17.10)	(17.11)	(16.97)	(17.04)	(17.45)	(16.33)	(15.01)	(14.21)	(13.64)	(14.00)	(13.73)
ΔCASH × GOV	-0.267***	-0.233***	-0.313*		-0.244***	-0.270***	-0.192**	-0.271***	-0.195**	-0.346***	-0.264***
	(-3.29)	(-2.80)	(-1.82)		(-2.96)	(-3.29)	(-2.10)	(-3.06)	(-2.08)	(-3.95)	(-3.26)
ΔCASH × Central				-0.261**							
				(-2.00)							
ΔCASH × Local				-0.266***							
				(-3.06)							
ΔCASH × EXCESS								-0.183***			
								(-2.72)			
ΔCASH × MOWN									2.996***		
									(2.89)		
ΔCASH × MOWN²									-5.66***		
									(-3.14)		
ΔCASH × INST										2.467**	
										(2.05)	
ΔCASH × ANACOV											0.123***
											(3.26)
ΔEBIT	1.431***	1.429***	1.432***	1.430***	1.446***	1.438***	1.396***	1.434***	1.460***	1.641***	1.416***
	(17.58)	(17.55)	(17.58)	(17.58)	(17.71)	(17.64)	(16.41)	(16.68)	(17.55)	(16.30)	(17.49)
ΔNA	0.465***	0.465***	0.467***	0.464***	0.468***	0.468***	0.474***	0.471***	0.462***	0.432***	0.444***
	(18.30)	(18.31)	(18.37)	(18.24)	(18.43)	(18.45)	(17.23)	(18.30)	(18.19)	(15.63)	(17.57)
ΔINT	1.056*	1.061*	1.075*	1.047*	1.044*	1.066*	0.793	1.444**	1.058*	0.669	0.902
	(1.90)	(1.91)	(1.93)	(1.89)	(1.87)	(1.92)	(1.32)	(2.49)	(1.87)	(1.12)	(1.63)
ΔDIV	2.755***	2.757***	2.764***	2.753***	2.856***	2.836***	3.112***	2.645***	2.656***	2.172***	2.487***
	(8.13)	(8.13)	(8.16)	(8.12)	(8.44)	(8.37)	(7.87)	(7.41)	(7.73)	(5.94)	(7.36)

CASH	0.169***	0.167***	0.166***	0.170***	0.098***	0.159***	0.239***	0.178***	0.182***	0.202***	0.144***
	(6.22)	(6.13)	(6.12)	(6.26)	(3.64)	(5.82)	(7.60)	(6.24)	(6.53)	(6.84)	(5.28)
MLEV	-0.606***	-0.606***	-0.607***	-0.602***	-0.594***	-0.580***	-0.611***	-0.628***	-0.611***	-0.481***	-0.557***
	(-20.73)	(-20.72)	(-20.74)	(-20.58)	(-20.31)	(-19.70)	(-18.77)	(-20.04)	(-20.19)	(-15.02)	(-19.51)
NF	-0.021	-0.022	-0.023	-0.022	-0.019	-0.017	0.010	-0.015	-0.013	-0.032	-0.070*
	(-0.53)	(-0.54)	(-0.57)	(-0.56)	(-0.46)	(-0.43)	(0.23)	(-0.38)	(-0.32)	(-0.75)	(-1.76)
ΔCASH × CASH	-1.395***	-1.410***	-1.417***	-1.399***	-1.152***	-1.239***	-1.266***	-1.364***	-1.283***	-1.483***	-1.470***
	(-6.42)	(-6.45)	(-6.50)	(-6.46)	(-5.56)	(-5.74)	(-5.42)	(-6.14)	(-5.78)	(-6.52)	(-6.76)
ΔCASH × MLEV	-2.450***	-2.464***	-2.511***	-2.439***	-2.458***	-2.367***	-2.386***	-2.417***	-2.452***	-2.124***	-2.277***
	(-8.97)	(-8.96)	(-9.14)	(-8.96)	(-9.09)	(-8.67)	(-7.82)	(-8.26)	(-8.53)	(-7.28)	(-8.24)
GOV	-0.015**	-0.016**	-0.030**		-0.008	-0.011	-0.028***	-0.015*	-0.021***	-0.024***	-0.015**
	(-2.04)	(-2.23)	(-2.01)		(-1.07)	(-1.39)	(-3.30)	(-1.85)	(-2.58)	(-2.93)	(-2.09)
Central				0.002							
				(0.18)							
Local				-0.023***							
				(-2.93)							
EXCESS								0.004			
								(0.64)			
MOWN									0.081		
									(0.89)		
$MOWN^2$									-0.312*		
									(-1.93)		
INST										2.143***	
										(17.40)	
ANACOV											0.049***
											(14.44)
Constant	-0.043*	-0.044*	-0.044*	-0.041*	-0.020	-0.052**	-0.008	-0.054*	-0.040	-0.100***	-0.052**
	(-1.80)	(-1.83)	(-1.83)	(-1.71)	(-0.84)	(-2.12)	(-0.29)	(-1.92)	(-1.56)	(-3.47)	(-2.29)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22	0.21	0.25	0.22
Observations	19,340	19,340	19,340	19,340	19,340	19,340	16,671	17,159	18,587	15,880	19,340

The table reports the robustness checks with alternative measures of government control, alternative measures of the expected change in cash and the inclusion of corporate governance variables. Columns 1-4 measure government control as *GOV1*, *GOV2*, *GOV_cont*, and *Central* and *Local*, respectively. Column 5-7 measure the expected change in cash as the portfolio average, the predicted value from ACW (1), and the predicted value from ACW (2), respectively. Columns 8-11 add corporate governance variables (*CG*), measured as excess control rights (*EXCESS*), managerial ownership (*MOWN*), institutional ownership (*INST*) and analyst coverage (*ANACOV*), respectively. The dependent variable is excess stock returns ($r - R^B$). Δ indicates the change from the previous year. All variables except *GOV* and *MLEV* are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 2.7 Robustness checks: the split share structure reform and the recent anti-corruption campaign

Variable	(1)	(2)	(3)	(4)
ΔCASH	1.226***	1.750***	1.212***	1.193***
	(9.67)	(15.86)	(9.61)	(8.34)
ΔCASH × GOV	-0.224***	-0.240***	-0.210**	-0.219*
	(-2.73)	(-2.95)	(-2.57)	(-1.70)
ΔCASH × Reform	0.673***		0.627***	0.551***
	(8.44)		(7.37)	(4.04)
ΔCASH × Campaign		0.312***	0.186*	0.434***
		(2.88)	(1.65)	(2.78)
ΔCASH ×GOV × Reform				0.150
				(0.86)
ΔCASH × GOV × Campaign				-0.567**
				(-2.53)
ΔEBIT	1.438***	1.436***	1.441***	1.442***
	(17.68)	(17.64)	(17.70)	(17.72)
ΔNA	0.460***	0.463***	0.459***	0.457***
	(18.33)	(18.23)	(18.28)	(18.23)
ΔINT	0.979*	1.075*	0.996*	1.027*
	(1.78)	(1.94)	(1.81)	(1.87)
ΔDIV	2.755***	2.756***	2.756***	2.750***
	(8.19)	(8.13)	(8.19)	(8.17)
CASH	0.162***	0.165***	0.160***	0.159***
	(5.94)	(6.04)	(5.85)	(5.81)
MLEV	-0.614***	-0.610***	-0.616***	-0.613***
	(-21.08)	(-20.87)	(-21.13)	(-21.14)
NF	-0.027	-0.022	-0.026	-0.027
	(-0.67)	(-0.54)	(-0.66)	(-0.68)
ΔCASH × CASH	-1.393***	-1.371***	-1.379***	-1.355***
	(-6.44)	(-6.31)	(-6.37)	(-6.18)
ΔCASH × MLEV	-2.225***	-2.432***	-2.230***	-2.151***
	(-8.27)	(-8.97)	(-8.30)	(-8.02)
GOV	-0.016**	-0.015**	-0.016**	-0.015**
	(-2.17)	(-2.01)	(-2.16)	(-2.08)
Reform	-0.002		-0.001	-0.002
	(-0.08)		(-0.05)	(-0.09)
Campaign		0.002	0.001	0.006
		(0.09)	(0.06)	(0.27)
Constant	-0.034	-0.042*	-0.034	-0.035
	(-1.45)	(-1.76)	(-1.44)	(-1.48)
Year effect	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes
R-squared	0.22	0.21	0.22	0.22
Observations	19,340	19,340	19,340	19,340

The table reports the robustness checks adding the split share structure reform and the recent anti-corruption campaign. Columns 1 and 2 consider the reform and the campaign separately. Column 3 takes into account the two events jointly. Column 4 includes three-way interactions and shows how the reform and the campaign affect the relationship between government control and the value of cash. The dependent variable is excess stock returns ($r - R^B$). Δ indicates the change from the previous year. All variables except *GOV* and *MLEV* are

deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 2.8 Disgorging cash via investment and investment efficiency

Variable	Increase in Investment		Increase in R&D	Investment Efficiency	
	(1)	(2)	(3)	(4)	(5)
GOV	-0.054	-0.037	-0.136	-0.004*	-0.005**
	(-1.10)	(-0.75)	(-1.37)	(-1.90)	(-2.07)
CASH	0.809***	0.985***	1.224***		
	(5.19)	(6.16)	(4.52)		
CASH × GOV	0.629***	0.584**	-0.883**		
	(2.73)	(2.48)	(-2.10)		
Q × GOV				-0.002***	-0.003***
				(-2.59)	(-3.75)
Q	0.017	0.011	0.032	0.003***	0.005***
	(1.29)	(0.87)	(1.50)	(5.53)	(8.06)
SIZE	0.004	-0.003	0.022	0.001	0.002**
	(0.23)	(-0.15)	(0.64)	(1.54)	(2.26)
CF	0.077	-0.202	-0.560	0.101***	0.102***
	(0.34)	(-0.90)	(-1.52)	(14.48)	(13.85)
BLEV	-0.398***	-0.441***	-0.138	0.063***	0.065***
	(-3.57)	(-3.94)	(-0.62)	(13.11)	(13.21)
DIV	-0.077**	-0.077**	0.510***	0.017***	0.018***
	(-2.13)	(-2.12)	(8.08)	(14.57)	(14.84)
SG	0.146***	0.076	0.454***	0.008***	0.0014***
	(2.67)	(1.37)	(5.65)	(6.04)	(9.08)
ROA	2.747***	2.904***	3.014***	0.040***	0.035***
	(7.87)	(8.26)	(5.15)	(3.88)	(3.23)
Constant	-0.305	-0.146	-3.693***	0.012	-0.005
	(-0.85)	(-0.40)	(-5.03)	(0.76)	(-0.32)
Year effect	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.02	0.02	0.28	0.16	0.16
Observations	16,682	16,682	12,532	19,321	19,321

The table reports the results of disgorging cash via investment and investment efficiency. Columns 1-3 report the impact of government control on disgorging cash via investment. Columns 4 and 5 report the impact of government control on investment efficiency. The dependent variable is the increase in investment (*INCR_INV*) in columns 1 and 2. Investment is measured as capital expenditure in column 1, the sum of capital expenditure and acquisitions in column 2. The dependent variable is the increase in R&D (*INCR_RD*) in column 3. The dependent variable is investment in column 4 and 5, where investment is measured as capital expenditure in column 4 and the sum of capital expenditure and acquisitions in column 5. *CASH* and *CF* are deflated by total assets. Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 2.9 Government control, financial constraints and external financing channels

Variable	Financial constraints		External financing channels	
	ΔCASH		*GEI*	*NDI*
	(1)	(2)	(3)	(4)
GOV	0.009***	0.003*	-0.011***	-0.003*
	(5.43)	(1.79)	(-7.25)	(-1.72)
GOV × *CF*	-0.025	0.010		
	(-1.18)	(0.50)		
CF	0.302***	0.312***		
	(17.82)	(18.71)		
MB	0.006***	0.006***	-0.001**	0.007***
	(8.19)	(8.89)	(-1.97)	(7.57)
SIZE	0.013***	0.012***	0.007***	0.012***
	(18.30)	(19.11)	(9.95)	(12.01)
CAPEX		-0.412***		
		(-29.29)		
ΔNWC		-0.207***		
		(-19.46)		
ΔSTD		0.188***		
		(13.71)		
ROA			0.017*	0.046***
			(1.75)	(3.14)
BLEV			-0.022***	0.282***
			(-4.96)	(38.01)
AGE			0.003**	-0.030***
			(2.40)	(-20.21)
Constant	-0.302***	-0.266***	-0.126***	-0.232***
	(-19.14)	(-18.78)	(-8.19)	(-11.10)
Year effect	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes
R-squared	0.14	0.28	0.03	0.21
Observations	16,636	16,636	16,636	16,636

The table reports the results of government control, financial constraints, and external financing channels. Columns 1 and 2 report the impact of government control on financial constraints. Columns 3 and 4 report the impact of government control on external financing channels. The dependent variable is the change in cash (*ΔCASH*) in columns 1 and 2, gross equity issuance (*GEI*) in column 3 and net debt issuance (*NDI*) in column 4. Δ indicates the change from the previous year. All variables except *GOV*, *SIZE*, and *AGE* are deflated by total assets. Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 2.10 Institutional development, government control and the value of cash

Variable	*MKT*		*BANK*		*GOVT*		*FISC*		*NADM*		*EMP*	
	Poor	Good	Poor	Good	Poor	Good	Poor	Good	Poor	Good	Poor	Good
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ΔCASH	1.904***	1.818***	1.745***	1.682***	1.757***	1.980***	1.888***	1.841***	1.735***	1.967***	1.881***	1.801***
	(12.39)	(11.88)	(10.39)	(11.37)	(11.24)	(13.59)	(11.28)	(13.28)	(10.34)	(14.00)	(11.02)	(13.27)
ΔCASH × *GOV*	-0.174	-0.405***	-0.140	-0.302**	-0.147	-0.456***	-0.131	-0.431***	-0.177	-0.337***	-0.207*	-0.327***
	(-1.57)	(-3.39)	(-1.15)	(-2.54)	(-1.30)	(-3.79)	(-1.12)	(-3.82)	(-1.42)	(-3.12)	(-1.68)	(-3.01)
ΔEBIT	1.217***	1.739***	1.277***	1.647***	1.285***	1.609***	1.131***	1.785***	1.207***	1.675***	1.210***	1.652***
	(12.96)	(11.80)	(13.21)	(11.33)	(13.19)	(11.68)	(11.96)	(12.55)	(11.61)	(13.69)	(11.62)	(13.02)
ΔNA	0.486***	0.433***	0.422***	0.414***	0.488***	0.433***	0.475***	0.451***	0.475***	0.453***	0.457***	0.472***
	(14.73)	(10.89)	(12.61)	(11.28)	(14.57)	(11.28)	(13.87)	(12.44)	(13.24)	(13.07)	(12.64)	(14.18)
ΔINT	1.760**	-0.439	1.220	0.697	1.721**	-0.359	1.588**	-0.080	2.093***	-0.078	1.668**	0.465
	(2.49)	(-0.50)	(1.54)	(0.86)	(2.34)	(-0.44)	(2.16)	(-0.10)	(2.58)	(-0.10)	(2.14)	(0.60)
ΔDIV	2.555***	2.795***	2.613***	2.307***	2.774***	2.511***	2.498***	2.865***	2.463***	2.915***	2.272***	3.055***
	(5.40)	(5.95)	(5.23)	(5.00)	(5.66)	(5.49)	(4.95)	(6.42)	(5.03)	(6.35)	(4.32)	(7.00)
CASH	0.200***	0.156***	0.176***	0.148***	0.197***	0.147***	0.195***	0.158***	0.205***	0.160***	0.162***	0.179***
	(5.31)	(3.95)	(4.61)	(3.79)	(5.18)	(3.75)	(4.81)	(4.32)	(5.11)	(4.36)	(3.92)	(4.87)
MLEV	-0.642***	-0.558***	-0.619***	-0.592***	-0.611***	-0.615***	-0.596***	-0.599***	-0.634***	-0.591***	-0.605***	-0.618***
	(-15.85)	(-12.90)	(-14.51)	(-14.56)	(-15.20)	(-14.52)	(-14.04)	(-14.40)	(-14.65)	(-15.09)	(-14.22)	(-15.20)
NF	-0.031	-0.007	0.030	-0.050	-0.048	0.011	-0.022	-0.030	-0.053	0.004	-0.003	-0.046
	(-0.57)	(-0.11)	(0.52)	(-0.87)	(-0.85)	(0.19)	(-0.38)	(-0.54)	(-0.90)	(0.07)	(-0.06)	(-0.84)
ΔCASH × *CASH*	-1.566***	-1.166***	-1.104***	-1.283***	-1.425***	-1.334***	-1.748***	-1.099***	-1.137***	-1.624***	-1.851***	-0.972***
	(-5.49)	(-3.57)	(-3.46)	(-4.12)	(-4.95)	(-4.14)	(-5.60)	(-3.66)	(-3.76)	(-5.68)	(-5.84)	(-3.23)
ΔCASH × *MLEV*	-2.384***	-2.803***	-2.546***	-2.153***	-2.199***	-2.951***	-2.226***	-2.830***	-2.288***	-2.755***	-1.869***	-3.031***
	(-6.25)	(-6.98)	(-6.56)	(-5.49)	(-6.01)	(-7.08)	(-5.68)	(-7.71)	(-5.69)	(-7.68)	(-4.47)	(-8.72)
GOV	-0.012	-0.023**	0.002	0.005	-0.011	-0.026**	-0.016	-0.013	-0.009	-0.017*	-0.019*	-0.009
	(-1.16)	(-2.03)	(0.15)	(0.45)	(-1.04)	(-2.35)	(-1.46)	(-1.25)	(-0.76)	(-1.70)	(-1.70)	(-0.89)
GRP	0.030**	-0.023	0.029**	-0.035	0.019	-0.038***	0.014	-0.025	0.021	-0.014	-0.010	-0.011
	(1.98)	(-1.08)	(2.38)	(-1.56)	(1.47)	(-2.72)	(0.66)	(-1.32)	(1.38)	(-1.09)	(-0.88)	(-0.93)

GRPGTH	0.271	-0.108	0.191	-0.367	0.218	0.110	0.210	-0.111	0.010	0.120	0.106	0.175
	(1.55)	(-0.51)	(1.20)	(-1.61)	(1.35)	(0.62)	(1.07)	(-0.64)	(0.06)	(0.74)	(0.63)	(0.93)
Constant	-0.343**	0.205	-0.330***	0.372	-0.256**	0.368**	-0.188	0.222	-0.215	0.026	0.034	0.037
	(-2.40)	(0.89)	(-2.67)	(1.54)	(-2.06)	(2.40)	(-1.00)	(1.12)	(-1.49)	(0.18)	(0.28)	(0.30)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.23	0.21	0.22	0.22	0.23	0.21	0.23	0.22	0.21	0.23	0.22	0.21
Observations	10,630	8,710	9,045	8,254	10,493	8,847	9,286	10,054	9,064	10,276	8,992	10,348

The table reports the results of institutional development, government control and the value of cash. Columns 1 and 2 report the results for firms from regions with poor and good overall market development (*MKT*). Columns 3 and 4 report the results for firms from regions with poor and good banking sector liberalisation (*BANK*). Columns 5 and 6 report the results for firms from regions with poor and good government decentralisation (*GOVT*). Columns 7 and 8 report the results for firms from regions with poor and good government fiscal condition (*FISC*). Columns 9 and 10 report the results for firms from regions with poor and good government non-arbitrary revenue (*NADM*). Columns 11 and 12 report the results for firms from regions with poor and good employment condition (*EMP*). The dependent variable is excess stock returns ($r - R^B$). Δ indicates the change from the previous year. All variables except *GOV* and *MLEV* are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

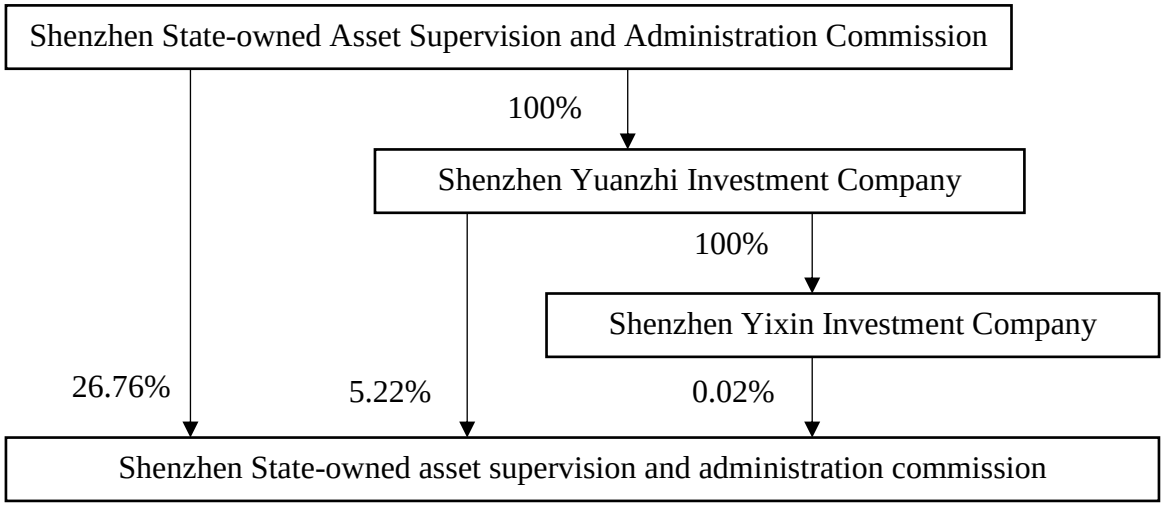
Appendix 2.A An example of ultimate control versus direct ownership by the government

Chinese listed companies typically announce state-owned shares in the section of restricted shares in annual reports. State-owned shares include the shares held by the state and the shares held by share-owned enterprises, listed in the restricted shares section. For example, the following is the share structure of Shenzhen Agricultural Products Company Limited (000061: SZSE) in the 2015 annual report.

	2014		Change	2015	
	Number	%	Number	Number	%
1. Restricted shares	91,086,761	5.37%	-1,632,816	89,453,945	5.27%
1.1 Shares held by the state	67,497,500	3.98%	0	67,497,500	**3.98%**
1.2 Shares held by state-owned corporations	16,372,500	0.96%	0	16,372,500	**0.96%**
1.3 Shares held by other domestic investors	7,216,761	0.43%	-1,632,816	5,583,945	0.33%
1.4 Shares held by foreign investors	0	0	0	0	0
2. Non-restricted shares	1,605,877,370	94.63%	1,632,816	1,607,510,186	94.73%
2.1 RMB common shares	1,605,877,370	94.63%	1,632,816	1,607,510,186	94.73%
2.2 Domestically listed foreign shares	0	0	0	0	0
2.3 Overseas listed foreign shares	0	0	0	0	0
2.4 Other	0	0	0	0	0
3. Total shares	1,696,964,131	100.00%	0	1,696,964,131	100.00%

As shown in the table, the percentage of state-owned shares is 4.94% (3.98% + 0.96%). The shares held by the state are owned by the company's largest shareholder – Shenzhen State-owned Asset Supervision and Administration Commission, and the shares held by the state-owned corporation are owned by the company's fourth largest shareholder – Shenzhen Yuanzhi Investment Company Limited. In addition to the state-owned shares, the two shareholders also hold non-restricted RMB common shares. The Shenzhen Yuanzhi Investment Company is further directly owned by the Shenzhen State-owned Asset Supervision and Administration Commission. The following figure presents the control

rights structure of the Shenzhen Agricultural Products Company Limited in the 2015 annual report. As shown in the figure, the total control rights by the government (i.e. Shenzhen) is 32% (26.76% + 5.22% + 0.02%). State ownership highly underestimates the degree of government control.



Appendix 2.B Government direct ownership and the value of cash

Variable	(1)	(2)	(3)
ΔCASH	1.633***	1.759***	1.785***
	(16.14)	(17.06)	(16.40)
ΔCASH × State	-0.120	-0.165	-0.025
	(-0.65)	(-0.89)	(-0.13)
ΔEBIT	1.336***	1.435***	1.303***
	(16.84)	(17.60)	(16.17)
ΔNA	0.444***	0.467***	0.450***
	(17.84)	(18.39)	(16.80)
ΔINT	1.055**	1.062*	1.685***
	(1.97)	(1.91)	(2.98)
ΔDIV	2.904***	2.754***	2.405***
	(8.67)	(8.13)	(7.07)
CASH	0.130***	0.163***	0.442***
	(4.96)	(6.02)	(10.40)
MLEV	-0.529***	-0.611***	-1.153***
	(-18.32)	(-20.80)	(-18.67)
NF	-0.035	-0.021	-0.023
	(-0.88)	(-0.51)	(-0.51)
ΔCASH × CASH	-1.469***	-1.443***	-1.269***
	(-6.65)	(-6.60)	(-5.58)
ΔCASH × MLEV	-2.329***	-2.536***	-2.522***
	(-8.50)	(-9.22)	(-8.63)
State	0.017	-0.016	0.022
	(1.10)	(-0.83)	(0.79)
Constant	-0.069***	-0.047*	-0.006
	(-9.16)	(-1.91)	(-0.29)
Year effect	No	Yes	Yes
Industry effect	No	Yes	No
Firm effect	No	No	Yes
R-squared	0.19	0.21	0.21
Observations	19,340	19,340	19,340

The table reports the results of government direct ownership and the value of cash. Columns 1-3 use different sets of year and industry effects. The dependent variable is excess stock returns ($r - R^B$). Δ indicates the change from the previous year. All variables except *State* and *MLEV* are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Appendix 2.C Government control, corporate governance and the value of cash

The presence of government control may also affect the relationship between corporate governance and the value of cash. Government-controlled firms are managed differently than privately controlled firms in many aspects. For example, as argued by Jiang and Kim (2015), the government is not literally a person. Unlike private owners, the government cannot personally benefit from tunnelling. In a related study, Jiang, Lee and Yue (2010) find that tunnelling through intercorporate loans is less likely to occur in firms controlled by the government, providing indirect evidence that the government as a controlling shareholder has no incentive to tunnel for private benefits. If this is true, excess control rights, the proxy for controlling shareholders' incentive to tunnel, should not affect the value of cash for government-controlled firms. Moreover, top managers in Chinese government-controlled firms are usually government employees, and the government still retains the right of their appointment (Firth, Fung and Rui, 2006). Managers, under pressure to fulfil political objectives, are usually subject to fixed term contracts. Once their terms as firm managers finish, they return to the government position, often with a promotion. Under such circumstances, it is unsurprising that the ownership by managers is quite low in government-controlled firms (Jiang and Kim, 2015). Managerial ownership in firms controlled by the government, at such a low level, casts doubt on its alignment or entrenchment effects on the value of cash. Finally, Firth *et al.* (2016) find that institutional investors are more likely to monitor government-controlled firms due to their complex agency problems than privately controlled firms. Based on these discussions, we expect that government control affects the relationship between corporate governance and the value of cash.

A few interesting results emerge, as reported in the table below. First, the coefficient on the interaction term $\Delta CASH \times EXCESS$ is negative but not significant for government-controlled

firms in column 1. In contrast, for privately controlled firms, the coefficient on the interaction term $\Delta CASH \times EXCESS$ is negative and significant in column 2, suggesting the value of cash is negatively associated with controlling shareholders' incentive to tunnel. The findings support the argument that the government, not literally a natural person, cannot enjoy the benefits of tunnelling and is unlikely to expropriate wealth from minority shareholders. Private owners, on the other hand, do tunnel. Second, for government-controlled firms, the coefficients on the interaction terms $\Delta CASH \times MOWN$ and $\Delta CASH \times MOWN^2$ are found to be insignificant in column 3. For privately controlled firms, the coefficient on the interaction term $\Delta CASH \times MOWN$ is significantly positive and the coefficient on the interaction term $\Delta CASH \times MOWN^2$ is significantly negative in column 4. Managerial ownership has no effect on the value of cash in firms controlled by the government, but the effect is highly significant for firms controlled by private owners, with an inverse U-shaped relationship. Given the pressure to pursue political-related projects and the low level of ownership, the interests of managers and shareholders cannot be aligned, and the issue concerning managerial entrenchment is negligible in firms owned by the government. In contrast, the alignment and entrenchment effects are still significant in firms owned by private owners. Third, the coefficient the interaction term $\Delta CASH \times INST$ is positive and significant for government-controlled firms in column 5, while the coefficient is positive but insignificant for privately controlled firms in column 6, suggesting the monitoring role of institutional investors is more evident in government-controlled firms. Finally, the coefficient on the interaction term $\Delta CASH \times ANACOV$ is positive and significant in both government- and privately controlled firms, and the difference is not significant.

Taken together, we find government control alters the impacts of many governance arrangements on the value of cash.

Variable	Excess control rights		Managerial ownership		Institutional ownership		Analyst coverage	
	Government-controlled	Privately controlled	Government-controlled	Privately controlled	Government-controlled	Privately controlled	Government-controlled	Privately controlled
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔCASH	1.703***	2.204***	1.440***	1.808***	1.304***	1.789***	1.284***	1.761***
	(7.81)	(13.09)	(10.38)	(11.17)	(8.59)	(11.29)	(8.73)	(10.87)
ΔCASH × EXCESS	-0.126	-0.217**						
	(-1.08)	(-2.50)						
ΔCASH × MOWN			8.998	2.540**				
			(1.50)	(2.39)				
ΔCASH × MOWN²			-29.699	-4.810***				
			(-1.42)	(-2.62)				
ΔCASH × INS					3.191**	1.935		
					(2.01)	(1.04)		
ΔCASH × ANACOV							0139***	0.125**
							(2.70)	(2.21)
ΔEBIT	1.146***	1.811***	1.164***	1.865***	1.318***	2.087***	1.143***	1.791***
	(11.12)	(12.44)	(11.78)	(13.16)	(11.27)	(11.67)	(11.83)	(13.00)
ΔNA	0.403***	0.551***	0.398***	0.539***	0.351***	0.532***	0.381***	0.521***
	(12.25)	(13.44)	(12.61)	(12.79)	(10.68)	(10.93)	(12.18)	(2.37)
ΔINT	1.191*	1.284	0.701	0.974	0.768	-0.231	0.722	0.506
	(1.69)	(1.33)	(1.01)	(1.04)	(1.11)	(-0.21)	(1.09)	(0.53)
ΔDIV	3.480***	1.789***	3.273***	1.986***	2.974***	1.321**	3.179***	1.744***
	(6.81)	(3.61)	(6.79)	(4.07)	(5.80)	(2.55)	(6.70)	(3.66)
CASH	0.222***	0.139***	0.222***	0.156***	0.253***	0.157***	0.202***	0.085*
	(5.50)	(3.19)	(5.95)	(3.38)	(6.33)	(3.37)	(5.42)	(1.96)
MLEV	-0.508***	-0.798***	-0.486***	-0.784***	-0.425***	-0.546***	-0.471***	-0.668***
	(-12.70)	(-15.36)	(-12.92)	(-15.00)	(-10.60)	(-9.41)	(-13.26)	(-13.18)

NF	-0.028	-0.003	-0.039	0.010	-0.032	-0.027	-0.085*	-0.061
	(-0.53)	(-0.05)	(-0.75)	(0.15)	(-0.60)	(-0.36)	(-1.68)	(-0.95)
ΔCASH × CASH	-1.111***	-1.557***	-1.108***	-1.394***	-1.327***	-1.617***	-1.204***	-1.702***
	(-3.46)	(-5.08)	(-3.57)	(-4.42)	(-4.25)	(-4.92)	(-3.96)	(-5.39)
ΔCASH × MLEV	-2.080***	-2.894***	-1.810***	-3.269***	-1.543***	-2.926***	-1.664***	-2.977***
	(-4.99)	(-6.77)	(-4.55)	(-7.67)	(-3.95)	(-6.67)	(-4.34)	(-7.36)
EXCESS	0.003	0.007						
	(0.34)	(0.95)						
MOWN			-0.043	-0.021				
			(-0.07)	(-0.22)				
$MOWN^2$			0.451	-0.171				
			(0.20)	(-1.02)				
INS					2.122***	2.117***		
					(12.37)	(11.92)		
ANACOV							0.046***	0.048***
							(9.94)	(9.47)
Constant	-0.099**	-0.056	-0.095***	-0.011	-0.142***	-0.101**	-0.091***	-0.035
	(-2.53)	(-1.41)	(-2.61)	(-0.33)	(-3.77)	(-2.30)	(-2.93)	(-1.01)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.22	0.24	0.21	0.24	0.24	0.27	0.22	0.24
Observations	8,738	8,421	9,620	8,967	8,479	7,401	10,134	9,206

The table reports the results of corporate governance and the value of cash for government- and privately controlled firms. Columns 1 and 2 consider excess control rights (*EXCESS*). Columns 3 and 4 consider managerial ownership (*MOWN*). Columns 5 and 6 consider institutional ownership (*INST*). Columns 7 and 8 consider analyst coverage (*ANACOV*). The dependent variable is excess stock returns ($r - R^B$). Δ indicates the change from the previous year. All variables except corporate governance variables and *MLEV* are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 2.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

CHAPTER 3 POLITICAL CORRUPTION AND CORPORATE CASH HOLDINGS

3.1 Introduction

Political corruption is widespread, especially in emerging countries where legal systems are opaque and administrative discretion is excessive (Shleifer and Vishny, 1993, 1994; Stulz, 2005). Politicians and bureaucrats can use their public power to seek rents by actions including outright confiscation, bribery taking, regulation favourable to themselves and redistribution of income taxes from firms at the expense of shareholders' wealth (Stulz, 2005). Though the impact of political corruption on macroeconomic and public choice variables are well studied in the extant literature (Shleifer and Vishny, 1993; Mauro, 1995; Tanzi and Davoodi, 1998), the literature on how firms respond to political corruption is still inconclusive. On the one hand, empirical evidence shows that firms attempt to avoid political extraction and protect shareholder rights by diversifying acquisitions, resorting to the underground economy, and adopting opaque disclosure (Choi and Thum, 2005; Stulz, 2005; Beneish *et al.*, 2008). On the other hand, a number of studies document that firms can take bribe opportunities and purchase political favours to benefit in the presence of a corrupt environment by using approaches such as corporate lobbying, political donations, campaign

contributions, and so forth (Claessens, Feijen and Laeven, 2008; Goldman, Rocholl and So, 2009; Blau, Brough and Thomas, 2013).[15]

This chapter adds to the above debate by investigating how firms manage their policy on liquid assets under the circumstance of political corruption. We are particularly interested in cash, since it is easier to access than other hard assets, such as PPE and inventory, and is one of the primary targets for political extraction (Myers and Rajan, 1998; Caprio, Faccio and McConnell, 2013). In line with this view, Caprio, Faccio and McConnell (2013) and Smith (2016) find that firms maintain a smaller portion of assets in liquid form in order to reduce their ability to pay for political officials in countries with a high potential for political extraction. However, there can be opposite motivation pushing firms to increase cash holdings to meet bribery needs in a corrupt environment. Liquid assets enable firms to exploit randomly arising bribing opportunities. Consistent with the notion, Chen (2011) finds corporate cash reserves are higher in countries with low control of corruption.

We evaluate which liquidity incentive dominates by focusing on the context of China and the recent Chinese anti-corruption campaign. Over the decades of economic reform, China has become one of the largest economies in the world. However, its rapid growth and development have been accompanied by a severe corrupt environment. Although the government's effort in combating corruption has never stopped, China is still regarded as a country with a high degree of corruption in the public and political sectors, according to the Corruption Perception Index. As corruption had become one of the major impediments to

[15] Benefits from political corruption include obtaining favorable access to the financial market, receiving preferential government contracts, and enjoying more subsidies and tax benefits (Adhikari, Derashid and Zhang, 2006; Faccio, Masulis and McConnell, 2006; Claessens, Feijen and Laeven, 2008; Chaney, Faccio and Parsley, 2011; Boubakri *et al.*, 2012).

economic growth, Xi Jinping, soon after taking office in late 2012, launched a far-reaching anti-corruption campaign, with the aim of reducing corruption in government officials. Several recent studies document that the anti-corruption campaign has taken its effect in curbing political corruption (Xu and Yano, 2016; Pan and Tian, 2017; Zhang, 2018).

The objective of this chapter is twofold. First, we investigate the impact of the recent Chinese anti-corruption campaign (the Campaign, henceforth) on corporate cash holdings. The Campaign represents an exogenous shock reducing the threat of political corruption and serves as an ideal framework to investigate how firms respond to this event in adjusting their hoardings of cash in concern about political expropriation. Second, we explore whether the change in cash holdings following the Campaign depends on the degree of rent-seeking behaviour by local government officials. Prior studies document that there are great variations in the development of local institutions across regions in China (Cull and Xu, 2005; Hasan, Wachtel and Zhou, 2009; Wang, Fan and Yu, 2017). These variations in regional characteristics reflect a varying degree of rent-seeking threats of local government, which motivates us to examine effectively the extent to which firms benefit from the Campaign in terms of cash holdings across regions. Our study considers a board set of variables, reflecting various aspects of regional development, compared to previous studies in the literature.

Based on a sample of 15,118 firm-year observations with 2,597 unique firms that cover 31 provinces over the period 2009-2016, we find that firms significantly hold more cash in the post-campaign period. The results are robust to subsample analysis, as well as the inclusion of additional variables, such as research and development (R&D), firm age, corporate governance and uncertainty concern that may have potential explanatory power in

determining the level of cash holdings. We extend our study by focusing on whether the level of cash sheltered by firms varies across regions with different degrees of rent-seeking incentives by local governments. Our measurements of rent-seeking incentives are captured by four broadly categorised groups: market development, government quality, fiscal status, and economic conditions, with each group having two alternative measures. Our empirical evidence reveals that the increase in cash holdings after the Campaign varies across the regions. Specifically, firms located in regions with high levels of rent-seeking threats are observed to increase more cash holdings. Our results strongly support the shielding hypothesis, in that firms are obliged to maintain a suboptimal level of cash in face of rent-seeking threats, as documented in Caprio, Faccio and McConnell (2013) and Smith (2016). The Campaign has mitigated this political expropriation, allowing firms to move cash holdings upward to the optimal level. The higher the rent-seeking attempts in a region that firms are located, the larger the increase in cash held by firms is observed.

We conduct several additional analyses to validate our main findings. First, as implied by Pinkowitz, Stulz and Williamson (2006), outside investors discount cash held by firms with the perceived government corruption. We find that the market value of cash increases significantly in the post-Campaign period, further supporting that the threat of political corruption decreases following the Campaign. For an average firm in our sample, with a one-unit increase in cash, the marginal value of cash increases from RMB 1.20-1.22 in the pre-campaign period to RMB 1.50-1.58 in the post-campaign period. Second, Acharya, Almeida and Campello (2007) and Denis and Sibilkov (2009) highlight the importance of cash used in funding investments without the need to resort to external costly finance. Consistent with their argument, we observe a positive relationship between investment and cash holdings after the Campaign and, further confirm that this positive relationship is associated with

growth opportunities. Third, Smith (2016) notes that debt borrowing could be used as another channel by firms to avoid political extraction. Firms take on more debts to signal their commitment of future cash flows to debt service, thereby limiting their ability to pay for corrupt public officials. Using both long-term and short-term debt ratios, we find that firms manage debt obligations downward as a result of the Campaign – decline in the threat of political extraction. Finally, we examine how the Campaign influences the relationship between corporate governance and cash holdings. As political extraction lowers corporate governance quality and aggravates the insider agency costs (Shleifer and Vishny, 1994), we expect that the reduction in political corruption by the Campaign can improve governance mechanisms and weaken the relationship between governance and cash holdings. The evidence in line with our prediction shows that the impact of governance on cash holdings becomes weaker following the Campaign.

This study contributes to the literature at least in the following two aspects. First, this study complements the literature on the determinants of cash holdings. The prior literature on cash policy primarily focuses on the importance of the agency costs between corporate insiders and minority shareholders (Dittmar, Mahrt-Smith and Servaes, 2003; Harford, Mansi and Maxwell, 2008; Tong, 2010; Gao, Harford and Li, 2013). Our findings emphasise the role of state agency problems (i.e. political corruption) in determining the level of cash held by firms (Chen, 2011; Caprio, Faccio and McConnell, 2013; Smith, 2016). More importantly, our research framework is based on an exogenous shock to political corruption, the recent anti-corruption campaign in China. The exogenous shock serves as an ideal setting to study the causal link between political corruption and corporate cash holdings for two reasons. First, firm locations may not be randomly selected. Firms with different cash policies may choose to locate in areas with different levels of political corruption, leading to an

endogenous issue in the relationship between political corruption and cash holdings (Smith, 2016). The anti-corruption campaign is an exogenous event at least to individual firms. It removes the political corruption by government officials and is not likely to be influenced by individual firms' cash policies. Second, the single-country setting also enables us to effectively address the problems encountered in cross-country studies, such as noisy variables, differences in cultural and economic factors and arbitrary weight determining each country in the cross-country sample (Fan, Rui and Zhao, 2008; Zhang, 2018).

Second, this work provides new insights into the literature on the recent studies relating to the effect of the recent Chinese anti-corruption campaign on firm value and financial policies. The aim of the Campaign is to remove political extraction and corruption in government officials. A number of studies have documented that the Campaign has taken its effect, in the sense that it has significantly improved corporate financial transparency (Hope, Yue and Zhong, 2018), decreased corporate fraud (Zhang, 2018), reduced political capital (Pan and Tian, 2017) and increased corporate innovation (Xu and Yano, 2016). This chapter is among the first to investigate the effects of the Campaign in general, and it is the first study to examine its impact on firms' liquid assets. In addition to cash, our supplementary analysis demonstrates that political expropriation also plays an important role in shaping corporate investment decisions and capital structure policies.

The rest of the chapter proceeds as follows. Section 3.2 provides an overview of the recent Chinese anti-corruption campaign and develops testable hypotheses. Section 3.3 describes the data, key variables, and methodology and Section 3.4 reports the empirical results. Concluding remarks are drawn in Section 3.5.

3.2 Institutional background and hypothesis development

3.2.1 The recent anti-corruption campaign in China

Since the economic reforms programme which began in the early 1980s, political corruption in China has grown significantly. The corrupt environment in China is rooted in its institutional background characterised by government control of the economy. The government plays an important role in allocating scarce resources, such as granting rights of land use, setting energy prices, controlling access to financial capital, and intervening in judicial and regulatory decisions at its discretion (Chen *et al.*, 2011a). With weak legal enforcement and poor property rights protection, it is not surprising that such an institutional background leads to a severely corrupt environment (Allen, Qian and Qian, 2005). According to the Transparency International Survey, the Corruption Perception Index for China is 40, ranked 79 out of 176 countries as of 2016.[16] As corruption is impeding economic growth, combating corruption has been one of the most important political and social issues in China.

Shortly after officially taking office in the 18th National Congress of the Communist Party of China in November 2012, Xi Jinping introduced a large-scale anti-corruption campaign and determined to crack down on 'tigers and flies', meaning high-ranking officials and petty civil servants alike. The anti-graft effort is being carried out by the Central Commission for Discipline Inspection (CCDI), which was established to enforce regulations and to fight

[16] The Corruption Perception Index by the Transparency International Survey reveals the overall extent of corruption in the public and political areas. A higher score (ranking) implies a lower (higher) public perception of corruption. Details of the Corruption Perception Index can be found from the Transparency International website (www.transparency.org).

against corruption within the party. In May 2013, the CCDI started dispatching central inspection teams to selected regions to carry out initial inspections. After spending around two months at the organisation targeted for oversight, the central inspection teams send their results to the CCDI to enact formal investigation procedures. By the end of September 2014, the central inspection teams had conducted four rounds of inspection, covering all provinces, municipalities, and autonomous regions. The Campaign is widely regarded as the most influential organised anti-graft effort in the history of China. It has now continued for more than five years and there is no sign of it ceasing. According to the official records of the CCDI, the number of corruption cases under investigation per year was less than 140,000 for the period 2008-2011, while the number soared to 172,000 in 2013, 226,000 in 2014, 330,000 in 2015 and 413,000 in 2016, respectively. Similarly, the number of people punished by Communist Party law for the period 2008-2011 was around 140,000, while the figure increased significantly to 182,000 in 2013, 232,000 in 2014, 336,000 in 2015 and 415,000 in 2016, respectively.[17]

The large scale of the anti-corruption effort has attracted great attention in the literature. For example, Ke, Liu and Tang (2018) find that the Campaign has significantly reduced the consumption of luxury goods and services by SOEs. Hope, Yue and Zhong (2018) contend that the Campaign is resulting in an increase in financial transparency for firms with official directors after 'Rule 18', an important action of the Campaign. Zhang (2018) maintains that firms are less likely to commit fraud as a result of the Campaign, indicating that this effect is more pronounced in firms with weaker legal environments and in areas with weaker local

[17] The information on inspection rounds carried out by central inspection teams and official records of CCDI can be found in Appendix 3.A and Appendix 3.B. For details, please refer to the CCDI official website (http://www.ccdi.gov.cn/).

economies. Xu and Yano (2016) further identify that strong anti-corruption efforts are enhancing firms' ability to acquire external finance, leading to more investment in R&D and patents. Pan and Tian (2017) identify firms connected with the ousting of corrupt politicians through bribery and personal relationships and find that after the ousting of corrupt officers, these firms experience a significant decline in investment expenditures compared with unconnected firms, especially so after the Campaign.

3.2.2 Hypothesis development

The prior literature suggests that there are three motives for holding cash: the transaction motive, the precautionary motive, and the agency motive (Opler *et al.*, 1999; Bates, Kahle and Stulz, 2009). In the absence of agency costs, firms choose the optimal level of cash to maximise firm values. Research indicates that firms with high transaction costs from converting non-cash assets to cash tend to hold a large fraction of liquid assets to facilitate transactions. Similarly, firms with high growth opportunities or severe financial constraints have the intention to hoard more cash for precautionary considerations. These determinants have been explored extensively in studies. For example, Opler *et al.* (1999) examine the determinants of cash holdings and find corporate cash holdings increase with growth opportunities and cash flow volatility and decrease with the access to the capital markets. Almeida, Campello and Weisbach (2004) and Acharya, Almeida and Campello (2007) argue that find that firms save cash out of cash flows when they face high financial constraints and have hedging needs. Bates, Kahle and Stulz (2009) provide the evidence that the cash ratio has significantly increased during 1980-2006, which can be explained by the precautionary motive. Specifically, riskier cash flows and more intensive R&D increase firms' incentive to hold higher cash reserves.

The agency motive states that conflicts between corporate insiders and minority shareholders may force firms to hold cash deviating from the optimal level. According to the free cash flow theory, self-interested managers have incentives to hold excess cash reserves at the expense of shareholders. In such circumstances, the agency motive for holding cash predicates that agency costs increase corporate cash holdings. However, the empirical evidence on how agency costs affect the level of cash is mixed and inconclusive. Opler et al. (1999) and Bates, Kahle and Stulz (2009) find no evidence that cash holdings are affected by agency considerations. The findings of Dittmar, Mahrt-Smith and Servaes (2003) and Gao, Harford and Li (2013) show that firms maintain high levels of cash where investor protection is weak, supporting the free cash flow theory. However, Harford, Mansi and Maxwell (2008) argue that entrenched managers prefer spending cash holdings quickly for private benefits in poorly governed firms. Consistent with the view, they find firms in the US with more agency costs hold less cash. From a different perspective, Dittmar and Mahrt-Smith (2007) and Pinkowitz, Stulz and Williamson (2006) investigate how agency costs affect the value rather than the level of cash reserves. The value of cash reflects investors' perceptions of the use of cash reserves, which largely depends on corporate agency costs. They find the value of cash holdings is highly discounted for firms where minority investor protection is weak and insider monitoring pressure is limited, consistent with agency theory.

However, the literature on how firms structure their liquid assets in the face of political extraction is rather scarce. Caprio, Faccio and McConnell (2013), based on a large cross-country sample, find that firms hold lower cash in countries with more political corruption. They further document that in countries where corruption is severe, firms invest more in hard assets, such as PPE, and inventory, and pay dividends to avoid having liquid assets to be extracted by politicians and bureaucrats. Likewise, using US Department of Justice data

on local corruption convictions of public officials as the main proxy for corruption, Smith (2016) finds that firms in more corrupt regions hold fewer cash holdings and have higher financial leverage than firms in less corrupt areas, and that the impacts of political corruption on cash and leverage are more pronounced for firms operating around their headquarters, concluding that firms manage liquid assets downward and debt obligations upward to limit the extraction by government officials, supporting what he refers to as the shielding hypothesis.

With the deepening of the recent anti-corruption campaign, the CCDI and central inspection teams have exerted stricter supervision, amidst the public and social media involved in monitoring. The cost of punishment also increases significantly. This leads to an increase in discipline inspections of officials and a decrease in the likelihood of being bribed. Under such circumstances, firms are expected to be less afraid of political extraction, and there is no need to hide liquid assets. This implies that firms would increase their cash holdings after the Campaign to reflect the precautionary motive for investment opportunities. The hypothesis is stated in the form below:

H1a: *Firms increase their cash holding in the post-campaign period.*

Alternatively, firms may position themselves as highly liquid to purchase political favours and take up bribery opportunities, which is referred to as the liquidity hypothesis (Smith, 2016). Chen (2011) argues that in areas with severe political corruption, firm managers are more likely to maintain large holdings of cash in the effort to collude with government officials, bypass financial regulations and enjoy political benefits. Consistent with this prediction, Chen (2011) documents that firms hold lower cash in countries with high control of corruption. Following the Campaign, the risk, as well as the benefit, of political corruption

should reduce. If the liquidity hypothesis holds, we should observe a decline in cash holdings after the Campaign. The alternative hypothesis is summarised below.

H1b: *Firms decrease their cash holdings in the post-campaign period.*

A natural extension of our hypothesis above is whether the level of cash sheltered by firms varies across regions with different degree of rent-seeking attempts by local government officials. A large number of studies document that there is a wide regional disparity in market development, government quality, government fiscal conditions, and economic conditions in China (Cull and Xu, 2005; Hasan, Wachtel and Zhou, 2009; Wang, Fan and Yu, 2017). These variations in regional characteristics reflect a varying degree of rent-seeking threats. For example, Chen *et al.* (2011a) report that firms look for safeguards in areas where the local economy is less market-oriented and the local government has more preference in allocating financial resources, as the attempts of rent-seeking by political officials in such areas are higher. Kusnadi, Yang and Zhou (2015) find that firms in regions with good institutions face a lower threat of political extraction and maintain more cash holdings than those in areas with poor institutions, where the institutional indices are measured by market development, government decentralisation, and legal property rights. Collectively, the existing literature demonstrates that the degree of political expropriation differs largely alongside regional development, which can be best described by a set of province-level indices.

If the shielding hypothesis holds and there exists a negative association between corruption and the level of cash, we would expect to observe a stronger effect of the Campaign in areas with higher corruption attempts before the Campaign. In order words, firms located in areas with higher pre-campaign political expropriation would benefit more from the current anti-

graft effort, and, consequently, the increase in cash by firms in these areas is expected to be higher in order to maintain a relatively efficient level for future growth opportunities. On the hand, if the liquidity hypothesis holds, firms formerly facing more rent-seeking attempts by government officials should reduce more cash. This is because they suffer more from the loss of benefits associated with political corruption following the Campaign. The implication that we draw from the above discussion leads to the second set of hypotheses as follows:

H2a: *The increase in cash holdings after the Campaign is more pronounced for firms located in regions with high rent-seeking incentives of government officials.*

H2b: *The decrease in cash holdings after the Campaign is more pronounced for firms located in regions with high rent-seeking incentives of government officials.*

3.3 Research design

3.3.1 Sample

We begin with all listed firms issuing A shares on the Shanghai and Shenzhen stock exchanges during the period 2009-2016. The sample period begins from 2009 to exclude the possible influences of the split share structure reform and the recent global financial crisis. We first exclude firms in the financial industries and then delete firm-year observations with missing stock returns, negative equities, and negative net assets (i.e. total assets minus cash and cash equivalents). Our final unbalanced data consists of 15,118 observations with 2,597 unique firms located in 31 province-level regions in China. The firm-level financial data is extracted from the China Stock Market and Accounting Research (CSMAR) database. All

province-level information is collected from the National Economic Research Institute (NERI) 2016 report and the National Bureau of Statistics (NBS) of China.

3.3.2 Measurement of key variables

3.3.2.1 The anti-corruption campaign

The anti-corruption campaign is measured in two ways. As discussed above, the CCDI central inspection teams have performed several series of inspection of corruption covering all provinces, municipalities, and autonomous regions. Our first variable, *POST1*, is a dummy variable, which takes the value of one if a firm located in a region has been inspected by the CCDI central inspection teams by the end of the year and zero otherwise. The location of a firm is based on its headquarters. Furthermore, the anti-corruption campaign announced in late 2012 may have already sent a clear signal to the market and, if managers are forward-looking and not myopic, this market-wide signal should have started to influence corporate financial policies from 2013 onward, even among firms in regions that have not been selected immediately by the CCDI to undergo corruption inspection. Therefore, our second measurement, *POST2*, is defined as a dummy variable equal to one for years 2013-2016 and zero for years 2009-2012. The former measure describes the region-specific effect from the year in which a region is chosen to implement the inspection onward, while the latter captures the market-wide effect from 2013 onward.

3.3.2.2 Rent-seeking incentives

We consider a wide range of factors that represent regional attributes to capture the degree of rent-seeking incentives by local government officials. These factors have been investigated in the prior literature (Cheung, Rau and Stouraitis, 2010; Chen *et al.*, 2011a;

Kusnadi, Yang and Zhou, 2015) and others, who document that regional differences tend to reflect varying degrees of political corruption. These factors can be classified into four groups: market development, government quality, fiscal status, and economic conditions. Regions with advanced market development and high government quality are regarded as being able to offer more protection to firms and exert more monitoring of government officials. Corruption in these areas is more likely to be detected and prosecuted, and thus government officials have a lower incentive to seek rents from firms. Similarly, in regions with better fiscal status and economic conditions, politicians have a lower need to supplement their budgets and provide social services, and thus the incentives to seek rents are lower.

Specifically, market development is measured in two alternative ways. First, *MKT* is a composite index, capturing the overall development of the market. Second, *BANK*, a sub-index, measures the degree of banking sector liberalisation, on the basis of the competitiveness of the banking sector and the marketisation of credit allocation. To measure the extent of government quality, we adopt two sub-indices. First, we use *GOVT* to capture the level of government decentralisation, determined by the corporate managers' perception of government administrative approval, industry entry access and other government intervention. This measure is in inverse relation to the government intervention in business and, therefore, a higher value of *GOVT* represents lower government intervention, thereby better government quality. Second, we use *LAW* to stand for the legal protection of property rights, proxied by the average of patents approved per researcher. The legal protection of property rights largely depends on the government enforcement of law and contracts. A higher value of property protection suggests better government quality. All four indices are

collected from the NERI report 2016 and used extensively in prior studies (Wang, Wong and Xia, 2008; Chen *et al.*, 2011a; Kusnadi, Yang and Zhou, 2015). [18]

Government fiscal status is measured by *FISC* and *NADM*. *FISC* is defined as the local government fiscal revenue divided by fiscal expenditure, and *NADM* is measured as the percentage of local government non-administrative revenue. While the former captures the local government's overall incentive to extract rents from firms, the latter measures the non-arbitrary collection of revenue by a local government. Officials in local governments with larger fiscal deficits and more non-arbitrary revenues are considered with more incentives and abilities to seek rents from firms (Chen *et al.*, 2011a). Finally, two indicators are adopted to characterise the local economic conditions. One is *GRP*, defined as the natural logarithm of regional gross domestic product in 100 million RMB, and another is *EMP*, measuring the local employment rate. Governments in regions with high gross regional products and employment rates are generally considered to have lower incentives to extract rents from firms (Cheung, Rau and Stouraitis, 2010). The data used to measure the above four indices is obtained from the annual statistics available from NBS of China.

3.3.3 Model specification

To investigate the impact of the anti-corruption campaign on corporate cash holdings, we employ the framework of Bates, Kahle and Stulz (2009) and Opler *et al.* (1999), as follows:[19]

[18] The four indices are divided by ten for consistency (Chen *et al.*, 2011a). A detailed description of NERI report 2016 can be found in Appendix 3.C.

[19] Another key determinant of cash holdings is the R&D variable. We add the R&D variable in the subsequent robustness tests since the variable is not available for the year 2016.

$$CASH_{i,t} = \beta_0 + \beta_1 POST_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MB_{i,t} + \beta_4 CF_{i,t} + \beta_5 NWC_{i,t} + \beta_6 IND\_SIG_{i,t} + \beta_7 CAPEX_{i,t} + \beta_8 BLEV_{i,t} + \beta_9 DIV\_DUM_{i,t} + \beta_{10} ACQ_{i,t} + \varepsilon_{i,t} \quad (3.1)$$

where the dependent variable, *CASH*, is cash and cash equivalents divided by net assets. We focus primarily on regressions using cash to net assets as the dependent variable, but our results remain qualitatively the same when alternative measures, such as cash to total assets and cash to sales, are used. The Campaign, *POST*, is the variable of interest in our analysis. Based on the shielding hypothesis (***H1a***), since the Campaign significantly alleviates political corruption, firms have less need to shelter cash and thus the level of cash holdings increases after the Campaign. A positive β_1 is predicted. Alternatively, if the liquidity hypothesis (***H1b***) is true, firms lose the political benefits associated with liquidity after the Campaign, and thus the level of cash holdings decreases. A negative $\beta_1$is predicted.

We control for firm size (*SIZE*), which is measured by the natural logarithm of net assets adjusted using the consumer price index provided by the NBS of China. It has been found that small firms maintain more cash than large firms to avoid the substantial cost of capital and prepare for unexpected liquidity shocks, according to economies of scale (Almeida, Campello and Weisbach, 2004; Bates, Kahle and Stulz, 2009). Thus, cash holdings are expected to decrease with firm size. Growth opportunities (*MB*) are measured as the market-to-book ratio of net assets. We expect a positive impact of growth opportunities on cash holdings since the opportunity cost of cash flow shortfalls and underinvestment problem is larger for these firms. Cash flow (*CF*) is net profits plus depreciation. Firms with higher cash flow have the ability to accumulate more cash, suggesting a positive effect of cash flow on cash. Net working capital (*NWC*) is measured as current assets minus cash and cash

equivalents and current liabilities. Net working capital can serve as a cash substitute and, therefore, a negative association between cash holdings and net working capital is predicted. Industry sigma (*IND_SIG*) stands for the mean of the standard deviations of cash flow ratios over five years for firms in the same industry, as defined by two-digit SIC codes. Industry sigma is expected to increase firms' incentives to hold precautionary cash to cope with industry cash flow uncertainty. Capital expenditure (*CAPEX*) is measured as the change in net fixed assets plus depreciation. On the one hand, capital expenditures can be utilised as collateral and thus reduce firms' motives to hold cash. On the other hand, capital expenditures are highly correlated with investment opportunities and can have a positive impact on cash holdings. Leverage (*LEV*) is measured as total debts divided by net assets. Firms can use cash holdings to reduce leverage, resulting in a negative relationship between leverage and cash holdings. Alternatively, the relationship can be positive, because high leverage increases the likelihood of financial distress and firms hold large cash reserves for hedging purpose. Dividend (*DIV_DUM*) is a dummy variable equal to one in years when a firm pays cash dividends and zero otherwise. A positive impact of dividend dummy on cash holdings is expected since firms that pay dividends tend to prepare more liquid assets to manage dividend payments. Acquisition (*ACQ*) is used to capture acquisition expenses. Firms that invest more in acquisitions accumulate less cash, and therefore this variable is expected to be negatively associated with cash. All control variables except for *MB*, *IND_SIG*, and *DIV_DUM* are deflated by net assets.

A detailed definition of the variables is outlined in Table 3.1. All continuous financial variables are winsorized at the top and bottom 1% level to eliminate the possible impacts of outliers. We employ the firm fixed-effect regression estimator, which helps eliminate the effect of time-invariance unobservable firm characteristics. The regression is estimated

based on robust standard errors clustered at the firm level to account for heteroscedasticity and autocorrelation.

[Insert Table 3.1 around here]

3.4 Empirical results

3.4.1 Descriptive statistics

Table 3.2 reports descriptive statistics for the main variables used in our analysis. On average, the mean level of cash holdings to net assets is 29.1%, similar to other China-based studies (Chen *et al.*, 2012; Megginson, Ullah and Wei, 2014). The mean of *POST1* suggests that 47.5% of firm-year observations are in the post-campaign period and the rest are in the pre-campaign period. Similarly, *POST2* has a mean of 57.0%, indicating that 57.0% of observations are in the years 2013-2016, and 43.0% of observations are in the years 2009-2012.

As far as the control variables are concerned, firm size has a mean of 21.40 and a median of 21.31. Growth opportunities, measured by the market-to-book ratio, have a mean of 3.42 and a median of 2.42. On average, operating cash flow consists of 7.9% of net assets, and net working capital comprises 2.1% of net assets. Cash flow volatility, measured by industry sigma, is 7.7% on average. The average capital expenditure is 6.3% of net assets. Book leverage has a mean of 20.2% and a median of 17.7%. The dividend dummy has a mean of 66.0%, indicating that over half of listed firms in China are paying dividends. The average acquisition expenditures are 0.9% of net assets.

[Insert Table 3.2 around here]

Table 3.3 reports the mean values for variables representing regional rent-seeking incentives averaged over 2009-2012. Firms in areas with high values of the eight variables are indicative of lower rent-seeking incentives. The mean values of *MKT* and *BANK*, two proxies for local market development, are 0.70 and 0.73, respectively. While Jiangsu and Zhejiang have the most developed markets, Tibet is ranked at the bottom by both measures. As to government quality, the value of *GOVT* ranges between -0.21 in Tibet and 0.90 in Tianjin, indicating that government intervention is strongest in Tibet and weakest in Tianjin. The mean value of *LAW* is 1.03, with the highest value located in Zhejiang and the lowest value, again, in Tibet.

The local government fiscal status represents a direct measure of rent-seeking incentives. In all 31 provinces, the value of *FISC* is less than one, suggesting that, in general, the revenue is not sufficient to cover the expenditure by local governments. It shows that the fiscal condition is best in Beijing, which is close to 0.89, and worst in Tibet at 0.08. The non-arbitrary fiscal condition, measured by *NADM*, indicates that the best is in Zhejiang and the worst in Chongqing. Finally, the two economic indicators show that the gross regional product (*GRP)* is highest (lowest) in Shanghai (Guizhou), and the Employment rate (*EMP*) is highest (lowest) in Beijing (Ningxia). Table 3.3 also shows that most firms in our sample are in Guangdong, followed by Zhejiang, Jiangsu, Beijing, and Shanghai.

[Insert Table 3.3 around here]

3.4.2 Main results

Table 3.4 reports the regression results of cash holdings, using three alternative measures, on the Campaign and a common set of control variables estimated from Eq. (3.1). The dependent variable is the ratio of cash to net assets in Columns 1 and 2. As displayed in these columns, the coefficients on both measurements of the Campaign, the key variable, are positive and statistically significant at the 1% level. Taking *POST1* as an example, on average, a firm increases its cash holdings by 2.2% after the Campaign. Given the unconditional mean of cash holdings of 29.1%, this translates to an economic significance of 7.5% (2.2/29.1%) increase in cash holdings from its average level.

The results hold when alternative measures of cash are used, as shown in Columns 3 and 4, using the ratio of cash to total assets, and Columns 5 and 6, using the ratio of cash to sales. The coefficient on *POST* is overwhelmingly positive in all cases and statistically significant at least above the 5% level in five out of six regressions. Taken together, the findings reported so far are consistent with our first shielding hypothesis (***H1a***) that the recent anti-corruption campaign is mitigating political expropriation, and firms have fewer incentives to shelter liquid assets. The Campaign facilitates a large increase in corporate cash holdings.

The impacts of control variables in the regressions on cash holdings are by and large in line with the extant literature. For example, we find that large firms hold less cash than small firms. Cash holdings are positively related to operating cash flows and growth opportunities. Net working capital has a negative impact on cash holdings, supporting the substitution effect between the two financial policies. Firms hold more cash in the presence of high industry cash flow volatility and low acquisition expenditures. These results are similar to the prior evidence based on US firms (Opler *et al.*, 1999; Liu and Mauer, 2011; Gao, Harford

and Li, 2013). We further find that cash holdings are positively associated with capital expenditure, leverage and the dividend dummy, consistent with prior empirical evidence based on Chinese firms (Feng and Johansson, 2014; Xu *et al.*, 2016).

[Insert Table 3.4 around here]

3.4.3 Robustness tests

In this section, we perform several tests to assess the robustness of our main findings.

3.4.3.1 Subsample analysis

We begin with the analysis using a subsample that excludes firms located in the three major advanced regions. As shown in Table 3.3, most listed firms in our sample are located in Guangdong, Zhejiang, and Jiangsu, the three highly developed provinces that cover approximately 33.6% of our sample observations. To mitigate the concern that our results may be driven by firms in these locations, we re-estimate Eq. (3.1) using a subsample excluding firms from these provinces. As displayed in Columns 1 and 2 of Table 3.5, although the total observations reduce to 10,044, the coefficient on *POST* is still positive and statistically significant at the 1% level in both columns, suggesting that the positive impact of the Campaign on corporate cash holdings is not driven by firms in the three major advanced regions.

3.4.3.2 Additional control variables

To mitigate the concern that our results may be dominated by high demand on R&D expenditures, we add a variable, *R&D*, measured as the ratio of R&D expenditures to sales,

as an additional explanatory variable in the regression.[20] Firms with high R&D tend to have high growth opportunities and need to reserve high levels of cash to avoid higher costs related to financial distress. As reported in Columns 3 and 4 of Table 3.5, the coefficient on R&D is positive and highly significant, suggesting that firms need to hold large amounts of cash to support high R&D demand. Most importantly, the coefficient on *POST* is still positive in both cases and statistically significant in column 3. Therefore, our results are robust after controlling for research and development expenses.

Second, to alleviate the concern that the increase in cash holdings after the Campaign might be driven by newly listed firms, we include firm age and an Initial Public Offering (IPO) dummy as additional control variables. Young firms hold more cash than mature firms due to the precautionary motive. Therefore, we include both firm age and IPO dummy. *AGE* is defined as the natural logarithm of years after listing, whereas *IPO* is a dummy variable set to one for the year of and after the IPO and zero otherwise. Besides, the Chinese stock exchanges designate a firm with two (three) consecutive years of losses as special treatment (possible delisting). To exclude the impact of special treatment, we further add a dummy variable, *ST*, which takes the value of one if a firm is designated as special treatment in that year and zero otherwise. We expect a negative relationship between special treatment and cash holdings since firms under special treatment are usually in financial distress and are not liquid. The results are reported in Columns 5 and 6 of Table 3.5. In line with our prediction, cash holdings are negatively correlated with firm age and special treatment and positively associated with the IPO dummy. Interestingly, the positive impact of the Campaign on cash holdings is still positive and statistically significant in both alternative measures. Cash

[20] Since R&D information is not available for the year 2016, regression observations are reduced to 12,807.

holdings increase following the Campaign, robust to including the firm age, IPO, and special treatment variables.

Third, the prior literature documents that corporate liquid assets are influenced by the insider agency cost and corporate governance (Dittmar, Mahrt-Smith and Servaes, 2003; Harford, Mansi and Maxwell, 2008; Gao, Harford and Li, 2013). To control for this effect, we add three corporate governance arrangements, i.e. multiple large shareholders, managerial ownership, and excess control rights, as additional control variables. Multiple large shareholders (*SHARE2_10*) are defined as the sum of the squared percentage of shares owned by the second to the tenth largest shareholders. Multiple large shareholders provide oversight of the firm, which minimises the agency costs between shareholders and managers (Bai *et al.*, 2004; Chen *et al.*, 2012). Managerial ownership (*MOWN*) is defined as the percentage of shares owned by the management. The existence of managerial ownership may help solve agency costs between managers and shareholders and has a positive impact on firm value (Jensen and Meckling, 1976; Liu, Uchida and Yang, 2012). Excess control rights (*EXCESS*) are the ratio of control rights to cash flow rights by the ultimate controlling shareholders (Lemmon and Lins, 2003; Xu *et al.*, 2016).[21] Excess control rights lead to more agency problems and tunnelling behaviours and destroy firm value (Claessens, Djankov and Lang, 2000; Claessens *et al.*, 2002; Lemmon and Lins, 2003). The results are shown in Columns 7 and 8 of Table 3.5. We find that the coefficients on *SHARE2_10* and *MOWN* are positive and significant at the 1% level, and the coefficient on *EXCESS* is negative but not significant. The evidence suggests that good corporate governance has a positive effect on

[21] Consistent with Claessens *et al.* (2002), we use the 10% level as a cut-off point in our empirical analysis to determine the effective control at the ultimate level. The results are robust to alternative cut-offs such as the 20% and 40% levels.

cash holdings, which is consistent with the spending hypothesis by Harford, Mansi and Maxwell (2008) that insiders in poorly governed firms tend to spend cash holdings quickly for private benefit. It is most notable that our result is indifferent to the inclusion of corporate governance variables. Importantly, the coefficient on *POST* in two measures is still consistently positive and highly statistically significant. Overall, the additional analysis presented in this section supports our hypothesis that the positive impact of the Campaign on cash holdings still holds after controlling for various potential explanatory variables.

3.4.3.3 Political corruption or uncertainty

Some may concern that the increase in cash might be a result of the increase in uncertainty that firms confront following the campaign. It is well known that in China making use of relations with people has been a long-established social norm. Lower cash holdings prior to the Campaign could be an outcome of equilibrium response in such a corrupt environment. However, the replacement and turnover of high-level officials as a result of anti-corruption create a so-called political uncertainty, which introduces a new shock to firms as the existing networks and connections are cut off. Under such circumstance, the previously established personal relationship built by firms to facilitate business is removed. Firms are in the position to confront the new rules and the uncertainty will be higher. This uncertainty may increase firms' precautionary motives to hold more cash. Bearing this in mind, we conduct additional tests to show that the impact of the Campaign on corporate cash holdings is above and beyond the effect of uncertainty resolution.

First, we include the firm-level uncertainty suggested by Bloom, Bond and Van Reenen (2007) and Leahy and Whited (1996) as an additional control. The firm-level uncertainty (*SD*) is measured as the standard deviation of a firm's daily stock returns in the previous

year. Second, we explicitly control for political uncertainty based on government official turnover (An *et al.*, 2016; Xu *et al.*, 2016). Specifically, we focus on the top officials at the province level (i.e., Communist Party Secretary and the governor). Political uncertainty (*POL_UN*) is measured as a dummy variable, which takes the value of one if a province where a firm is located has experienced a turnover of province-level officials. The results are reported in columns 9-12 of Table 3.5. We find that the firm-level uncertainty in columns 9 and 10 and political uncertainty in columns 11 and 12 are both positively and significantly related to corporate cash holdings, consistent with precautionary motive. More importantly, our main finding that firms hide the liquid asset to minimise the likelihood of lost from political extraction is still robust after controlling for uncertainty.

[Insert Table 3.5 around here]

3.4.4 Rent-seeking incentives of local government

An implication of the shielding hypothesis is that the positive relationship between the Campaign and cash holdings should be strengthened in the areas where local government officials have higher rent-seeking incentives. Therefore, the effect of the Campaign on corporate cash holdings can vary with regional characteristics. Firms located in regions with high government rent-seeking incentives should benefit more from this event. More specifically, we expect that the increase in cash holdings is higher for firms in regions with slow market development, inferior government quality, severe fiscal deficit, and weak economic conditions. To examine this conjecture, we augment Eq. (3.1) with an interaction between the Campaign and variables that are used to proxy for rent-seeking incentives, as shown below.

$$CASH_{i,t} = \beta_0 + \beta_1 POST_{i,t} + \beta_2 POST_{i,t} \times Z_i + \beta_3 SIZE_{i,t} + \beta_4 MB_{i,t} + \beta_5 CF_{i,t} + \beta_6 NWC_{i,t} + \beta_7 IND\_SIG_{i,t} + \beta_8 CAPEX_{i,t} + \beta_9 BLEV_{i,t} + \beta_{10} DIV\_DUM_{i,t} + \beta_{11} ACQ_{i,t} + \varepsilon_{i,t} + \varepsilon_{i,t} \quad (3.2)$$

where Z_i refers to variables that capture rent-seeking incentives prior to the Campaign (i.e., 2009-2012), including market development (*MKT* and *BANK*), government quality (*GOVT* and *LAW*), fiscal status (*FISC* and *NADM*), and economic conditions (*GRP* and *EMP*).[22] Generally speaking, government officials in regions with a highly developed market and good government quality have less incentive to extract rents from firms; in contrast, in regions with large fiscal deficits and poor economic conditions, government officials have a high incentive to require financial resources from listed firms, leading to a higher degree of corruption. According to the shielding hypothesis, the increase in cash holdings is expected to be greater in regions with stronger rent-seeking incentives. As constructed, higher Z_i indicates lower rent-seeking incentives. Therefore, we predict a negative coefficient on the interaction term *POST* × *Z* (β_2). Otherwise, based on the liquidity hypothesis, the decrease in cash holdings is expected to be greater in regions with stronger rent-seeking incentives, and a positive β_2 is predicted. All control variables are the same as in Eq. (3.1).

Table 3.6 reports the regression results, with the measures of the Campaign being *POST1* and *POST2* in Panel A and Panel B, respectively. The coefficients on the interactions *POST* × *Z* are uniformly negative and statistically significant above the conventional level in all twelve regressions. Overall, the cross-sectional analysis reported in Table 3.6 supports our second shielding hypothesis (***H2a***). The level of cash sheltered by firms depends on the

[22] Because Z_i is measured as the average of province-level rent-seeking incentive variables over the pre-campaign years, stand-alone Z_i is not included in the regressions with firm fixed effect. Similar results are found when $Z_{i,t}$ is employed rather than Z_i (there we include $Z_{i,t}$ on its own). See Appendix 3.D.

degree of rent-seeking attempts captured by a wide range of factors, indicating that the higher the threats of political extraction, the larger the liquid assets intended to be sheltered by firms. The Campaign decreases the risk of political extraction, especially in regions with sluggish market development, weak government quality, and poor fiscal and economic conditions. Firms in more corrupt environments benefit more from the Campaign and therefore their shielding needs decrease more significantly, leading to a higher increase in liquid assets, compared to firms located in low rent-seeking areas. Our findings on the relationship between rent-seeking incentives and the level of cash holdings are consistent with Kusnadi, Yang and Zhou (2015), who document that good institutional development increases cash holdings for Chinese firms.

To sum up, our empirical results strongly support the shielding hypothesis that firms hold less cash to avoid political extraction by government officials, in line with Caprio, Faccio and McConnell (2013) and Smith (2016). We find no evidence supporting the liquidity hypothesis (Chen, 2011).

[Insert Table 3.6 around here]

3.4.5 Further analyses

In this section, we first investigate investors' valuation of cash and the subsequent use of cash holdings in investment prior to and after the Campaign. Then we report the effect of the Campaign on the use of leverage. Finally, we examine the twin agency problems.

3.4.5.1 How does the Campaign affect the marginal value of cash?

Pinkowitz, Stulz and Williamson (2006) find that minority shareholders value cash holdings less in countries with more risks of the corruption of government officials than in other countries, implying that outside investors are concerned about expropriation and are susceptible to the value-destroying effects of corruption. We, therefore, expect that cash holdings are more valuable to shareholders in the post-campaign period with the declined threat of political expropriation. To test for this, we employ an extended model of Faulkender and Wang (2006), as shown below:[23]

$$\begin{aligned} r_{i,t} - R^{B}{}_{i,t} = {} & \beta_0 + \beta_1 \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} + \beta_2 \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} \times POST_{i,t} + \beta_3 \frac{\Delta EBIT_{i,t}}{MVE_{i,t-1}} \\ & + \beta_4 \frac{\Delta NA_{i,t}}{MVE_{i,t-1}} + \beta_5 \frac{\Delta INT_{i,t}}{MVE_{i,t-1}} + \beta_6 \frac{\Delta DIV_{i,t}}{MVE_{i,t-1}} + \beta_7 \frac{CASH_{i,t-1}}{MVE_{i,t-1}} \\ & + \beta_8 MLEV_{i,t} + \beta_9 \frac{NF_{i,t}}{MVE_{i,t-1}} + \beta_{10} \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} \times \frac{CASH_{i,t-1}}{MVE_{i,t-1}} \\ & + \beta_{11} \frac{\Delta CASH_{i,t}}{MVE_{i,t-1}} \times MLEV_{i,t} + \beta_{12} POST_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{3.3}$$

where the dependent variable is excess stock return ($r_{i,t} - R^{B}{}_{i,t}$), i.e. firm's stock return minus the corresponding benchmark return. The benchmark portfolios are Fama and French (1993) size and book-to-market portfolios, constructed by sorting stocks independently on their size and book-to-market ratio. Our variable of interest (*ΔCASH*) is the change in cash. We control for changes in the firm's profitability using earnings before interest and taxes (*ΔEBIT*) investment policy using net assets (*ΔNA*), and financing variables using interest

[23] Our findings are robust to three alternative measurements of the change in cash used in Faulkender and Wang (2006). The results are available in Appendix 3.E.

expenses (*ΔINT*), total cash dividends (*ΔDIV*), cash holdings (*CASH*), market leverage (*MLEV*), and the firm's net financing (*NF*). All control variables except for market leverage (*MLEV*) are deflated by the one-year lagged market value of equity (*MVE*).

Since both excess stock return and change in cash are normalised by the lagged market value of equity, the coefficient on *ΔCASH* (β_1) measures the change in shareholder value following a change in cash held by the firm, i.e. the marginal value of cash. We include *POST* and its interaction with the change in cash Δ*CASH*, in Eq. (3.3) to capture the impact of the anti-corruption campaign on the marginal value of cash holdings. After the anti-corruption campaign, the perceived grabbing hand of political extraction is expected to decline, which raises the confidence of outside shareholders that the cash will be used in funding valuable projects. Therefore, we predict a positive coefficient on the interaction term *ΔCASH* × *POST* (β_2).

The regression results are shown in Panel A of Table 3.7. As expected, the coefficient on the interaction term Δ*CASH* × *POST* is found to be positive and significant in columns 2 and 3 in Panel A. Cash holdings are assigned with higher value by outside shareholders after the Campaign. For example, for an average firm in our sample, with a one-unit increase (RMB) in cash, the value of cash increases from RMB 1.20-1.22 in the pre-campaign period to RMB 1.50-1.58 in the post-campaign period, as shown in Panel B of Table 3.7.

The coefficients on the control variables are consistent with the prior literature (Faulkender and Wang, 2006; Dittmar and Mahrt-Smith, 2007). For example, excess returns are positively related to the change in profitability, net assets, interest expenses, dividends, lagged cash holdings, and net financing; and negatively related to market leverage. The value of cash holdings decreases when firms hold more cash holdings, in that precautionary

motives are weaker when firms hold more cash holdings. Similarly, cash holdings in firms with high leverage benefit debtholders more than shareholders, and thus are not regarded as valuable to outside shareholders.

[Insert Table 3.7 around here]

3.4.5.2 Cash holdings, investment, and investment efficiency

So far, our empirical evidence suggests that due to the decline in the threat of political corruption, cash is less likely to be extracted by politicians for private benefits. Therefore, firms are willing to hold more cash after the Campaign, and cash is perceived as more valuable by outside shareholders. In this section, we provide more direct evidence by comparing the use of cash for investment prior to and after the Campaign.

The extant literature has shown that cash is one of the most important determinants of corporate investment. For example, Acharya, Almeida and Campello (2007) and Denis and Sibilkov (2009) find that firms with high cash holdings are able to fund investment without the need to resort to external costly finance, and that the positive impact of cash on investment is more pronounced in firms with high financial constraints and hedging needs. Duchin, Ozbas and Sensoy (2010) assert that corporate investment has significantly decreased following the financial crisis and the decrease in investment is stronger in firms with low cash holdings. These studies highlight the importance of cash used to fund investment. Hence, we expect to observe a stronger positive relationship between investment and cash holdings after the Campaign. To investigate this, we augment the Q-model of investment by including the proxy for the Campaign and its interaction with cash holdings in the regression analysis. The dependent variable, *CAPEX*, is the change in fixed assets plus

depreciation in the subsequent year. *DCASH* is a dummy variable set to one if the ratio of cash to net assets is higher than the industry median in that year and zero otherwise. Following Chen *et al.* (2011b), we control for the market-to-book ratio (*MB*), a proxy for Tobin's q, cash flow (*CF*), seasoned equity offering (*SEO*), book leverage (*LEV*), firm size (*SIZE*), and firm age (*AGE*).[24] We predict a positive coefficient on the interaction term *POST* × *DCASH*.

The results are shown in Columns 1-2 of Table 3.8. In both cases, the coefficient on *CASH* is positive and highly significant, consistent with the claim in the previous literature that cash reserved by firms helps to enhance firms' ability to fund investment. Most importantly, the coefficient on *POST* × *DCASH* is positive and statistically significant in the two columns. The positive relationship indicates that the increase in cash after the Campaign is associated with the subsequent investment, supporting Xu and Yano (2016), who find that firms invest more in R&D promoted by the Campaign.

In terms of control variables, we find that investment is positively related to growth opportunities, cash flow, and seasoned equity offering, and negatively associated with book leverage, firm size, and firm age, all consistent with the extant literature. The coefficient on *POST* on its own is negative. One possible explanation for the negative relationship is that in the pre-campaign period, liquid assets were transferred into hard assets regardless of growth opportunities in order to shelter from political extraction, which may lead to overinvestment problems. If the Campaign has alleviated political corruption, firms should respond to it by holding an optimal level of cash to invest in more efficient projects, which in turn mitigate overinvestment problems. To confirm this conjecture, we further analyse the

[24] Variables except for the Campaign, secondary equity offering, firm size, and age are all deflated by net assets.

relationship between the Campaign and investment efficiency and expect to observe a positive link if overinvestment problems due to political extraction are relieved after the Campaign. Using market-to-book ratio (*MB*) as a proxy for the growth opportunities as presented in Columns 3-4 of Table 3.8, we find that the coefficient on the interaction term *POST* × *MB* is positive and statistically significant in the two regressions, supporting our prediction. Furthermore, to address the concern that market-to-book ratio could be a noisy measure of growth opportunities, we also adopt sales growth rate (*SG*) as an alternative proxy, measured as the average of sales growth rate over the prior five years. As exhibited in Columns 5-6 of Table 3.8, the coefficient on the interaction term *POST* × *SG* is, again, positive in the two cases and statistically significant in both regressions. Overall, the evidence presented in this section suggests that the increase in cash holdings is facilitated in enhancing firms' ability to finance investments, and the capital expenditures are more likely to be used in projects with growth opportunities after the Campaign.

[Insert Table 3.8 around here]

3.4.5.3 Does the campaign affect capital structure?

The empirical analyses above show that the campaign increases corporate cash holdings, since firms have fewer incentives to shield their liquid assets from political expropriation. In this section, we further examine the robustness of this result by exploring the impact of the campaign on corporate capital structure. Smith (2016) contends that another method used by firms to shield their assets from political extraction is to increase their debt obligations. By increasing leverage, firms signal their commitment to future cash flows on debt service and limit their ability to pay public officials. This is to say that the threat of political extraction

could also be reflected in firms' choice of capital structure. If the shielding hypothesis holds, then the reduction in the threat of political corruption resulted from the campaign should reduce corporate use of debt service (i.e. leverage).

Consistent with the prior literature (Flannery and Rangan, 2006; Frank and Goyal, 2009), we control for firm profitability (*ROA*), growth opportunities (MB*)*, and depreciation (*DEP*), together with firm size (*SIZE*), tangibility (*FA*) and industry median leverage (*IND_LEV*). All variables in the model except firm size (*SIZE*) and the Campaign (*POST*) are deflated by net assets. The results are displayed in Table 3.9, where the dependent variable is total debts illustrated in Columns 1 and 2, long-term debts in Columns 3 and 4, and short-term debts in Columns 5 and 6. We find leverage is negatively related to profitability, growth opportunities, and depreciation, and positively associated with firm size, tangibility and industry median leverage. Interestingly, in all nine regressions, the coefficient on *POST* is overwhelmingly negative and statistically significant, suggesting a significant decrease in leverage stimulated by the Campaign. The result is also economically significant: for example, on average, a firm decreases leverage by 2.6% after the Campaign. Given the unconditional mean of leverage of 20.2%, this translates into an economic significance of a 12.9% (2.6/20.2%) decrease in leverage. Firms structure their debt policy as another approach to limiting political expropriation, and firms reduce their debt obligation, either in short-term or in long-term, in the prediction of reduced threats of political extraction, consistent with Smith (2016) assertion that political extraction affects firms' choice of cash holding and capital structure.

[Insert Table 3.9 around here]

3.4.5.4 Twin agency problems

According to the twin agency argument by Stulz (2005), firms suffer from both the insiders' expropriation (i.e., the insider agency problem) and the state's extraction (i.e., the state agency problem). We now examine how the effect of the Campaign on corporate cash holdings varies with firm-level agency costs. As stated by Shleifer and Vishny (1994), corporate insiders in a more corrupt environment have greater incentives to extract private benefits by lowering corporate governance. In other words, the state agency problem lowers corporate governance quality and aggravates insider agency costs. The Campaign has reduced political corruption, which can reduce insider agency costs and increase cash holdings, especially in firms with poor governance mechanisms. Therefore, we predict that a weaker relationship between corporate governance and cash holdings in the post-campaign period.

The results are reported in Table 3.10. Corporate governance (*CG*) variables are measured as multiple large shareholders (*SHARE2_10*) in columns 1 and 2, managerial ownership (*MOWN*) in columns 3 and 4, and the inverse ratio of excess control rights (*1/EXCESS*) in columns 5 and 6.[25] A higher governance variable indicates better governance. The coefficients on the interaction term *POST* × *CG* are negative and highly significant in all six columns. In line with our prediction, the results suggest poorly governed firms increase more cash holdings after the Campaign than well-governed firms. The Campaign reduces corruption threat and firm-level agency costs and therefore weakens the impact of governance variables on cash holdings.

[25] To ensure consistency, we use the inverse ratio of excess control rights, i.e. the ratio of cash flow rights to control rights. Higher inverse excess control rights, better corporate governance.

[Insert Table 3.10 here]

Collectively, all these additional checks reinforce our main evidence that the Campaign has significantly decreased extraction by politicians and as a result, firms can make optimal financial policies.

3.5 Conclusions

The recent Chinese anti-corruption campaign has widely been considered as the largest organised effort devoted by the Chinese leaders to curb the political extraction by public officials. Using this quasi-natural experiment, we investigate the relationship between political corruption and cash holdings. The prior literature suggests firms can manage cash holdings in two opposite ways in the presence of political corruption. According to the shielding hypothesis, firm managers maintain small holdings of cash to avoid the potential extraction by political officials. In contrast, the liquidity hypothesis argues that firm managers may hold high levels of cash reserves to buy political favours and benefit from a political corrupt environment.

Using a large sample of Chinese listed firm during 2009-2016, we observe a significant increase in corporate cash holdings following the Campaign, after controlling for generally recognised explanatory variables, in accordance with the shielding hypothesis that firms shelter liquidity assets from political extraction in a corrupt environment. Our result is insensitive to various measures of cash and additional tests, including sub-sample analysis, R&D expenditures, newly listed firms and corporate governance consideration. Our result also remains when controlling for stock return volatility and political uncertainty, which

addresses the concern that the increase in cash holdings following the campaign might be a result of an increase in uncertainty.

We investigate whether the rent-seeking incentives by government officials influence the relationship between the campaign and cash holdings. We expect to observe a stronger effect of the Campaign in areas with higher corruption attempts. Firms located in areas with high political expropriation would benefit more from the current anti-graft effort, and, consequently, the increase in cash by firms in these areas is expected to be higher to maintain a relatively efficient level for future investment opportunities. In line with the expectation, we observe that the positive impact of the Campaign on cash is more evident in firms located in regions with less developed markets, poorer government quality, worse fiscal condition and lower economic level.

Our results in the extended analyses reveal that political expropriation lowers the value of firms through its impact on cash and plays an important role in shaping investment and financing decisions. Specifically, we find the campaign significantly increases the marginal value of cash. Large holdings of cash are more likely to be invested in the subsequent investment and investment efficiency greatly improves after the campaign. In addition to cash holdings, financial leverage also significantly decreases in the post-campaign period, further supporting the shielding hypothesis that the reduction in political corruption threat decreases firm managers' incentives to limit their ability to pay government officials. Finally, we find the Campaign improves corporate governance and reduce insider agency problems, which lead to a weaker relationship between corporate governance and cash holdings.

Overall, based on a single country setting, our findings support the shielding hypothesis that firms structure liquidity assets downward to avoid political extraction in a corrupt environment. The evidence suggests that political corruption should be regarded as a significant factor of cash holdings. In addition to cash, our results reveal that political expropriation lowers the value of firms and plays an important role in shaping investment decisions, both through its impact on cash policy and its effects on leverage. Our results, therefore, provide new insights into the microeconomic impacts of political corruption at the firm level. There are also some implications for policymakers from the empirical results of this study. The threat of political corruption makes firms to adopt suboptimal financial policies, which ultimately slows the development of the overall economy. It is of great importance for countries, in particular developing countries, to organise anti-graft activities and combat corruption. It is essential to provide a fair institutional environment, enabling firms to make optimal financial policies and protecting shareholders' interests.

Table 3.1 Definition of main variables in Chapter 3

Variable	Source	Definitions
CASH	CSMAR	Cash and cash equivalents
POST1	CCDI website	A dummy variable, which takes the value of one if a firm is located in a region which has experienced corruption inspection by the end of the year and zero otherwise
POST2	CCDI website	A dummy variable, which takes the value of one for years 2013-2016 and zero for the years 2009-2012
SIZE	CSMAR, NBS	Firm size, defined as the natural logarithm of net assets adjusted using the CPI deflator
MB	CSMAR	Market to book ratio, defined as the market value of equity plus total liabilities minus cash and cash equivalents divided by net assets
CF	CSMAR	Cash flow, defined as net profits plus depreciation
NWC	CSMAR	Net working capital, defined as current assets minus cash and cash equivalents minus current liabilities
IND_SIG	CSMAR	Industry sigma, defined as the industry average of standard deviations of cash flows over the prior five years
CAPEX	CSMAR	Capital expenditures, defined as the change in fixed assets plus depreciation
BLEV	CSMAR	Book leverage, defined as total debts divided by net assets
DIV_DUM	CSMAR	A dummy variable, which takes the value of one if a firm has paid cash dividends in that year and zero otherwise
ACQ	CSMAR	Acquisitions, defined as cash flows paid for acquisitions
R&D	CSMAR	Research and development expenditures divided by sales
AGE	CSMAR	Firm age, defined as the natural logarithm of years after the initial public offering
IPO	CSMAR	A dummy variable, which takes the value of one for the year of and the year after the IPO and zero otherwise
ST	CSMAR	A dummy variable, which takes the value of one if a firm's stock has been designated as 'special treatment' in that year and zero otherwise
SHARE2_10	CSMAR	Multiple large shareholders, defined as the sum of the squared percentage of shares owned by second to tenth largest shareholders
MOWN	CSMAR	Managerial ownership, defined as the percentage of shares owned by managers
EXCESS	CSMAR	Excess control rights, defined as control rights divided by cash flow rights by ultimate controlling shareholders
SD	CSMAR	The standard deviation of daily stock returns
POL_UN	Local governments' websites, Baidu	Political uncertainty, defined as a dummy variable set to one if the province where a firm is located experiences a province-level government official turnover
MKT	NERI reports	Market development, defined as the National Economic Research Institution (NERI) index

BANK	NERI reports	NERI sub-index, the degree of banking sector liberalisation
GOVT	NERI reports	NERI sub-index, the role of government decentralisation in business
LAW	NERI reports	NERI sub-index, the degree of legal protection of property rights
FISC	NBS	The province-level government fiscal condition, defined as local government revenue divided by expenditures
NADM	NBS	The province-level non-administration revenue, defined as the percentage of local government non-administrative revenue
GRP	NBS	Gross regional product, defined as the natural logarithm of GRP in 100 million yuan at the province level
EMP	NBS	The province-level employment rate, defined as one minus the unemployment rate in a province
$r - R^B$	CSMAR	Excess stock return, where r is stock return and R^B is the corresponding benchmark portfolio return in the same year
EBIT	CSMAR	Earnings before interests and taxes, defined as net profits plus interest expenses and taxes
NA	CSMAR	Net assets, measured as total assets minus cash and cash equivalents
INT	CSMAR	Interest expenses
DIV	CSMAR	Cash dividends
MLEV	CSMAR	Market leverage, defined as total debts divided by the market value of equity
NF	CSMAR	Net financing, defined as the sum of net proceeds from equity and debt issuance
MVE	CSMAR	The market value of equity
DCASH	CSMAR	A dummy variable, which takes the value of one if cash to net asset ratio is higher than the industry median in that year and zero otherwise
SG	CSMAR	Average sales growth over the prior five years
SEO	CSMAR	Secondary equity offering, defined as a dummy variable which takes the value of one if a firm has conducted secondary equity offerings during the year and zero otherwise
ROA	CSMAR	Return on assets, defined as earnings before interests and taxes divided by net assets
DEP	CSMAR	Depreciation
FA	CSMAR	Tangibility, defined as net fixed assets
IND_LEV	CSMAR	Industry median leverage; leverage is measured by total debts divided by net assets, long-term debts divided by net assets or short-term debts divided by net assets
CG	CSMAR	Corporate governance, measured by multiple large shareholders, managerial ownership, and inverse excess control rights

Table 3.2 Summary statistics of main variables

Variable	Obs.	Mean	p25	p50	p75	SD
CASH	15,118	0.291	0.101	0.178	0.330	0.354
POST1	15,118	0.475	0.000	0.000	1.000	0.499
POST2	15,118	0.570	0.000	1.000	1.000	0.495
SIZE	15,118	21.399	20.533	21.306	22.166	1.225
MB	15,118	3.424	1.591	2.421	3.984	3.100
CF	15,118	0.079	0.038	0.067	0.110	0.078
NWC	15,118	0.021	-0.115	0.031	0.164	0.210
IND_SIG	15,118	0.077	0.063	0.074	0.089	0.021
CAPEX	15,118	0.063	0.013	0.043	0.094	0.081
BLEV	15,118	0.202	0.039	0.177	0.326	0.175
DIV_DUM	15,118	0.660	0.000	1.000	1.000	0.474
ACQ	15,118	0.009	0.000	0.000	0.000	0.027
R&D	12,807	0.027	0.000	0.007	0.040	0.042
AGE	15,118	1.942	1.386	2.197	2.708	0.898
IPO	15,118	0.083	0.000	0.000	0.000	0.275
ST	15,118	0.028	0.000	0.000	0.000	0.164
SHARE2_10	15,107	0.017	0.002	0.008	0.025	0.021
MOWN	14,491	0.116	0.000	0.001	0.178	0.194
EXCESS	13,776	1.306	1.000	1.000	1.379	0.610
SD	15,102	0.035	0.030	0.025	0.041	0.017
POL_UN	15,118	0.345	0.000	0.000	1.000	0.475

This table presents summary statistics of key variables. *CASH*, *CF*, *NWC*, *CAPEX*, and *ACQ* are deflated by net assets. Definitions of all variables are in Table 3.1.

Table 3.3 Summary statistics of province-level variables

Region	N	MKT	BANK	GOVT	LAW	FISC	NADM	GRP	EMP
Anhui	459	0.629	0.624	0.552	0.448	0.436	0.911	10.018	0.962
Beijing	1,157	0.779	0.502	0.472	1.451	0.891	0.984	11.253	0.986
Chongqing	239	0.633	0.580	0.341	0.485	0.551	0.799	10.321	0.963
Fujian	603	0.688	0.795	0.453	0.521	0.676	0.954	10.664	0.962
Gansu	180	0.352	0.503	0.094	0.043	0.244	0.931	9.765	0.969
Guangdong	2,106	0.791	0.864	0.620	1.346	0.835	0.940	10.756	0.975
Guangxi	200	0.556	0.529	0.297	0.056	0.383	0.904	9.994	0.964
Guizhou	159	0.398	0.422	0.008	0.078	0.336	0.943	9.595	0.964
Hainan	166	0.474	0.407	0.176	0.060	0.430	0.966	10.150	0.975
Hebei	308	0.542	0.715	0.127	0.131	0.482	0.939	10.328	0.962
Heilongjiang	226	0.521	0.496	0.360	0.220	0.350	0.912	10.277	0.958
Henan	418	0.627	0.712	0.317	0.213	0.401	0.908	10.165	0.966
Hubei	541	0.585	0.662	0.391	0.320	0.438	0.885	10.316	0.959
Hunan	477	0.558	0.544	0.164	0.239	0.412	0.883	10.191	0.958
Inner-Mongolia	162	0.485	0.664	-0.019	0.039	0.455	0.940	10.847	0.961
Jiangsu	1,431	0.897	0.836	0.862	2.371	0.824	0.942	10.936	0.968
Jiangxi	223	0.570	0.670	0.400	0.092	0.412	0.898	10.041	0.968
Jilin	276	0.579	0.614	0.364	0.099	0.368	0.913	10.446	0.962
Liaoning	421	0.651	0.814	0.370	0.350	0.645	0.938	10.725	0.963
Ningxia	79	0.416	0.627	0.097	0.092	0.288	0.934	10.274	0.956
Qinghai	57	0.262	0.269	-0.004	0.020	0.162	0.964	10.167	0.963
Shaanxi	240	0.444	0.463	0.047	0.210	0.456	0.956	10.296	0.964
Shandong	892	0.709	0.893	0.560	0.491	0.679	0.923	10.683	0.966
Shanghai	975	0.864	0.763	0.762	1.668	0.873	0.966	11.265	0.962
Shanxi	206	0.461	0.639	0.146	0.073	0.520	0.941	10.232	0.964
Sichuan	607	0.590	0.615	0.385	0.439	0.394	0.927	10.047	0.959
Tianjin	228	0.742	0.536	0.904	0.744	0.785	0.878	11.259	0.964
Tibet	85	0.041	0.105	-0.214	0.004	0.075	0.967	9.827	0.966
Xinjiang	261	0.308	0.456	-0.203	0.062	0.308	0.956	10.192	0.966
Yunnan	199	0.480	0.575	0.345	0.056	0.373	0.955	9.763	0.959
Zhejiang	1,537	0.850	1.040	0.749	2.464	0.817	0.985	10.897	0.969
Total	15,118	0.696	0.730	0.500	1.034	0.652	0.939	10.630	0.967

This table presents means of province-level institutional indices in the pre-campaign period, including market development (*MKT* and *BANK*), government quality (*GOVT* and *LAW*), fiscal status (*FISC* and *NADM*) and economic condition (*GRP* and *EMP*). Definitions of all variables are in Table 3.1.

Table 3.4 The anti-corruption campaign and cash holdings: Main results

Variable	Cash/Net assets		Cash/Total assets		Cash/Sales	
	(1)	(2)	(3)	(4)	(5)	(6)
POST1	0.022***		0.005**		0.049***	
	(3.37)		(2.16)		(4.11)	
POST2		0.017***		0.003		0.038***
		(2.70)		(1.11)		(3.35)
SIZE	-0.166***	-0.163***	-0.065***	-0.064***	-0.156***	-0.150***
	(-14.74)	(-14.73)	(-16.93)	(-16.85)	(-8.11)	(-7.85)
MB	0.007***	0.007***	0.001*	0.001**	0.009**	0.011***
	(2.86)	(3.16)	(1.92)	(2.26)	(2.55)	(2.92)
CF	1.514***	1.509***	0.541***	0.538***	0.672***	0.664***
	(18.09)	(17.99)	(22.47)	(22.30)	(5.90)	(5.82)
NWC	-0.438***	-0.439***	-0.155***	-0.155***	-0.347***	-0.347***
	(-11.53)	(-11.52)	(-12.32)	(-12.31)	(-5.36)	(-5.38)
IND_SIG	1.102***	0.980**	0.327**	0.281**	0.482	0.227
	(2.81)	(2.58)	(2.25)	(1.98)	(0.72)	(0.35)
CAPEX	0.106***	0.102***	0.064***	0.062***	0.437***	0.429***
	(2.94)	(2.82)	(4.67)	(4.50)	(6.56)	(6.47)
LEV	0.097***	0.092***	0.034***	0.032**	0.142**	0.133**
	(3.02)	(2.89)	(2.65)	(2.51)	(2.25)	(2.12)
DIV_DUM	0.006	0.005	0.008***	0.007***	0.001	-0.002
	(1.17)	(0.88)	(3.64)	(3.48)	(0.13)	(-0.21)
ACQ	-0.281**	-0.278**	-0.069*	-0.069*	0.181	0.190
	(-2.49)	(-2.46)	(-1.83)	(-1.83)	(0.94)	(0.99)
Constant	3.594***	3.543***	1.496***	1.472***	3.616***	3.514***
	(14.64)	(14.61)	(17.71)	(17.61)	(8.55)	(8.32)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.34	0.34	0.33	0.32	0.08	0.08
Observations	15,118	15,118	15,118	15,118	15,118	15,118

This table reports the regression results of the anti-corruption campaign and cash holdings. The dependent variables are the ratio of cash and cash equivalents to net assets in columns 1 and 2, the ratio of cash and cash equivalents to total assets in columns 3 and 4, and the ratio of cash and cash equivalents to sales in columns 5 and 6. *CF*, *NWC*, *CAPEX*, and *ACQ* are deflated by net assets. Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.5 Robustness checks

Variable	Subsample		R&D		Age, IPO, and ST		Corporate Governance		Firm-level uncertainty		Political uncertainty	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
POST1	0.028***		0.013**		0.057***		0.029***		0.026***		0.027***	
	(3.63)		(2.05)		(8.78)		(4.12)		(3.99)		(4.09)	
POST2		0.024***		0.007		0.053***		0.021***		0.026***		0.022***
		(3.28)		(1.04)		(8.77)		(3.05)		(4.29)		(3.52)
SIZE	-0.138***	-0.135***	-0.199***	-0.196***	-0.126***	-0.124***	-0.179***	-0.175***	-0.163***	-0.163***	-0.169***	-0.166***
	(-10.96)	(-10.90)	(-14.66)	(-14.56)	(-11.26)	(-11.12)	(-14.80)	(-14.69)	(-14.51)	(-14.75)	(-14.86)	(-14.85)
MB	0.010***	0.010***	0.004*	0.005**	0.008***	0.009***	0.004*	0.005**	0.006**	0.006**	0.007***	0.008***
	(3.11)	(3.37)	(1.76)	(2.00)	(3.43)	(3.94)	(1.88)	(2.24)	(2.37)	(2.53)	(3.03)	(3.35)
CF	1.392***	1.390***	1.471***	1.463***	1.382***	1.383***	1.518***	1.511***	1.482***	1.483***	1.507***	1.504***
	(14.03)	(13.98)	(16.31)	(16.20)	(17.29)	(17.30)	(17.06)	(16.94)	(17.72)	(17.74)	(18.08)	(18.00)
NWC	-0.378***	-0.379***	-0.477***	-0.477***	-0.478***	-0.480***	-0.456***	-0.457***	-0.441***	-0.442***	-0.439***	-0.439***
	(-8.12)	(-8.13)	(-11.64)	(-11.62)	(-12.88)	(-12.95)	(-11.04)	(-11.03)	(-11.56)	(-11.59)	(-11.55)	(-11.55)
IND_SIG	1.297***	1.192***	1.320***	1.205***	0.961***	0.772**	0.971**	0.795*	1.349***	1.302***	1.178***	1.048***
	(2.84)	(2.69)	(3.21)	(3.01)	(2.59)	(2.15)	(2.27)	(1.91)	(3.42)	(3.39)	(3.01)	(2.76)
CAPEX	0.051	0.049	0.086**	0.080**	-0.054	-0.055	0.083**	0.077**	0.089**	0.090**	0.109***	0.106***
	(1.21)	(1.16)	(2.29)	(2.12)	(-1.55)	(-1.58)	(2.29)	(2.11)	(2.48)	(2.49)	(3.03)	(2.94)
LEV	0.125***	0.122***	0.147***	0.143***	0.091***	0.086***	0.071**	0.065**	0.099***	0.097***	0.103***	0.099***
	(3.35)	(3.25)	(4.33)	(4.21)	(2.96)	(2.81)	(2.15)	(1.98)	(3.09)	(3.06)	(3.23)	(3.09)
DIV_DUM	0.009	0.007	0.023***	0.023***	-0.002	-0.006	0.003	0.001	0.013**	0.011**	0.008	0.006
	(1.57)	(1.22)	(4.00)	(3.91)	(-0.48)	(-1.30)	(0.55)	(0.22)	(2.39)	(2.09)	(1.46)	(1.09)
ACQ	-0.087	-0.082	-0.567***	-0.565***	-0.360***	-0.344***	-0.365***	-0.360***	-0.296***	-0.289**	-0.287**	-0.281**
	(-0.63)	(-0.59)	(-4.50)	(-4.49)	(-3.33)	(-3.19)	(-3.35)	(-3.31)	(-2.63)	(-2.56)	(-2.56)	(-2.51)
R&D			0.959***	0.966***								
			(5.17)	(5.15)								
AGE					-0.069***	-0.067***						
					(-5.60)	(-5.51)						
IPO					0.181***	0.185***						
					(15.66)	(16.10)						

ST					-0.093***	-0.088***						
					(-4.77)	(-4.58)						
SHARE2_10							2.449***	2.433***				
							(7.46)	(7.41)				
MOWN							0.173***	0.169***				
							(3.02)	(2.94)				
EXCESS							-0.015	-0.015				
							(-1.62)	(-1.63)				
SD									1.161***	1.238***		
									(6.40)	(6.80)		
POL_UN											0.028***	0.027***
											(8.20)	(8.14)
Constant	2.946***	2.906***	4.246***	4.183***	2.877***	2.827***	3.852***	3.778***	3.471***	3.460***	3.630***	3.582***
	(10.74)	(10.68)	(14.58)	(14.47)	(12.33)	(12.22)	(14.62)	(14.50)	(14.12)	(14.29)	(14.73)	(14.69)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.30	0.30	0.36	0.36	0.40	0.40	0.37	0.37	0.34	0.34	0.34	0.34
Observations	10,044	10,044	12,807	12,807	15,118	15,118	13,199	13,199	15,102	15,102	15,118	15,118

This table presents the regression results of robustness checks with subsample and additional control variables. Columns 1 and 2 use the subsample excluding firms located in the three major advanced regions. Columns 3 and 4 add R&D expense variable. Columns 5 and 6 add firm age, IPO, and special treatment. Columns 7 and 8 add corporate governance variables, including multiple large shareholders, managerial ownership and excess control rights. Columns 9 and 10 consider firm-level uncertainty. Columns 11 and 12 consider political uncertainty. The dependent variables are the ratio of cash and cash equivalents to net assets. *CF*, *NWC*, *CAPEX*, and *ACQ* are deflated by net assets. Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.6 The anti-corruption campaign, rent-seeking incentives and cash holdings

Panel A: *POST1* as the proxy for the Campaign								
Variable	MKT	BANK	GOVT	LAW	FISC	NADM	GRP	EMP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST1	0.190***	0.111***	0.085***	0.062***	0.156***	0.556***	0.896***	4.197***
	(8.32)	(4.91)	(7.40)	(7.20)	(9.26)	(3.77)	(7.01)	(5.20)
POST1×Z	-0.246***	-0.123***	-0.130***	-0.041***	-0.211***	-0.570***	-0.082***	-4.317***
	(-7.80)	(-4.26)	(-6.92)	(-7.38)	(-8.63)	(-3.62)	(-6.84)	(-5.16)
SIZE	-0.163***	-0.166***	-0.164***	-0.164***	-0.162***	-0.165***	-0.164***	-0.164***
	(-14.66)	(-14.73)	(-14.71)	(-14.66)	(-14.66)	(-14.71)	(-14.67)	(-14.62)
MB	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
	(3.11)	(2.98)	(3.02)	(3.07)	(3.14)	(2.95)	(3.09)	(2.92)
CF	1.513***	1.514***	1.514***	1.514***	1.511***	1.513***	1.510***	1.515***
	(18.20)	(18.13)	(18.21)	(18.18)	(18.22)	(18.14)	(18.13)	(18.17)
NWC	-0.432***	-0.437***	-0.432***	-0.433***	-0.430***	-0.439***	-0.432***	-0.438***
	(-11.42)	(-11.54)	(-11.43)	(-11.47)	(-11.42)	(-11.56)	(-11.42)	(-11.54)
IND_SIG	1.069***	1.091***	1.060***	1.080***	1.064***	1.088***	1.057***	1.130***
	(2.78)	(2.81)	(2.75)	(2.80)	(2.77)	(2.78)	(2.73)	(2.90)
CAPEX	0.105***	0.102***	0.105***	0.105***	0.103***	0.106***	0.107***	0.102***
	(2.90)	(2.83)	(2.91)	(2.90)	(2.87)	(2.94)	(2.96)	(2.82)
LEV	0.098***	0.095***	0.099***	0.097***	0.102***	0.097***	0.099***	0.103***
	(3.11)	(3.00)	(3.14)	(3.06)	(3.21)	(3.06)	(3.11)	(3.24)
DIV_DUM	0.005	0.006	0.006	0.006	0.005	0.005	0.005	0.006
	(1.05)	(1.19)	(1.12)	(1.06)	(0.98)	(0.99)	(1.02)	(1.10)
ACQ	-0.260**	-0.271**	-0.262**	-0.262**	-0.260**	-0.277**	-0.264**	-0.273**
	(-2.32)	(-2.41)	(-2.33)	(-2.34)	(-2.32)	(-2.46)	(-2.35)	(-2.43)
Constant	3.524***	3.577***	3.556***	3.538***	3.511***	3.572***	3.540***	3.536***
	(14.58)	(14.64)	(14.64)	(14.58)	(14.58)	(14.62)	(14.59)	(14.54)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.34	0.34	0.34	0.34	0.35	0.34	0.34	0.34
Observations	15,118	15,118	15,118	15,118	15,118	15,118	15,118	15,118

Panel B: *POST2* as the proxy for the Campaign								
Variable	MKT	BANK	GOVT	LAW	FISC	NADM	GRP	EMP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST2	0.194***	0.111***	0.084***	0.059***	0.157***	0.562***	0.946***	4.328***
	(8.53)	(4.84)	(7.42)	(7.07)	(9.28)	(3.73)	(7.14)	(4.99)
POST2×Z	-0.260***	-0.131***	-0.139***	-0.043***	-0.220***	-0.582***	-0.088***	-4.458***
	(-8.17)	(-4.46)	(-7.34)	(-7.59)	(-8.80)	(-3.62)	(-7.01)	(-4.97)
SIZE	-0.160***	-0.163***	-0.162***	-0.161***	-0.160***	-0.163***	-0.161***	-0.161***
	(-14.68)	(-14.72)	(-14.73)	(-14.68)	(-14.68)	(-14.72)	(-14.70)	(-14.63)
MB	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(3.40)	(3.28)	(3.31)	(3.35)	(3.44)	(3.21)	(3.38)	(3.24)
CF	1.504***	1.507***	1.507***	1.506***	1.503***	1.507***	1.503***	1.509***
	(18.08)	(18.02)	(18.10)	(18.07)	(18.10)	(18.04)	(18.02)	(18.08)
NWC	-0.430***	-0.436***	-0.431***	-0.432***	-0.429***	-0.438***	-0.431***	-0.437***
	(-11.36)	(-11.52)	(-11.40)	(-11.41)	(-11.34)	(-11.51)	(-11.35)	(-11.48)
IND_SIG	0.983***	0.975***	0.962**	1.007***	0.991***	0.998***	0.985***	1.033***
	(2.64)	(2.59)	(2.57)	(2.70)	(2.66)	(2.62)	(2.62)	(2.74)
CAPEX	0.100***	0.097***	0.101***	0.101***	0.100***	0.103***	0.105***	0.099***
	(2.77)	(2.68)	(2.79)	(2.79)	(2.79)	(2.84)	(2.90)	(2.74)
LEV	0.094***	0.091***	0.095***	0.093***	0.098***	0.094***	0.095***	0.100***
	(2.99)	(2.87)	(3.01)	(2.94)	(3.10)	(2.95)	(2.99)	(3.15)
DIV_DUM	0.004	0.005	0.005	0.004	0.004	0.004	0.004	0.004
	(0.83)	(0.91)	(0.87)	(0.87)	(0.74)	(0.81)	(0.82)	(0.80)
ACQ	-0.275**	-0.274**	-0.272**	-0.274**	-0.279**	-0.279**	-0.280**	-0.277**
	(-2.45)	(-2.43)	(-2.42)	(-2.44)	(-2.49)	(-2.48)	(-2.48)	(-2.46)
Constant	3.479***	3.524***	3.507***	3.490***	3.466***	3.527***	3.495***	3.489***
	(14.57)	(14.61)	(14.61)	(14.56)	(14.57)	(14.60)	(14.57)	(14.51)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.34	0.34	0.34	0.34	0.35	0.34	0.34	0.34
Observations	15,118	15,118	15,118	15,118	15,118	15,118	15,118	15,118

This table presents the regression results of the anti-corruption campaign, rent-seeking incentives and cash holdings. The anti-corruption is measured as *POST1* in Panel A and *POST2* in Panel B. *Z* refers to the average of each rent-seeking incentives measurement prior to the anti-corruption campaign, i.e. 2009-2012. Rent-seeking incentives

are measured as overall market development (*MKT*) in column 1, banking sector liberalisation (*BANK*) in column 2, government decentralisation (*GOV*) in column 3, legal protection of property rights (*LAW*) in column 4, local government fiscal condition (*FISC*) in column 5, government non-administrative revenue (*NADM*) in column 6, gross regional product (*GRP*) in column 7, and employment rate (*EMP*) in column 8. The dependent variable is the ratio of cash to net assets. *CF*, *NWC*, *CAPEX*, and *ACQ* are deflated by net assets. Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.7 The anti-corruption campaign and the value of cash

Panel A: Regression results			
Variable	(1)	(2)	(3)
ΔCASH	1.813***	1.652***	1.675***
	(16.87)	(14.43)	(14.17)
ΔCASH × POST1		0.381***	
		(3.47)	
ΔCASH × POST2			0.280***
			(2.62)
ΔEBIT	1.690***	1.692***	1.696***
	(14.24)	(14.25)	(14.29)
ΔNA	0.589***	0.588***	0.589***
	(17.22)	(17.26)	(17.26)
ΔINT	1.573**	1.565**	1.564**
	(2.33)	(2.32)	(2.32)
ΔDIV	3.641***	3.666***	3.665***
	(6.89)	(6.94)	(6.92)
CASH	0.383***	0.383***	0.389***
	(10.13)	(10.10)	(10.29)
MLEV	-0.390***	-0.389***	-0.390***
	(-23.14)	(-23.20)	(-23.26)
NF	0.146**	0.139**	0.139**
	(2.49)	(2.38)	(2.39)
ΔCASH × CASH	-1.998***	-1.925***	-1.962***
	(-5.38)	(-5.19)	(-5.30)
ΔCASH × MLEV	-0.833***	-0.863***	-0.862***
	(-6.68)	(-6.72)	(-6.76)
POST1		-0.004	
		(-0.58)	
POST2			0.006
			(0.89)
Constant	-0.076***	-0.074***	-0.080***
	(-13.24)	(-11.27)	(-12.19)
R-squared	0.24	0.24	0.24
Observations	15,118	15,118	15,118
Panel B: The value of cash before and after the Campaign			
Sample means for cash value computation		(1)	(2)
CASH		0.143	0.143
MLEV		0.205	0.205
The value of RMB 1.00 before		1.20	1.22
The value of RMB 1.00 after		1.58	1.50

This table presents the regression results of the anti-corruption campaign and the value of cash in Panel A and the value of cash for the average firm before and after the Campaign in Panel B. In Panel A, column 1 is the baseline Faulkender and Wang (2006) regression. Columns 2 and 3 use *POST1* and *POST2*, respectively. The dependent variable is excess stock return (r-R^B). Δ indicates the change from the previous year. All variables except for *POST1, POST2* and *MLEV* are deflated by the lagged market value of equity (*MVE*). In Panel B, the computation is based on the results of columns 2 and 3 in Panel A. Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.8 The anti-corruption campaign, cash holdings and the subsequent investment

Variable	Investment		Investment efficiency			
	(1)	(2)	(3)	(4)	(5)	(6)
CASH	0.019***	0.017***	0.021***	0.021***	0.022***	0.021***
	(4.27)	(3.87)	(4.85)	(4.74)	(5.12)	(4.97)
POST1×DCASH	0.009***					
	(4.12)					
POST2×DCASH		0.010***				
		(4.60)				
POST1×MB			0.001*			
			(1.65)			
POST2×MB				0.001**		
				(1.98)		
POST1×SG					0.014*	
					(1.72)	
POST2×SG						0.015*
						(1.84)
MB	0.001	0.001	0.000	-0.000		
	(1.56)	(1.53)	(0.13)	(-0.14)		
SG					0.041***	0.040***
					(6.24)	(6.33)
CF	0.111***	0.113***	0.114***	0.115***	0.097***	0.098***
	(6.26)	(6.35)	(6.35)	(6.45)	(5.71)	(5.72)
LEV	-0.034***	-0.033***	-0.034***	-0.032***	-0.034***	-0.033***
	(-3.79)	(-3.63)	(-3.71)	(-3.58)	(-3.78)	(-3.69)
SEO	0.023***	0.023***	0.023***	0.023***	0.020***	0.021***
	(10.49)	(10.46)	(10.41)	(10.34)	(9.43)	(9.45)
SIZE	-0.016***	-0.016***	-0.016***	-0.017***	-0.021***	-0.022***
	(-5.90)	(-6.15)	(-6.00)	(-6.24)	(-7.60)	(-7.96)
AGE	-0.017***	-0.018***	-0.017***	-0.019***	-0.013***	-0.014***
	(-5.94)	(-6.55)	(-5.99)	(-6.64)	(-4.73)	(-5.29)
POST1	-0.008***		-0.006***		-0.003	
	(-3.60)		(-2.65)		(-1.48)	
POST2		-0.006***		-0.004*		-0.002
		(-2.60)		(-1.86)		(-0.70)
Constant	0.416***	0.430***	0.426***	0.439***	0.523***	0.535***
	(7.56)	(7.89)	(7.63)	(7.97)	(9.01)	(9.48)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.10	0.10	0.10	0.10	0.11	0.11
Observation	13,856	13,856	13,856	13,856	13,855	13,855

This table presents the regression results of the anti-corruption campaign, cash holdings and the subsequent investment. Columns 1 and 2 report the impact of the campaign on the use of cash in investment. Columns 3-6 report the impact of the campaign on investment efficiency. Growth opportunities are measured as market-to-book ratio in columns 1-4, and sales growth rate in columns 5 and 6. The dependent is capital expenditure (*CAPEX*). Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.9 The anti-corruption campaign and capital structure

Variable	Total debts		Long-term debts		Short-term debts	
	(1)	(2)	(3)	(4)	(5)	(6)
POST1	-0.026***		-0.009***		-0.017***	
	(-9.58)		(-4.91)		(-7.62)	
POST2		-0.023***		-0.007***		-0.015***
		(-8.46)		(-4.05)		(-6.76)
ROA	-0.118***	-0.109***	-0.023**	-0.019*	-0.098***	-0.092***
	(-6.25)	(-5.81)	(-2.08)	(-1.75)	(-6.30)	(-5.98)
MB	-0.001**	-0.002***	0.000	-0.000	-0.001***	-0.002***
	(-2.36)	(-3.66)	(0.43)	(-0.45)	(-3.01)	(-4.00)
DEP	-0.484***	-0.523***	-0.636***	-0.651***	0.130	0.105
	(-2.86)	(-3.09)	(-6.03)	(-6.16)	(0.87)	(0.71)
SIZE	0.039***	0.036***	0.026***	0.025***	0.012***	0.011***
	(11.80)	(11.25)	(11.90)	(11.72)	(4.51)	(4.02)
FA	0.074***	0.077***	0.070***	0.071***	0.006	0.008
	(4.42)	(4.64)	(5.77)	(5.87)	(0.41)	(0.56)
IND_LEV	0.252***	0.243***	0.205***	0.198***	0.225***	0.214***
	(9.60)	(9.24)	(4.77)	(4.59)	(7.55)	(7.13)
Constant	-0.653***	-0.592***	-0.485***	-0.460***	-0.147**	-0.109*
	(-8.96)	(-8.31)	(-10.13)	(-9.90)	(-2.38)	(-1.81)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.07	0.07	0.05	0.05	0.04	0.03
Observations	15,106	15,106	15,106	15,106	15,106	15,106

This table presents the regression results of the anti-corruption campaign and capital structure. The dependent is the ratio of total debt to net assets in columns 1 and 2, the ratio of long-term debts to net assets in columns 3 and 4, and the ratio of short-term debts to net assets in columns 5 and 6. *DEP* and *FA* are deflated by net assets. Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.10 Twin agency problem

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Multiple large shareholders		Managerial ownership		Inverse excess control rights	
CG	3.113***	3.363***	0.263***	0.328***	0.105***	0.113***
	(9.13)	(9.43)	(4.39)	(5.31)	(3.37)	(3.56)
POST1×CG	-1.746***		-0.491***		-0.105***	
	(-5.70)		(-14.16)		(-4.72)	
POST2×CG		-2.015***		-0.513***		-0.107***
		(-6.67)		(-14.77)		(-4.83)
POST1	0.053***		0.064***		0.110***	
	(6.62)		(9.04)		(5.57)	
POST2		0.051***		0.059***		0.103***
		(6.75)		(8.67)		(5.41)
SIZE	-0.166***	-0.162***	-0.154***	-0.151***	-0.170***	-0.166***
	(-14.98)	(-14.94)	(-13.91)	(-13.85)	(-14.75)	(-14.63)
MB	0.007***	0.008***	0.008***	0.009***	0.005**	0.006**
	(3.11)	(3.47)	(3.66)	(3.91)	(2.14)	(2.45)
CF	1.465***	1.457***	1.496***	1.479***	1.527***	1.518***
	(18.01)	(17.92)	(18.25)	(18.04)	(17.20)	(17.06)
NWC	-0.445***	-0.443***	-0.471***	-0.470***	-0.428***	-0.426***
	(-11.90)	(-11.86)	(-12.32)	(-12.24)	(-10.58)	(-10.51)
IND_SIG	0.063*	0.055	0.041	0.034	0.126***	0.119***
	(1.74)	(1.52)	(1.18)	(0.98)	(3.46)	(3.26)
CAPEX	0.110***	0.105***	0.091***	0.085***	0.093***	0.089***
	(3.48)	(3.35)	(2.99)	(2.81)	(2.76)	(2.62)
LEV	1.058***	0.964**	1.330***	1.351***	0.996**	0.844**
	(2.74)	(2.58)	(3.49)	(3.65)	(2.36)	(2.06)
DIV_DUM	0.006	0.004	0.005	0.004	0.007	0.006
	(1.06)	(0.74)	(1.04)	(0.71)	(1.32)	(1.04)
ACQ	-0.296***	-0.294***	-0.300***	-0.348***	-0.333***	-0.331***
	(-2.69)	(-2.67)	(-2.84)	(-3.26)	(-3.03)	(-3.02)
Constant	3.534***	3.464***	3.290***	3.226***	3.597***	3.522***
	(14.71)	(14.62)	(13.72)	(13.57)	(14.26)	(14.09)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.35	0.36	0.38	0.39	0.34	0.34
F-statistics	70.42	71.71	79.59	81.23	62.64	63.77
Observations	15,107	15,107	14,491	14,491	13,776	13,776

This table presents the regression results of the anti-corruption campaign, rent-seeking incentives and cash holdings. *CG* is measured as multiple large shareholders (*SHARE2_10*) in column 1 and 2, managerial ownership (*MOWN*) in columns 3 and 4, and inverse excess control rights (*1/EXCESS*) in columns 5 and 6. The dependent variable is the ratio of cash to net assets. *CF*, *NWC*, *CAPEX*, and *ACQ* are deflated by net assets. Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Appendix 3.A Four inspection rounds carried out by the CCDI central inspection teams

Inspection round	Region	Inspection period	Inspection feedback date	Announcement date of local government rectification situation
1	Jiangxi	27 May 2013 – 20 August 2013	18 September 2013	21 February 2014
	Guizhou	29 May 2013 – 29 July 2013	25 September 2013	21 February 2014
	Chongqing	29 May 2013 – 29 July2013	25 September 2013	21 February 2014
	Hubei	2 June 2013 – 23 July 2013	16 September 2013	21 February 2014
	Inner-Mongolia	3 June 2013 – 6 August 2013	16 September 2013	21 February 2014
2	Guangdong	29 October 2013 – 29 December 2013	26 February 2014	6 June 2014
	Jilin	30 October 2013 – 26 December 2013	26 February 2014	8 June 2014
	Yunnan	30 October 2013 – 28 December 2013	13 February 2014	18 June 2014
	Shanxi	30 October 2013 – 29 December 2013	24 February 2014	7 June 2014
	Anhui	31 October 2013 – 27 December 2013	24 February 2014	9 June 2014
	Hunan	1 November 2013 – 27 December 2013	24 February 2014	17 June 2014
3	Hainan	24 March 2014 – 27 May 2014	10 July 2014	10 October 2014
	Fujian	27 March 2014 – 26 May 2014	14 July 2014	10 October 2014
	Gansu	27 March 2014 – 27 May 2014	6 July 2014	10 October 2014
	Henan	28 March 2014 – 27 May 2014	7 July 2014	14 October 2014
	Tianjin	28 March 2014 – 28 May 2014	9 July 2014	10 October 2014
	Shandong	29 March 2014 – 28 May 2014	10 July 2014	10 October 2014
	Xinjiang	30 March 2014 – 24 May 2014	12 July 2014	11 October 2014
	Liaoning	30 March 2014 – 25 May 2014	7 July 2014	10 October 2014
	Ningxia	31 March 2014 – 13 May 2014	10 July 2014	10 October 2014
	Beijing	31 March 2014 – 30 May 2014	9 July 2014	10 October 2014
4	Tibet	25 July 2014 – 24 September 2014	3 November 2014	31 January 2015
	Qinghai	26 July 2014 – 29 September 2014	28 October 2014	25 January 2015
	Heilongjiang	28 July 2014 – 27 September 2014	28 October 2014	31 January 2015
	Jiangsu	28 July 2014 – 27 September 2014	30 October 2014	30 January 2015

Guangxi	28 July 2014 – 27 September 2014	1 November 2014	31 January 2015
Sichuan	28 July 2014 – 28 September 2014	31 October 2014	29 January 2015
Hebei	29 July 2014 – 25 September 2014	30 October 2014	30 January 2015
Zhejiang	29 July 2014 – 28 September 2014	4 November 2014	30 January 2015
Shaanxi	30 July 2014 – 28 September 2014	31 October 2014	28 January 2015
Shanghai	30 July 2014 – 30 September 2014	30 October 2014	29 January 2015

This table presents the information on inspection rounds carried out by central inspection teams by September 2014, including inspection round, inspection period, inspection feedback date, announcement date of local government rectification situation. The source of information is the CCDI official website (http://www.ccdi.gov.cn/special/zyxszt/).

Appendix 3.B Official records of the CCDI for the period 2003-2016

Year	Cases under investigation	Cases concluded	People punished by Communist Party law
2003	172,649	172,571	174,580
2004	162,032	160,602	164,831
2005	147,539	148,931	115,143
2006	123,489	122,777	97,260
2007	-	-	-
2008	128,516	127,949	133,951
2009	134,504	132,808	138,708
2010	139,621	139,482	146,517
2011	137,859	136,679	142,893
2012	-	-	-
2013	172,000	173,000	182,000
2014	226,000	218,000	232,000
2015	330,000	317,000	336,000
2016	413,000	-	415,000

This table presents the annual official records of the CCDI from 2003 to 2016. The source of information is from the CCDI official website (http://www.ccdi.gov.cn/xxgk/hyzl/).

Appendix 3.C A description of marketisation index of China's provinces NERI report 2016

The NERI report 2016 provides the marketisation index of 31 province-level regions during 2008-2014, collected by the NERI with the support of the China Reform Foundation in each year. The overall marketisation index consists of 18 factors from the following five aspects: the government, the non-state sector, product markets, factor markets, market intermediaries and the legal environment. Each aspect further includes two or three sub-indices. The structure of NERI report 2016 is reported in the table below.

1. The relationship between the government and the market
   - 1a. The role of the market in allocating economic resources
   - 1b. The role of government decentralisation in business
   - 1c. The reduction in government size

2. The development of the non-state sector in the economy
   - 2a. The percentage of industrial operating revenues by the non-state sector
   - 2b. The percentage of total investment in fixed assets by the non-state sector
   - 2c. The percentage of urban employment by the non-state sector

3. The development of product markets
   - 3a. The extent to which prices are determined by the market
   - 3b. The reduction in regional protection in commodity markets

4 The development of factor markets
   - 4a. The liberalisation of banking sector
     - (4a1) The competitiveness of the banking sector
     - (4a2) The marketisation of credit allocation
   - 4b. The supply of human resources
     - (4b1) The supply of technical staff
     - (4b2) The supply of managerial staff
     - (4b3) The supply of skilled workers
   - 4c. The marketisation of technological innovation

5. The development of market intermediaries and the legal environment
   - 5a. The development of market intermediaries
     - (5a1) The service condition of lawyers and accountants
     - (5a2) The degree of help from industry associations
   - 5b. The legal environment of the market
   - 5c. The protection of property rights

The indices of five main aspects are available in each year, while the sub-indices are only available for even years during 2008-2014. In this study, we measure these sub-indices in odd years by averaging the corresponding figures in the previous and following years. The value of indices in 2015 and 2016 are assumed to be the same as the respective value in 2014. For each of the 18 factors, the year 2008 is set as the base year. The value of an index in 2008 ranges from zero to ten. A higher value means a better market development. Afterwards, the value of an index is determined by adding changes to the respective value in the base year. The indices following the base year, therefore, can be greater than ten or less than zero. For more details, please refer to the NERI report 2016 (Wang, Fan and Yu, 2017).

Appendix 3.D The anti-corruption campaign, time-variant rent-seeking incentives and cash holdings

Panel A: *POST1* as the proxy for the Campaign								
Variable	MKT	BANK	GOVT	LAW	FISC	NADM	GRP	EMP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST1	0.199***	0.074***	0.084***	0.064***	0.169***	0.490***	0.687***	3.777***
	(8.64)	(2.70)	(7.27)	(7.25)	(9.32)	(3.15)	(4.87)	(4.82)
POST1×Z	-0.248***	-0.104***	-0.121***	-0.038***	-0.229***	-0.496***	-0.065***	-3.888***
	(-8.75)	(-3.37)	(-6.24)	(-8.32)	(-8.93)	(-3.01)	(-5.04)	(-4.80)
Z	0.221***	0.458***	-0.166***	0.046***	0.256***	0.061	0.184***	8.970***
	(3.71)	(8.83)	(-6.29)	(5.41)	(3.83)	(0.22)	(10.78)	(7.44)
SIZE	-0.165***	-0.175***	-0.165***	-0.168***	-0.163***	-0.164***	-0.179***	-0.167***
	(-14.52)	(-15.12)	(-14.75)	(-14.73)	(-14.63)	(-14.47)	(-14.83)	(-14.84)
MB	0.008***	0.008***	0.008***	0.008***	0.008***	0.007***	0.009***	0.008***
	(3.31)	(3.56)	(3.55)	(3.36)	(3.23)	(2.96)	(3.61)	(3.24)
CF	1.522***	1.539***	1.517***	1.526***	1.511***	1.511***	1.538***	1.524***
	(18.21)	(18.42)	(18.29)	(18.30)	(18.27)	(18.06)	(18.43)	(18.33),
NWC	-0.433***	-0.443***	-0.435***	-0.438***	-0.430***	-0.438***	-0.441***	-0.439***
	(-11.48)	(-11.75)	(-11.54)	(-11.59)	(-11.41)	(-11.54)	(-11.69)	(-11.64)
IND_SIG	1.045***	1.000***	0.915**	0.979**	1.021***	1.053***	0.918**	1.029***
	(2.73)	(2.59)	(2.39)	(2.54)	(2.65)	(2.69)	(2.39)	(2.67)
CAPEX	0.108***	0.114***	0.097***	0.106***	0.104***	0.104***	0.122***	0.106***
	(2.97)	(3.16)	(2.70)	(2.94)	(2.89)	(2.88)	(3.40)	(2.94)
LEV	0.103***	0.109***	0.103***	0.103***	0.104***	0.096***	0.121***	0.109***
	(3.25)	(3.43)	(3.26)	(3.27)	(3.31)	(3.00)	(3.78)	(3.43)
DIV_DUM	0.004	0.001	0.003	0.004	0.004	0.005	0.000	0.003
	(0.74)	(0.23)	(0.63)	(0.72)	(0.78)	(0.92)	(0.08)	(0.55)
ACQ	-0.248**	-0.241**	-0.258**	-0.248**	-0.256**	-0.276**	-0.237**	-0.269**
	(-2.21)	(-2.16)	(-2.32)	(-2.22)	(-2.29)	(-2.45)	(-2.12)	(-2.41)
Constant	3.413***	3.424***	3.647***	3.579***	3.354***	3.491***	1.898***	-5.068***
	(14.23)	(14.15)	(14.87)	(14.57)	(13.49)	(10.37)	(8.26)	(-4.45)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

R-squared	0.35	0.35	0.35	0.35	0.35	0.34	0.35	0.35
F-statistics	70.50	69.36	69.74	70.54	71.13	67.08	70.96	69.30
Observations	15,118	15,118	15,118	15,118	15,118	15,118	15,118	15,118

Panel B: *POST2* as the proxy for the Campaign

Variable	MKT	BANK	GOVT	LAW	FISC	NADM	GRP	EMP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST2	0.200***	0.077***	0.089***	0.068***	0.162***	0.482***	0.645***	3.769***
	(8.56)	(2.85)	(7.51)	(7.58)	(8.91)	(2.95)	(4.45)	(4.71)
POST2×Z	-0.232***	-0.089***	-0.116***	-0.037***	-0.208***	-0.480***	-0.059***	-3.871***
	(-8.11)	(-2.90)	(-5.85)	(-7.56)	(-7.82)	(-2.77)	(-4.49)	(-4.68)
Z	0.148***	0.409***	-0.179***	0.044***	0.268***	-0.063	0.160***	8.309***
	(2.59)	(8.21)	(-6.81)	(5.21)	(4.05)	(-0.23)	(9.65)	(6.94)
SIZE	-0.168***	-0.179***	-0.169***	-0.170***	-0.166***	-0.167***	-0.183***	-0.170***
	(-14.54)	(-15.20)	(-14.92)	(-14.79)	(-14.81)	(-14.63)	(-14.91)	(-14.94)
MB	0.007***	0.008***	0.008***	0.008***	0.007***	0.007***	0.008***	0.007***
	(2.96)	(3.15)	(3.25)	(3.12)	(3.01)	(2.69)	(3.17)	(2.94)
CF	1.525***	1.551***	1.522***	1.530***	1.515***	1.515***	1.552***	1.527***
	(18.25)	(18.55)	(18.41)	(18.40)	(18.35)	(18.20)	(18.58)	(18.42)
NWC	-0.435***	-0.444***	-0.436***	-0.440***	-0.432***	-0.436***	-0.443***	-0.439***
	(-11.50)	(-11.77)	(-11.58)	(-11.65)	(-11.49)	(-11.51)	(-11.72)	(-11.64)
IND_SIG	1.175***	1.182***	1.015***	1.076***	1.113***	1.131***	1.145***	1.110***
	(3.10)	(3.09)	(2.69)	(2.83)	(2.94)	(2.94)	(3.02)	(2.92)
CAPEX	0.113***	0.124***	0.103***	0.112***	0.109***	0.108***	0.132***	0.111***
	(3.12)	(3.41)	(2.86)	(3.08)	(3.03)	(2.98)	(3.67)	(3.06)
LEV	0.106***	0.115***	0.108***	0.106***	0.108***	0.100***	0.126***	0.111***
	(3.35)	(3.59)	(3.41)	(3.35)	(3.41)	(3.13)	(3.93)	(3.48)
DIV_DUM	0.005	0.002	0.004	0.005	0.005	0.006	0.001	0.005
	(1.03)	(0.45)	(0.87)	(0.89)	(0.98)	(1.18)	(0.26)	(0.92)
ACQ	-0.254**	-0.242**	-0.265**	-0.252**	-0.260**	-0.283**	-0.238**	-0.273**
	(-2.26)	(-2.16)	(-2.38)	(-2.26)	(-2.32)	(-2.51)	(-2.13)	(-2.44)

Constant	3.515***	3.541***	3.729***	3.625***	3.405***	3.664***	2.230***	-4.378***
	(14.44)	(14.37)	(14.98)	(14.58)	(13.73)	(10.57)	(9.50)	(-3.86)
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.34	0.35	0.35	0.35	0.35	0.34	0.35	0.35
F-statistics	68.66	67.22	67.19	67.85	68.56	65.35	68.99	67.43
Observations	15,118	15,118	15,118	15,118	15,118	15,118	15,118	15,118

This table presents the regression results of the anti-corruption campaign, rent-seeking incentives and cash holdings. The anti-corruption is measured as *POST1*in Panel A and *POST2* in Panel B. *Z* refers to each rent-seeking incentives measurement. Rent-seeking incentives are measured as overall market development (*MKT*) in column 1, banking sector development (*BANK*) in column 2, government decentralisation (*GOV*) in column 3, legal protection of property rights (*LAW*) in column 4, local government fiscal condition (*FISC*) in column 5, government non-administrative revenue (*NADM*) in column 6, gross regional product (*GRP*) in column 7, and employment rate (*EMP*) in column 8. The dependent variable is the ratio of cash to net assets. *CF*, *NWC*, *CAPEX*, and *ACQ* are deflated by net assets. Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Appendix 3.E The Campaign and the marginal value of cash using alternative measures of the expected change in cash

Variable	Portf.Ave		ACW (1)		ACW (2)	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔCASH	1.809***	1.850***	1.615***	1.620***	1.515***	1.537***
	(15.64)	(15.51)	(14.02)	(13.56)	(12.60)	(12.30)
ΔCASH × POST1	0.248**		0.294**		0.363***	
	(2.23)		(2.54)		(3.07)	
ΔCASH × POST2		0.129		0.243**		0.277**
		(1.19)		(2.13)		(2.35)
ΔEBIT	1.697***	1.699***	1.753***	1.755***	1.671***	1.674***
	(14.27)	(14.29)	(14.48)	(14.52)	(14.01)	(14.04)
ΔNA	0.591***	0.592***	0.602***	0.603***	0.594***	0.596***
	(17.36)	(17.36)	(17.44)	(17.46)	(16.65)	(16.67)
ΔINT	1.058	1.046	0.902	0.902	1.036	1.057
	(1.57)	(1.55)	(1.33)	(1.33)	(1.49)	(1.52)
ΔDIV	3.581***	3.572***	3.942***	3.934***	3.955***	3.935***
	(6.77)	(6.74)	(7.40)	(7.37)	(7.04)	(7.00)
CASH	0.347***	0.348***	0.374***	0.374***	0.366***	0.368***
	(8.97)	(9.01)	(9.30)	(9.34)	(8.76)	(8.79)
MLEV	-0.399***	-0.400***	-0.396***	-0.397***	-0.397***	-0.398***
	(-23.40)	(-23.42)	(-22.52)	(-22.59)	(-21.88)	(-21.95)
NF	0.125**	0.127**	0.181***	0.181***	0.180***	0.179***
	(2.14)	(2.18)	(3.10)	(3.11)	(3.03)	(3.02)
ΔCASH × CASH	-2.100***	-2.124***	-1.584***	-1.604***	-1.351***	-1.386***
	(-5.68)	(-5.76)	(-4.46)	(-4.51)	(-3.72)	(-3.82)
ΔCASH × MLEV	-0.806***	-0.803***	-0.821***	-0.826***	-0.816***	-0.817***
	(-6.29)	(-6.31)	(-6.25)	(-6.29)	(-6.13)	(-6.17)
POST1	0.005		0.005		-0.007	
	(0.67)		(0.66)		(-0.87)	
POST2		0.007		0.005		-0.009
		(0.94)		(0.69)		(-1.16)
Constant	-0.050***	-0.051***	-0.063***	-0.064***	-0.051***	-0.050***
	(-7.39)	(-7.65)	(-9.08)	(-9.18)	(-7.15)	(-6.92)
R-squared	0.24	0.24	0.24	0.24	0.24	0.24
Observations	15,118	15,118	15,106	15,106	13,517	13,517

This table presents the regression results of the anti-corruption campaign and the marginal value of cash holdings with alternative measures of the expected change in cash. The expected change in cash is assumed the portfolio average change in cash in columns 1 and 2, and the predicted value from ACW (1) in columns 3 and 4, and the predicted value from ACW (2) in columns 5 and 6, respectively. The dependent variable is excess stock return (r-R^B). Δ indicates the change from the previous year. All variables except for *POST1, POST2* and *MLEV* are deflated by the lagged market value of equity (*MVE*). Definitions of all variables are in Table 3.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

CHAPTER 4 POLITICAL CONNECTIONS AND STOCK RETURN VOLATILITY

4.1 Introduction

Connections between firms and politicians have become a prevalent phenomenon around the world, and their impacts have attracted growing research interest. While a large strand of the literature examines the implications of political connections on firm value and financial policies (Fisman, 2001; Faccio, 2006; Faccio, Masulis and McConnell, 2006; Fan, Wong and Zhang, 2007; Boubakri, Cosset and Saffar, 2008; Goldman, Rocholl and So, 2009; Faccio, 2010), one issue that remains largely unexplored is the implications of political connections on the volatility of stock returns. In this chapter, we aim to fill this void in the extant literature and investigate the relationship between political connections and stock return volatility.

It is important to understand both the *level* and the *variability* of stock returns. The volatility of stock returns is of great interest to investors and firm managers. A high level of stock return volatility can increase a firm's perceived riskiness and proxy for asymmetric information problems (Lang and Lundholm, 1993; Krishnaswami and Subramaniam, 1999; Bushee and Noe, 2000). Total stock volatility can be decomposed into systematic volatility and idiosyncratic volatility. Systematic volatility, associated with the volatility of the market, is a key determinant of the cost of capital. Idiosyncratic volatility, which captures the unique uncertainty relevant to individual firms, is important to investors for diversifying portfolios,

to arbitrageurs for substituting mispriced stocks, and to managers for developing compensation policies (Rajgopal and Venkatachalam, 2011).

Political connections can affect stock return volatility through three possible channels. First, firms with political connections can enjoy preferential treatment from the government, including profitable government contracts, favourable government subsidies, lenient government requirements, and cheap access to credit (Faccio, 2006; Goldman, Rocholl and So, 2009). Politically connected firms have also been found to be expected to obtain bailout during periods of financial distress (Faccio, Masulis and McConnell, 2006). The preferential treatment and implicit government guarantee reduce market pressure and competition that firms confront, particularly during economic downturns. Therefore, political connections can lead to lower overall exposure to market volatility, driving systematic return volatility down.

Second, political connections also make it possible for politicians to syphon corporate resources at the expense of other corporate stakeholders (Shleifer and Vishny, 1994). In addition, corporate insiders with political connections are found to be more entrenched and to enjoy more private benefits than those without (Leuz and Oberholzer-Gee, 2006; Qian, Pan and Yeung, 2011; Cao *et al.*, 2017). The severe agency problem associated with political connections can reduce the cost of expropriation and increases the negative relationship between expropriation and market conditions, leading to higher levels of systematic volatility and the cost of capital (Chen, Chen and Wei, 2009; Boubakri, Guedhami and Mishra, 2010).

Finally, evidence shows that politically connected firms exhibit poor financial reporting quality (Chaney, Faccio and Parsley, 2011; Boubakri *et al.*, 2012). This is due to a lesser

need to attract external finance and a greater incentive to hide the benefits from political connections. The prior literature has shown that firms with earnings management and poor accounting quality exhibit higher idiosyncratic volatility (Rajgopal and Venkatachalam, 2011). Therefore, political connections associated with poor financial reporting quality can lead to higher idiosyncratic volatility. Chen, Ding and Kim (2010) find that politically connected firms have less accurate analyst forecasts than unconnected firms, further supporting that political connections lead to severe asymmetric information problems and volatile stock returns. Considering the conflicting arguments of political connections, how political connections influence stock return volatility is eventually an empirical question.

To empirically explore the issue, we focus on non-state-owned firms listed in China. Chinese privately controlled firms are particularly suitable for examining the topic as China is a political and relational economy. First, the government controls most of the economy, and government officials have the authority to allocate resources. Therefore, despite rapid development in recent years, privately controlled firms in China have long been discriminated against in terms of credit access, regulatory protection, tax benefits, and government subsidies. Second, social networks are especially important in China and can serve as a substitute for formal institutional support (Xin and Pearce, 1996; Allen, Qian and Qian, 2005). Among the different types of networks, political connections are the most important one. To compete with government-controlled firms, privately controlled firms have strong incentives to cultivate political connections by either hiring ex-politicians as executives or attracting ownership by the government. The previous literature demonstrates that political connections can be value-destroying for firms controlled by the government, but value-enhancing for firms with private owners (Li *et al.*, 2008; Wu, Wu and Rui, 2012; Chen *et al.*, 2017a). Recent research, however, sheds some light on the drawbacks of political

connections of executives in privately controlled firms, for instance, entrenched managers and poor accounting quality (Cao *et al.*, 2017; Hope, Yue and Zhong, 2018). Therefore, whether political connections are valuable for firms in the private sector is still inconclusive and requires further research.

Our empirical analysis yields several interesting results. First, *ceteris paribus*, firms with a higher percentage of politically connected directors have higher total volatility of stock returns. When decomposing total return volatility into systematic and idiosyncratic volatility, we find the positive impact is mainly concentrated on idiosyncratic volatility. The effect of political connections on systematic volatility is minimal and statistically insignificant. The positive relationship supports the idea that political connections lead to poor financial reporting quality and information asymmetry, and therefore higher idiosyncratic volatility. The findings are robust to alternative definitions of key variables and controlling for additional variables.

A potential problem of the relationship between political connections and stock return volatility is the endogeneity of political connections. A firm's political connections may be endogenously determined and related to unobserved factors that also affect stock return volatility. Therefore, the positive impact of political connections on stock return volatility can be a spurious correlation. To solve this concern, we re-estimate the regression with a propensity-score matched sample. Specifically, we match firm-years with high political connections (highest tercile of political connections) with those with low political connections (lowest tercile of political connections) on all the control variables, year and industry effects, based on the nearest neighbour technique with replacement. The results with the matched sample show that the treated group (firms with high political connections) has

higher volatility of stock returns than the control group (firms with low political connections), consistent with our main result.

In addition, stock return volatility may have a reverse causality on political connections. Firms with high stock return volatility may have higher incentives to hire more politically connected directors to enhance their financing ability and obtain government support. We use an instrumental variable approach to address this problem. Specifically, similar to Chaney, Faccio and Parsley (2011) and Guedhami, Pittman and Saffar (2014), we choose whether a firm's headquarters is the capital city in a province as the instrument for political connections. Firms located in capital cities have more capacity and resources to cultivate political connections. In line with the proposition, we find a strong positive relationship between the instrument and political connections in the first stage. The results in the second stage show that the positive impact of political connections on idiosyncratic and total volatility remains.

Next, we examine the heterogeneity in the association between political ties and stock return volatility by conditioning on regional market development and political uncertainty. Faccio (2006) argues that a poor institutional environment can encourage the building of political connections and lower the detection and punishment of abuses. Similar results are also found in Boubakri, Cosset and Saffar (2008) and Chen, Ding and Kim (2010). Accordingly, the impact of political connections should be stronger in regions with poor institutional quality. First, following prior studies (Chen *et al.*, 2011a; Kusnadi, Yang and Zhou, 2015), we measure market development from four aspects: overall market development, government decentralisation, banking sector liberalisation and legal rights protection. Specifically, we bisect the sample at the median value of each regional variable and re-estimate the model

for firms in regions with more and less developed markets. Consistent with the argument, we find that the positive impact of political connections on stock risk is more pronounced for firms in regions with poor institutional development. Second, we consider the role of political uncertainty. Political connections depend largely on the success of connected politicians (Leuz and Oberholzer-Gee, 2006). Uncertain politics may remove the existing political connections, especially those connections with local governments, and therefore the impact of political connections should be stronger in regions with low political uncertainty. Following Xu *et al.* (2016), we focus on the turnover of regional government leaders to measure political uncertainty. We divide the sample into firms located in regions with high political uncertainty and low uncertainty. In line with the prediction, we find that the impact of political connections on stock return volatility is only significant in the subsample of regions with low political uncertainty.

Finally, we run two tests to alleviate an alternative explanation. The prior literature also uses the volatility of stock returns as a proxy for corporate risk-taking behaviours (Cassell *et al.*, 2012; Kini and Williams, 2012; Serfling, 2014). As argued by Boubakri, Mansi and Saffar (2013), firms with political connections have more financial resources and government support and thus have a stronger ability to take on risky but value-enhancing projects. The positive impact of political connections on stock return volatility, therefore, may be a result of the benefits rather than asymmetric information problems of political connections. Although the cash flow volatility controlled in the regressions can alleviate the issue, we further and directly address this concern by investigating the impact of political connections on the riskiness of investment and financing policies. The riskiness of investment and financial leverage are measured by R&D expenditures, capital expenditures, working capital, operating leverage and financial leverage. We find that political connections have

insignificant impacts on investment riskiness and a weak positive impact on financing riskiness. Moreover, we test the impact of earnings management and political connections on stock return volatility. If the information asymmetry hypothesis is valid, then we should expect a stronger relationship between political connections and stock return volatility in firms with more earnings management. In line with the view, we find that political connections with high earnings management are associated with more volatile stock returns. The results, taken together, suggest that our findings are consistent with the costs of political connections associated with poor accounting quality and information asymmetry problems.

The main contribution of this study is that, to the best of our knowledge, we provide the first evidence of political connections and stock return volatility. While recent research has shown how political connections affect the level of corporate performance (Fisman, 2001; Faccio, 2006; Fan, Wong and Zhang, 2007; Boubakri, Cosset and Saffar, 2008), only two empirical studies have examined the impact of political connections on the variability of firm performance. Boubakri, Cosset and Saffar (2013), for example, find state ownership and political connections have negative impacts on the volatility of earnings and interpret the results as consistent with political objectives and agency costs of political connections. In contrast, Boubakri, Mansi and Saffar (2013) document a positive association between political connections and earnings volatility. They argue that the positive relationship is attributable to the bailout protection and implicit guarantee associated with political connections. Our study differs from the two papers in that we focus on the volatility of stock returns rather than the volatility of accounting performance. Stock return volatility, based on investors' perceptions, reflect corporate value uncertainty and information environment. In addition, systematic and idiosyncratic return volatility have important implications for

investors, arbitrageurs and managers. Earnings volatility, based on accounting information, can suffer from earnings management and poor financial reporting quality.

Second, our results also contribute to the literature on the determinants of stock return volatility. Campbell *et al.* (2001) document an increasing trend of stock return volatility in the US and highlight the importance of idiosyncratic volatility as opposed to systematic volatility. Existing studies identify a number of factors affecting stock return volatility (Bushee and Noe, 2000; Xu and Malkiel, 2003; Rajgopal and Venkatachalam, 2011; Chen *et al.*, 2013; Vo, 2016), and our findings propose political connections as a novel and important determinant of stock return volatility and idiosyncratic volatility.

Third, our findings shed light on the literature on how board directors' personal traits affect corporate policies. Traditional corporate governance largely ignores the influence of directors' characteristics and focuses primarily on board size and independence. Recent studies show that board directors' gender, age and education can shape a firm's financing and investment decisions (Berger, Kick and Schaeck, 2014; Levi, Li and Zhang, 2014; Chen, Leung and Goergen, 2017). Our evidence identifies another characteristic of board directors influencing firm performance, i.e. the working experience for the government.

The remainder of this chapter is structured as follows. Section 4.2 reviews the relevant literature and develops testable hypotheses. Section 4.3 describes the data, the measurement of key variables and regression models. Section 4.4 discusses the empirical results and Section 4.5 reports the conclusion of the chapter.

4.2 Hypothesis development

In this section, we first review the literature on the benefits and the costs of political connections and then develop testable hypotheses linking political connections to systematic volatility and idiosyncratic volatility. Next, the literature on institutional development in political connections is reviewed and finally hypotheses associated with institutional development are proposed.

4.2.1 Political connections and stock return volatility

Firms can benefit from close ties with politicians and bureaucrats. For example, with a sample of Indonesian firms, Fisman (2001) finds that stock prices connected to President Suharto declined significantly around the announcement of the president's illness. The evidence suggests that a large proportion of firm value is attributable to political connections. Using a cross-country sample, Faccio (2006) documents a significant increase in firm value when a firm's businessperson enters politics.[26] In addition, many papers investigate the mechanisms through which political connections benefit firms. Politically connected firms are found to gain easier access to bank loans (Khwaja and Mian, 2005; Claessens, Feijen and Laeven, 2008; Li *et al.*, 2008), have better access to equity markets (Francis, Hasan and Sun, 2009; Boubakri *et al.*, 2012), enjoy more subsidies and tax benefits (Johnson and Mitton, 2003; Adhikari, Derashid and Zhang, 2006; Wu *et al.*, 2012), face favourable regulatory conditions (Agrawal and Knoeber, 2001; Goldman, Rocholl and So, 2009) and are more likely to receive bailout in times of financial distress (Faccio, Masulis and McConnell, 2006)

[26] Similar results are found in the US (Goldman, Rocholl and So, 2009; Cooper, Gulen and Ovtchinnikov, 2010), Denmark (Amore and Bennedsen, 2013), Brazil (Claessens, Feijen and Laeven, 2008) and China (Li *et al.*, 2008).

than their comparable unconnected peers. Due to these benefits, they are less subject to market competition and pressure. That is, politically connected firms face a lower degree of market-wide risk especially during economic downturns, driving their systematic volatility down. Stock return volatility, particularly systematic volatility, should be lower for firms with more political connections. Our first hypothesis is summarised below.

H1a*: Government support: Political connections decrease stock return volatility via systematic volatility.*

Despite the widely found benefits of political connections, studies also suggest that political connections can increase agency costs and destroy firm value. For example, Shleifer and Vishny (1994) argue and document that politically connected firms hire more workers and make higher payments to employees than unconnected ones. More importantly, politicians will extract at least some of the rents when they bring connected firms benefits. Fan, Wong and Zhang (2007) and Boubakri, Cosset and Saffar (2008) find politically connected newly privatised firms tend to underperform compared with their unconnected peers, supporting the argument that firms with political connections suffer from political extraction. Other costs of political connections are associated with tunnelling by corporate insiders (Qian, Pan and Yeung, 2011; Tu, Lin and Liu, 2013) and entrenched executives (You and Du, 2012; Cao *et al.*, 2017). Since the extant literature suggests good governance leads to lower systematic volatility and cost of capital (Chen, Chen and Wei, 2009; Boubakri, Guedhami and Mishra, 2010),[27] the tunnelling and expropriation by politicians and corporate insiders

[27] According to Chen, Chen and Wei (2009), good corporate governance can reduce the cost of expropriation and further decrease the negative association between expropriation and market conditions, leading to lower systematic volatility and cost of capital.

suggest a positive relationship between political connections and stock return volatility via systematic volatility.

***H1b**: Agency cost: Political connections increase stock return volatility via systematic volatility.*

In addition, political connections can deteriorate the information environment and increase the risk of information asymmetry between investors and managers for several reasons. First, firms foster political connections to gain benefits, and most benefits provided by political connections are in the 'grey area' (Fisman, 2001). Therefore, managers tend to distort financial statements and manipulate accounting figures to hide political cronyism and corruption. In line with this argument, Leuz and Oberholzer-Gee (2006) find that politically connected firms are less likely to cross list to avoid potential increased scrutiny and public attention associated with cross-listing. Second, because politically connected firms can obtain preferential bank loans, they have fewer incentives to raise external capital from the market. Consequently, managers in politically connected firms are less encouraged to improve financial transparency to attract external investors. Consistent with this view, Chaney, Faccio and Parsley (2011) document that earnings management is more severe in politically connected firms than in similar unconnected firms. Third, firms with political connections also need to carry political burdens. For example, Piotroski, Wong and Zhang (2015) find that politicians and their affiliated firms in China temporarily suppress negative information in response to political incentives. Therefore, the information quality of politically connected firms can be distorted by political needs. Finally, regulatory monitoring is less severe for politically connected firms. Yu and Yu (2011) find that politically connected firms are less likely to be detected for fraud. Therefore, the government-provided

shielding from regulatory monitoring offers managers of politically connected firms much discretion as to how financial information is disclosed, which reduces managers' motivation to provide high-quality information. Chen, Ding and Kim (2010) find that firms with political connections have less accurate analyst forecasts about earnings, further suggesting more information asymmetry between investors and managers in these firms. The previous literature uses stock return volatility as a proxy for information asymmetry and finds that poor financial reporting leads to volatile idiosyncratic returns (Lang and Lundholm, 1993; Krishnaswami and Subramaniam, 1999; Rajgopal and Venkatachalam, 2011). Based on the discussion above, political connections can have a positive impact on idiosyncratic volatility and total return volatility.

***H1c**: Information asymmetry: Political connections increase stock return volatility via idiosyncratic volatility.*

4.2.2 The role of market development

Political connections and their impact on firm value and financial policies are found to be largely influenced by regional institutional quality. For example, Faccio (2006), in her seminal work, investigates political connections around the world, and find political connections are more common in countries with high levels of corruption and more cross-border restrictions, where the detection and punishment of abuses are low. She further documents that stock prices increase more in corrupt areas when a businessperson enters politics. Chen *et al.* (2011a) observe that privately controlled firms in China are more likely to hire politically connected directors in regions with less market-oriented economies and poorer government fiscal conditions, in order to reduce the extraction by politicians and bureaucrats. Chen, Ding and Kim (2010) find the costs of political connections associated

with analyst forecast error are more pronounced in countries that are more corrupt. Boubakri, Mansi and Saffar (2013) document that political connections increase corporate earnings volatility and the increase is stronger in regions where local political institutions are weak and the likelihood of bailout is high. Overall, the literature above suggests that the benefits and costs of political connections vary with institutional development. In less developed areas, political connections exert a stronger role in firm behaviours. We predict the impact of political connections on stock return volatility should be more evident in less developed regions.

***H2**: The impact of political connections on stock return volatility is greater for firms in regions with poorer institutional development.*

4.2.3 The role of political uncertainty

The value of political connections can be easily influenced by political climate and events (Fisman, 2001; Faccio, 2006). Leuz and Oberholzer-Gee (2006) argue that the role of political connections depends largely on the political fortunes of their backers. The investment in political connections can become completely meaningless when the connected politicians lose their power. Liu, Shu and Wei (2017) find that political uncertainty, led by the Bo Xilai scandal in 2012 in China, caused a significant drop in stock prices, especially for firms with high levels of political connections. During periods of high political uncertainty, the benefits, as well as the costs, of political connections may suddenly disappear, and therefore politically connected firms may behave in a similar way as unconnected firms. Based on this discussion, the impacts of political connections on stock return and its volatility should be lower in regions with high political uncertainty. We analyse

whether political uncertainty influences the association between political links and stock return volatility.

H3: *The impact of political connections on stock return volatility is greater for firms in regions with lower political uncertainty.*

4.3 Research design

4.3.1 Sample

The sample consists of all privately controlled firms listed on the Shanghai and Shenzhen stock exchanges during the period 2008-2016. Since directors in government-owned firms are typically determined by the government, it is difficult to disentangle the impact of government control and political affiliation of board directors (Cheung, Rau and Stouraitis, 2010). To confirm that political links are built by firms rather than imposed by the government, in this study, we focus only on privately controlled firms. Privately controlled firms are defined as listed firms ultimately controlled by private institutions and individuals. The financial data at the firm level is obtained from the China Stock Market and Accounting Research (CSMAR) database and the market indices at the province-level are extracted from the National Economic Research Institute (NERI) 2016 report. The political background of directors and the turnovers of government officials are manually collected from corporate annual reports and local governments' websites, respectively. When the information is not available from the above sources, we refer to *Baidu*, the most popular search engine in China. Following customary practices, we exclude financial firms because of their industry uniqueness. We also exclude firm-years with missing market values, firm-years with zero

total assets, and firm-years that do not have the required stock returns. We require a firm to have at least two consecutive years of data. Our final unbalanced panel data consists of 7,822 observations of 1,547 unique firms covering the period from 2008 to 2016.

4.3.2 Measurement of key variables

4.3.2.1 Political connections

The variable of interest in this study is political connections. There is no generally accepted definition of corporate political connections. Faccio (2006), for example, defines a firm as politically connected if one of its largest shareholder or one of its top officers is a member of parliament, a minister, a head of state, or closely related to a top official. Boubakri, Cosset and Saffar (2008) consider a firm as politically connected if there is a politician serving on the board of directors or supervisory board.

The Chinese financial system is dominated by government participation and privately controlled firms are greatly discriminated against by the state and the public. Under such circumstances, they have high incentives to build political connections by hiring directors with working experience in political organisations in order to compete with government-controlled firms and enjoy preferential government-granted benefits. China's political regime comprises three fundamental organisations: the central and local administrative governments, the National People's Congress (NPC) and the Chinese People's Political Consultative Conference (CPPCC) (Chen *et al.*, 2011a; Chen *et al.*, 2017a). The latter two are important quasi-government organisations in the Chinese political system, serving as the unicameral legislature and advisory body, respectively. In each firm-year, we identify the

active directors on the board and examine their political background.[28] A board director is considered as politically connected if he or she used to work or is currently working for either of the three political organisations mentioned above. In our sample, 85.82% of observations have at least one politically connected director.[29] Therefore, the presence of politically connected directors cannot effectively identify the level of corporate political connections. Taking into account the institutional setting of the Chinese non-state sector, as opposed to a dummy variable, we follow Chen *et al.* (2011a) and define a firm's political connections (*PC*) as the percentage of board directors with working experience as a politician to disentangle the degree of political connections. To avoid ambiguity in defining the variable, we further distinguish the strength in the connection (Francis, Hasan and Sun, 2009; Chen *et al.*, 2011a). Three measures of political connections are constructed based on the political rankings of directors: *PC1* is defined as the percentage of directors with political connections at all levels; *PC2* (*PC3*) is defined as the percentage of directors with political connections at the city (province) level or above. Since the high-ranking political working background is much more effective, political connections at higher levels can exert a stronger impact on corporate outcomes. Our empirical analyses are mainly based on the political connections at the city level or above (*PC2*). Inferences remain qualitatively the same when political connections at all levels (*PC1*) and the province level or above (*PC3*) are used.

[28] The CSMAR director database includes existing directors, directors leaving in the current year and new directors coming in the next financial year. We manually identify existing directors based on directors' contract start and end date. When the contract date is missing, we refer to the annual reports and personal working profiles.

[29] The distribution of firm-year observations with politically connected directors across year, industry and region is reported in Appendix 4.A.

4.3.3.2 Stock return volatility

Following Chen *et al.* (2013), we first use the annualised standard deviation of daily returns as the proxy for firm overall volatility (*TVOL*). Daily stock returns are measured as the first difference in the natural logarithm of the closing prices over two consecutive trading days, adjusted by cash dividends, stock dividends and stock splits. Political connections can affect both the level and the composition of stock return volatility. Therefore, we decompose total return volatility into idiosyncratic volatility and systematic volatility. We define idiosyncratic volatility (*IVOL*) as the annualised standard deviation of daily abnormal returns generated by the market model. The SSE and SZSE composite market-value-weighted indices are employed as benchmark portfolios for firms listed on the Shanghai and Shenzhen stock exchanges, respectively (Farag and Mallin, 2018). For robustness analysis, we also define $IVOL^{Agg}$ as the annualised standard deviation of daily abnormal returns generated by the market model using the aggregated value-weighted market return, which includes all shares in the two stock exchanges as the market return. $IVOL^{FF}$ is defined as the annualised standard deviation of daily abnormal returns generated by the Fama and French (1993) three-factor model. Measures of systematic volatility (*SVOL*, $SVOL^{Agg}$, and $SVOL^{FF}$) are the difference between total return volatility (*TVOL*) and the corresponding measures of idiosyncratic volatility (*IVOL*, $IVOL^{Agg}$, and $IVOL^{FF}$). All volatility measures are calculated with at least 60 days of returns of data (Low, 2009).

4.3.3.3 Regional characteristics

We consider a few regional market characteristics to examine the heterogeneity in the relationship between political connections and return volatility. These factors affect the establishment and the impact of political connections and are commonly used in the prior

literature (Chen *et al.*, 2011a; Kusnadi, Yang and Zhou, 2015). We first consider the degree of overall market development (*MKT*). In addition, we employ three sub-indices that capture three aspects of local economies. Specifically, *GOVT* is a measurement of government decentralisation, determined by the corporate managers' perception of government administrative approval, industry entry access and other government intervention. *BANK* describes the extent of liberalisation in the banking sector, based on the competition in the banking sector and the marketisation of credit allocation. *LAW* measures the legal protection of property rights, determined by the average number of patents approved per researcher. Regions with higher values of market indices are considered more developed.

In addition, we measure political uncertainty based on the turnover of government officials (An *et al.*, 2016; Xu *et al.*, 2016). Two levels of political uncertainty are constructed, based on the turnover of government officials at the province level and city level, respectively. The top two leaders at the province (city) level refer to the province's (city's) Communist Party Secretary and the Governor (Mayor), which reveals the dual roles of the Communist Party and the government in the Chinese political system. Regions are considered more uncertain when the current leaders leave and new officials (especially from other regions) are appointed. The first measure of political uncertainty, *TOVER_PROV*, is the number of turnovers of province-level Communist Party Secretary and Governor in a province in each year. The second measure, *TOVER_CITY*, is the total number of turnovers of city-level Communist Party Secretary and Mayor in a province by the end of each year. Regions with a higher turnover of government officials experience higher political uncertainty.

4.3.3 Model specification

To examine the impact of political connections on stock return volatility, we employ the following basic regression model (Rajgopal and Venkatachalam, 2011; Chen *et al.*, 2013).

$$\begin{aligned} VOL_{i,t} = {} & \beta_0 + \beta_1 PC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 AGE_{i,t-1} + \beta_4 MB_{i,t-1} \\ & + \beta_5 SG_{i,t-1} + \beta_6 LEV_{i,t-1} + \beta_7 ROA_{i,t-1} + \beta_8 RET_{i,t-1} \\ & + \beta_9 CFVOL_{i,t-1} + \beta_{10} BFEM_{i,t-1} + \beta_{11} BAGE_{i,t-1} \\ & + \beta_{12} BOWN_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (4.1)$$

where the dependent variable, *VOL* refers to total return volatility (*TVOL*), systematic volatility (*SVOL*, $SVOL^{Agg}$, $SVOL^{FF}$) or idiosyncratic volatility (*IVOL*, $IVOL^{Agg}$, $IVOL^{FF}$). *PC* refers to the three measures of political connections at different political rankings (*PC1*, *PC2*, and *PC3*). We include several firm characteristics that are potentially correlated with stock return volatility and political connections as control variables, including firm size, firm age, market-to-book ratio, sales growth rate, leverage, return on assets, stock return and cash flow volatility (Rajgopal and Venkatachalam, 2011; Serfling, 2014; Sila, Gonzalez and Hagendorff, 2016). Specifically, *SIZE* is defined as the natural logarithm of total assets expressed in 2008 prices. *AGE* is the natural logarithm of one plus the number of years since the initial public offering. *MB* is the market value of equity plus total liabilities divided by the book value of total assets. The market value of equity is the sum of the market value of tradable shares and the book value of non-tradable shares. *SG* is the annual rate of growth of sales. Smaller, younger firms with greater growth opportunities are riskier and more likely to experience higher stock volatility. *LEV* is the sum of short-term and long-term debts divided by total assets. Highly levered firms are more likely to fall into financial distress,

leading to higher stock volatility. In addition, we control for firm accounting and stock return performances. *ROA* is earnings before interest and taxes divided by total assets. *RET* is the annual stock return. The riskiness of operations, *CFVOL*, is the standard deviation of annual operating cash flows scaled by total assets over the trailing five-year window for the firm. Firms with more volatile cash flows increase the volatility of stock returns. In addition, we include three board directors' characteristics that potentially affect stock return volatility: gender, age and ownership. *BFEM* is the percentage of female directors on the board. *BAGE* is the natural logarithm of one plus average director age. *BOWN* is the percentage of shares owned by board directors. Firms with more female and elderly directors are considered less risky by investors. Political connections and control variables are lagged one period to alleviate the potential endogenous problem.

The definitions of all variables are summarised in Table 4.1. All continuous variables are winsorized at the top and bottom 1% level to minimise the effect of outliers. The year and industry effects are included to control for the time-specific characteristics and industry heterogeneity. We use robust standard errors adjusted for clustering at the firm level to control for heteroscedasticity and serial correlation of the error term.

[Insert Table 4.1 around here]

4.4 Empirical results

4.4.1 Descriptive statistics

Table 4.2 reports the mean values of political connections by year, industry, location and province. As reported in Panel A, on average, 24.3% of directors in our sample have political working experience when all political levels are considered. At the city (province) level or above, 21.5% (15.4%) of directors are politically connected. It is also noticeable that political connections decrease over time. For example, at the city level or above, 23.1% of directors are politically connected in 2008, while only 16.5% are politically connected in 2015. The decrease is especially significant in 2014 and 2015. This can be explained by the 'Rule 18' implemented in October 2013. As described in Chapter 1, the 'Rule 18' prohibited current or recently retired government and party officials from serving as directors in listed firms. A number of politically connected directors are found to have unwillingly resigned from their roles as directors (Hope, Yue and Zhong, 2018). Panel B indicates that political connections are not an industry-based phenomenon. Still, firms in the properties industry have the highest political connections. The result is plausible since the operations of firms in the properties industry are highly linked to government decisions. For example, to obtain the granting rights of land use, firms in the properties industry have high incentives to build political connections. As shown in Panel C, firms located in the capital cities of provinces have higher political connections at the city and province levels or above than firms located in other cities. The differences in political connections at the city and the province level or above (0.022 and 0.046) are both significant at the 1% level. This is consistent with the literature that firms in capital cities have a closer link and easier access to high-level government officials (Boubakri, Cosset and Saffar, 2008; Chaney, Faccio and Parsley, 2011). Panel D of Table 4.2 presents the mean values of political connections across provinces. It is clearly shown in the regional distribution that political connections exhibit much diversification across geographical areas. On average, firms in Hainan have the highest

political connections (34.3% at all levels, 30.8% at the city level or above, and 26.1% at the province level or above). Firms in Inner-Mongolia have the lowest political connections at the city level or above (16.2%) and at the province level or above (10.9%). It is also noticeable that most firms in our sample are in Guangdong, Zhejiang and Jiangsu, suggesting relatively developed and active private sectors in these regions.

[Insert Table 4.2 around here]

Table 4.3 presents the summary statistics for stock return volatility and other key variables in this study. The mean and median of total stock volatility (*TVOL*) are 49.8% and 46.4%, respectively. The three measures of idiosyncratic volatility are similar, the mean (median) values calculated based on the market model (*IVOL* and $IVOL^{Agg}$), and the Fama and French model ($IVOL^{FF}$) are 38.4% (36.6%), 39.9% (37.8%) and 37.0% (35.4%), respectively. The descriptive statistics of idiosyncratic volatility are quite similar to the studies in the US (Serfling, 2014; Sila, Gonzalez and Hagendorff, 2016). The three measures of systematic volatility are also similar, the mean (median) values calculated based on the market model (*SVOL* and $SVOL^{Agg}$), and the Fama and French three-factor model ($SVOL^{FF}$) are 11.4% (9.6%), 9.9% (8.3%) and 12.7% (10.6%), respectively. It is noticeable and important that total return volatility is comprised most by idiosyncratic volatility rather than systematic volatility in our sample. In terms of board characteristics, on average, female directors (*BFEM*) constitute 14.5% of the board. The proxy for board age (*BAGE*) has a mean value of 3.921, indicating that on average board directors are aged 49 in our sample. The average ownership by directors (*BOWN*) is 17.1%. The mean of *CAPITAL* suggests that approximately 40% of firms in our sample are headquartered in capital cities in the corresponding regions.

[Insert Table 4.3 around here]

4.4.2 Main results

Table 4.4 presents the regression results of the relationship between political connections and total return volatility (*TVOL*) obtained from Eq. (4.1). The year and industry fixed effects are controlled, and the t-statistics reported are adjusted for heteroscedasticity and clustering at the firm level in all columns. Total return volatility, *TVOL*, is the dependent variable. Political connections are measured as *PC1*, *PC2*, and *PC3* in columns 1-3, respectively. We observe that the coefficient on *PC* for each measure of political connections is positive in all three columns. The coefficient is statistically significant at either the 1% or 5% levels. Inconsistent with government support hypothesis (***H1a***), we find a positive impact of political connections on stock return volatility.

The impacts of control variables on stock return volatility, if significant, are broadly consistent with previous evidence in the literature (Rajgopal and Venkatachalam, 2011; Serfling, 2014; Cain and McKeon, 2016). Specifically, return volatility is negatively associated with firm size, firm age, market-to-book ratio and return on assets, while positively related to sales growth rate, leverage, and cash flow volatility. In addition, board age has a negative impact on return volatility, suggesting that investors perceive stock returns of firms with elderly directors as less volatile. Board ownership has a positive relationship with stock return volatility. The percentage of female directors is negatively associated with stock return volatility, but the impact is not statistically significant.

[Insert Table 4.4 around here]

To further disentangle which effect is the driving force behind the positive relationship between political connections and stock return volatility, we decompose total volatility into systematic volatility and idiosyncratic volatility. The results are reported in Table 4.5, where the dependent variables are *SVOL*, $SVOL^{Agg}$, and $SVOL^{FF}$ in columns 1-3, and *IVOL*, $IVOL^{Agg}$, and $IVOL^{FF}$ in columns 3-6, respectively. Political connections at the city level and above (*PC2*) is employed in the following results, and our results are identical using the other two proxies (*PC1* and *PC3*). In terms of systematic volatility, the coefficient on *PC2* is negative but not significant in the three columns. This implies that the benefits associated with government support may be mitigated by the agency costs, leading to an insignificant relationship between political connections and systematic volatility. As for idiosyncratic volatility, the coefficient on *PC2* is positive and highly significant at the 1% level in all three columns. The positive impact of political connections on idiosyncratic volatility supports the information asymmetry hypothesis (***H1c***) that firms with higher political connections suffer from poor financial reporting quality and asymmetric information problems and, therefore, investors in the market perceive them as riskier, leading to more volatile stock returns.

[Insert Table 4.5 around here]

The results in Table 4.4 and Table 4.5, however, may suffer from potential endogeneity. The degree of political connections may not be an exogenous random variable. It can be endogenously chosen by firms to fit into their operating and contracting environment. Two sources of endogeneity are particularly likely to bias our estimates of how political connections affect stock return volatility. First, our results can be affected by omitted variables. Although we have included firm and board characteristics, industry and year effects, we cannot guarantee that all important determinants of stock return volatility are

controlled in the regression. There may be other factors, observable and unobservable, that influence both political connections and stock return volatility. Second, there may be a self-selection bias. Rather than political connections affecting stock return volatility, stock return volatility can affect the appointment of politically connected directors. For example, politically connected directors may self-select into highly volatile firms possibly because of their lower risk aversion. Although our one-year lagged political connections can, to some extent, mitigate the problem, to avoid spurious inferences and to isolate causation, in the next section, we formally address the issue by employing two methods: (1) a matched-sample approach and (2) an instrumental variable approach.

4.4.3 Robustness checks

4.4.3.1 A matched-sample approach

Propensity score matching allows us to identify a control sample of firms with low politically connections and that exhibit no observable differences in characteristics pertaining to firms with high political connections. Thus, each pair of matched firms is almost indistinguishable from one another except for political connections. To do this, we first implement a dummy variable (*Dummy PC*), which takes the value of one for the highest tercile of political connections and zero for the lowest tercile of political connections. Firms in the middle tercile of political connections are excluded. We then calculate the probability (i.e., the propensity score) that a firm with given characteristics is highly politically connected, as a function of all control variables in Eq. (4.1). Firms with high political connections (i.e. *Dummy PC* is one) are matched with those with low political connections (i.e. *Dummy PC* is zero) based on the nearest neighbour technique with replacement. To ensure sufficient matching, we require the maximum difference in the propensity scores of the politically

connected firm and its matching peer not exceeding 0.1% in absolute value.[30] If the positive impact of political connections on stock return volatility is valid, we should observe a positive coefficient on *Dummy PC2*.

Table 4.6 reports the results based on the balanced matched sample of highly and lowly politically connected firms. The observations reduce to 4,924. Similar to the results in Table 4.4 and Table 4.5, the results show that, as expected, firms with high political connections have higher total return volatility and idiosyncratic return volatility, significant at the 1% and 5% levels. The impact of political ties on systematic volatility becomes positive and significant at the 10% level, shedding some light on the agency cost hypothesis (***H1b***). Overall, our main results that political connections increase stock return volatility, especially idiosyncratic volatility, still remain.

[Insert Table 4.6 around here]

4.4.3.2 Instrumental variable estimator

To alleviate the concern that self-selection might explain our results, we employ an instrumental variable approach. We use an exogenous determinant of the choice of hiring politically connected directors, the firm location. In the prior work, Agrawal and Knoeber (2001) and Boubakri, Cosset and Saffar (2008) among others, document that firm location

[30] The pre-match logit regression results are reported in column 1 of Panel A of Appendix 4.B. We employ two diagnostic checks and the results are presented in Appendix 4.B. First, we re-estimate the logit model with the matched sample. The result reported in column 2 of Panel A show that none of the coefficients is significant. Second, we examine the difference in each observable characteristic between the two groups. The results in Panel C show that none of the differences is significant. Taken together, the two diagnostic tests suggest that the PSM removes all other observable differences and the treatment and control groups in our matched sample are indistinguishable. In addition, our results remain the same when the maximum difference in propensity scores is set at 0.5% in absolute value, reported in Panel C of Appendix 4.B.

appears to be important to the establishment of political connections. Firms located in major cities are more likely to build political connections given their resources. More specifically, similar to Chaney, Faccio and Parsley (2011) and Guedhami, Pittman and Saffar (2014), we use *CAPITAL*, a dummy variable set to one if a firm is located in the capital city in a province and zero otherwise, as the instrument of political connections. As also shown in Panel C of Table 4.2, firms located in capital cities have a higher level of political connections than firms located in other cities, and the difference is significant at the 1% level. Importantly, the correlation between *CAPITAL* and measures of stock return volatility (less than 0.04) is low in our dataset, supporting the validity of the exclusion restriction. In the first stage, we regress political connections on the dummy variable *CAPITAL* and control variables included in Eq. (4.1). The fitted value of political connections from the first stage is then used in the second stage explaining stock return volatility.

Table 4.7 reports the results using a two-stage least square (2SLS) estimator. Column 1 reports the result of the first stage, where *PC* is the dependent variable. Similar to Chaney, Faccio and Parsley (2011) and Guedhami, Pittman and Saffar (2014), the coefficient on the instrumental variable, *CAPITAL*, is positive and highly significant, suggesting that firms located in the capital city of provinces are more likely to build political connections. The validity tests of the instrument, including the F statistic and the Cragg-Donald's F Wald statistic, are also reported. The F statistic exceeds the often-used threshold of 10. The Cragg-Donald's Wald F statistic exceeds the Stock and Yogo (2005) critical value. Both tests suggest that our instrument is not weak (Cragg and Donald, 1993; Stock and Yogo, 2005). In addition, we find larger firms with more growth opportunities, higher leverage, higher stock return and elderly directors have a higher level of political connections. Mature firms with greater cash flow volatility and more female directors have a lower level of political

connections. The results of the second stage are shown in columns 2-4, where the dependent variable is total volatility in column 2, systematic volatility in column 3, and idiosyncratic volatility in column 4, respectively. Consistent with our earlier results, we find that firms with greater political connections have higher total volatility and idiosyncratic volatility. Our results are robust after taking into account the endogeneity issue in the political connections, using the firm's location as an instrument.

[Insert Table 4.7 around here]

4.4.3.3 Alternative measures and additional variables

We use alternative measures of variables and add control variables to further validate the robustness of our main results. We begin with alternative measures of stock return volatility. First, we calculate stock return volatility based on daily stock returns excluding dividends. The results are reported in columns 1-3 of Table 4.8. Consistent with previous results, we observe positive impacts of political connections on total and idiosyncratic volatilities and an insignificant impact on systematic volatility. Second, we use weekly returns to measure stock return volatility. The results reported in columns 4-6 support the hypothesis that political connections increase total return volatility and idiosyncratic volatility. Finally, we control for several additional variables identified by the extant literature to further reduce the concern of potential correlated omitted variables. First, we add three firm-level financial variables which may affect the variability of stock returns, namely surplus cash (*SCASH*), R&D expenditures (R&D) and capital expenditures (*CAPEX*). Firms with more surplus cash and capital expenditure are viewed as less risky, while firms with more R&D expenditures are considered riskier. Moreover, we further control for gross regional product (*GRP*) growth

rate (*GRPGTH*) and the ratio of investment to GRP (*INVGRP*) at the province level to mitigate the impact of regional economic quality. We re-estimate our baseline model with the additional controlling variables. As presented in columns 7-9 of Table 4.8, the positive impacts of political connections on stock return volatility and idiosyncratic volatility are unaffected.

[Insert Table 4.8 around here]

Taken together, the checks in this section reinforce our main results in Table 4.4 and Table 4.5 that political connections deteriorate the information environment and drive stock returns more volatile, especially idiosyncratic returns.

4.4.4 Market development and political uncertainty

Next, we examine whether the relationship between political connections and stock return volatility is affected by market development and political uncertainty. Since the positive impact of political connections on stock return volatility is concentrated in idiosyncratic volatility, the results reported in the following tables are based on idiosyncratic volatility. Our inferences remain the same when total return volatility is used.[31]

4.4.4.1 Market development

Given the prior research, the above relationship between political connections and return volatility should be strengthened in areas where local economies are less market-oriented. This is because political connections can facilitate business as a substitute for formal

[31] The results of political connections and total return volatility across regions with different institutional development are reported in Appendix 4.C.

contracts and the detection and punishment of abuses are also lower in these areas. Political connections are expected to exert a stronger influence in return volatility in less developed markets. Specifically, we expect the association between political connections and return volatility is more evident in regions with lower market development, measured by overall market development, government decentralisation, banking sector liberalisation, and legal rights protection. To do this, we re-estimate the regression in Eq. (4.1) after bisecting the sample into regions with weak and strong market development, according to the median value of the various proxies described earlier.[32]

Table 4.9 provides the results after dividing the sample into two groups based on the median value of each proxy for provincial-level market development. The dependent variable is idiosyncratic volatility based on the market model (*IVOL*). Market development is measured as overall market development (*MKT*) in columns 1 and 2, the role of government decentralisation in business (*GOVT*) in columns 3 and 4, the liberalisation of the banking sector (*BANK*) in columns 5 and 6, and legal rights protection (*LAW*) in columns 7 and 8. We observe that the coefficient on *PC2* is positive and significant at either the 1% or 5% levels for firms in regions with less market-oriented economies (columns 2, 4, 6 and 8). The perceived uncertainty associated with political connections is magnified in these areas. These results lend support to the idea that the perceived volatility of firms with political connections is stronger in regions with relatively poor institutional development. Our findings are consistent with recent evidence that political connections exert a greater impact

[32] The sub-sample analysis regarding regional characteristics follows extensive prior research (Pinkowitz, Stulz and Williamson, 2006; Boubakri *et al.*, 2012; Guedhami, Pittman and Saffar, 2014). This can alleviate some multicollinearity due to the high correlations between regional characteristics and their interactions with political connections in the analysis.

on corporate policies and outcomes in less developed regions (Chen, Ding and Kim, 2010; Boubakri *et al.*, 2012; Guedhami, Pittman and Saffar, 2014).

[Insert Table 4.9 around here]

4.4.4.2 Political uncertainty

Next, we investigate the heterogeneity in the relationship by conditioning on political uncertainty. The establishment and removal of political connections are largely dependent on the local political environment. For example, political connections are likely to cut off when existing politicians are dismissed and new ones from other regions are appointed. The risk of losing political connections is especially high during an uncertain political period. Therefore, in regions with high political uncertainty, firms with political connections have incentives to improve financial reporting quality and reduce information asymmetry in case they lose their connections with local government officials. We predict that the positive impact of political connections becomes weaker during highly uncertain political periods.

As described above, we measure political uncertainty by the turnover of local government officials (Xu *et al.*, 2016). We first divided the sample into two groups: (1) firms in regions with a turnover of the province-level Governor or Communist Party Secretary; and (2) firms in regions without such a turnover. The results are shown in columns 1 and 2 in Table 4.10. The dependent variable is idiosyncratic volatility based on the market model (*IVOL*). In line with the prediction, the impact of political connections on firm risk is positive and statistically significant in the subsample without a province-level official turnover. We then consider the city-level official turnover and bisect the sample into subsample of firms located in regions with high and low city-level official turnover based on its median value. The

results are reported in columns 3 and 4 of Table 4.10. Similarly, the positive impact of political connections on return volatility is only significant for firms which experience a lower level of political uncertainty at the city level. The findings together support our third hypothesis (***H3***) that political uncertainty weakens the association between political connections and stock return volatility.

[Insert Table 4.10 around here]

To sum up, our empirical findings strongly support regional characteristics such as market development and political uncertainty shape the role of political connections in the variability of stock returns.

4.4.5 Further analyses

4.4.5.1 The riskiness of investment and financing policies

There is an alternative explanation for our main result. The positive impact of political connections on stock return volatility may be a result of risk-taking behaviours. Firms with political connections have a greater ability to take risks, as these firms benefit from the implicit bailout guarantee and are protected against bankruptcy (Boubakri, Mansi and Saffar, 2013). Therefore, the volatility of stock returns might be due to the risk-taking incentives.

To solve the concern, we directly test the impact of political connections on different measures of riskiness of investment and financing policies, including R&D expenditures, capital expenditures, working capital, operating leverage and financial leverage, which have been used as risk-taking behaviours in the prior literature (Kim and Lu, 2011; Serfling, 2014). Firms with high R&D expenditures, lower capital expenditures, less working capital,

high operating leverage and financial leverage are considered riskier. If the risk-taking behaviours explain our main result, we predict a significant positive relationship between political connections and the riskiness of investment and financing policies.

Table 4.11 reports the results. We find the coefficient on *PC2* is not significant in columns 1-4. The coefficient on *PC2* for financial leverage is positive and weakly significant at the 10% level in column 5. Taken together, we do not observe a consistent result that political connections increase firms' risk-taking behaviours. The results contradict the findings of Boubakri, Mansi and Saffar (2013) and suggest that political connections do not encourage firm managers to invest in more risky investments in the Chinese private sector.

[Insert Table 4.11 around here]

4.4.5.2 Earnings management

If the information asymmetry hypothesis of political connections explains corporate stock return volatility, we would expect that the positive impact of political connections on stock return volatility, especially idiosyncratic part, is more pronounced in firms with poorer financial reporting quality. Financial reporting quality is proxied by the accrual-based measure of earnings quality. Earnings management (*EM*) is defined as the absolute value of discretionary accruals (*DA*) estimated based on the modified Jones (1991) model, following the extant literature (Aboody, Hughes and Liu, 2005; Yu, 2008).[33]

Table 4.12 reports the results. The dependent variable is idiosyncratic volatility based on the market model (*IVOL*) in columns 1 and 2. We first add *EM* into Eq. (4.1) and the result in

[33] More information about the proxy for earnings management is described in Appendix 4.D.

column 1 shows that earnings management has a positive impact on idiosyncratic volatility, consistent with the prior literature (Rajgopal and Venkatachalam, 2011) that poor financial reporting quality increases corporate perceived risks. Next, we further add the interaction between political connections and earnings management (*PC2* × *EM*) into the model. The result in column 2 reports a positive coefficient on the interaction term *PC2* × *EM*. The coefficient on *PC2* is still positive but not significant. This finding is consistent with our prediction that firms with political connections increase stock return volatility primarily due to poor accounting information quality and severe information asymmetry. The results remain when alternative measures of idiosyncratic volatility ($IVOL^{Agg}$ and $IVOL^{FF}$) are used, as shown in columns 3-6 of Table 4.12.

4.5 Conclusions

Connections with politicians are important to firm value and corporate financial decisions, especially for firms in the private sector. In this chapter, we investigate the impact of political connections on the volatility of stock returns. Political connections can possibly affect the variability of stock returns through three mechanisms. First, political connections can provide firms with an implicate bailout guarantee and preferential access to capital, which makes market risk matters less and suggests a lower stock return volatility. Second, the severe agency problems associated with political connections can increase systematic volatility and the cost of capital required by investors. Third, previous evidence finds that firms with political connections exhibit poor financial reporting quality and information asymmetry, leading to higher return volatility, especially idiosyncratic return volatility.

Using a sample of Chinese non-SOEs between 2008 and 2016, we find political connections, measured as the percentage of directors with political working experience, have positive and significant impacts on stock return volatility and, in particular, idiosyncratic return volatility. The impact is robust to a variety of model specifications, alternative measures of key variables and controlling for additional variables. To mitigate endogeneity concerns, we employ two methods: a propensity-score matched sample and an instrumental variable approach. The positive impact of political connections on stock return volatility is found to be stronger for firms with poorer financial reporting quality. The results support the information asymmetry hypothesis of political connections that investors perceive stock returns of politically connected firms with more asymmetric information as more volatile.

Next, we test the roles of market development and political uncertainty in the impact of political connections on stock return volatility. We observe that the positive impact of political connections on stock return volatility is stronger for firms in areas with weaker institutional development, suggesting weak institutional quality magnifies the costs of political connections. In addition, the positive impact of political connections on stock return volatility is more evident for firms in regions with lower political uncertainty, supporting the view that political connections are more important during periods of political stability.

Finally, we address the concern that our results may be driven by corporate risk-taking rather than asymmetric information channels. We directly test the impact of political connections on various proxies for the riskiness of investment and financing policies and find no results that political connections increase a firm's riskiness of investment policy. Our analysis demonstrates that the impact of political connections on stock return volatility is consistent with asymmetric information mechanisms and not due to corporate risk-taking.

Overall, our findings suggest that political connections affect not only the level but the variability of stock returns. Investors perceive firms with politically connected directors as risky, leading to higher stock return volatility.

The empirical results of this study have clear implications for policymakers. Government policy should continue to aim at reducing the political link between privately listed firms and the government, which can improve the information quality in the financial market. Moreover, it is important to reduce the political and social discrimination that firms in the private sector face. It is essential to provide a fair institutional environment, a strong legal system and adequate investor protection for firms in the private sector, which can fundamentally reduce their incentives to build political connections.

Table 4.1 Definition of main variables in Chapter 4

Variable	Source	Definition
PC1	Annual reports	The percentage of directors with political connections at all levels on the board of directors
PC2	Annual reports	The percentage of directors with political connections at the city level or above on the board of directors
PC3	Annual reports	The percentage of directors with political connections at the province level or above on the board of directors
TVOL	CSMAR	Total return volatility, defined as the annualised standard deviations of daily stock returns over the fiscal year
IVOL	CSMAR	Idiosyncratic volatility, defined as the annualised standard deviations of the residuals from the regression of daily stock returns on the market model estimated over the fiscal year; market return is proxied by SSE and SZSE composite market-value-weighted returns for firms listed on the Shanghai and Shenzhen stock exchanges, respectively
$IVOL^{Agg}$	CSMAR	Idiosyncratic volatility, defined as the annualised standard deviations of the residuals from the regression of daily stock returns on the market model estimated over the fiscal year; market return is proxied by aggregated value-weighted market return including all shares in the two stock exchanges
$IVOL^{FF}$	CSMAR	Idiosyncratic volatility, defined as the annualised standard deviations of the residuals from the regression of daily stock returns on the Fama and French three-factor model estimated over the fiscal year
SVOL	CSMAR	Systematic volatility, defined as the difference between total return volatility and idiosyncratic volatility based on the market model (*IVOL*)
$SVOL^{Adj}$	CSMAR	Systematic volatility, defined as the difference between total return volatility and idiosyncratic volatility based on the market model ($IVOL^{Agg}$)
$SVOL^{FF}$	CSMAR	Systematic volatility, defined as the difference between total return volatility and idiosyncratic volatility based on the Fama and French three-factor model ($IVOL^{FF}$)
SIZE	CSMAR, NBS	The natural logarithm of total assets deflated using CPI to the year 2008
AGE	CSMAR	The natural logarithm of one plus the number of years after IPO
MB	CSMAR	The market value of total assets divided by the book value of total assets
SG	CSMAR	The percentage change in total operating revenues
LEV	CSMAR	The sum of short-term and long-term debts divided by total assets
ROA	CSMAR	The earnings before interest and taxes divided by total assets
RET	CSMAR	Annual stock return

CFVOL	CSMAR	The standard deviation of annual operating cash flow divided by total assets over the trailing five-year window
BFEM	CSMAR	The percentage of female directors on the board
BAGE	CSMAR	Natural logarithm of one plus average director age
BOWN	CSMAR	The percentage of shares owned by board directors
CAPITAL	Baidu	A dummy variable which is set to one if a firm's headquarters is located in the capital city of a province, and zero otherwise
Dummy PC2	Annual reports	A dummy variable, which takes the value of one for the highest tercile of *PC2* and zero for the lowest tercile of *PC2*
SCASH	CSMAR	Operating cash flow minus depreciation and R&D expenses divided by total assets
R&D	CSMAR	R&D expenses divided by total assets
CAPEX	CSMAR	Capital expenditures divided by total assets
GRPGTH	NBS	The growth rate of gross regional product at the province level
INVGRP	NBS	Total fixed investment divided by gross regional product at the province level
MKT	NERI report	Market development, defined as the National Economic Research Institution (NERI) index at the province level
GOVT	NERI report	NERI sub-index, the role of government decentralisation in business at the province level
BANK	NERI report	NERI sub-index, the degree of liberalisation in the banking sector at the province level
LAW	NERI report	NERI sub-index, the degree of legal protection of property rights at the province level
TOVER_PROV	Local governments' websites, Baidu	The number of turnovers of the province-level governor and secretary
TOVER_CITY	Local governments' websites, Baidu	The number of turnovers of the city-level mayor and secretary
WC	CSMAR	Current assets minus current liabilities divided by total assets
OPLEV	CSMAR	The percentage change in operating income for a percentage change in sales and is estimated using quarterly data from year *t* to year *t+2*
EM	CSMAR	Earnings management, defined as the absolute value of discretionary accruals

Table 4.2 Summary statistics of political connections

Panel A: By year

Year	Obs.	*PC1*	*PC2*	*PC3*
2008	505	0.259	0.231	0.171
2009	566	0.268	0.238	0.178
2010	648	0.265	0.236	0.174
2011	940	0.265	0.232	0.166
2012	1,208	0.259	0.228	0.163
2013	1,322	0.256	0.226	0.158
2014	1,263	0.232	0.204	0.141
2015	1,370	0.184	0.165	0.122
Total	7,822	0.243	0.215	0.154

Panel B: By industry

Industry	Obs.	*PC1*	*PC2*	*PC3*
Commence	430	0.241	0.226	0.172
Conglomerates	297	0.288	0.245	0.171
Industrials	5,459	0.243	0.212	0.150
Properties	539	0.274	0.251	0.191
Utilities	1,097	0.217	0.196	0.145

Panel C: By location

Location	Obs.	*PC1*	*PC2*	*PC3*
Capital cities	3,092	0.243	0.228	0.182
Other cities	4730	0.243	0.206	0.136
Difference		0.000	0.022	0.046
t-value		0.13	6.08***	14.44***

Panel D: By province

Province	Obs.	*PC1*	*PC2*	*PC3*
Anhui	187	0.257	0.236	0.186
Beijing	486	0.210	0.206	0.169
Chongqing	84	0.236	0.222	0.198
Fujian	322	0.265	0.257	0.184
Gansu	78	0.305	0.277	0.194
Guangdong	1,422	0.225	0.196	0.115
Guangxi	90	0.227	0.204	0.126
Guizhou	46	0.250	0.219	0.142
Hainan	98	0.343	0.308	0.261
Hebei	133	0.214	0.191	0.152
Heilongjiang	80	0.267	0.250	0.172
Henan	177	0.253	0.225	0.170
Hubei	244	0.267	0.239	0.186
Hunan	164	0.301	0.283	0.224
Inner-Mongolia	73	0.187	0.162	0.109
Jiangsu	898	0.212	0.171	0.113
Jiangxi	64	0.295	0.251	0.188
Jilin	112	0.290	0.260	0.197
Liaoning	187	0.201	0.195	0.131
Ningxia	34	0.219	0.190	0.160
Qinghai	25	0.173	0.173	0.119
Shaanxi	69	0.214	0.202	0.189
Shandong	489	0.249	0.209	0.137
Shanghai	487	0.224	0.216	0.176
Shanxi	60	0.254	0.232	0.180

	Sichuan	304	0.267	0.251	0.193
	Tianjin	65	0.254	0.246	0.209
	Tibet	46	0.190	0.190	0.174
	Xinjiang	73	0.224	0.214	0.192
	Yunnan	43	0.294	0.251	0.195
	Zhejiang	1,182	0.274	0.222	0.161

This table presents summary statistics of political connections by year in Panel A, by industry in Panel B, and by location in Panel C, and by province in Panel D. Definitions of all variables are in Table 4.1.

Table 4.3 Summary statistics of main variables

Variable	Obs.	Mean	p25	p50	p75	SD
TVOL	7,822	0.498	0.391	0.464	0.565	0.147
IVOL	7,822	0.384	0.302	0.366	0.449	0.113
$IVOL^{Agg}$	7,822	0.399	0.313	0.378	0.464	0.122
$IVOL^{FF}$	7,822	0.370	0.294	0.354	0.433	0.108
SVOL	7,822	0.114	0.064	0.096	0.148	0.070
$SVOL^{Agg}$	7,822	0.099	0.050	0.083	0.140	0.062
$SVOL^{FF}$	7,822	0.127	0.075	0.106	0.161	0.075
SIZE	7,822	21.387	20.679	21.294	22.010	1.038
AGE	7,822	1.865	1.386	1.792	2.565	0.741
MB	7,822	2.444	1.372	1.827	2.731	1.881
SG	7,822	0.223	-0.031	0.126	0.302	0.605
LEV	7,822	0.168	0.018	0.142	0.278	0.153
ROA	7,822	0.059	0.030	0.055	0.087	0.061
RET	7,822	0.354	-0.158	0.192	0.679	0.742
CFVOL	7,822	0.056	0.030	0.046	0.074	0.036
BFEM	7,822	0.145	0.000	0.111	0.222	0.128
BAGE	7,822	3.921	3.871	3.921	3.970	0.073
BOWN	7,822	0.171	0.000	0.033	0.343	0.213
CAPITAL	7,822	0.395	0.000	0.000	1.000	0.489

This table presents summary statistics of key variables. Definitions of all variables are in Table 4.1.

Table 4.4 Political connections and total return volatility

Variable	(1)	(2)	(3)
	All levels	City level or above	Province level or above
PC1	0.014**		
	(2.06)		
PC2		0.019***	
		(2.60)	
PC3			0.019**
			(2.34)
SIZE	-0.023***	-0.023***	-0.023***
	(-15.09)	(-15.14)	(-15.21)
AGE	-0.010***	-0.010***	-0.011***
	(-5.17)	(-5.20)	(-5.28)
MB	-0.004***	-0.004***	-0.004***
	(-4.92)	(-4.96)	(-4.96)
SG	0.009***	0.009***	0.009***
	(5.45)	(5.42)	(5.42)
LEV	0.007	0.007	0.008
	(0.87)	(0.90)	(0.96)
ROA	-0.198***	-0.199***	-0.200***
	(-9.15)	(-9.18)	(-9.22)
RET	0.034***	0.034***	0.034***
	(17.01)	(16.99)	(16.98)
CFVOL	0.025	0.026	0.026
	(0.77)	(0.83)	(0.82)
BFEM	-0.006	-0.006	-0.006
	(-0.65)	(-0.64)	(-0.66)
BAGE	-0.042***	-0.044***	-0.043***
	(-2.70)	(-2.84)	(-2.75)
BOWN	0.026***	0.026***	0.027***
	(4.07)	(4.08)	(4.09)
Constant	1.262***	1.272***	1.269***
	(18.41)	(18.51)	(18.45)
Year Effect	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes
R-squared	0.71	0.71	0.71
Observations	7,822	7,822	7,822

This table presents regression results of political connections and stock return volatility. Political connections are measured as *PC1* in column 1, *PC2* in column 2, and *PC3* in column 3, respectively. The dependent variable is total return volatility (*TVOL*). Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.5 Systematic volatility versus idiosyncratic volatility

Variable	Systematic volatility			Idiosyncratic volatility		
	SVOL	$SVOL^{Agg}$	$SVOL^{FF}$	IVOL	$IVOL^{Agg}$	$IVOL^{FF}$
	(1)	(2)	(3)	(4)	(5)	(6)
PC2	-0.000	-0.003	-0.003	0.019***	0.022***	0.022***
	(-0.11)	(-0.87)	(-0.78)	(2.75)	(3.10)	(3.19)
SIZE	0.001	0.005***	-0.001	-0.024***	-0.029***	-0.023***
	(0.57)	(6.45)	(-0.77)	(-16.33)	(-19.23)	(-15.87)
AGE	-0.011***	-0.001	-0.005***	0.001	-0.009***	-0.006***
	(-9.72)	(-1.20)	(-4.22)	(0.34)	(-4.81)	(-3.00)
MB	-0.002***	-0.001***	-0.002***	-0.002***	-0.003***	-0.002**
	(-4.10)	(-2.91)	(-4.45)	(-2.77)	(-3.74)	(-2.43)
SG	-0.001	-0.003***	-0.002**	0.010***	0.011***	0.010***
	(-1.17)	(-3.56)	(-1.99)	(6.03)	(6.84)	(6.32)
LEV	-0.020***	-0.013***	-0.017***	0.028***	0.021***	0.025***
	(-4.02)	(-3.11)	(-3.35)	(3.51)	(2.60)	(3.17)
ROA	0.010	0.009	-0.011	-0.208***	-0.208***	-0.187***
	(0.84)	(0.89)	(-0.92)	(-10.63)	(-10.43)	(-9.97)
RET	0.002*	-0.000	0.003**	0.032***	0.034***	0.032***
	(1.86)	(-0.26)	(2.12)	(16.80)	(17.72)	(16.93)
CFVOL	-0.060***	-0.024	-0.059***	0.085***	0.050	0.085***
	(-3.21)	(-1.48)	(-3.05)	(2.73)	(1.55)	(2.71)
BFEM	-0.009*	-0.009**	-0.011**	0.003	0.003	0.005
	(-1.70)	(-2.07)	(-2.15)	(0.41)	(0.32)	(0.62)
BAGE	0.012	0.018**	0.016*	-0.059***	-0.064***	-0.062***
	(1.31)	(2.34)	(1.70)	(-3.94)	(-4.24)	(-4.29)
BOWN	0.015***	0.003	0.009**	0.011*	0.023***	0.018***
	(4.09)	(1.11)	(2.29)	(1.88)	(3.72)	(2.98)
Constant	0.106**	-0.039	0.126***	1.174***	1.324***	1.152***
	(2.50)	(-1.14)	(3.01)	(17.73)	(19.79)	(17.91)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.61	0.64	0.62	0.52	0.57	0.48
Observations	7,822	7,822	7,822	7,822	7,822	7,822

This table presents regression results of political connection, systematic volatility and idiosyncratic volatility. The dependent variable is systematic volatility (*SVOL*, $SVOL^{Agg}$, and $SVOL^{FF}$) in columns 1-3 and idiosyncratic volatility (*IVOL*, $IVOL^{Agg}$, and $IVOL^{FF}$) in columns 4-6. Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.6 Addressing endogeneity: Matched-sample analysis

Variable	Total volatility	Systematic volatility	Idiosyncratic volatility
	(1)	(3)	(5)
Dummy PC2	0.010***	0.003*	0.007**
	(3.00)	(1.74)	(2.01)
SIZE	-0.020***	0.000	-0.020***
	(-8.77)	(0.37)	(-9.49)
AGE	-0.009***	-0.010***	0.001
	(-3.08)	(-6.14)	(0.26)
MB	-0.004**	-0.003***	-0.001
	(-2.29)	(-3.44)	(-0.54)
SG	0.005**	-0.001	0.007**
	(2.13)	(-0.98)	(2.39)
LEV	0.019	-0.030***	0.049***
	(1.44)	(-4.25)	(3.84)
ROA	-0.155***	0.030	-0.186***
	(-3.99)	(1.46)	(-5.78)
RET	0.033***	0.005***	0.028***
	(9.64)	(2.64)	(8.40)
CFVOL	0.060	-0.088***	0.147***
	(1.08)	(-3.00)	(2.92)
BFEM	-0.004	-0.009	0.005
	(-0.34)	(-1.27)	(0.37)
BAGE	-0.042*	0.008	-0.055**
	(-1.83)	(0.64)	(-2.29)
BOWN	0.032***	0.012**	0.020**
	(3.33)	(2.26)	(2.14)
Constant	1.188***	0.127**	1.077***
	(11.73)	(2.16)	(10.58)
Year Effect	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes
R-squared	0.71	0.61	0.50
Observations	4,924	4,924	4,924

This table presents regression results of political connections and stock return volatility, with the propensity-score matched sample. The dependent variable is total volatility (*TVOL*) in column 1, systematic volatility (*SVOL*) in column 2, and idiosyncratic volatility (*IVOL*) in column 3, respectively. Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.7 Addressing endogeneity: Two-stage least squares regression

Variable	1st stage	2nd Stage		
	Political connections	Total volatility	Systematic volatility	Idiosyncratic volatility
	(1)	(2)	(3)	(6)
PC2		0.261***	0.054	0.205**
		(2.94)	(1.18)	(2.40)
CAPITAL	0.023***			
	(6.43)			
SIZE	0.016***	-0.027***	-0.000	-0.027***
	(6.95)	(-13.90)	(-0.37)	(-14.31)
AGE	-0.013***	-0.008***	-0.011***	0.003
	(-4.33)	(-3.81)	(-10.72)	(1.38)
MB	0.004***	-0.005***	-0.002***	-0.003***
	(3.15)	(-5.89)	(-5.22)	(-3.56)
SG	0.002	0.008***	-0.001	0.009***
	(0.77)	(4.52)	(-1.32)	(5.32)
LEV	0.046***	-0.002	-0.022***	0.020**
	(3.48)	(-0.26)	(-5.23)	(2.55)
ROA	0.023	-0.204***	0.008	-0.212***
	(0.77)	(-10.53)	(0.87)	(-12.11)
RET	0.006*	0.033***	0.002	0.031***
	(1.67)	(14.65)	(1.58)	(14.90)
CFVOL	-0.106**	0.054*	-0.054***	0.106***
	(-2.86)	(1.74)	(-3.50)	(3.59)
BFEM	-0.039***	0.004	-0.007	0.011
	(-2.86)	(0.49)	(-1.47)	(1.31)
BAGE	0.480***	-0.161***	-0.014	-0.148***
	(18.64)	(-3.57)	(-0.60)	(-3.39)
BOWN	-0.012	0.028***	0.016***	0.013**
	(-1.15)	(4.86)	(5.30)	(2.26)
Constant	-2.07***	1.684***	0.235**	1.450***
	(-18.26)	(8.70)	(2.35)	(7.72)
Year Effect	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes
R-squared	0.10	0.65	0.59	0.46
Observations	7,822	7,822	7,822	7,822
F-statistic	41.38			
Cragg-Donald Wald F-statistic	41.31			
Stock and Yogo (2005)weak ID test critical value	16.38			

This table presents 2SLS regression results of political connections and stock return volatility. The dependent variables are political connections (*PC2*) in column 1, total volatility (*TVOL*) in column 2, systematic volatility (*SVOL*) in column 3, and idiosyncratic volatility (*IVOL*) in column 4, respectively. The instrumental variable used in the first stage is whether a firm operates in the capital city of a province (*CAPITAL*). Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.8 Robustness checks

Variable	Returns unadjusted by dividends			Weekly returns			Additional control variables		
	Total volatility	Systematic volatility	Idiosyncratic volatility	Total volatility	Systematic volatility	Idiosyncratic volatility	Total volatility	Systematic volatility	Idiosyncratic volatility
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PC2	0.019***	-0.001	0.019***	0.023**	0.003	0.020**	0.020***	0.000	0.020***
	(2.60)	(-0.12)	(2.76)	(2.26)	(0.71)	(2.07)	(2.82)	(0.04)	(2.87)
SIZE	-0.023***	0.000	-0.024***	-0.035***	-0.000	-0.035***	-0.023***	0.000	-0.024***
	(-15.09)	(0.52)	(-16.26)	(-16.33)	(-0.35)	(-17.07)	(-15.01)	(0.35)	(-16.13)
AGE	-0.011***	-0.011***	0.001	-0.006**	-0.007***	0.001	-0.009***	-0.009***	-0.000
	(-5.24)	(-9.72)	(0.30)	(-2.07)	(-7.45)	(0.55)	(-4.22)	(-7.62)	(-0.01)
MB	-0.004***	-0.002***	-0.002***	-0.005***	-0.001***	-0.004***	-0.005***	-0.002***	-0.002***
	(-4.97)	(-4.09)	(-2.78)	(-4.35)	(-3.19)	(-3.46)	(-5.40)	(-4.77)	(-2.85)
SG	0.009***	-0.001	0.010***	0.010***	0.001	0.010***	0.009***	-0.001	0.010***
	(5.38)	(-1.14)	(5.98)	(3.98)	(0.79)	(3.80)	(5.33)	(-1.32)	(5.99)
LEV	0.007	-0.019***	0.027***	0.019	-0.013***	0.031***	0.010	-0.019***	0.029***
	(0.82)	(-3.95)	(3.39)	(1.60)	(-3.24)	(2.70)	(1.20)	(-3.73)	(3.57)
ROA	-0.196***	0.009	-0.205***	-0.326***	-0.004	-0.321***	-0.174***	0.016	-0.190***
	(-9.09)	(0.78)	(-10.52)	(-10.78)	(-0.42)	(-11.18)	(-7.86)	(1.40)	(-9.30)
RET	0.034***	0.002*	0.032***	0.041***	0.003**	0.039***	0.034***	0.002*	0.032***
	(16.97)	(1.89)	(16.76)	(14.06)	(2.34)	(13.69)	(16.69)	(1.70)	(16.67)
CFVOL	0.026	-0.061***	0.086***	0.051	-0.040***	0.094**	0.022	-0.056***	0.076**
	(0.83)	(-3.22)	(2.74)	(1.12)	(-2.59)	(2.11)	(0.70)	(-2.99)	(2.43)
BFEM	-0.005	-0.009*	0.003	-0.006	-0.006	-0.001	-0.001	-0.006	0.005
	(-0.63)	(-1.71)	(0.42)	(-0.50)	(-1.35)	(-0.08)	(-0.13)	(-1.23)	(0.65)
BAGE	-0.044***	0.013	-0.059***	-0.100***	-0.007	-0.094***	-0.041***	0.013	-0.057***
	(-2.83)	(1.33)	(-3.95)	(-4.44)	(-0.83)	(-4.26)	(-2.70)	(1.43)	(-3.82)
BOWN	0.026***	0.015***	0.011*	0.027***	0.011***	0.015*	0.022***	0.013***	0.009
	(4.03)	(4.12)	(1.81)	(2.96)	(3.50)	(1.73)	(3.40)	(3.41)	(1.55)

SCASH							-0.065***	-0.029***	-0.036**
							(-4.54)	(-3.64)	(-2.55)
R&D							0.232***	0.206***	0.031
							(3.16)	(4.53)	(0.43)
CAPEX							-0.044**	0.015	-0.061***
							(-2.24)	(1.38)	(-3.12)
GRPGTH							0.052	0.055**	-0.005
							(1.18)	(2.35)	(-0.11)
INVGRP							-0.024***	-0.013***	-0.011*
							(-4.11)	(-3.50)	(-1.94)
Constant	1.268***	0.106**	1.170***	1.733***	0.138***	1.596***	1.260***	0.095**	1.172***
	(18.49)	(2.51)	(17.73)	(17.72)	(3.96)	(16.78)	(18.12)	(2.27)	(17.39)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.72	0.61	0.52	0.63	0.50	0.50	0.72	0.61	0.52
Observations	7822	7822	7822	7822	7822	7822	7822	7822	7822

This table presents the results of robustness checks. Columns 1-3 calculate stock return volatility excluding dividends. Columns 4-6 calculate stock return volatility with weekly returns. Columns 7-9 include additional control variable, including surplus cash (*SCASH*), R&D expenditures (*R&D*), capital expenditures (*CAPEX*), GRP growth (*GRPGTH*) and investment-to-GRP ratio (*INVGRP*). The dependent variables are total volatility (*TVOL*) in columns 1, 4 and 7, systematic volatility (*SVOL*) in columns 2, 5 and 8, and idiosyncratic volatility (*IVOL*) in columns 3, 6 and 9. Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.9 Market development, political connections and idiosyncratic return volatility

Variable	Market development		Government decentralisation		Banking sector liberalisation		Legal rights protection	
	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PC2	0.010	0.025***	0.010	0.025***	0.013	0.019**	0.016	0.022**
	(0.86)	(2.91)	(0.90)	(2.81)	(1.16)	(2.20)	(1.28)	(2.54)
SIZE	-0.022***	-0.025***	-0.025***	-0.024***	-0.028***	-0.021***	-0.024***	-0.024***
	(-8.87)	(-13.53)	(-9.59)	(-13.08)	(-11.83)	(-11.56)	(-9.80)	(-13.27)
AGE	-0.003	0.003	-0.000	0.001	0.002	-0.002	0.003	-0.000
	(-0.91)	(1.09)	(-0.16)	(0.47)	(0.79)	(-0.79)	(0.83)	(-0.04)
MB	-0.002	-0.002**	-0.002	-0.002**	-0.002	-0.002**	-0.002	-0.002**
	(-1.23)	(-2.32)	(-1.25)	(-2.20)	(-1.56)	(-2.19)	(-1.60)	(-2.23)
SG	0.008**	0.011***	0.007**	0.011***	0.013***	0.008***	0.007**	0.010***
	(2.39)	(5.77)	(2.27)	(5.85)	(3.77)	(4.74)	(2.06)	(5.70)
LEV	0.026**	0.030***	0.033**	0.025**	0.022*	0.029***	0.025*	0.032***
	(2.02)	(2.98)	(2.50)	(2.56)	(1.80)	(2.93)	(1.77)	(3.36)
ROA	-0.240***	-0.195***	-0.256***	-0.187***	-0.215***	-0.212***	-0.216***	-0.207***
	(-7.11)	(-8.23)	(-8.30)	(-7.70)	(-6.92)	(-8.53)	(-6.07)	(-8.87)
RET	0.034***	0.030***	0.033***	0.031***	0.031***	0.032***	0.032***	0.032***
	(11.20)	(12.14)	(10.67)	(12.78)	(10.43)	(12.97)	(10.41)	(13.30)
CFVOL	0.138**	0.057	0.117**	0.065*	0.058	0.115***	0.104*	0.078**
	(2.58)	(1.49)	(2.20)	(1.73)	(1.22)	(2.87)	(1.89)	(2.09)
BFEM	-0.010	0.011	-0.015	0.012	-0.012	0.014	-0.007	0.012
	(-0.73)	(1.05)	(-1.13)	(1.13)	(-0.93)	(1.29)	(-0.52)	(1.10)
BAGE	-0.029	-0.074***	-0.050**	-0.064***	-0.043*	-0.065***	-0.041*	-0.066***
	(-1.19)	(-3.98)	(-2.17)	(-3.37)	(-1.89)	(-3.43)	(-1.67)	(-3.56)
BOWN	-0.003	0.019**	-0.011	0.023***	0.014	0.006	0.011	0.008
	(-0.35)	(2.51)	(-1.13)	(2.98)	(1.64)	(0.69)	(1.18)	(1.05)

MKT	-0.016***	0.001						
	(-3.07)	(0.51)						
GOVT			-0.002	-0.001				
			(-0.76)	(-1.10)				
BANK					0.003	-0.002**		
					(1.41)	(-1.99)		
LAW							-0.002***	0.000
							(-3.90)	(1.08)
Constant	1.156***	1.243***	1.183***	1.188***	1.169***	1.155***	1.119***	1.201***
	(10.04)	(15.22)	(10.99)	(14.34)	(10.63)	(13.98)	(10.13)	(14.79)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.53	0.52	0.55	0.50	0.56	0.50	0.54	0.51
Observations	2,864	4,958	2,863	4,959	3,123	4,699	2,844	4,978

This table presents results of province-level subsample analysis of market development. Columns 1 and 2 use the sample of firms from regions with high and low overall market development (*MKT*). Columns 3 and 4 use sample of firms from regions with high and low government decentralisation (*GOVT*). Columns 5 and 6 use the sample of firms from regions with high and low banking sector liberalisation (*BANK*). Columns 7 and 8 use the sample of firms from regions with high and low legal rights protection (*LAW*). The dependent variable is idiosyncratic volatility *(IVOL*). Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.10 Political uncertainty, political connections and idiosyncratic volatility

Variable	Province-level political turnover		City-level political turnover	
	Yes	No	High	Low
	(1)	(2)	(3)	(4)
PC2	0.008	0.025***	0.014	0.022***
	(0.69)	(3.15)	(1.43)	(2.64)
SIZE	-0.019***	-0.026***	-0.025***	-0.023***
	(-7.83)	(-15.33)	(-12.22)	(-13.15)
AGE	-0.005	0.003	0.001	0.000
	(-1.56)	(1.44)	(0.52)	(0.10)
MB	0.001	-0.003***	-0.001	-0.003***
	(0.66)	(-3.93)	(-1.09)	(-2.88)
SG	0.012***	0.009***	0.012***	0.009***
	(3.91)	(4.75)	(4.56)	(4.17)
LEV	0.021	0.033***	0.043***	0.019*
	(1.56)	(3.67)	(3.91)	(1.87)
ROA	-0.213***	-0.205***	-0.216***	-0.202***
	(-6.29)	(-9.75)	(-7.95)	(-8.20)
RET	0.022***	0.035***	0.031***	0.032***
	(5.66)	(15.95)	(10.49)	(12.99)
CFVOL	0.076	0.091***	0.046	0.113***
	(1.43)	(2.63)	(1.13)	(2.91)
BFEM	0.016	-0.002	-0.001	0.007
	(1.22)	(-0.22)	(-0.05)	(0.75)
BAGE	-0.046*	-0.060***	-0.051**	-0.059***
	(-1.89)	(-3.54)	(-2.46)	(-3.19)
BOWN	0.010	0.012*	0.004	0.015**
	(1.00)	(1.78)	(0.45)	(1.97)
TOVER_CITY			0.000	-0.001
			(0.27)	(-1.30)
Constant	1.027***	1.216***	1.160***	1.170***
	(9.30)	(15.96)	(12.37)	(14.38)
Year effect	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes
R-squared	0.29	0.57	0.56	0.49
Observations	2,363	5,459	3,045	4,777

This table presents results of province-level subsample analysis of political uncertainty. Columns 1 and 2 report the results for firms in provinces with high and low province-level official turnover (*TOVER_PROV*). Columns 3 and 4 report the results for firms in provinces with high and low city-level official turnover (*TOVER_CITY*). The dependent variable is idiosyncratic volatility (*IVOL*). Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.11 Political connections and riskiness of investment and financing policies

Variable	R&D expenses	Capital expenditures	Working capital	Operating leverage	Financial leverage
	(1)	(2)	(3)	(4)	(5)
PC2	0.000	0.001	-0.010	0.170	0.009*
	(0.07)	(0.22)	(-0.45)	(0.84)	(1.71)
SIZE	0.001***	0.003**	-0.009	-0.019	0.009***
	(3.19)	(2.36)	(-1.41)	(-0.36)	(6.53)
AGE	-0.004***	-0.020***	-0.046***	0.007	-0.003**
	(-7.86)	(-12.55)	(-6.14)	(0.10)	(-2.09)
MB	0.001***	0.000	-0.010**	-0.023	-0.002*
	(3.13)	(0.10)	(-2.47)	(-0.46)	(-1.90)
SG	-0.001***	0.001	-0.010**	0.123	0.008***
	(-2.74)	(0.79)	(-1.97)	(1.10)	(4.35)
LEV	-0.019***	0.028***	-0.762***	-0.416	0.823***
	(-9.17)	(3.98)	(-23.29)	(-1.17)	(92.17)
ROA	0.017***	0.111***	0.513***	1.183	-0.035*
	(3.01)	(8.51)	(7.19)	(1.13)	(-1.69)
RET	0.001*	0.002*	0.006	0.111	0.001
	(1.65)	(1.84)	(1.06)	(1.28)	(0.39)
BFEM	-0.009***	0.002	-0.008	0.204	0.006
	(-3.77)	(0.38)	(-0.22)	(0.73)	(0.94)
BAGE	0.005	0.001	0.108*	0.654	-0.028**
	(1.26)	(0.12)	(1.77)	(1.18)	(-2.12)
BOWN	0.008***	-0.009*	0.058***	0.003	-0.007
	(3.58)	(-1.83)	(2.69)	(0.02)	(-1.52)
Constant	-0.026	0.003	0.158	-1.174	-0.045
	(-1.43)	(0.06)	(0.58)	(-0.49)	(-0.82)
Year effect	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
R squared	0.27	0.15	0.36	0.01	0.75
Observations	7,822	7,822	7,822	6,448	7,822

This table presents results of political connections and the riskiness of investment and financing policies. The dependent variable R&D expenses (*R&D*) in column 1, capital expenditures (*CAPEX*) in column 2, working capital (*WC*) in column 3, operating leverage (*OPLEV*) in column 4 and financial leverage (*LEV*) in column 5. Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4.12 Political connections, earnings management and return volatility

Variable	IVOL		$IVOL^{Agg}$		$IVOL^{FF}$	
	(1)	(2)	(3)	(4)	(5)	(6)
PC2	0.019***	0.008	0.021***	0.006	0.021***	0.011
	(2.73)	(0.88)	(3.08)	(0.69)	(3.17)	(1.30)
PC2×EM		0.171**		0.196**		0.154*
		(2.04)		(2.35)		(1.91)
EM	0.056***	0.020	0.049***	0.011	0.061***	0.029
	(3.64)	(0.82)	(3.10)	(0.46)	(4.01)	(1.19)
SIZE	-0.024***	-0.024***	-0.028***	-0.024***	-0.022***	-0.022***
	(-16.17)	(-16.16)	(-19.05)	(-16.35)	(-15.68)	(-15.67)
AGE	0.001	0.001	-0.010***	-0.000	-0.006***	-0.006***
	(0.30)	(0.31)	(-4.84)	(-0.03)	(-3.05)	(-3.04)
MB	-0.002***	-0.002***	-0.003***	-0.002***	-0.002***	-0.002***
	(-3.05)	(-2.98)	(-3.97)	(-2.65)	(-2.73)	(-2.67)
SG	0.009***	0.009***	0.011***	0.010***	0.010***	0.010***
	(5.87)	(5.89)	(6.72)	(5.89)	(6.15)	(6.17)
LEV	0.026***	0.026***	0.020**	0.024***	0.023***	0.023***
	(3.34)	(3.33)	(2.46)	(2.99)	(2.99)	(2.98)
ROA	-0.207***	-0.209***	-0.208***	-0.215***	-0.186***	-0.188***
	(-10.56)	(-10.68)	(-10.37)	(-10.86)	(-9.89)	(-10.01)
RET	0.032***	0.032***	0.034***	0.033***	0.031***	0.031***
	(16.63)	(16.62)	(17.56)	(17.35)	(16.75)	(16.73)
CFVOL	0.049	0.048	0.018	0.046	0.045	0.045
	(1.48)	(1.47)	(0.53)	(1.40)	(1.37)	(1.36)
BFEM	0.003	0.003	0.002	0.001	0.004	0.004
	(0.33)	(0.32)	(0.26)	(0.12)	(0.54)	(0.52)
BAGE	-0.057***	-0.057***	-0.062***	-0.054***	-0.060***	-0.060***
	(-3.82)	(-3.85)	(-4.14)	(-3.59)	(-4.15)	(-4.18)
BOWN	0.011*	0.011*	0.023***	0.014**	0.017***	0.017***
	(1.80)	(1.81)	(3.66)	(2.25)	(2.89)	(2.90)
Constant	1.162***	1.165***	1.314***	1.169***	1.140***	1.143***
	(17.55)	(17.63)	(19.62)	(17.54)	(17.70)	(17.76)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.52	0.52	0.57	0.55	0.48	0.48
Observations	7822	7822	7822	7822	7822	7822

This table presents results of political connections, earnings management and idiosyncratic return volatility. The dependent variable is *IVOL* in columns 1 and 2, $IVOL^{Agg}$ in columns 3 and 4, and $IVOL^{FF}$ in columns 5 and 6. Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Appendix 4.A Distribution of observations with politically connected directors by year, industry and location

Panel A: By year							
Year	Obs.	With PC directors		With PC directors at city level or above		With PC directors at province level or above	
		Obs.	(%)	Obs.	(%)	Obs.	(%)
2008	505	449	88.91%	429	84.95%	368	72.87%
2009	566	502	88.69%	483	85.34%	417	73.67%
2010	648	582	89.81%	561	86.57%	487	75.15%
2011	940	845	89.89%	814	86.60%	693	73.72%
2012	1,208	1,076	89.07%	1,032	85.43%	890	73.68%
2013	1,322	1,176	88.96%	1,135	85.85%	955	72.24%
2014	1,263	1,077	85.27%	1,034	81.87%	852	67.46%
2015	1,370	1,006	73.43%	968	70.66%	821	59.93%
Total	7,822	6,713	85.82%	6,456	82.54%	5,483	70.10%
Panel B: By industry							
Industry							
Conglomerates	297	253	85.19%	243	81.82%	214	72.05%
Commence	430	366	85.12%	359	83.49%	289	67.21%
Industrials	5,459	4709	86.26%	4,511	82.63%	3,810	69.79%
Properties	539	472	87.57%	464	86.09%	418	77.55%
Utilities	1,097	913	83.23%	879	80.13%	752	68.55%
Panel C: By location							
Location							
Capital cities	3,092	2,662	86.09%	2634	85.19%	2384	77.10%
Other cities	4,730	4,051	85.64%	3822	80.80%	3099	65.52%

This table reports the distribution of observations with politically connected directors at different political levels by year in Panel A, by industry in Panel B, and by location in Panel C, respectively.

Appendix 4.B Diagnostic and robust tests for the matched sample results

Panel A: Pre-match and post-match propensity score regressions

Variable	Pre-match	Post-match
	(1)	(2)
SIZE	0.158**	0.015
	(2.19)	(0.18)
AGE	-0.152*	-0.034
	(-1.66)	(-0.32)
MB	0.045	-0.025
	(1.40)	(-0.62)
SG	0.044	0.014
	(0.88)	(0.20)
LEV	0.626	-0.166
	(1.57)	(-0.35)
ROA	0.312	-0.138
	(0.39)	(-0.14)
RET	0.055	0.008
	(0.96)	(0.10)
CFVOL	-0.239	-0.607
	(-0.16)	(-0.35)
BFEM	-0.553	-0.072
	(-1.33)	(-0.15)
BAGE	7.273***	-0.187
	(9.49)	(-0.21)
BOWN	0.046	-0.362
	(0.15)	(-1.03)
_cons	-31.337***	0.685
	(-9.50)	(0.18)
Year effect	Yes	Yes
Industry effect	Yes	Yes
Pseudo R-squared	0.07	0.00
Observations	5,210	4,924

Panel B: Differences in firm characteristics

Variable	Firms with high PCs (N=2462)	Firms with low PCs (N=2462)	Difference	t-statistics
SIZE	21.469	21.426	0.043	1.47
AGE	1.849	1.842	0.007	0.36
MB	2.318	2.401	-0.083	-1.56
SG	0.227	0.219	0.008	0.47
LEV	0.176	0.176	0.000	-0.02
ROA	0.061	0.062	-0.001	-0.39
RET	0.325	0.349	-0.024	-1.14
CFVOL	0.056	0.056	0.000	-0.63
BFEM	0.137	0.138	-0.001	-0.36
BAGE	3.934	3.934	0.000	0.23

BOWN	0.167	0.176	-0.009	-1.59

Panel C: The regression results when the maximum permissible difference in propensity scores is 0.5% in absolute value

Variable	Total volatility	Systematic volatility	Idiosyncratic volatility
	(1)	(2)	(3)
Dummy PC	0.010***	0.003*	0.007**
	(3.08)	(1.82)	(2.02)
SIZE	-0.020***	0.000	-0.020***
	(-8.69)	(0.16)	(-9.20)
AGE	-0.009***	-0.009***	-0.001
	(-3.21)	(-5.41)	(-0.19)
MB	-0.004**	-0.003***	-0.001
	(-2.28)	(-3.61)	(-0.43)
SG	0.006**	-0.001	0.007***
	(2.36)	(-1.09)	(2.62)
LEV	0.018	-0.032***	0.050***
	(1.37)	(-4.43)	(3.86)
ROA	-0.164***	0.025	-0.191***
	(-4.26)	(1.24)	(-6.02)
RET	0.033***	0.004**	0.029***
	(9.90)	(2.40)	(8.67)
CFVOL	0.068	-0.098***	0.164***
	(1.24)	(-3.38)	(3.29)
BFEM	-0.004	-0.010	0.005
	(-0.34)	(-1.30)	(0.38)
BAGE	-0.038*	0.002	-0.043*
	(-1.69)	(0.14)	(-1.80)
BOWN	0.030***	0.014***	0.017*
	(3.23)	(2.60)	(1.80)
Constant	1.164***	0.158***	1.019***
	(11.78)	(2.75)	(9.84)
Year effect	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes
R-squared	0.71	0.61	0.50
Observations	5,078	5,078	5,078

This table reports the diagnostic and robustness tests for the matched sample results. Panel A reports the pre-match propensity score regression and post-match diagnostic regression. The dependent variable is *Dummy PC2*. Panel B reports the difference in firm characteristics between firms with high political connections and firms with low political connections. Panel C reports the regression results with the maximum permissible difference in propensity scores of 0.5%. The dependent variable is total volatility (*TVOL*) in column 1, systematic volatility (*SVOL*) in column 2 and idiosyncratic volatility (*IVOL*) in column 3.

Appendix 4.C Institutional development, political connections and total return volatility

Variable	Market development		Government decentralisation		Bank sector liberalisation		Legal rights protection		Province-level political turnover		City-level political turnover	
	High	Low	High	Low	High	Low	High	Low	Yes	No	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
PC2	0.007	0.027***	0.005	0.028***	0.012	0.020**	0.011	0.025***	0.006	0.025***	0.019*	0.018**
	(0.57)	(2.92)	(0.45)	(3.07)	(1.10)	(2.22)	(0.96)	(2.75)	(0.53)	(3.22)	(1.92)	(2.11)
SIZE	-0.022***	-0.025***	-0.025***	-0.023***	-0.026***	-0.021***	-0.025***	-0.023***	-0.018***	-0.026***	-0.025***	-0.023***
	(-8.37)	(-12.48)	(-9.27)	(-11.78)	(-11.15)	(-10.76)	(-9.85)	(-11.97)	(-7.06)	(-14.67)	(-11.29)	(-12.50)
AGE	-0.013***	-0.008***	-0.012***	-0.010***	-0.007**	-0.014***	-0.007**	-0.011***	-0.014***	-0.009***	-0.009***	-0.011***
	(-3.94)	(-3.24)	(-3.87)	(-3.78)	(-2.25)	(-5.19)	(-2.24)	(-4.30)	(-4.54)	(-3.85)	(-3.21)	(-4.76)
MB	-0.005***	-0.004***	-0.004***	-0.004***	-0.004***	-0.005***	-0.005***	-0.004***	-0.002	-0.005***	-0.002**	-0.006***
	(-3.42)	(-3.67)	(-2.60)	(-3.93)	(-2.68)	(-4.11)	(-2.82)	(-3.92)	(-0.86)	(-5.71)	(-2.02)	(-5.12)
SG	0.009***	0.009***	0.007**	0.010***	0.014***	0.007***	0.009**	0.009***	0.012***	0.008***	0.012***	0.007***
	(2.67)	(4.86)	(2.20)	(5.16)	(4.25)	(3.81)	(2.40)	(4.67)	(4.36)	(3.87)	(4.87)	(3.57)
LEV	0.012	0.008	0.019	0.001	0.007	0.005	0.006	0.012	0.011	0.008	0.022*	-0.002
	(0.86)	(0.80)	(1.46)	(0.06)	(0.60)	(0.43)	(0.41)	(1.29)	(0.81)	(0.83)	(1.85)	(-0.19)
ROA	-0.251***	-0.172***	-0.267***	-0.168***	-0.236***	-0.186***	-0.236***	-0.184***	-0.201***	-0.197***	-0.218***	-0.185***
	(-6.90)	(-6.57)	(-8.06)	(-6.28)	(-6.84)	(-6.86)	(-6.24)	(-7.20)	(-5.46)	(-8.46)	(-7.13)	(-6.95)
RET	0.036***	0.032***	0.033***	0.035***	0.033***	0.034***	0.032***	0.035***	0.025***	0.037***	0.032***	0.035***
	(11.47)	(12.34)	(10.55)	(13.06)	(10.91)	(12.75)	(9.38)	(13.87)	(5.96)	(15.95)	(10.71)	(13.24)
CFVOL	0.087	-0.014	0.054	0.004	0.001	0.050	0.074	-0.002	0.057	0.014	0.008	0.036
	(1.59)	(-0.36)	(1.02)	(0.11)	(0.02)	(1.27)	(1.40)	(-0.05)	(1.07)	(0.39)	(0.20)	(0.92)
BFEM	-0.026*	0.006	-0.020	0.001	-0.015	0.003	-0.022	0.006	0.012	-0.012	-0.012	-0.002
	(-1.85)	(0.52)	(-1.44)	(0.07)	(-1.14)	(0.23)	(-1.57)	(0.53)	(0.89)	(-1.24)	(-0.96)	(-0.15)
BAGE	-0.049**	-0.038*	-0.059**	-0.034*	-0.043*	-0.041**	-0.060**	-0.032*	-0.039	-0.043**	-0.023	-0.050***
	(-1.99)	(-1.94)	(-2.57)	(-1.74)	(-1.83)	(-2.08)	(-2.40)	(-1.68)	(-1.55)	(-2.44)	(-1.06)	(-2.73)
BOWN	0.012	0.032***	0.008	0.035***	0.031***	0.019**	0.018*	0.026***	0.023**	0.028***	0.024***	0.028***
	(1.15)	(3.78)	(0.87)	(4.26)	(3.45)	(2.17)	(1.77)	(3.09)	(2.36)	(3.89)	(2.69)	(3.53)
MKTDEV	-0.015***	0.003***	-0.001	-0.000	-0.000	-0.002*	-0.002***	0.001***				
	(-2.99)	(3.01)	(-0.34)	(-0.51)	(-0.16)	(-1.87)	(-4.56)	(3.48)				
Constant	1.391***	1.244***	1.378***	1.220***	1.322***	1.236***	1.376***	1.217***	1.135***	1.315***	1.206***	1.289***
	(11.87)	(14.43)	(12.85)	(14.14)	(11.83)	(14.23)	(12.32)	(14.27)	(10.21)	(16.85)	(12.37)	(16.02)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.72	0.71	0.75	0.70	0.74	0.70	0.73	0.71	0.45	0.75	0.75	0.69
Observations	2,864	4,958	2,863	4,959	3,123	4,699	2,844	4,978	2,363	5,459	3,045	4,777

This table presents results of province-level subsample analysis of market development. Columns 1 and 2 use the sample of firms from regions with high and low overall market development (*MKT*). Columns 3 and 4 use sample of firms from regions with high and low government decentralisation (*GOVT*). Columns 5 and 6 use the sample of firms from regions with high and low banking sector liberalisation (*BANK*). Columns 7 and 8 use the sample of firms from regions with high and low legal rights protection (*LAW*). Columns 9 and 10 use the sample of firms from regions with and without the province-level official turnover (*TOVER_PROV*). Columns 11 and 12 use the sample of firms from regions with high and low city-level official turnover (*TOVER_CITY*). The dependent variable is total return volatility *(TVOL*). Definitions of all variables are in Table 4.1. For all regressions, t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. ***, **, and *denote significance at the 1%, 5%, and 10% levels, respectively.

Appendix 4.D Measurement of earnings management

We use the accrual-based earnings management to proxy for financial reporting quality. The change in a firm's accruals should be determined by the changes in firm characteristics, such as the change in revenues, property, plant and equipment, and firm performance. If the deviation of a firm's accruals from the predicted level is significant, then the firm is considered as having more earnings management and poorer accounting quality. Earnings management is measured as follows. First, we employ a modified version of the Jones (1991) model.

$$TA_{i,t} = \alpha_1 + \alpha_2 \Delta REV_{i,t} + \alpha_3 PPE_{i,t} + \alpha_3 ROA_{i,t} + \varepsilon_{i,t} \quad (4.D.1)$$

where *TA* is total accruals, measured as net income minus operating cash flows. *REV* is operating revenues. *PPE* is gross property, plant and equipment. All variables are deflated by the lagged total assets. Eq. (4.D.1) is estimated separately for each combination of year and industry. We then use the predicted coefficients and account receivables (AR) to construct non-discretionary accruals (*NDA*) and discretionary accruals (*DA*).

$$NDA_{i,t} = \hat{\alpha}_1 + \hat{\alpha}_2(\Delta REV_{i,t} - \Delta AR_{i,t}) + \hat{\alpha}_3 PPE_{i,t} + \hat{\alpha}_4 ROA_{i,t} \quad (4.D.2)$$

$$DA_{i,t} = TA_{i,t} - NDA_{i,t} \quad (4.D.3)$$

Finally, the absolute value of discretionary accruals (|*DA*|) is used as the proxy for earnings management.

CHAPTER 5 CONCLUSIONS

This thesis empirically examines the impact of government involvement on firm value and outcomes, with a relatively comprehensive dataset of listed firms in China. In the introduction, we provide three features of government involvement in China, including the presence of government control, the current corruption situation and the recent anti-corruption campaign, and the building of political connections by privately controlled firms. These typical characteristics are closely linked to the three empirical studies in this thesis. Specifically, we first focus on the ultimate control by the government and investigate its impact on investors' valuation of cash holdings, extending the literature on government control. Second, based on the recent Chinese anti-corruption campaign, we examine how political corruption affects corporate cash holdings, revealing the causal impact of political corruption on firm-level policies. Third, this thesis, as the first study, examines the impact of political connections on the variability of stock returns, shedding some light on the costs of political connections related to information asymmetry problems for firms in the private sector.

This chapter contains three sections. Section 5.1 summarises the key findings and conclusions of the three empirical studies. Section 5.2 highlights the main contributions of this thesis to the extant literature. Section 5.3 acknowledges the limitations of the current research and proposes interesting avenues for future work.

5.1 Key empirical findings and conclusions

5.1.1 Government control and the value of cash

There is a great amount of previous literature on the impact of direct government ownership on firm value and performance. However, as argued by Bortolotti and Faccio (2009) and Boubakri *et al.* (2018), the ultimate control right by the government better describes the power of the government than direct ownership. The mixed evidence in the prior literature may be caused by the inaccurate measurement of government ownership. Motivated by the advantage of the ultimate control by the government, in Chapter 2, we empirically investigate how government control affects firm value through cash holdings. Cash holdings represent a large fraction of total firm value, and the value of cash holdings are primarily dependent on the agency costs and financial constraints that firms confront. Government control and private control can differ in terms of both agency costs and financial constraints, which can lead to different valuations of cash holdings. We propose two hypotheses, the agency costs hypothesis and the financial constraints hypothesis. According to the agency costs hypothesis, government-controlled firms are more likely to pursue political objectives rather than shareholders' wealth maximisation and suffer from poor governance in the absence of efficient monitoring from the government and capital markets. Due to the severe agency costs, cash holdings can be expropriated by managers in government-controlled firms for political objectives and managerial benefits, and the investors in the market, therefore, discount the value of cash holdings. On the other hand, the financial constraints hypothesis suggests that government-controlled firms can have easier access to external finance and softer budget constraints, and therefore the value of cash holdings is lower for

firms with government control than that for firms with private control, due to precautionary motive.

Based on the extended model of the marginal value of cash holdings by Faulkender and Wang (2006), we obtain strong evidence that government control leads to a lower value of cash holdings. The negative relationship between government control and the value of cash is robust to the consideration of endogeneity, alternative measures of government control and the expected change in cash holdings, and the inclusion of additional control variables. Further analyses show that government-controlled firms invest more (less) cash holdings in capital expenditures and acquisitions (R&D) than privately controlled firms; investment efficiency is lower in firms with government control than that in firms with private control. The results support the agency costs hypothesis that managers in government-controlled firms overinvest cash holdings in investment with low efficiency to pursue either political objectives or managerial benefits. However, we find no evidence supporting the financial constraints hypothesis. Specifically, the findings show that government control exerts no significant impacts on financial constraints measured by the cash flow sensitivity of cash, or external financing abilities measured by gross equity issuances and net debt issuances. Finally, we find the relationship between government control and the value of cash varies with province-level institutional development. The negative impact of government control on the value of cash becomes insignificant in less developed regions, suggesting that the investors care less about the uses and the value of cash holdings in government-controlled firms possibly due to the development pressure and investor protection in those regions.

5.1.2 Political corruption and corporate cash holdings

Political corruption impedes the development of investment, entrepreneurship and innovation. Although much prior literature agrees on the destroying impacts of political corruption on macroeconomic development, studies that examine how firms behave in the presence of political corruption are mixed. On the one hand, firms have incentives to adopt different strategies to avoid extraction by politicians and bureaucrats. On the other hand, firms can take bribe opportunities and purchase political favours to benefit from a corrupt environment. In terms of cash management, some evidence supports that firms maintain small hoardings of cash to limit the ability for political extraction – shielding hypothesis (Caprio, Faccio and McConnell, 2013; Smith, 2016), while evidence is also found that managers have large cash holdings for bribing – liquidity hypothesis (Chen, 2011). To provide more evidence on the unclear relationship and alleviate the potential endogeneity problem, in Chapter 3, we investigate the impact of political corruption on corporate cash holdings based on a quasi-natural experiment of the recent anti-corruption campaign in China. With the deepening of the campaign, stricter supervision and heavier punishment have been exerted, amidst the public and social media involved in monitoring, leading to an increase in discipline inspections of officials and a decrease in the likelihood of bribing. Therefore, the campaign serves as an ideal setting to examine how firms respond to this event by adjusting their cash management in concern of political corruption.

We find that firms increase cash holdings significantly in the post-campaign period, after controlling for operational, investment and financing factors. The result is robust to subsample analysis, as well as the inclusion of additional variables. More importantly, the increase in cash holdings remains when controlling for stock return volatility and political

uncertainty. This addresses the concern that firms increase cash holdings simply due to an increase in corporate uncertainty. The findings strongly support the shielding hypothesis, in that firms are obliged to maintain a suboptimal level of cash in face of rent-seeking threats. The anti-corruption campaign removed such political corruption threat, and firms, therefore, adjust their cash holdings upward to an optimal level.

Moreover, we extend our study by testing whether the level of cash sheltered by firms varies across regions with different degrees of rent-seeking incentives by local governments. The rent-seeking incentives by local governments are captured from the following four aspects: market development, government quality, fiscal status, and economic conditions. Our empirical evidence reveals that the increase in cash holdings after the campaign varies across regions. Specifically, firms located in regions with high levels of rent-seeking incentives threats are observed to increase more cash holdings.

We conduct several additional analyses to validate our main findings. First, we find that the market value of cash holdings significantly increases following the campaign. Second, we observe a positive relationship between investment and cash holdings after the Campaign, and further confirm that this positive relationship is associated with high growth opportunities. Third, firms are found to manage their debt obligations downward as a result of the campaign. Finally, we find the Campaign alleviates insider agency problems and weakens the relationship between governance mechanisms and cash holdings. Overall, our findings provide strong evidence that political corruption is a key determinant of corporate financial policies.

5.1.3 Political connections and stock return volatility

While a number of studies in the prior literature investigating the implications of political connections on firm value and performance, the variability of firm performance, in particular, stock returns, is largely unexplored. In Chapter 4, we attempt to narrow this literature gap and investigate the relationship between political connections and the volatility of stock returns.

Political connections can possibly affect the variability of stock returns through several mechanisms. First, political connections can provide firms with an implicit bailout guarantee and preferential access to capital, which makes market risk matters less to politically connected firms. The benefits of political connections suggest a lower perceived uncertainty and a lower stock return volatility. Second, political connections lead to more expropriation by politicians and corporate insiders. The severe agency problems associated with political connections can increase the systematic volatility and the cost of capital required by investors in the market. Third, previous evidence shows that politically connected firms exhibit poor financial reporting quality and deteriorate information environment, which can further increase the idiosyncratic return volatility.

Using a sample of Chinese privately controlled firms during the period 2008-2016, we provide empirical evidence that firms with more directors with political connections have higher stock return volatility. When we further decompose total stock return volatility into idiosyncratic and systematic volatility, we find that the positive impact is concentrated in idiosyncratic volatility. The results are robust to alternative measures of political connections, different measures of return volatility, and the inclusion of additional control variables. We address the potential endogenous problem associated with political

connections using a matched sample approach and an instrumental variable estimation. Our findings are consistent with the view that the costs of political connections concerning poor financial reporting quality and asymmetric information lead to more volatile stock returns.

In additional analyses, we explore the heterogeneity in the relationship between political connections and return volatility in the regional characteristics in terms of market development and political uncertainty. We find that the impact of political connections on stock return volatility is more pronounced in regions with low market development, measured by overall market development, banking sector liberalisation, government decentralisation and legal rights protection. Furthermore, the results show political connections increase return volatility only in regions with low political uncertainty. Taken together, our findings suggest institutional characteristics influence the roles of political connections in firm value.

Finally, to address the concern that the positive relationship between political connections and stock return volatility might be due to risk-taking behaviours, we directly investigate the impact of political connections on the riskiness of investment and financing decisions. We find political connections have no significant impacts on investment riskiness and a weak impact on financing riskiness. The results can to some extent defy the alternative explanation of risk-taking behaviours. In addition, we test the role of earnings management and find political connections are associated with more volatile stock returns in firms with more earnings management. The result can further support that political connections reduce financial reporting quality and increase information asymmetry, leading to more volatile stock returns.

5.2 Main contributions and implications

This thesis deepens our understanding of the importance of government involvement in business. The three empirical studies contribute to the extant literature in the following five main ways. First, Chapter 2 of this thesis adds to the recent debate regarding the effect of government ownership on firm value (Liu, Uchida and Yang, 2012; Beuselinck *et al.*, 2017; Boubakri *et al.*, 2018). Our evidence suggests that government control has a negative impact on firm value through its effect on liquid assets. More importantly, our study helps facilitate a better understanding of the mechanisms that underlie the relationship between government control and the value of cash. In particular, the value-destroying effect is mainly due to the agency costs of government expropriation. Cash holdings are invested in overinvestment for political considerations and personal benefits. We find no evidence that government control helps firms to enhance their external financing channels or lower their financial constraints in Chinese listed firms. Our results are consistent with the recent evidence that government ownership does not necessarily decrease the cost of capital or enhance corporate financing ability (Ben-Nasr, Boubakri and Cosset, 2012; Firth *et al.*, 2012; Borisova *et al.*, 2015; Jaslowitzer, Megginson and Rapp, 2016).

Second, Chapter 3 of this thesis provides new insights into the recent studies relating to the impact of the anti-corruption campaign on listed firms in China. The aim of the Campaign is to remove political extraction and corruption. A number of studies have documented that the Campaign has taken its effect, in the sense that it has significantly improved corporate financial transparency (Hope, Yue and Zhong, 2018), decreased corporate fraud (Zhang, 2018), reduced political capital (Pan and Tian, 2017) and increased corporate innovation (Xu and Yano, 2016). This study is among the first to investigate the effects of the Campaign in

general and the first to examine its impact on firms' liquid assets. In addition to cash, our supplementary analysis demonstrates that political expropriation also plays an important role in shaping investment decisions through its impact on the cash policy, and significantly influences corporate capital structure.

Third, in Chapter 4, we provide novel evidence of political connections and the volatility of stock return performance. While recent research has extensively studied how political connections affect the level of corporate performance (Fisman, 2001; Faccio, 2006; Fan, Wong and Zhang, 2007; Boubakri, Cosset and Saffar, 2008), the impact of political connections on the variability of firm value is largely unexplored. Two exceptions are Boubakri, Cosset and Saffar (2013) and Boubakri, Mansi and Saffar (2013). Based on cross-country samples, they investigate how political connections influences earnings volatility and report mixed results. Our study differs from the two papers in that we focus on the volatility of stock returns, which reflects investors' perceptions of political connections.

Fourth, our findings in Chapters 2 and 3 contribute to the literature on corporate cash management. Existing studies find cash holdings are more valuable in well-governed firms than in poorly governed firms (Pinkowitz, Stulz and Williamson, 2006; Dittmar and Mahrt-Smith, 2007; Frésard and Salva, 2010). Complementing their evidence, our findings in Chapter 2 show that government control, associated with agency costs, affect the use and investors' valuation of cash holdings. In addition, this study complements the literature on the determinants of cash holdings. The prior literature on cash policy primarily focuses on the importance of the agency costs between corporate insiders and minority shareholders (Dittmar, Mahrt-Smith and Servaes, 2003; Harford, Mansi and Maxwell, 2008; Tong, 2010; Gao, Harford and Li, 2013). Our evidence in Chapter 4 alleviates some endogeneity issues

and emphasises the state's agency costs in determining the level of cash held by firms (Chen, 2011; Caprio, Faccio and McConnell, 2013; Smith, 2016). In particular, firms following the shielding hypothesis hold a small fraction of liquidity to avoid extraction by politicians.

Finally, the results in the thesis shed further insights into the literature on institutional quality. The quality of institutional development has long been shown to affect firm value, governance and financial policies in cross-country context (La Porta, Lopez-de-Silanes and Shleifer, 1999; La Porta *et al.*, 2002; Doidge, Karolyi and Stulz, 2007; Caprio, Faccio and McConnell, 2013) and in China (Li, Yue and Zhao, 2009; Fan, Huang and Zhu, 2013; Kusnadi, Yang and Zhou, 2015). Consistent with prior studies (Chen, Ding and Kim, 2010; Chen *et al.*, 2011a; Boubakri *et al.*, 2012; Guedhami, Pittman and Saffar, 2014; Kusnadi, Yang and Zhou, 2015), our results of Chapter 3 and 4 show that the rent-seeking incentives by government officials and the impacts of political connections are stronger in regions with low institutional quality. Importantly, the results in Chapter 2 suggest that in less developed regions in China, the costs of the government as a controlling shareholder can be alleviated to some extent, due to political pressure and investor protection, which differs from cross-country evidence (Guedhami, Pittman and Saffar, 2009; Beuselinck *et al.*, 2017; Boubakri *et al.*, 2018).

In addition to theoretical contributions, the empirical findings from this thesis offer a few implications for policymakers and investors. First, government control is value-destroying. In emerging countries with weak investor protection and government intervention, policymakers should continue to reduce government ownership and control. There should be more effective monitoring mechanisms in government-controlled firms to discipline managers' behaviours. Second, political corruption has an adverse impact on firm

behaviours and value. It is essential for governments to continue to fight against corruption and provide firms with a fair institutional environment, which enable firms to make optimal financial policies and ultimately promote the development of the overall economy. Third, political connections deteriorate corporate information environment and lead to information asymmetries. Policymakers should aim to reduce the political link between firms and the government. It is desirable to provide a strong legal system and adequate investor protection for firms, which fundamentally reduces firms' incentives to build political connections. Finally, the findings in the three chapters can also enhance the understanding of the Chinese stock market for domestic and international investors. Investors should be aware of the three key characteristics of the Chinese market, government control, political corruption and political connections, and their impacts on firm value and behaviours.

5.3 Limitations and further research

There are two main limitations of the thesis which need to be recognised. First, there is some overlap among the three empirical chapters. For example, since Chapter 2 and 3 both focus on corporate cash holdings, there is some duplication of the literature review on the agency costs of cash holdings. We attempt to emphasise the literature on the value of cash and the insider agency problem in Chapter 2 and the level of cash and the state agency problem in Chapter 3, respectively, to limit the amount of duplication. In addition, as we examine the roles of institutional development in all three empirical chapters, there are some overlapping materials in the institutional background and the construction of institutional variables. We attempt to minimise the amount of overlap. Second, the validity of results and conclusions in the three empirical studies may depend to some extent on the sample selection, variable

measurements, model specification, and estimation techniques. We try to mitigate the concern by conducting a battery of robustness checks and additional analyses.

Our empirical studies can be extended in several directions and a few promising ideas are proposed as follows. In Chapter 2, we find the evidence that the negative impact of government control on the value of cash is not significant in less developed regions. We argue that the results support the view that governments in less developed regions have high incentives to promote regional development and improve the regional disparity problem in China. It is highly likely that governments in those regions discipline government-controlled firms to invest effectively and improve performance. Another possible explanation is that government control in less developed regions can better protect minority shareholders' rights compared with private control. The evidence may not hold in other large emerging markets without testing those markets; thus, it is important to examine whether similar results can be found in other major economies characterised by government control and marked differences across regions, such as Russia.

In Chapter 3, we examine the impact of the recent anti-corruption campaign on corporate cash holdings. The recent literature suggests that cash holdings depend on the previous level of cash holdings (Jiang and Lie, 2016; Guariglia and Yang, 2018). In other words, there is a dynamic relationship in corporate cash holdings. Therefore, we suggest future research to investigate how political corruption affects the adjustment speed of cash holdings. It is possible that political corruption increases the cost of adjustment and thus lower the adjustment speed of liquid assets. In addition, corporate cash management and other financial policies such as capital structure can be jointly determined (Al-Najjar, 2013;

Harford, Klasa and Maxwell, 2014). Therefore, it is interesting to examine whether political corruption is a joint determinant of cash holdings and capital structure.

In addition, we examine the impact of the recent anti-corruption campaign as a whole on the behaviours of Chinese listed firms in Chapter 3. However, it is interesting to compare the corporate financial outcomes between firms connected to the ousting of corrupt officials and firms not. Specifically, we can manually collect the cases of the ousting of corrupt officials and identify treated firms as those with connections to the corrupt officials and control firms as those without. The connections can be in the form of serving as directors, personal connections with executives, and so forth. Through the difference-in-difference methodology, the results can offer new insights into the impact of political corruption on corporate financial policies.

We only focus on firms in the private sector in Chapter 4, where we investigate the impact of political connections on the variability of stock returns in firms with private owners. The positive relationship between political connections and stock return volatility supports the costs of political connections regarding poor financial quality and information asymmetry information. The previous literature suggests that political connections play different roles in privately controlled firms and government-controlled firms (Wu, Wu and Rui, 2012; Chen *et al.*, 2017a), and thus further research could investigate the possible different impacts of political connections on variability of stock returns between firms controlled by the government and those by private owners.

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