



Anti-corruption, government intervention, and corporate cash holdings: Evidence from China

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ABSTRACT

We use China as an example to examine how anti-corruption and government intervention shape corporate cash holding decisions. The findings show that firms in provinces with less government intervention (weak anti-corruption intensity) hold smaller (larger) cash reserves than those in provinces with more government intervention (strong anti-corruption intensity). Furthermore, we find that the positive relationship between government intervention and corporate cash holdings is alleviated as the anti-corruption intensity increases, and this alleviation effect is more prominent for state-owned enterprises (SOEs), firms in high intervention areas and firms without political connections. These findings support the argument that corruption-free and low intervention governments can benefit firms in making more profitable corporate decisions.

1. Introduction

After nearly four decades of economic reforms, the Chinese economy has grown tremendously, becoming the second largest in the world. Contrary to the free market economic model followed by most developed economies, China has long been implementing a government-planned economic model, always expressed in “Five-Year Plans” (Chen et al., 2017; Lim et al., 2018). The role governments should play in promoting economic growth has been a longstanding and unsettled worldwide debate (e.g., Hayek, 1945; Easterly and Levine, 1997) and there is literature pointing out that government intervention in China induces some market distortions, such as rent-seeking and resource misallocation (Fan et al., 2008; Chen et al., 2011b; Kusnadi et al., 2015).

Because corporate policies are potentially influenced by institutional development, the extent to which government intervention is reasonable has intensely fascinated researchers (Ndikumana, 2005; Javorcik and Wei, 2009; Lim et al., 2018). Prior studies on how government intervention in China affects corporate decisions have focused on many topics, such as opportunities for passing initial public offerings (IPOs) (Johansson et al., 2017), firm performance (Lin and Wong, 2013) and financial preference (Smith, 2016). As cash is closely linked to investment policies, financing decisions and operating management, firms should arrange cash holdings to enhance liquidity and reduce transaction costs (Acharya et al., 2007; Bates et al., 2009; Al-Najjar, 2013; Megginson et al., 2014; Chen et al., 2015). However, Myers and Rajan (1998) show that cash and cash equivalents can always be expropriated by governments because of their liquidity. Meanwhile, Svensson (2003) documents that corrupt bureaucrats can be price discriminators who take into account a firm’s ability to pay and bargaining power when determining the amount of bribe money to extract. As a result, firms tend to invest more in tangible assets and keep fewer liquid assets (particularly cash) as protection against political expropriation (Stulz, 2005; Caprio et al., 2013; Kusnadi et al., 2015). Therefore, it is necessary for firms to take into account government factors such as intervention and corruption when making cash holding decisions.

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Smith (2016, p. 350) indicates that political corruption, especially in the form of rent-seeking, is pervasive and approximately 20 % of firms worldwide have experienced at least one bribe request from a public official. Corruption impairs the efficiency of social resources, distorts the investment environment, impedes economic growth and endangers political stability. The official corruption situation in China is intensifying and is increasingly regarded as a major impediment of ruling efficiency because of its potentially destructive effect on economic development (Ayyagari et al., 2014; Lin et al., 2016; Ke et al., 2017). Correspondingly, successive leaders in China have never stopped efforts to fight corruption, especially after late 2012, when President Xi came to power. With the great strength of anti-corruption, we expect political extraction to be suppressed effectively.

We seek to investigate corporate cash holding decisions with regard to China for a number of important research reasons. First, China provides a unique environment based on the co-existence of both SOEs and non-SOEs (Allen et al., 2005). Because the government gives preferential treatment to SOEs, whereas non-SOEs tend to pursue political connections as an alternative protection (Li et al., 2008; Liu et al., 2016a), it is valuable to determine whether cash holding decisions differ between SOEs and non-SOEs and between politically connected firms and non-connected ones. Second, firms' financial practices vary because of some socio-economic factors (La Porta et al., 1997; Venard and Hanafi, 2008; Kirch and Terra, 2012; Al-Najjar, 2013; Gennaioli et al., 2013; Du et al., 2015; Favara et al., 2017). China provides us with the opportunity to investigate how government intervention affects corporate cash holdings within a country that combines obvious regional disparities across its provinces with varying local economic development and government intervention levels (Kanbur and Zhang, 2005). Third, anti-corruption, which has intensified in developing countries in recent years, benefits economic growth and mitigates the adverse effects of corruption (Ayyagari et al., 2014; Ke et al., 2017; Xu and Yano, 2017). Because the intensity of anti-corruption in China increased recently, we suggest that China is suitable for examining the effect of anti-corruption on corporate decision-making.

In this study, we use a sample of publicly listed firms from 2009 to 2015 to investigate the relationship between government intervention and corporate cash holdings under the circumstances of aggressive anti-corruption in China. Our results demonstrate that government intervention positively affects corporate cash holdings and that this positive relationship alleviates as the anti-corruption intensity increases. Furthermore, we find that this alleviation effect is more profound for firms in high intervention areas, SOEs and non-politically-connected firms. In contrast with Kusunadi et al. (2015), who suggest that firms hold less cash in provinces with less institutional development due to the money-grabbing behavior of the government, our findings provide evidence that firms tend to hold more cash when government intervention and the likelihood of official extraction increase. Our results remain consistent when using alternative measures for anti-corruption, government intervention and political connections.

This study makes the following contributions. First, instead of a dummy variable to capture the anti-corruption campaign starting in 2013 (e.g., Liu et al., 2016b; Kong et al., 2017; Pan and Tian, 2017), we use annual provincial-level anti-corruption proxies to measure the anti-corruption intensity for each year. Hence, our proxies can reflect regional disparities across provinces and more closely match other data, such as provincial government intervention. Second, some literature demonstrates that firms tend to reduce their liquid asset holdings such as cash when faced with high political extraction threats (e.g., Myers and Rajan, 1998; Caprio et al., 2013; Smith, 2016), whereas our findings imply that firms tend to hold more cash as the level of government intervention increases. Third, China is a rather interesting research subject because it has a homogenous culture and varying degrees of institutional development across provinces due to geographical and historical reasons. Thus, it provides us with the opportunity to examine the effect of government intervention within one country, which is advantageous compared to cross-country research (e.g., Dittmar et al., 2003; Pinkowitz et al., 2006; Al-Najjar, 2013; Caprio et al., 2013), as the latter is subject to omitted correlated variable problems. Fourth, our study enriches the increasing literature on the effects of ongoing anti-corruption in China on firms' policies, including firms' R&D input and innovation (Xu and Yano, 2017), corporate investments (Pan and Tian, 2017), firm performance (Kong et al., 2017), and firm value (Ke et al., 2017). Lastly, although Lin et al. (2016) find a positive market reaction to the anti-corruption campaign, Ke et al. (2017) and Xu (2018) find a significant decline in firm value afterwards. Hence, it is still unclear how Chinese firms are affected by anti-corruption measures. This study helps understand the effect of anti-corruption in a different setting.

The rest of the paper is organized as follows. Section 2 reviews the related literature and develops our hypotheses. Section 3 offers measurement designs, data selection and descriptive statistics. Section 4 explains the main empirical analyses and Section 5 shows the robustness tests. Finally, Section 6 concludes.

2. Literature review and hypothesis construction

Over the past two decades, companies around the world have considerably increased their cash holdings (Dittmar et al., 2003; Bates et al., 2009; Amess et al., 2015). Accompanying this trend, a growing literature has emerged investigating the determinants and consequences of firm cash holdings.

The extant literature highlights the impact of precautionary motives and political expropriation on corporate cash holdings (Myers and Rajan, 1998; Dittmar et al., 2003; Boubakri et al., 2013; Caprio et al., 2013). Precautionary motives cause firms to hold more cash to avoid costly access to capital markets when they have better investment opportunities (Han and Qiu, 2007; Bates et al., 2009). The expropriation theory (i.e., shielding assets hypothesis) argues that firms can shield their assets when they are susceptible to money-grabbing behavior of governments and officials use threats of regulation to solicit bribes and extort liquid assets such as cash (Stulz, 2005; Durnev and Fauver, 2010). Caprio et al. (2013) find that firms operating in a corrupt environment have less cash reserves and tend to issue more dividends. Hence, to protect assets from political extraction, firms tend to keep fewer liquid assets (particularly cash) when they are faced with a higher risk of rent-seeking and an unfavorable institutional environment (Kusunadi et al., 2015; Smith, 2016).

However, some studies have contrary opinions. The agency conflict hypothesis shows that firms with serious agency issues tend to

accumulate cash even if they do not have good investment opportunities (Jensen, 1986; Pinkowitz et al., 2006; Harford et al., 2008). Numerous studies indicate that firms can rarely deter political expropriation when exposed to a corrupt environment (Shleifer and Vishny, 1993; Stulz, 2005; Fisman and Svensson, 2007; Durnev and Fauver, 2010). In fact, they may even cater to bureaucrats to survive prevailing threats of government extraction (Shleifer and Vishny, 1993; Fisman and Svensson, 2007; Li et al., 2008; Cheung et al., 2012; Ayyagari et al., 2014; Lin et al., 2016). Thakur and Kannadhasan (2019) argue that firms in corrupt circumstances may take advantage of political favors by being expropriated. With the co-existence of irresistible extraction expenses and necessary liquidity for routine operations, firms in emerging economies with more market imperfections, less developed institutions, poorer investor protection and higher policy uncertainty tend to hold more cash (Dittmar et al., 2003; Piotroski and Wong, 2012; Al-Najjar, 2013; Chen et al., 2015).

Because of China's performance-based political competition and the economic performance-based promotion rules (Blanchard and Shleifer, 2001; Li and Zhou, 2005), local officials are prone to fulfill short-term political achievements in their tenures (Du et al., 2015; Cao et al., 2016; Cull et al., 2017). To some extent, the decisions of politicians for private or political goals are inevitably at the expense of corporate interests. Therefore, China's political promotion regimes coupled with self-benefitting officials tend to undermine the consistency of policies and add uncertainty to firms' operating environments. Shao et al. (2015) indicate that government intervention in emerging markets is more prevalent than in developed countries and can have a significant impact on firms when bureaucracy is more severe. When officials pursue their private or political goals, they will intervene in business activities more frequently. As a result, firms' overall costs increase and their precautionary motive for holding cash is strengthened.

According to this discussion, we present hypothesis H1 as follows:

Hypothesis 1. With increased government intervention, firms tend to hold more cash.

Although the early literature documents that corruption can act as a lubricant to improve market efficiency and promote a country's economic growth in the case of extremely ineffective institutions (Leff, 1964; Lui, 1985), a growing stream of literature takes a negative view of this and argues that corruption actually acts as a stumbling block to firms' business activities (Shleifer and Vishny, 1993; Beck et al., 2005; Fisman and Svensson, 2007; Collins et al., 2009; Ayyagari et al., 2014). Whereas corruption deteriorates the financial and investment environment and eventually hinders economic growth (Mauro, 1995; Svensson, 2003; Ahlin and Pang, 2008; Barth et al., 2009), anti-corruption can alleviate bureaucrats' rent-setting, increase government efficiency and improve institutional environments. The literature on China's recent anti-corruption campaign suggests that stricter supervision and harsher punishments associated with corruption significantly reduce officials' misconduct (Li et al., 2017). Empirical evidence also shows that anti-corruption reduces uncertainty and transaction costs for firms and increases their value by fostering competition, enhancing investment efficiency and boosting innovation activities (Lin et al., 2016; Ke et al., 2017; Pan and Tian, 2017; Xu and Yano, 2017). In line with the aforementioned literature, we suggest that anti-corruption can be viewed as a positive indicator of better government quality and institutional development and will influence corporate cash holding decisions. With an intensified crackdown on corruption, officials are more cautious about their behavior, private relations and reputation. To avoid potential scandals, they will refrain from misconduct, especially associated with bribes and vanity projects. Therefore, firms will be faced with a fairer institutional environment with lower possibilities of rent-seeking and will hold less cash for paying rents or catering to bureaucrats.

According to this discussion, we present our hypothesis H2 as follows:

Hypothesis 2. As anti-corruption intensity increases, government intervention can be alleviated and firms tend to hold less cash.

3. Research design

3.1. Sample selection and data sources

Our study employs data on Chinese firms listed on the Shanghai and Shenzhen Stock Exchanges from 2009 to 2015. During the data selection process, we first drop special treatment (ST) companies because of their financial and operational problems. Second, we exclude firms in financial and regulated utility industries because they are more strictly regulated. We obtain the financial data from the China Stock Market & Accounting Research (CSMAR) database. All continuous variables are winsorized at the 1st and 99th percentiles to avoid the influence of outliers.

Following Chen et al. (2011b) and Xie (2015), we define a firm as an SOE if it is ultimately controlled by the government, including the central government, local governments at the provincial, municipal and county level, and other governmental institutions. A firm is considered a non-SOE when its ultimate controlling shareholder is an individual or a non-state entity, such as a town-village enterprise, foreign enterprise or other non-state-controlled enterprise. If there are absent or ambiguous definitions for ultimate controlling shareholders in CSMAR, we confirm this with the WIND financial database and firms' annual reports.

Anti-corruption data are manually collected for each province from the official People's Procuratorate website.¹ The index of the relationship between government and market stems from the Marketization Index of China's Provinces, which is widely employed in existing studies (e.g., Chen et al., 2011a; Shao et al., 2015), and is used to measure government intervention.

¹ We drop Xinjiang province because of significant missing data on its registered officials and cases.

Table 1
Variable definitions.

Variable	Definition
Cash1 _t	Cash and cash equivalents divided by total assets at the end of year <i>t</i> .
Cash2 _t	Natural logarithm of cash and cash equivalents divided by net assets (total assets minus cash and cash equivalents) at the end of year <i>t</i> .
Intervention _t	The index of the relationship between government and market for each province in year <i>t</i> multiplied by -1.
PC _t	A dummy variable defined as 1 if any CEO or chairman is or was a government official of deputy county/division rank or above or a member of the People's Congress, Chinese People's Political Consultative Conference, or Chinese Communist People Committee at the deputy county level or above, and 0 otherwise at year <i>t</i> .
Anti1 _t	The provincial number of registered cases on corruption of vice county/division rank (xianchuj) or above per million civil servants in year <i>t</i> .
Anti2 _t	The provincial number of registered officials on corruption of vice county/division rank (xianchuj) or above per million civil servants in year <i>t</i> .
Leverage _t	Total debt divided by total assets at the end of year <i>t</i> .
Size _t	Natural logarithm of total assets in millions of yuan at the end of year <i>t</i> .
BM _t	Total book equity divided by market value of equity at the end of year <i>t</i> .
Cashflow _t	Earnings after interest, dividends and taxes before depreciation divided by total assets at the end of year <i>t</i> .
NWC _t	Net working capital divided by total assets at the end of year <i>t</i> .
Capex _t	Capital expenditure divided by total assets at the end of year <i>t</i> .
Age _t	Natural logarithm of the number of years plus 1 since the firm's IPO at the end of year <i>t</i> .
Tangibility _t	Net property, plant and equipment divided by total assets at the end of year <i>t</i> .
ROA _t	Earnings before interest and tax to total assets at the end of year <i>t</i> .

3.2. Variable construction

3.2.1. Government intervention and anti-corruption effort

We use the index of the relationship between government and market compiled by the National Economic Research Institute (Wang et al., 2017)² to measure the extent of government intervention in each province annually. This index includes provincial government spending (a percentage of provincial GDP), provincial tax rates, time spent by entrepreneurs dealing with bureaucracy, and time needed for firm registration and obtaining various licenses. The index mainly takes a value between 0 and 10 and increases as government intervention decreases.³ Thus, we define the variable *Intervention* as the product of the index and -1 to make its numerical value consistent with the government intervention trend. Because the index was only updated until 2014 and the institutional environment of provinces always remains steady within one or two years, we use the method of moving averages to compute the score for 2015. Specifically, we regard the score for 2014 as the average value of the scores for 2013 and 2015 and thus calculate the score for 2015.

Following Xu and Yano (2017), we measure the provincial anti-corruption intensity in two ways. *Anti1_t* is defined as the province's number of registered corruption cases that include officials at the vice county/division rank (xianchuj) or above per million civil servants at year *t*, and *Anti2_t* is defined as the province's number of registered officials on corruption at the vice county/division rank (xianchuj) or above per million civil servants at year *t*. The registered cases include those involving the misappropriation of public property, extortion and acceptance of bribes, abuse of power, and dereliction of duty.

3.2.2. Political connection

Following Chen et al. (2011a); Liu et al. (2016a), and Xu and Yano (2017), we use CSMAR to define politically connected firms. A firm is defined as politically connected if the chairman or CEO of the firm is or was a government official of deputy county/division rank (xianchuj) or above or a member of the People's Congress, Chinese People's Political Consultative Conference, or Congress of the Communist Party of China at the deputy county level (xianjishi) or above. If ambiguous disclosures exist, we exploit firms' annual reports to do a cross-check.

3.2.3. Cash holdings

Following the previous literature (e.g., Dittmar et al., 2003; Boubakri et al., 2013; Chen et al., 2014; Xie et al., 2017), we construct two proxies for firms' cash holdings. The first measure, *Cash1*, is calculated as cash and cash equivalents divided by the total assets at the end of year *t*. The second measure, *Cash2*, is calculated as the logarithm of the amount of cash and cash equivalents scaled by total assets net of cash and cash equivalents at the end of year *t*.

3.2.4. Control variables

Referring to the extant literature, including Dittmar et al. (2003); Caprio et al. (2013) and Chen et al. (2014), we use the following control variables in our regressions: *Leverage* (total debt divided by total assets), *Size* (natural logarithm of total assets in millions of yuan), *BM* (total book equity divided by market value of equity), *Cashflow* (earnings after interest, dividends and taxes, but before depreciation, divided by total assets), *NWC* (net working capital divided by total assets), *Capex* (capital expenditure divided by total assets), *Age* (natural logarithm of the number of years plus 1 since the firm's IPO), *Tangibility* (net property, plant and equipment

² This book includes the indexes from 2008 to 2014, taking 2008 as the base year.

³ The indexes of Tibet are negative during our sample period.

Table 2
Summary statistics.

Panel A: Annual statistics from 2009 to 2015							
Year	N	Percentage (%)	Intervention	Anti1	Anti2	Cash1	Cash2
2009	1095	9.84	-7.6266	2.3389	3.4037	0.1728	0.2053
2010	1208	10.85	-7.4082	2.3573	3.4137	0.1830	0.2213
2011	1511	13.58	-7.3600	2.3357	3.3966	0.2041	0.2548
2012	1733	15.57	-6.7995	2.3564	3.4025	0.2000	0.2488
2013	1851	16.63	-6.7740	2.3572	3.4016	0.1764	0.2124
2014	1865	16.76	-7.1060	2.3542	3.4025	0.1528	0.1810
2015	1867	16.77	-7.4342	2.3610	3.4015	0.1540	0.1798
Panel B: Province-level statistics							
Province	N	Percentage %	Intervention	Anti1	Anti2	Cash1	Cash2
Anhui	342	3.07	-7.4695	2.9678	3.7304	0.1785	0.2228
Beijing	799	7.18	-6.6500	0.9196	2.4806	0.1793	0.2143
Chongqing	176	1.58	-6.7400	2.8211	3.6439	0.1721	0.2058
Fujian	420	3.77	-7.2376	3.2234	3.7882	0.1794	0.2188
Gansu	137	1.23	-4.1980	1.9060	3.4264	0.1793	0.2156
Guangdong	2224	19.98	-8.3003	2.3761	3.3763	0.1816	0.2220
Guangxi	144	1.29	-6.6687	3.0538	3.7012	0.1451	0.1666
Guizhou	100	0.90	-4.5040	2.3601	3.3964	0.1590	0.1815
Hainan	160	1.44	-5.4564	2.1757	3.4211	0.1659	0.1959
Hebei	198	1.78	-6.1423	2.2134	3.5256	0.1618	0.1926
Henan	289	2.60	-6.7697	2.7582	3.6997	0.1854	0.2271
Heilongjiang	149	1.34	-6.4053	3.3215	3.8296	0.1762	0.2061
Hubei	415	3.73	-6.7377	3.0798	3.7237	0.1521	0.1761
Hunan	392	3.52	-6.0688	1.7628	3.1880	0.1741	0.2047
Jilin	191	1.72	-6.3033	4.2544	4.1031	0.1636	0.1829
Jiangsu	1069	9.60	-8.6987	2.3968	3.4180	0.1833	0.2254
Jiangxi	173	1.55	-6.7212	2.2654	3.3369	0.1666	0.1990
Liaoning	334	3.00	-6.1189	2.9497	3.8343	0.1594	0.1890
Inner Mongolia	112	1.01	-4.2663	2.0248	3.4786	0.1753	0.2241
Ningxia	74	0.66	-4.4417	6.2235	4.2532	0.1796	0.2354
Qinghai	40	0.36	-3.5967	1.7947	3.2705	0.1811	0.2115
Shandong	644	5.79	-7.3789	1.9855	3.4167	0.1676	0.1991
Shanxi	133	1.19	-4.7710	2.3192	3.4543	0.1682	0.1809
Shaanxi	172	1.55	-4.8791	2.1016	3.4343	0.1624	0.1976
Shanghai	403	3.62	-8.4616	1.8747	3.1750	0.1140	0.1551
Sichuan	441	3.96	-6.3767	2.1143	3.3720	0.1688	0.2000
Tianjin	139	1.25	-8.4290	2.1491	3.4233	0.1965	0.2477
Xizang	48	0.43	4.8375	0.3961	1.7106	0.2440	0.3151
Yunnan	152	1.37	-5.6948	3.1512	3.6123	0.1650	0.1956
Zhejiang	1060	9.52	-7.7814	2.2357	3.3927	0.1887	0.2288
Panel C: Anti-corruption, government intervention, cash holdings and control variables.							
Variable	N	Mean	SD	Min	p25	Median	p75
Cash1	11130	0.1765	0.1408	0.0076	0.0764	0.1345	0.2350
Cash2	11130	0.2133	0.2118	0.0076	0.0795	0.1444	0.2678
Intervention	11130	-7.1766	1.5047	-9.5200	-8.2645	-7.5129	-6.3530
Anti1	11130	2.3525	0.8427	0.2387	1.9594	2.3170	2.7454
Anti2	11130	3.4027	0.3684	1.4644	3.3064	3.4493	3.5662
Size	11130	7.8449	1.1879	5.1352	7.0223	7.6822	8.5041
Leverage	11130	0.5181	0.2675	0.0088	0.3034	0.5167	0.7203
Cashflow	11130	0.1635	0.3835	-0.1829	0.0208	0.0573	0.1411
BM	11130	0.8753	0.8022	0.0778	0.3729	0.6143	1.0708
NWC	11130	0.2058	0.7337	-0.9034	-0.0444	0.1155	0.2880
Capex	11130	0.0553	0.0551	-0.0517	0.0153	0.0405	0.0803
Age	11130	2.4239	0.8030	0	2.0794	2.6391	2.9957
Tangibility	11130	0.9447	0.0621	0.6034	0.9315	0.9624	0.9820
ROA	11130	0.0476	0.0620	-0.1128	0.0157	0.0427	0.0778

Table 3
Univariate tests.

Panel A: Strong anti-corruption intensity vs. weak anti-corruption intensity						
(Partitioned by Anti1) Variable	Strong Mean	Median	Weak Mean	Median	Diff t-value	z-value
Cash1	0.1721	0.1297	0.1805	0.1396	0.0084***	0.0099***
Cash2	0.2078	0.1389	0.2184	0.1504	0.0107***	0.0115***
Intervention	-7.3218	-7.5225	-7.0449	-7.5129	0.2769***	0.0096***
Anti1	2.9029	2.7454	1.8534	1.9718	-1.0495***	-0.7736***
Anti2	3.6364	3.5593	3.1908	3.3190	-0.4456***	-0.2403***
Size	7.8846	7.7217	7.8090	7.6494	-0.0756***	-0.0723***
Leverage	0.5156	0.5142	0.5205	0.5185	0.0049	0.0043
Cashflow	0.1646	0.5517	0.1625	0.0589	-0.0021	-0.4928
BM	0.9199	0.6453	0.8348	0.5850	-0.0851***	-0.0603**
NWC	0.2258	0.1177	0.1877	0.1126	-0.0381***	-0.0051***
Capex	0.0553	0.0414	0.0553	0.0399	-0.0000	-0.0015
Age	2.4370	2.6391	2.4119	2.6391	-0.0250	0.0000
Tangibility	0.9434	0.9619	0.9460	0.9628	0.0026**	0.0009
ROA	0.0481	0.0427	0.0471	0.0426	-0.0011	-0.0001
N	5293	5293	5837	5837		

Panel B: High intervention level vs. low intervention level						
Variable	High intervention		Low intervention		Diff.	
	Mean	Median	Mean	Median	t-value	z-value
Cash1	0.1830	0.1395	0.1686	0.1297	-0.0144***	-0.0098***
Cash2	0.2233	0.1502	0.2013	0.1389	-0.0220***	-0.0113***
Intervention	-5.9730	-6.2480	-8.1691	-8.1441	-2.1961***	-1.8961***
Anti1	2.3214	2.3170	2.3901	2.3038	0.0687***	-0.0132**
Anti2	3.4005	3.4293	3.4055	3.4901	-0.0050***	-0.0608***
Size	7.7848	7.5941	7.9179	7.7947	-0.1331***	0.2006***
Leverage	0.5030	0.4957	0.5365	0.5371	0.0034***	-0.0414***
Cashflow	0.1623	0.0580	0.1650	0.0561	0.0027	0.0019
BM	0.8421	0.5979	0.9155	0.6355	0.0735***	0.0375***
NWC	0.2073	0.1207	0.2040	0.1092	-0.0033	-0.0115
Capex	0.0562	0.0413	0.0541	0.0398	-0.0021**	-0.0015
Age	2.3193	2.3979	2.5507	2.8332	0.2314***	-0.4353***
Tangibility	0.9460	0.9638	0.9432	0.9608	-0.0028**	-0.0030***
ROA	0.0495	0.0450	0.0453	0.0399	-0.0042***	-0.0051***
N	6100	6100	5030	5030		

Note: *, ** and *** represent significance at the 10 %, 5% and 1% levels.

divided by total assets), and ROA (earnings before interest and tax divided by total assets).

The detailed definitions of all variables are reported in Table 1.

3.3. Summary statistics

Table 2 presents the summary statistics of our main variables. Panel A reports the annual statistics from 2009 to 2015. The anti-corruption intensity increases smoothly from 2009 to 2015. Corporate cash holdings and government intervention rise from 2009 to 2011 and fall in the subsequent years. Panel B presents the mean values for key variables based on provincial-level statistics. Across the sample period, government intervention in Jiangsu (Xizang) is lowest (highest) with a mean value of -8.6897 (4.8375), and anti-corruption intensity in Ningxia (Xizang) is the strongest (weakest) with mean values of 6.2235 (0.3961) for *Anti1* and 4.2532 (1.7106) for *Anti2*. Meanwhile, corporate cash holdings in Xizang (Shanghai) are the highest (lowest) with 24.40 % (11.40 %) for *Cash1* and 31.51 % (15.51 %) for *Cash2*. Panel C reports the descriptive statistics. The means of anti-corruption and government intervention are 2.3525 (3.4027) and -7.1766, respectively. On average, firms in our sample have a cash holding ratio of 17.65 % (21.33 %), a size (natural logarithm of total assets in millions of yuan) of 7.8849, leverage ratio of 0.5181, and a cash flow ratio of 0.1635, which is similar to the studies of Kusnadi et al. (2015); Liu et al. (2016a) and Xu and Yano (2017).

4. Empirical analysis

4.1. Univariate tests

Table 3 presents the univariate test results. We refer to a province as having strong anti-corruption intensity if its *Anti1* is higher

Table 4
The effects of government intervention and anti-corruption on corporate cash holdings.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash1	Cash1	Cash2	Cash2	Cash1	Cash1	Cash2	Cash2
Intervention _t	0.0002** (2.81)	0.0104** (2.47)	0.0003** (2.09)	0.0165** (2.43)	0.0002** (2.80)	0.0104** (2.48)	0.0003** (2.09)	0.0166** (2.40)
Anti1 _t	-0.0059** (-2.28)	-0.0403*** (-3.74)	-0.0076* (-1.87)	-0.0586*** (-3.29)				
Intervention _t *Anti1 _t		-0.0036** (-2.19)		-0.0057** (-2.16)				
Anti2 _t					-0.0154** (-2.05)	-0.0353*** (-3.70)	-0.0200* (-1.71)	-0.0514*** (-3.28)
Intervention _t *Anti2 _t						-0.0035** (-2.09)		-0.0055** (-2.17)
Size _{t-1}	-0.0260*** (-16.04)	-0.0260*** (-16.49)	-0.0378*** (-14.54)	-0.0379*** (-14.93)	-0.0260*** (-16.46)	-0.0260*** (-16.47)	-0.0379*** (-14.85)	-0.0379*** (-14.93)
Leverage _{t-1}	-0.0131 (-1.47)	-0.0129 (-1.44)	-0.0211 (-1.50)	-0.0208 (-1.48)	-0.0130 (-1.45)	-0.0129 (-1.46)	-0.0210 (-1.48)	-0.0206 (-1.45)
BM _{t-1}	-0.0103*** (-4.64)	-0.0100*** (-4.65)	-0.0152*** (-5.00)	-0.0149*** (-5.02)	-0.0102*** (-4.63)	-0.0110*** (-4.65)	-0.0151*** (-4.98)	-0.0147*** (-6.01)
Cashflow _{t-1}	-0.0139** (-2.17)	-0.0138** (-2.12)	-0.0164 (-1.59)	-0.0164 (-1.55)	-0.0137** (-2.12)	-0.0138** (-2.02)	-0.0162 (-1.55)	-0.0162 (-1.59)
NWC _{t-1}	-0.0035* (-1.79)	-0.0035* (-1.75)	-0.0060** (-2.08)	-0.0060** (-2.05)	-0.0035* (-1.74)	-0.0044* (-1.77)	-0.0059* (-2.04)	-0.0061** (-2.08)
Capex _{t-1}	-0.2657*** (-6.69)	-0.2559*** (-6.72)	-0.4152*** (-7.58)	-0.4154*** (-7.61)	-0.2658*** (-6.72)	-0.2557*** (-6.73)	-0.4161*** (-7.62)	-0.4155*** (-7.67)
Age _{t-1}	-0.0038 (-1.09)	-0.0033 (-0.98)	-0.0059 (-1.17)	-0.0055 (-1.04)	-0.0036 (-1.04)	-0.0038 (-0.96)	-0.0058 (-1.12)	-0.0053 (-1.05)
Tangibility _{t-1}	0.2321*** (6.80)	0.2332*** (6.84)	0.3525*** (7.32)	0.3542*** (7.35)	0.2331*** (6.82)	0.2335*** (6.89)	0.3531*** (7.34)	0.3543*** (7.37)
ROA _{t-1}	0.2045*** (4.89)	0.2046*** (4.85)	0.2961*** (4.71)	0.2952*** (4.66)	0.2044*** (4.86)	0.2049*** (4.85)	0.2952*** (4.68)	0.2958*** (4.69)
Constant	0.2031*** (4.82)	0.2962*** (6.94)	0.2433*** (4.24)	0.3791*** (6.08)	0.2394*** (4.88)	0.2961*** (6.98)	0.2905*** (4.21)	0.3793*** (6.09)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1024	0.1021	0.0996	0.1035	0.1027	0.1007	0.0998	0.1007
N	11130	11130	11130	11130	11130	11130	11130	11130

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

than 2.3525, which is the mean of *Anti1*, and weak anti-corruption intensity otherwise.⁴ Comparisons of the variables between firms facing strong anti-corruption intensity and low intensity are presented in Panel A, which shows that the differences of *Cash1* and *Cash2* between firms in the strong anti-corruption group and those in the weak anti-corruption group are significant. Similarly, a province is viewed as one with high intervention if its *Intervention* is higher than -7.1766, which is the mean of *Intervention*, and low intervention otherwise. Panel B shows that the differences of *Cash1* and *Cash2* between firms in the high and those in the low intervention group are also significant.

These examinations provide preliminary evidence for our argument that firms will hold less cash as government intervention decreases. Additionally, Table 3 shows that there are substantial financial differences between firms in areas with different anti-corruption intensity and government intervention.

4.2. Multivariate regressions

4.2.1. The effects of government intervention and anti-corruption on corporate cash holdings

Based on Chen et al. (2014) and Kusnadi et al. (2015), the following model is estimated using ordinary least squares (OLS) regressions for the pooled sample.

$$Cash_{i,t} = \alpha_0 + \beta_1 Intervention_{i,t} + \beta_2 Anti_{i,t} + \beta_3 Intervention_{i,t} \times Anti_{i,t} + \gamma X_{i,t-1} + Industry\ and\ Year\ Dummies + \varepsilon_{i,t} \quad (1)$$

where $Cash_{i,t}$, $Intervention_{i,t}$ and $Anti_{i,t}$ measure corporate cash holdings, government intervention and anti-corruption, respectively. $X_{i,t-1}$ is a vector of control variables lagged by one year.

Table 4 reports the effect of government intervention and anti-corruption on corporate cash holdings. Columns (1) and (3), which are based on *Anti1*, show that corporate cash holdings increase when government intervention rises, but decrease as the anti-

⁴ We also used *Anti2* to define strong and low anti-corruption groups in the univariate test. Because the results are similar to those of *Anti1*, we omit the results based on *Anti2* to conserve space.

Table 5
The effects of government intervention and anti-corruption on corporate cash holdings in two sub-samples.

	2009–2012				2013–2015			
	(1) Cash1	(2) Cash1	(3) Cash2	(4) Cash2	(5) Cash1	(6) Cash1	(7) Cash2	(8) Cash2
Intervention _t	0.0206*** (5.24)	0.0312*** (4.61)	0.0207*** (5.26)	0.0310*** (4.60)	0.0025 (0.74)	0.0049 (0.94)	0.0025 (0.77)	0.0048 (0.94)
Anti1 _t	-0.0608*** (-4.93)	-0.0891*** (-4.16)			-0.0207** (-2.43)	-0.0297** (-2.11)		
Intervention _t *Anti1 _t	-0.0070*** (-4.47)	-0.0106*** (-3.96)			-0.0010 (-0.73)	-0.0018 (-0.88)		
Anti2 _t			-0.0533*** (-4.98)	-0.0780*** (-4.19)			-0.0181** (-2.63)	-0.0260** (-2.11)
Intervention _t *Anti2 _t			-0.0068*** (-4.97)	-0.0103*** (-3.97)			-0.0009 (-0.74)	-0.0019 (-0.84)
Size _{t-1}	-0.0259*** (-10.91)	-0.0389*** (-10.39)	-0.0260*** (-10.92)	-0.0391*** (-10.43)	-0.0243*** (-18.08)	-0.0341*** (-16.18)	-0.0239*** (-19.11)	-0.0344*** (-16.20)
Leverage _{t-1}	-0.0457*** (-3.91)	-0.0697*** (-3.63)	-0.0459*** (-3.92)	-0.0699*** (-3.62)	0.0150 (1.69)	0.0209 (1.66)	0.0151 (1.68)	0.0210 (1.56)
BM _{t-1}	-0.0167*** (-8.53)	-0.0248*** (-9.03)	-0.0169*** (-8.51)	-0.0249*** (-9.02)	-0.0043 (-1.69)	-0.0067* (-1.90)	-0.0045 (-1.70)	-0.0065* (-1.92)
Cashflow _{t-1}	-0.0191** (-2.38)	-0.0235* (-1.85)	-0.0192** (-2.30)	-0.0231* (-1.88)	-0.0069 (-0.91)	-0.0067 (-0.56)	-0.0063 (-0.92)	-0.0067 (-0.60)
NWC _{t-1}	-0.0065** (-2.05)	-0.0102** (-2.09)	-0.0067** (-2.05)	-0.0102** (-2.13)	-0.0001 (-0.04)	-0.0016 (-0.33)	-0.0001 (-0.04)	-0.0014 (-0.35)
Capex _{t-1}	-0.3004*** (-6.20)	-0.4843*** (-6.55)	-0.3006*** (-6.20)	-0.4845*** (-6.58)	-0.2414*** (-5.82)	-0.3726*** (-7.08)	-0.2412*** (-5.90)	-0.3727*** (-7.36)
Age _{t-1}	-0.0049 (-1.21)	-0.0083 (-1.35)	-0.0047 (-1.11)	-0.0081 (-1.29)	-0.0042 (-1.29)	-0.0058 (-1.27)	-0.0047 (-1.26)	-0.0060 (-1.21)
Tangibility _{t-1}	0.2967*** (5.39)	0.4505*** (5.82)	0.2964*** (5.42)	0.4502*** (5.87)	0.1446*** (4.43)	0.2208*** (4.81)	0.1442*** (4.47)	0.2207*** (4.83)
ROA _{t-1}	0.2542*** (4.75)	0.3695*** (4.63)	0.2544*** (4.76)	0.3689*** (4.57)	0.0852** (2.31)	0.1193** (2.26)	0.0848** (2.31)	0.1194** (2.20)
Constant	0.3312*** (4.99)	0.4431*** (4.61)	0.3315*** (4.89)	0.4413*** (4.80)	0.2794*** (7.12)	0.3444*** (6.15)	0.2739*** (7.22)	0.3435*** (6.22)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1326	0.1276	0.1327	0.1274	0.0816	0.0827	0.0826	0.0816
N	5547	5547	5547	5547	5583	5583	5583	5583

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

corruption intensity strengthens. Meanwhile, we employ the interaction term $Intervention \times Anti1$ in columns (2) and (4) to investigate how anti-corruption affects the relationship between government intervention and corporate cash holdings. The coefficients of $Intervention \times Anti1$ in columns (2) and (4) are -0.0036 and -0.0057, respectively, and both are significant at the 5% level with t -statistics of -2.19 and -2.16, respectively. In terms of economic magnitude, a one standard deviation (0.8427) increase in anti-corruption effort leads to a 0.0030 % and 0.0048 % decrease (0.0036×0.8427 and 0.0057×0.8427) in the corporate cash holdings given a typical increase in government intervention. The results from columns (5) to (8), which are based on $Anti2$, are similar to those of columns (1) to (4). As for control variables, consistent with [Dittmar et al. \(2003\)](#); [Caprio et al. \(2013\)](#) and [Chen et al. \(2014\)](#), we find that firms with more growth opportunities (lower BM), more fixed assets and higher ROA tend to hold more cash, and firms with more working capital, higher leverage and higher capital expenditures tend to hold less cash.

Considering the advancement of the anti-corruption campaign after the 18th National Congress of the Communist Party of China in December 2012, we divide our sample into two sub-samples from 2009 to 2012 and 2013–2015 and present the results in [Table 5](#). The results for the 2009–2012 sub-sample are reported in columns (1) to (4) and those from the 2013–2015 sub-sample are shown in columns (5) to (8). The results in [Table 5](#) are similar to those in [Table 4](#) but the variable $Intervention$ in columns (5) to (8) is not significant, although it has a positive sign. These results demonstrate that government intervention does not have an impact on firm cash holdings after 2013, which indicates that political extraction can be suppressed effectively when officials are faced with a harsher anti-corruption campaign.

[Tables 4 and 5](#) show that firms hold more cash as government intervention rises, whereas anti-corruption has a negative effect on corporate cash holdings. Additionally, the interaction term reflects the fact that firms tend to hold less cash with intensifying anti-corruption given a certain government intervention level. The results support our two hypotheses that firms hold more cash as government intervention increases and that anti-corruption intensity alleviates this positive relation. Firms hold more cash because they can rarely deter political expropriation when exposed to a corrupt environment ([Shleifer and Vishny, 1993](#); [Stulz, 2005](#); [Fisman and Svensson, 2007](#); [Durnev and Fauver, 2010](#)) or may even cater to bureaucrats to survive prevailing threats of government extraction ([Shleifer and Vishny, 1993](#); [Fisman and Svensson, 2007](#); [Li et al., 2008](#); [Cheung et al., 2012](#); [Ayyagari et al., 2014](#); [Lin et al.,](#)

Table 6

The effects of government intervention and anti-corruption on corporate cash holdings: SOEs vs. non-SOEs.

	SOEs				Non-SOEs			
	(1) Cash1	(2) Cash1	(3) Cash2	(4) Cash2	(5) Cash1	(6) Cash1	(7) Cash2	(8) Cash2
Intervention _t	0.0159*** (6.43)	0.0268*** (7.18)	0.0158*** (6.46)	0.0281*** (7.18)	0.0066 (0.86)	0.0087 (0.69)	0.0067 (0.86)	0.0082 (0.68)
Anti1 _t	-0.0451*** (-4.35)	-0.0696*** (-4.75)			-0.0338* (-2.02)	-0.0442 (-1.61)		
Intervention _t *Anti1 _t			-0.0395*** (-4.35)	-0.0610*** (-4.75)			-0.0297* (-2.01)	-0.0387 (-1.60)
Anti2 _t			-0.0047*** (-3.82)	-0.0085*** (-4.51)			-0.0028 (-0.99)	-0.0033 (-0.79)
Intervention _t *Anti2 _t	-0.0051*** (-3.82)	-0.0086*** (-4.51)			-0.0027 (-0.93)	-0.0034 (-0.76)		
Size _{t-1}	-0.0145*** (-5.33)	-0.0199*** (-5.17)	-0.0142*** (-5.34)	-0.0197*** (-5.11)	-0.0337*** (-15.39)	-0.0498*** (-14.77)	-0.0334*** (-15.24)	-0.0498*** (-14.59)
Leverage _{t-1}	0.0053 (0.46)	0.0059 (0.35)	0.0056 (0.43)	0.0057 (0.35)	-0.0167 (-1.23)	-0.0252 (-1.18)	-0.0165 (-1.34)	-0.0249 (-1.21)
BM _{t-1}	-0.0035 (-1.38)	-0.0051 (-1.49)	-0.0039 (-1.33)	-0.0050 (-1.49)	-0.0177*** (-5.19)	-0.0263*** (-5.46)	-0.0179*** (-5.14)	-0.0263*** (-5.43)
Cashflow _{t-1}	-0.0078 (-1.27)	-0.0105 (-1.37)	-0.0076 (-1.20)	-0.0105 (-1.37)	-0.0159 (-1.56)	-0.0173 (-1.05)	-0.0159 (-1.60)	-0.0175 (-1.13)
NWC _{t-1}	0.0025 (0.81)	0.003 (0.69)	0.0024 (0.80)	0.0033 (0.69)	-0.0065** (-2.40)	-0.0103** (-2.55)	-0.0068** (-2.29)	-0.0115** (-2.65)
Capex _{t-1}	-0.1975*** (-4.33)	-0.2854*** (-4.47)	-0.1973*** (-4.39)	-0.2854*** (-4.47)	-0.3425*** (-6.33)	-0.5606*** (-7.46)	-0.3412*** (-6.35)	-0.5603*** (-7.41)
Age _{t-1}	-0.0044 (-0.85)	-0.0063 (-0.84)	-0.0044 (-0.63)	-0.0063 (-0.84)	-0.0024 (-0.55)	-0.0046 (-0.67)	-0.0024 (-0.45)	-0.0047 (-0.64)
Tangibility _{t-1}	0.1489** (2.40)	0.2001** (2.47)	0.1492** (2.43)	0.2005** (2.58)	0.2576*** (7.16)	0.4053*** (7.58)	0.2575*** (7.26)	0.4052*** (7.46)
ROA _{t-1}	0.0742 (1.54)	0.1047 (1.48)	0.0745 (1.55)	0.1044 (1.36)	0.2452*** (5.06)	0.3489*** (4.73)	0.2445*** (5.07)	0.3498*** (4.72)
Constant	0.2682*** (4.12)	0.3593*** (4.22)	0.2680*** (4.20)	0.3596*** (4.12)	0.3345*** (6.15)	0.4193*** (4.88)	0.3342*** (6.14)	0.4197*** (4.98)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.0691	0.0698	0.0691	0.0697	0.1311	0.1259	0.1310	0.1258
N	4273	4273	4273	4273	6857	6857	6857	6857

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

2016). Caprio et al. (2013) and Kusnadi et al. (2015) argue that firms hold less cash in the case of official extraction; however, our findings suggest that firms located in provinces with more government intervention hold more cash than their counterparts in provinces with less government intervention. Our results differ due to the following factors. First, by using data from 2009 to 2015, we can capture the recent trend of Chinese institutional development, including intensifying anti-corruption and government decentralization, whereas Caprio et al. (2013) employ cross-country data from 2005 and the listed Chinese firms in Kusnadi et al. (2015) are from 1999 to 2007. Second, we utilize the index of the relationship between government and market rather than the overall marketization index used by Kusnadi et al. (2015), who focus on the effect of institutional development on firms' cash holdings. Kusnadi et al. (2015, p. 353) state: "This index (the NERI index of marketization) captures the following aspects of regional market development: the relationship between the government and the market; development of non-state business; development of product markets; development of factor markets; development of market intermediaries and legal environment." Hence, our measurement (including the data on provincial government spending, provincial tax rates, time spent by entrepreneurs dealing with bureaucracy, and time needed for firm registration and obtaining various licenses) can more accurately reflect how government extraction affects corporate decisions. Third, we bring increasing anti-corruption intensity into our research to reveal that top-down monitoring plays a role in rectifying government corruption. Our results support the argument that anti-corruption suppresses official misconduct, and this helps the formation of governments that inflict less rent-seeking and have a lower likelihood of policy uncertainty (Lin et al., 2016; Kong et al., 2017; Xu and Yano, 2017).

4.2.2. SOEs vs. non-SOEs

Because SOEs bear social responsibilities such as full employment and social stability in addition to profitability, they may perform differently than non-SOEs (Chen et al., 2011b; Sun et al., 2002). Hence, we divide the sample into SOEs and non-SOEs and present the results in Table 6.

Columns (1) to (4) show the results for SOEs and columns (5) to (8) those for non-SOEs. The results based on the SOE sub-sample are in line with those in Table 4. However, although the coefficients of *Intervention*, *Anti1* (*Anti2*), and their interaction terms in

Table 7

The effects of government intervention and anti-corruption on corporate cash holdings: High intervention areas vs. low intervention areas.

	High intervention areas				Low intervention areas			
	(1) Cash1	(2) Cash1	(3) Cash2	(4) Cash2	(5) Cash1	(6) Cash1	(7) Cash2	(8) Cash2
Intervention _t	0.0115*** (3.10)	0.0171*** (2.84)	0.0116*** (3.08)	0.0172*** (2.89)	0.0391 (0.30)	0.0421 (0.21)	0.0389 (0.28)	0.0420 (0.20)
Anti _t	-0.0339** (-2.72)	-0.0443** (-2.13)			-0.0943 (-0.26)	-0.0946 (-0.17)		
Intervention _t *Anti _t	-0.0032* (-1.83)	-0.0046 (-1.58)			-0.0140 (-0.34)	-0.0153 (-0.25)		
Anti _{2t}			-0.0294** (-2.68)	-0.0388** (-2.18)			-0.0817 (-0.29)	-0.0829 (-0.19)
Intervention _t *Anti _{2t}			-0.0031* (-1.93)	-0.0045 (-1.57)			-0.0136 (-0.30)	-0.0149 (-0.20)
Size _{t-1}	-0.0246*** (-10.49)	-0.0347*** (-10.18)	-0.0241*** (-10.37)	-0.0351*** (-10.21)	-0.0270*** (-15.22)	-0.0404*** (-11.47)	-0.0268*** (-15.13)	-0.0402*** (-11.40)
Leverage _{t-1}	0.0013 (0.13)	0.0011 (0.07)	0.0015 (0.11)	0.0015 (0.07)	0.0279*** (3.02)	0.0440** (2.76)	0.0280*** (3.03)	0.0439** (2.70)
BM _{t-1}	-0.0086*** (-2.84)	-0.0128*** (-3.24)	-0.0088*** (-2.78)	-0.0128*** (-3.12)	-0.0104*** (-4.21)	-0.0152*** (-4.29)	-0.0114*** (-4.18)	-0.0155*** (-4.32)
Cashflow _{t-1}	-0.0119 (-1.12)	-0.0133 (-0.79)	-0.0116 (-1.15)	-0.0136 (-0.89)	-0.0157** (-2.42)	-0.0196* (-1.92)	-0.0158** (-2.44)	-0.0196* (-1.97)
NWC _{t-1}	-0.0023 (-0.70)	-0.0042 (-0.85)	-0.0024 (-0.74)	-0.0043 (-0.88)	-0.0045* (-2.04)	-0.0076** (-2.73)	-0.0049* (-2.17)	-0.0071** (-2.79)
Capex _{t-1}	-0.221*** (-3.33)	-0.3442*** (-3.84)	-0.2219*** (-3.23)	-0.3446*** (-3.89)	-0.3130*** (-7.11)	-0.5086*** (-7.34)	-0.3138*** (-7.19)	-0.5089*** (-7.41)
Age _{t-1}	-0.0057 (-0.91)	-0.0092 (-1.10)	-0.0056 (-0.94)	-0.0090 (-1.08)	-0.0028 (-0.87)	-0.0044 (-0.89)	-0.0030 (-0.77)	-0.0045 (-0.88)
Tangibility _{t-1}	0.2281*** (3.55)	0.3464*** (3.85)	0.2283*** (3.58)	0.3476*** (3.88)	0.2357*** (8.40)	0.3556*** (9.11)	0.2377*** (8.42)	0.3565*** (9.08)
ROA _{t-1}	0.1334** (2.61)	0.1862** (2.57)	0.1335** (2.62)	0.1863** (2.56)	0.2787*** (6.85)	0.4078*** (5.97)	0.2780*** (6.39)	0.4073*** (5.77)
Constant	0.2701*** (3.68)	0.3252*** (3.17)	0.2705*** (3.69)	0.3255*** (3.21)	0.0005 (0.00)	0.0721 (0.05)	-0.0004 (-0.00)	0.0722 (0.05)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.0958	0.0942	0.0959	0.0940	0.1193	0.1162	0.1194	0.1163
N	5659	5659	5659	5659	5471	5471	5471	5471

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

columns (5) to (8) have the same signs as those of their counterparts in columns (1) to (4), most are not significant. CEOs in SOEs are nominated by the government of the corresponding level and have to be supervised by the government (Kato and Long, 2006; Chen et al., 2011b; Xie, 2015; Zhou and Xie, 2016). The anti-corruption campaign has been promoted and implemented by the Central Inspection Teams led by Qishan Wang, who is a member of the Standing Committee of the Central Political Bureau of the Communist Party of China and the secretary of the Central Commission for Discipline Inspection of the Communist Party of China. The Central Inspection Teams are sent to a variety of provinces and SOEs to oversee the practices of officials and managers. Once the Central Inspection Teams detect corruption cases, the involved officials or managers in SOEs are brought to trial. Hence, the results in Table 6 provide some supporting evidence that anti-corruption acts as a top-down reform and has more obvious effects on corporate decisions for SOEs (Pan and Tian, 2017; Xu and Yano, 2017).

4.2.3. High intervention vs. Low intervention

Based on the uneven development across districts in China, a policy may present different outcomes due to the varying institutional environments. Therefore, we divide the sample into high intervention and low intervention groups according to the median value of *Intervention* and report the results in Table 7.

Table 7 shows that the variable coefficients are similar to those in Table 4. The coefficients in the high intervention group remain significant at the 1% level, whereas those in the low intervention group are insignificant. We suggest that this is because the institutional environment in low intervention areas is sounder and more developed than in high intervention areas. With a more efficient market environment, higher government quality and fiercer competition among officials, governments tend to display a lower likelihood of rent-seeking and intervention. Therefore, firms in these areas tend to make cash holding decisions based on practical demands and strategies with less consideration of political extraction, and the effects of anti-corruption will not be as obvious as those in high intervention areas, where official corruption is more prevalent and severe.

Table 8
The effects of government intervention and anti-corruption on corporate cash holdings: Politically connected vs. non-politically connected firms.

	Politically connected firms				Non-politically connected firms			
	(1) Cash1	(2) Cash1	(3) Cash2	(4) Cash2	(5) Cash1	(6) Cash1	(7) Cash2	(8) Cash2
Intervention _t	0.0017 (0.25)	0.0038 (0.38)	0.0018 (0.20)	0.0036 (0.39)	0.0132** (2.72)	0.0211** (2.65)	0.0133** (2.73)	0.0210** (2.64)
Anti1 _t	-0.0161 (-0.86)	-0.0206 (-0.77)			-0.0501*** (-4.44)	-0.0748*** (-4.04)		
Intervention _t *Anti1 _t	-0.0001 (-0.05)	-0.0004 (-0.11)			-0.0051** (-2.51)	-0.0079** (-2.49)		
Anti2 _t			-0.0141 (-0.80)	-0.0181 (-0.89)			-0.0439*** (-4.48)	-0.0656*** (-4.13)
Intervention _t *Anti2 _t			-0.0001 (-0.03)	-0.0004 (-0.12)			-0.0047** (-2.50)	-0.0075** (-2.48)
Size _{t-1}	-0.0275*** (-9.65)	-0.0397*** (-9.80)	-0.0277*** (-9.55)	-0.0399*** (-9.78)	-0.0256*** (-12.06)	-0.0373*** (-10.73)	-0.0259*** (-12.01)	-0.0374*** (-10.87)
Leverage _{t-1}	0.0007 (0.08)	0.0042 (0.32)	0.0008 (0.09)	0.0044 (0.36)	-0.0221* (-1.95)	-0.0365** (-2.14)	-0.0220* (-1.92)	-0.0362** (-2.19)
BM _{t-1}	-0.0113*** (-3.87)	-0.0166*** (-4.13)	-0.0113*** (-3.88)	-0.0168*** (-4.15)	-0.0093*** (-3.47)	-0.0138*** (-3.63)	-0.0092*** (-3.50)	-0.0136*** (-3.61)
Cashflow _{t-1}	-0.0143 (-1.58)	-0.0231** (-2.07)	-0.0140 (-1.45)	-0.0232** (-2.09)	-0.0150* (-1.87)	-0.0146 (-1.01)	-0.0153* (-1.89)	-0.0146 (-1.00)
NWC _{t-1}	-0.0055 (-1.43)	-0.0098* (-1.76)	-0.0052 (-1.46)	-0.0098* (-1.79)	-0.0038 (-1.66)	-0.0059 (-1.60)	-0.0031 (-1.66)	-0.0056 (-1.57)
Capex _{t-1}	-0.2454*** (-4.25)	-0.3786*** (-4.90)	-0.2475*** (-4.29)	-0.3788*** (-4.89)	-0.2709*** (-5.78)	-0.4420*** (-6.53)	-0.2708*** (-5.82)	-0.4429*** (-6.51)
Age _{t-1}	0.0014 (0.30)	0.0011 (0.16)	0.0013 (0.30)	0.0010 (0.17)	-0.0065* (-1.72)	-0.0095 (-1.64)	-0.0067* (-1.79)	-0.0098 (-1.61)
Tangibility _{t-1}	0.2655*** (7.05)	0.3957*** (7.65)	0.2658*** (7.09)	0.3959*** (7.68)	0.2293*** (5.76)	0.3524*** (6.09)	0.2293*** (5.78)	0.3526*** (6.12)
ROA _{t-1}	0.2002*** (3.84)	0.2904*** (3.80)	0.2007*** (3.78)	0.2906*** (3.79)	0.2098*** (4.68)	0.3026*** (4.41)	0.2095*** (4.71)	0.3028*** (4.38)
Constant	0.1921*** (2.96)	0.2178** (2.43)	0.1922*** (2.99)	0.2181** (2.41)	0.3325*** (7.14)	0.4394*** (6.14)	0.3326*** (7.11)	0.4397*** (6.11)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1086	0.1069	0.1087	0.1068	0.1105	0.1074	0.1105	0.1073
N	4121	4121	4121	4121	6819	6819	6819	6819

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

4.2.4. Politically connected vs. Non-politically connected

The extant literature argues that political connections can provide benefits to private firms, such as mitigating credit market frictions (Li et al., 2008; Liu et al., 2016a), gaining the privilege of operating in regulated industries (Ke et al., 2017), facilitating transfers of critical resources to assist firm diversification (Fan et al., 2017), and increasing the capital available for firms to address under-investment problems (Xu et al., 2011). Specifically, Chen et al. (2011a) demonstrate that firms are prone to establishing political connections in regions with less market orientation or more government discretion in allocating economic resources. Hence, we divide firms into politically connected and non-politically connected ones. Table 8 reports the regression results on whether political connection has an effect on corporate cash holdings. According to Table 8, 4121 firm-year observations belong to connected firms and 6819 to non-politically connected firms.

In Table 8, the coefficients of *Anti1* and *Anti2* remain negative and highly significant in all eight specifications, and the signs of *Intervention* and *Anti1* (*Anti2*) × *Intervention* are consistent with the results in Table 4. However, *Intervention* and *Anti1* (*Anti2*) × *Intervention* are only significant at 1% for non-politically connected firms. Xu and Yano (2017) find that firms without political backgrounds invest significantly more in R&D in response to anti-corruption efforts. Because connected firms may still enjoy some implicitly favorable treatments, anti-corruption efforts are not sufficient to promote their innovations. Similar to this deduction, our results suggest that non-politically connected firms are more susceptible to official extraction and the uncertainty of governmental policy changes. These firms tend to increase their cash holdings as government intervention rises because of unavoidable expenditures related to catering to officials. Hence, intensifying anti-corruption acts as a positive signal for firms without political backgrounds and its alleviation effect on the positive relationship between government intervention and corporate cash holdings is more obvious than for connected firms.

5. Robustness tests

In this section, we perform several tests to examine the robustness of our findings, with all results confirming our previous

Table 9
The effects of government intervention and anti-corruption on corporate cash holdings: Alternative measures for government intervention.

	Intervention1			Intervention2			Intervention3					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2
Intervention _t	0.0082* (2.17)	0.0128** (2.25)	0.0080** (2.04)	0.0120** (2.04)	0.0137*** (6.81)	0.0213*** (6.28)	0.0132*** (6.00)	0.0206*** (5.45)	0.0153*** (6.45)	0.0233*** (6.10)	0.0153*** (6.39)	0.0232*** (5.95)
Anti _t	-0.0149*** (-4.68)	-0.0220*** (-4.59)	-0.0288*** (-7.03)	-0.0435*** (-6.60)	-0.0288*** (-7.03)	-0.0435*** (-6.60)	-0.0288*** (-7.03)	-0.0435*** (-6.60)	-0.0372*** (-6.77)	-0.0546*** (-6.64)	-0.0372*** (-6.77)	-0.0546*** (-6.64)
Intervention*Anti _t	-0.0013** (-2.35)	-0.0020** (-2.42)	-0.0027*** (-6.20)	-0.0042*** (-5.74)	-0.0027*** (-6.20)	-0.0042*** (-5.74)	-0.0027*** (-6.20)	-0.0042*** (-5.74)	-0.0031*** (-5.98)	-0.0047*** (-5.74)	-0.0031*** (-5.98)	-0.0047*** (-5.74)
Anti _t ²			-0.0143*** (-4.60)	-0.0208*** (-4.46)			-0.0256*** (-6.51)	-0.0401*** (-5.97)			-0.0356*** (-6.85)	-0.0522*** (-6.62)
Intervention*Anti _t ²			-0.0012** (-2.18)	-0.0018** (-2.19)			-0.0026*** (-5.52)	-0.0038*** (-5.00)			-0.0029*** (-6.09)	-0.0044*** (-5.77)
Size _{t-1}	-0.0263*** (-22.64)	-0.0383*** (-21.85)	-0.0263*** (-22.62)	-0.0382*** (-21.82)	-0.0262*** (-16.33)	-0.0380*** (-14.81)	-0.0262*** (-16.38)	-0.0380*** (-14.85)	-0.0260*** (-16.15)	-0.0379*** (-14.59)	-0.0260*** (-16.26)	-0.0378*** (-14.66)
Leverage _{t-1}	-0.0139*** (-2.84)	-0.0222*** (-3.01)	-0.0138*** (-2.83)	-0.0221*** (-3.00)	-0.0142** (-1.62)	-0.0226** (-1.64)	-0.0140** (-1.59)	-0.0224** (-1.62)	-0.0142** (-1.62)	-0.0227** (-1.64)	-0.0142** (-1.59)	-0.0224** (-1.61)
BM _{t-1}	-0.0100*** (-6.01)	-0.0147*** (-5.89)	-0.0100*** (-6.03)	-0.0148*** (-5.91)	-0.0099*** (-4.65)	-0.0147*** (-5.04)	-0.0100*** (-4.66)	-0.0147*** (-5.05)	-0.0100*** (-4.65)	-0.0148*** (-5.01)	-0.0100*** (-4.65)	-0.0148*** (-5.02)
Cashflow _{t-1}	-0.0141*** (-4.04)	-0.0167*** (-3.18)	-0.0140*** (-4.02)	-0.0166*** (-3.15)	-0.0142** (-2.13)	-0.0156** (-1.56)	-0.0141** (-2.11)	-0.0167** (-1.55)	-0.0139** (-2.18)	-0.0164** (-1.59)	-0.0138** (-2.16)	-0.0163** (-1.57)
NWC _{t-1}	-0.0036** (-2.08)	-0.0060** (-2.31)	-0.0036** (-2.07)	-0.0060** (-2.30)	-0.0037** (-1.80)	-0.0061** (-2.10)	-0.0036** (-1.80)	-0.0061** (-2.09)	-0.0036** (-1.76)	-0.0059** (-2.06)	-0.0035** (-1.75)	-0.0054** (-2.05)
CapeX _{t-1}	-0.2562*** (-10.88)	-0.4101*** (-11.57)	-0.2563*** (-10.90)	-0.4102*** (-11.59)	-0.2584*** (-6.71)	-0.4132*** (-7.60)	-0.2584*** (-6.69)	-0.4133*** (-7.58)	-0.2602*** (-6.69)	-0.4174*** (-7.60)	-0.2613*** (-6.69)	-0.4175*** (-7.59)
Age _{t-1}	-0.0044** (-2.49)	-0.0065** (-2.51)	-0.0041** (-2.46)	-0.0064** (-2.49)	-0.0040** (-1.13)	-0.0061** (-1.18)	-0.0040** (-1.11)	-0.0060** (-1.17)	-0.0042** (-1.19)	-0.0064** (-1.27)	-0.0040** (-1.16)	-0.0062** (-1.23)
Tangibility _{t-1}	0.2343*** (11.33)	0.3544*** (11.39)	0.2346*** (11.34)	0.3544*** (11.40)	0.2302*** (6.82)	0.3486*** (7.33)	0.2317*** (6.87)	0.3501*** (7.37)	0.2306*** (6.65)	0.3482*** (7.18)	0.2305*** (6.68)	0.3497*** (7.20)
ROA _{t-1}	0.2012*** (9.53)	0.2908*** (9.15)	0.2011*** (9.52)	0.2903*** (9.15)	0.1992*** (4.64)	0.2875*** (4.46)	0.1991*** (4.65)	0.2883*** (4.48)	0.2011*** (4.76)	0.2912*** (4.58)	0.2014*** (4.76)	0.2915*** (4.58)
Constant	0.2912*** (8.86)	0.3753*** (7.58)	0.2913*** (8.79)	0.3734*** (7.48)	0.3535*** (7.29)	0.4712*** (6.75)	0.3472*** (7.08)	0.4623*** (6.48)	0.3978*** (8.60)	0.5324*** (7.99)	0.3977*** (8.41)	0.5307*** (7.75)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1005	0.0978	0.1005	0.0979	0.1045	0.1024	0.1047	0.1022	0.1050	0.1025	0.1051	0.1024
N	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% level. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

Table 10
The effects of government intervention and anti-corruption on corporate cash holdings: Alternative measures for anti-corruption.

	Full Sample											
	SOEs						Non-SOEs					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	
Intervention _t	0.0128*** (4.60)	0.0200*** (4.61)	0.0126*** (4.16)	0.0194*** (4.07)	0.0173*** (3.78)	0.0276*** (4.20)	0.0178*** (3.90)	0.0282*** (4.35)	0.0072 (1.35)	0.0104 (1.27)	0.0066 (1.22)	0.0092 (1.10)
Anti _t	-0.0246*** (-4.70)	-0.0369*** (-4.66)	-0.0260*** (-4.88)	-0.0390*** (-4.59)	-0.0260*** (-4.48)	-0.0390*** (-4.59)	-0.0260*** (-4.48)	-0.0390*** (-4.59)	-0.0217*** (-3.53)	-0.0321*** (-3.39)	-0.0217*** (-3.53)	-0.0321*** (-3.39)
Intervention _t * Anti _t	-0.0023*** (-4.15)	-0.0035*** (-4.17)	-0.0028*** (-3.43)	-0.0045*** (-3.78)	-0.0028*** (-3.43)	-0.0045*** (-3.78)	-0.0028*** (-3.43)	-0.0045*** (-3.78)	-0.0016* (-1.95)	-0.0023* (-1.86)	-0.0016* (-1.95)	-0.0023* (-1.86)
Anti _t ⁴			-0.0230*** (-4.64)	-0.0344*** (-4.53)			-0.0247*** (-4.82)	-0.0372*** (-5.07)			-0.0198*** (-3.35)	-0.0288*** (-3.16)
Intervention _t * Anti _t ⁴			-0.0022*** (-3.79)	-0.0036*** (-3.74)			-0.0027*** (-3.43)	-0.0046*** (-3.81)			-0.0013* (-1.74)	-0.0019 (-1.61)
Size _{t-1}	-0.0262*** (-16.52)	-0.0382*** (-15.04)	-0.0262*** (-16.55)	-0.0381*** (-15.05)	-0.0146*** (-3.37)	-0.0201*** (-5.25)	-0.0146*** (-3.36)	-0.0201*** (-5.24)	-0.0340*** (-20.18)	-0.0502*** (-19.32)	-0.0340*** (-20.16)	-0.0502*** (-19.30)
Leverage _{t-1}	-0.0139 (-1.60)	-0.0221 (-1.63)	-0.0137 (-1.58)	-0.0220 (-1.60)	0.0048 (0.42)	0.0051 (0.32)	0.0049 (0.42)	0.0052 (0.32)	-0.0182*** (-2.69)	-0.0274*** (-2.63)	-0.0180*** (-2.67)	-0.0272*** (-2.61)
BM _{t-1}	-0.0099*** (-4.55)	-0.0145*** (-4.91)	-0.0098*** (-4.57)	-0.0146*** (-4.93)	-0.0033 (-1.34)	-0.0049 (-1.46)	-0.0035 (-1.35)	-0.0049 (-1.46)	-0.0176*** (-6.74)	-0.0260*** (-6.45)	-0.0177*** (-6.75)	-0.0261*** (-6.47)
Cashflow _{t-1}	-0.0141** (-2.16)	-0.0166 (-1.58)	-0.0140** (-2.14)	-0.0165 (-1.56)	-0.0080 (-1.30)	-0.0105 (-1.39)	-0.0079 (-1.27)	-0.0103 (-1.36)	-0.0160*** (-3.21)	-0.0173** (-2.26)	-0.0159*** (-3.20)	-0.0173** (-2.25)
NWC _{t-1}	-0.0036* (-1.78)	-0.0061** (-2.08)	-0.0036* (-1.77)	-0.0060** (-2.07)	0.0024 (0.80)	0.0030 (0.68)	0.0024 (0.80)	0.0030 (0.68)	-0.0064*** (-2.75)	-0.0102*** (-2.83)	-0.0064*** (-2.74)	-0.0102*** (-2.83)
CapeX _{t-1}	-0.2564*** (-6.59)	-0.4105*** (-7.46)	-0.2563*** (-6.59)	-0.4112*** (-7.46)	-0.1965*** (-4.37)	-0.2844*** (-4.51)	-0.1978*** (-4.38)	-0.2852*** (-4.52)	-0.3398*** (-10.79)	-0.5569*** (-11.49)	-0.3392*** (-10.79)	-0.5567*** (-11.49)
Age _{t-1}	-0.0039 (-1.11)	-0.0059 (-1.17)	-0.0038 (-1.09)	-0.0059 (-1.16)	-0.0045 (-0.89)	-0.0063 (-0.86)	-0.0045 (-0.89)	-0.0063 (-0.85)	-0.0030 (-1.21)	-0.0049 (-1.27)	-0.0030 (-1.19)	-0.0048 (-1.25)
Tangibility _{t-1}	0.2334*** (6.96)	0.353*** (7.48)	0.2332*** (6.98)	0.3534*** (7.50)	0.1475** (2.40)	0.1973** (2.47)	0.1475** (2.41)	0.1984** (2.48)	0.2573*** (9.25)	0.405*** (9.43)	0.2582*** (9.26)	0.4053*** (9.44)
ROA _{t-1}	0.2012*** (4.68)	0.2900*** (4.50)	0.2014*** (4.69)	0.2905*** (4.51)	0.0732 (1.51)	0.1042 (1.47)	0.0733 (1.51)	0.1044 (1.47)	0.2392*** (8.09)	0.3415*** (7.47)	0.2404*** (8.10)	0.3411*** (7.48)
Constant	0.3393*** (7.53)	0.4492*** (7.04)	0.3364*** (7.36)	0.4443*** (6.81)	0.3091*** (4.50)	0.4162*** (4.54)	0.3087*** (4.51)	0.4153*** (4.56)	0.3776*** (7.30)	0.4980*** (6.26)	0.3781*** (7.18)	0.4879*** (6.10)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1044	0.1018	0.1043	0.1017	0.0712	0.0705	0.0711	0.0704	0.1276	0.1225	0.1275	0.1224
N	11130	11130	11130	11130	4273	4273	4273	4273	6857	6857	6857	6857

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

Table 11
The effects of government intervention and anti-corruption on corporate cash holdings: Ranking of political connections.

	Politically connected				Non-politically connected			
	(1) Cash1	(2) Cash1	(3) Cash2	(4) Cash2	(5) Cash1	(6) Cash1	(7) Cash2	(8) Cash2
Intervention _t	0.0319 (0.44)	0.0573 (0.53)	0.0058 (0.10)	0.0015 (0.02)	0.0131*** (5.35)	0.0203*** (5.26)	0.0129*** (4.92)	0.0200*** (4.74)
Anti1 _t	-0.0461 (-0.65)	-0.0727 (-0.68)			-0.0253*** (-5.16)	-0.0384*** (-5.21)		
Intervention _t *Anti1 _t	-0.0055 (-0.56)	-0.0091 (-0.62)			-0.0023*** (-4.50)	-0.0036*** (-4.61)		
Anti2 _t			-0.0048 (-0.09)	-0.0118 (-0.14)			-0.0240*** (-5.30)	-0.0363*** (-5.29)
Intervention _t *Anti2 _t			-0.0001 (-0.01)	-0.0010 (-0.09)			-0.0022*** (-4.21)	-0.0034*** (-4.24)
Size _{t-1}	-0.0270*** (-3.84)	-0.0401*** (-3.76)	-0.0270*** (-3.81)	-0.0401*** (-3.74)	-0.0266*** (-15.69)	-0.0385*** (-14.66)	-0.0266*** (-15.74)	-0.0385*** (-14.68)
Leverage _{t-1}	0.0268 (1.05)	0.0369 (1.04)	0.0267 (1.04)	0.0367 (1.03)	-0.0169* (-1.79)	-0.0266* (-1.79)	-0.0168* (-1.76)	-0.0265* (-1.77)
BM _{t-1}	-0.0014 (-0.15)	-0.0053 (-0.41)	-0.0015 (-0.16)	-0.0054 (-0.42)	-0.0102*** (-4.40)	-0.0149*** (-4.73)	-0.0102*** (-4.41)	-0.0150*** (-4.74)
Cashflow _{t-1}	-0.0561*** (-3.52)	-0.0852*** (-3.77)	-0.0570*** (-3.53)	-0.0865*** (-3.76)	-0.0122* (-1.75)	-0.0136 (-1.22)	-0.0121* (-1.74)	-0.0135 (-1.21)
NWC _{t-1}	-0.0005 (-0.09)	-0.0019 (-0.25)	-0.0006 (-0.11)	-0.0021 (-0.27)	-0.0042* (-1.98)	-0.0069** (-2.21)	-0.0043* (-1.97)	-0.0069** (-2.20)
Capex _{t-1}	-0.1795 (-1.62)	-0.2976* (-1.80)	-0.1814 (-1.60)	-0.3002* (-1.78)	-0.2598*** (-6.41)	-0.4176*** (-7.32)	-0.2607*** (-6.42)	-0.4189*** (-7.32)
Age _{t-1}	0.0139 (1.42)	0.0167 (1.22)	0.0137 (1.41)	0.0164 (1.20)	-0.00536 (-1.47)	-0.0079 (-1.52)	-0.0053 (-1.45)	-0.0078 (-1.50)
Tangibility _{t-1}	0.1855 (1.56)	0.2198 (1.06)	0.1995 (1.63)	0.2397 (1.13)	0.2378*** (7.21)	0.3619*** (7.78)	0.2385*** (7.24)	0.3626*** (7.82)
ROA _{t-1}	0.2136** (2.30)	0.3168** (2.35)	0.2112** (2.23)	0.3172** (2.29)	0.1992*** (4.56)	0.2871*** (4.38)	0.1998*** (4.57)	0.2872*** (4.38)
Constant	0.4142 (0.74)	0.6935 (0.81)	0.1192 (0.25)	0.2577 (0.37)	0.3508*** (8.13)	0.4643*** (7.81)	0.3492*** (8.04)	0.4617*** (7.66)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1827	0.1744	0.1823	0.1727	0.1070	0.1039	0.1070	0.1039
N	805	805	805	805	10325	10325	10325	10325

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

conclusions.

5.1. Three sub-measures for government intervention

The variable *Intervention* is the average of three sub-indexes: the government decentralization index, the government downsizing index, and the index measuring market functions in resource allocation. Thus, similar to *Intervention*, we multiply these three sub-indexes by -1 to measure government intervention and define them as *Intervention1*, *Intervention2* and *Intervention3*, respectively. The results are included in [Table 9](#) and show that our main regression results remain solid.

5.2. Alternative measures for anti-corruption

Next, we use alternative measures for anti-corruption to re-run our regressions. The first proxy, *Anti3_t*, is measured as the natural logarithm of registered corruption cases of officials of county/division rank (xianchuj) or above in each province at year *t*. The second proxy, *Anti4_t*, is measured as the natural logarithm of officials of county/division rank (xianchuj) or above in annual registered corruption cases in each province at year *t*. As mentioned, the registered corruption cases include those involving the misappropriation of public property, extortion and acceptance of bribes, abuse of power, and dereliction of duty. The results in [Table 10](#) remain robust.

5.3. The effects of high-ranking political connections

[Bertrand et al. \(2006\)](#) show that influential politicians are better able to extract political favors. [Francis et al. \(2009\)](#) further point out that Chinese firms with greater political connections can obtain more favorable outcomes during IPOs. Hence, we re-examine our modules to investigate whether firms with high-ranking political connections present outcomes that differ from the results in [Table 8](#).

Table 12
The effects of government intervention and anti-corruption on corporate cash holdings: 2SLS method.

Dependent Variable: Intervention		SOEs										Non-SOEs		
		Full sample					SOEs					Non-SOEs		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
Anti1 _t		0.1651*** (13.68)	0.1621*** (13.69)	0.1621*** (13.69)	0.1621*** (13.69)	0.2200*** (10.86)	0.2200*** (10.86)	0.2200*** (10.86)	0.2200*** (10.86)	0.1288*** (8.71)	0.1288*** (8.71)	0.1288*** (8.71)	0.1288*** (8.71)	
Distance		0.0035*** (42.40)	0.0035*** (42.40)	0.0035*** (42.40)	0.0035*** (42.40)	0.0033*** (33.10)	0.0033*** (33.10)	0.0033*** (33.10)	0.0084*** (20.20)	0.0037*** (28.16)	0.0037*** (28.16)	0.0069*** (15.63)	0.0069*** (15.63)	
Distance*Anti1 _t		-0.0005*** (-50.03)	-0.0005*** (-50.03)	-0.0005*** (-50.03)	-0.0005*** (-50.03)	-0.0005*** (-39.42)	-0.0005*** (-39.42)	-0.0005*** (-39.42)	-0.0005*** (-39.42)	-0.0005*** (-32.89)	-0.0005*** (-32.89)	-0.0005*** (-32.89)	-0.0005*** (-32.89)	
Anti2 _t		0.4545*** (15.10)	0.4545*** (15.10)	0.4545*** (15.10)	0.4545*** (15.10)	0.4545*** (15.10)	0.4545*** (15.10)	0.4545*** (15.10)	0.6213*** (13.34)	0.6213*** (13.34)	0.6213*** (13.34)	0.6213*** (13.34)	0.6213*** (13.34)	
Distance*Anti2 _t		-0.0011*** (-26.38)	-0.0011*** (-26.38)	-0.0011*** (-26.38)	-0.0011*** (-26.38)	-0.0011*** (-26.38)	-0.0011*** (-26.38)	-0.0011*** (-26.38)	-0.0012*** (-21.43)	-0.0012*** (-21.43)	-0.0012*** (-21.43)	-0.0012*** (-21.43)	-0.0012*** (-21.43)	
Size _{t-1}		0.0234*** (3.89)	0.0234*** (3.89)	0.0453*** (4.10)	0.0453*** (4.10)	0.0351*** (3.70)	0.0351*** (3.70)	0.0351*** (3.70)	0.0808*** (4.85)	0.0137* (1.75)	0.0137* (1.75)	0.0198 (1.31)	0.0198 (1.31)	
Leverage _{t-1}		0.0712*** (2.92)	0.0712*** (2.92)	0.1059*** (2.30)	0.1059*** (2.30)	0.1486 (0.34)	0.1486 (0.34)	0.1486 (0.34)	0.0075 (0.10)	0.0905*** (3.05)	0.0905*** (3.05)	0.1623*** (2.74)	0.1623*** (2.74)	
Cashflow _{t-1}		0.0008 (0.04)	0.0008 (0.04)	0.0117 (0.34)	0.0117 (0.34)	0.0881*** (2.60)	0.0881*** (2.60)	0.0881*** (2.60)	0.1128** (2.15)	0.0612*** (2.58)	0.0612*** (2.58)	0.0567 (1.32)	0.0567 (1.32)	
BM _{t-1}		0.0437*** (5.28)	0.0437*** (5.28)	0.1006*** (6.45)	0.1006*** (6.45)	0.0644*** (5.42)	0.0644*** (5.42)	0.0644*** (5.42)	0.1033*** (4.87)	0.0130 (1.11)	0.0130 (1.11)	0.1091*** (4.65)	0.1091*** (4.65)	
NWC _{t-1}		-0.0033 (-0.39)	-0.0033 (-0.39)	-0.0069 (-0.43)	-0.0069 (-0.43)	-0.0087 (-0.73)	-0.0087 (-0.73)	-0.0087 (-0.73)	-0.0404* (-1.79)	0.0024 (0.21)	0.0024 (0.21)	0.0155 (0.70)	0.0155 (0.70)	
CapeX _{t-1}		-0.1680 (-1.54)	-0.1680 (-1.54)	-0.1333 (-0.63)	-0.1333 (-0.63)	0.1004 (0.51)	0.1004 (0.51)	0.1004 (0.51)	0.1138 (0.32)	-0.3822*** (-2.94)	-0.3822*** (-2.94)	-0.3392 (-1.30)	-0.3392 (-1.30)	
Age _{t-1}		0.0733*** (9.33)	0.0733*** (9.33)	0.1491*** (10.72)	0.1491*** (10.72)	0.0635*** (5.81)	0.0635*** (5.81)	0.0635*** (5.81)	0.1068*** (5.03)	0.0719*** (6.78)	0.0719*** (6.78)	0.1774*** (9.25)	0.1774*** (9.25)	
Constant		-8.4022*** (-83.32)	-8.4022*** (-83.32)	-10.97*** (-46.23)	-10.97*** (-46.23)	-8.7937*** (-53.40)	-8.7937*** (-53.40)	-8.7937*** (-53.40)	-12.2161*** (-32.83)	-8.0897*** (-62.23)	-8.0897*** (-62.23)	-10.1417*** (-32.50)	-10.1417*** (-32.50)	
N		11130	11130	11130	11130	4273	4273	4273	4273	6857	6857	6857	6857	
The p-value of the instrument's partial F-test		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Underidentification test: Kleibergen-Paap rk LM statistic		665.24***	665.24***	762.62***	762.62***	416.63***	416.63***	416.63***	335.13***	252.87***	252.87***	420.43***	420.43***	
Weak identification test: Cragg-Donald Wald F statistic		390.55***	390.55***	474.75***	474.75***	243.95***	243.95***	243.95***	201.52***	146.05***	146.05***	266.22***	266.22***	

(continued on next page)

Table 12 (continued)

Panel B: Second-stage results of the IV test

	Full Sample						SOEs						Non-SOEs					
	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2	Cash1	Cash2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)		
Intervention _{it} *Anti1 _{it}	(-3.52) (-2.65)	(-3.41) (-2.58)	-0.0039*** (-2.96)	-0.0057*** (-2.86)	(-2.07) (-1.55)	(-2.23) (-1.80)	-0.0044* (-1.80)	-0.0027 (-1.55)	-0.0044* (-1.80)	(-2.07) (-1.55)	(-2.23) (-1.80)	-0.0027 (-1.55)	-0.0044* (-1.80)	(-2.07) (-1.55)	(-2.23) (-1.80)	-0.0027 (-1.55)		
Anti2 _{it}			-0.0328*** (-2.96)	-0.0474*** (-2.86)			-0.0160 (-1.17)	-0.0257 (-1.35)					-0.0160 (-1.17)	-0.0257 (-1.35)				
Intervention _{it} *Anti2 _{it}			-0.0035** (-2.32)	-0.0051** (-2.26)			-0.0023 (-1.24)	-0.0038 (-1.51)					-0.0023 (-1.24)	-0.0038 (-1.51)				
Size _{it-1}	-0.0264*** (-23.68)	-0.0384*** (-22.91)	-0.0264*** (-23.53)	-0.0385*** (-22.70)	-0.0136*** (-8.61)	-0.0188*** (-8.35)	-0.0142*** (-9.00)	-0.0197*** (-8.72)	-0.0354*** (-22.72)	-0.0521*** (-21.73)	-0.0352*** (-22.36)	-0.0519*** (-21.35)	-0.0354*** (-22.72)	-0.0521*** (-21.73)	-0.0352*** (-22.36)	-0.0519*** (-21.35)		
Leverage _{it-1}	-0.0167*** (-3.35)	-0.0262*** (-3.52)	-0.0166*** (-3.33)	-0.0261*** (-3.51)	0.0068 (0.93)	0.0078 (0.76)	0.0070 (0.97)	0.0081 (0.79)	-0.0232*** (-3.40)	-0.0344*** (-3.33)	-0.0223*** (-3.25)	-0.0333*** (-3.21)	-0.0232*** (-3.40)	-0.0344*** (-3.33)	-0.0223*** (-3.25)	-0.0333*** (-3.21)		
Cashflow _{it-1}	-0.0150*** (-3.42)	-0.0184*** (-2.63)	-0.0150*** (-3.41)	-0.0184*** (-2.63)	-0.0082 (-1.57)	-0.0109 (-1.56)	-0.0090* (-1.73)	-0.0121* (-1.73)	-0.0171*** (-2.59)	-0.0195* (-1.77)	-0.0170** (-2.56)	-0.0193* (-1.75)	-0.0171*** (-2.59)	-0.0195* (-1.77)	-0.0170** (-2.56)	-0.0193* (-1.75)		
BM _{it-1}	-0.0126*** (-9.27)	-0.0185*** (-9.58)	-0.0128*** (-9.25)	-0.0188*** (-9.56)	-0.0035** (-2.09)	-0.0053** (-2.31)	-0.0039** (-2.33)	-0.0059** (-2.55)	-0.0217*** (-9.91)	-0.0318*** (-9.92)	-0.0214*** (-9.42)	-0.0313*** (-9.46)	-0.0217*** (-9.91)	-0.0318*** (-9.92)	-0.0214*** (-9.42)	-0.0313*** (-9.46)		
NWC _{it-1}	-0.0042** (-2.04)	-0.0070** (-2.13)	-0.0042** (-2.04)	-0.0070** (-2.13)	0.0026 (0.94)	0.0033 (0.83)	0.0030 (1.05)	0.0038 (0.94)	-0.0078*** (-2.68)	-0.0123*** (-2.61)	-0.0077*** (-2.66)	-0.0122*** (-2.59)	-0.0078*** (-2.68)	-0.0123*** (-2.61)	-0.0077*** (-2.66)	-0.0122*** (-2.59)		
CapeX _{it-1}	-0.2512*** (-11.81)	-0.4043*** (-13.04)	-0.2515*** (-11.84)	-0.4051*** (-13.07)	-0.2054*** (-6.87)	-0.2962*** (-7.20)	-0.2106*** (-6.94)	-0.3032*** (-7.26)	-0.3346*** (-11.38)	-0.5548*** (-12.56)	-0.3362*** (-11.42)	-0.5556*** (-12.59)	-0.3346*** (-11.38)	-0.5548*** (-12.56)	-0.3362*** (-11.42)	-0.5556*** (-12.59)		
Age _{it-1}	-0.0067*** (-4.16)	-0.0099*** (-4.21)	-0.0069*** (-3.97)	-0.0102*** (-4.00)	-0.0058** (-2.55)	-0.0082** (-2.51)	-0.0073** (-3.06)	-0.0103** (-3.01)	-0.0064*** (-2.71)	-0.0093*** (-2.70)	-0.0055** (-2.13)	-0.0082** (-2.14)	-0.0064*** (-2.71)	-0.0093*** (-2.70)	-0.0055** (-2.13)	-0.0082** (-2.14)		
Constant	0.6553*** (10.92)	0.9101*** (10.16)	0.6412*** (11.04)	0.8913*** (10.26)	0.4621*** (6.30)	0.6283*** (6.04)	0.4645*** (6.18)	0.6361*** (5.95)	0.7861*** (8.22)	1.0931*** (7.44)	0.7443*** (8.32)	1.0302*** (7.46)	0.7861*** (8.22)	1.0931*** (7.44)	0.7443*** (8.32)	1.0302*** (7.46)		
N	11130	11130	11130	11130	4273	4273	4273	4273	6857	6857	6857	6857	6857	6857	6857	6857		

Note: *, **, and *** represent significance at the 10 %, 5% and 1% levels.

Table 13
The effects of government intervention and anti-corruption on corporate cash holdings: Controlling for other firm-level factors.

Panel A: Results for Anti1								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash1	Cash1	Cash1	Cash1	Cash2	Cash2	Cash2	Cash2
Intervention _t	0.0129*** (4.64)	0.0129*** (4.62)	0.0129*** (4.59)	0.0129*** (4.65)	0.0200*** (4.64)	0.0200*** (4.62)	0.0200*** (4.59)	0.0200*** (4.63)
Anti _t	-0.0247*** (-4.72)	-0.0246*** (-4.71)	-0.0247*** (-4.68)	-0.0248*** (-4.71)	-0.0369*** (-4.68)	-0.0369*** (-4.66)	-0.0370*** (-4.63)	-0.0371*** (-4.66)
Intervention _t *Anti _t	-0.0023*** (-4.18)	-0.0023*** (-4.16)	-0.0023*** (-4.13)	-0.0023*** (-4.18)	-0.0035*** (-4.20)	-0.0035*** (-4.18)	-0.0036*** (-4.14)	-0.0036*** (-4.18)
Size _{t-1}	-0.0262*** (-16.54)	-0.0263*** (-16.51)	-0.0262*** (-16.53)	-0.0262*** (-16.57)	-0.0381*** (-15.03)	-0.0382*** (-15.06)	-0.0381*** (-15.13)	-0.0381*** (-15.14)
Leverage _{t-1}	-0.0139 (-1.61)	-0.0138 (-1.60)	-0.0138 (-1.59)	-0.0138 (-1.60)	-0.0222 (-1.63)	-0.0221 (-1.63)	-0.0220 (-1.61)	-0.0221 (-1.62)
BM _{t-1}	-0.0100*** (-4.68)	-0.0098*** (-4.56)	-0.0098*** (-4.61)	-0.0100*** (-4.75)	-0.0147*** (-5.01)	-0.0145*** (-4.91)	-0.0145*** (-4.97)	-0.0146*** (-5.08)
Cashflow _{t-1}	-0.0140** (-2.14)	-0.0141** (-2.16)	-0.0140** (-2.16)	-0.0140** (-2.14)	-0.0165 (-1.57)	-0.0166 (-1.58)	-0.0166 (-1.58)	-0.0165 (-1.56)
NWC _{t-1}	-0.0036* (-1.77)	-0.0036* (-1.78)	-0.0036* (-1.78)	-0.0036* (-1.77)	-0.0063** (-2.07)	-0.0060** (-2.07)	-0.0064** (-2.08)	-0.0063** (-2.07)
Capex _{t-1}	-0.2555*** (-6.54)	-0.2563*** (-6.59)	-0.2566*** (-6.57)	-0.2554*** (-6.52)	-0.4102*** (-7.41)	-0.4104*** (-7.45)	-0.4102*** (-7.42)	-0.4107*** (-7.37)
Age _{t-1}	-0.0039 (-1.12)	-0.0038 (-1.09)	-0.0039 (-1.13)	-0.0039 (-1.12)	-0.0059 (-1.17)	-0.0059 (-1.16)	-0.0060 (-1.20)	-0.0060 (-1.19)
Tangibility _{t-1}	0.2332*** (6.97)	0.2335*** (6.95)	0.2333*** (6.96)	0.2332*** (6.96)	0.3536*** (7.49)	0.3583*** (7.47)	0.3540*** (7.47)	0.3536*** (7.47)
ROA _{t-1}	0.2012*** (4.68)	0.2004*** (4.68)	0.2015*** (4.66)	0.2009*** (4.67)	0.2907*** (4.51)	0.2908*** (4.51)	0.2910*** (4.48)	0.2911*** (4.49)
Issues	0.0003*** (4.09)			0.0004*** (3.99)	0.0003*** (3.00)			0.0003*** (2.87)
Dividends		-0.0057 (-0.26)		-0.0053 (-0.25)		-0.0022 (-0.08)		-0.0017 (-0.06)
R&D			0.0174 (0.30)	0.0164 (0.28)			0.0348 (0.36)	0.0339 (0.36)
Constant	0.3392*** (7.54)	0.3455*** (7.18)	0.3389*** (7.52)	0.3457*** (7.18)	0.4489*** (7.04)	0.4522*** (6.63)	0.4503*** (7.01)	0.4522*** (6.63)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1045	0.1044	0.1044	0.1016	0.1019	0.1018	0.1019	0.1019
N	11130	11130	11130	11130	11130	11130	11130	11130

Panel B: Results for Anti2								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash1	Cash1	Cash1	Cash1	Cash2	Cash2	Cash2	Cash2
Intervention _t	0.0126*** (4.19)	0.0126*** (4.17)	0.0126*** (4.15)	0.0126*** (4.19)	0.0195*** (4.09)	0.0194*** (4.08)	0.0195*** (4.05)	0.0195*** (4.09)
Anti _{2t}	-0.0231*** (-4.67)	-0.0230*** (-4.65)	-0.0231*** (-4.62)	-0.0232*** (-4.66)	-0.0344*** (-4.55)	-0.0344*** (-4.53)	-0.0345*** (-4.51)	-0.0346*** (-4.53)
Intervention _t *Anti _{2t}	-0.0021*** (-3.82)	-0.0022*** (-3.80)	-0.0023*** (-3.78)	-0.0021*** (-3.81)	-0.0033*** (-3.76)	-0.0032*** (-3.74)	-0.0033*** (-3.72)	-0.0033*** (-3.74)
Size _{t-1}	-0.0262*** (-16.57)	-0.0263*** (-16.54)	-0.0262*** (-16.57)	-0.0262*** (-16.60)	-0.0381*** (-15.04)	-0.0381*** (-15.07)	-0.0381*** (-15.14)	-0.0381*** (-15.16)
Leverage _{t-1}	-0.0138 (-1.59)	-0.0137 (-1.58)	-0.0137 (-1.57)	-0.0137 (-1.57)	-0.0220 (-1.61)	-0.0220 (-1.60)	-0.0218 (-1.59)	-0.0219 (-1.59)
BM _{t-1}	-0.0100*** (-4.70)	-0.0099*** (-4.58)	-0.0098*** (-4.63)	-0.0100*** (-4.77)	-0.0147*** (-5.03)	-0.0146*** (-4.94)	-0.0145*** (-4.99)	-0.0147*** (-5.11)
Cashflow _{t-1}	-0.0139** (-2.13)	-0.0140** (-2.14)	-0.0140** (-2.14)	-0.0139** (-2.12)	-0.0164 (-1.55)	-0.0165 (-1.56)	-0.0165 (-1.56)	-0.0164 (-1.55)
NWC _{t-1}	-0.0036* (-1.76)	-0.0036* (-1.77)	-0.0036* (-1.77)	-0.0036* (-1.76)	-0.0060** (-2.06)	-0.0060** (-2.07)	-0.0060** (-2.07)	-0.0060** (-2.06)
Capex _{t-1}	-0.2562*** (-6.54)	-0.2566*** (-6.59)	-0.2556*** (-6.57)	-0.2564*** (-6.52)	-0.4107*** (-7.41)	-0.4112*** (-7.45)	-0.4117*** (-7.42)	-0.4109*** (-7.37)
Age _{t-1}	-0.0038 (-1.10)	-0.0038 (-1.08)	-0.0037 (-1.12)	-0.0039 (-1.11)	-0.0059 (-1.16)	-0.0058 (-1.15)	-0.0059 (-1.18)	-0.0060 (-1.18)
Tangibility _{t-1}	0.2331*** (6.99)	0.2328*** (6.98)	0.2333*** (6.98)	0.2336*** (6.99)	0.3543*** (7.51)	0.3538*** (7.50)	0.3534*** (7.49)	0.3523*** (7.49)
ROA _{t-1}	0.2012***	0.2011***	0.2013***	0.2014***	0.2902***	0.2901***	0.2912***	0.2912***

(continued on next page)

Table 13 (continued)

Panel B: Results for Anti2								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash1	Cash1	Cash1	Cash1	Cash2	Cash2	Cash2	Cash2
Issues	(4.70) 0.0003*** (4.11)	(4.70)	(4.67)	(4.68) 0.0003*** (4.01)	(4.52) 0.0004*** (3.02)	(4.52)	(4.49)	(4.50) 0.0004*** (2.89)
Dividends		-0.0056 (-0.26)		-0.0053 (-0.25)		-0.0022 (-0.08)		-0.0017 (-0.06)
R&D			0.0170 (0.29)	0.0160 (0.28)			0.0341 (0.36)	0.0333 (0.35)
Constant	0.3361*** (7.37)	0.3425*** (7.05)	0.3366*** (7.35)	0.3422*** (7.05)	0.4446*** (6.81)	0.4467*** (6.44)	0.4442*** (6.78)	0.4456*** (6.43)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.1044	0.1043	0.1043	0.1045	0.1018	0.1018	0.1017	0.1018
N	11130	11130	11130	11130	11130	11130	11130	11130

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

We consider the firm to be politically connected if at least one CEO or chairman is or was a government official at the provisional level or above. The results in Table 11 remain steady.

5.4. Two-stage least squares method

Because it is possible that government intervention and corporate cash holdings are simultaneously influenced by some omitted variables, our empirical results might suffer from simultaneity bias. Hence, we apply the two-stage least squares (2SLS) method to address the potential endogeneity problem. Similar to Kusnadi et al. (2015), we employ *Distance*, which is defined as the geographic distance between a firm's headquarters and Beijing as the instrumental variable for government intervention. In the first stage, we estimate *Intervention* with other control variables including *Distance*. In the second stage, we then use the predicted *Intervention* as an independent variable in estimating Eq. (1). The results are presented in Table 12. Panel A shows the results of the first stage and Panel B those of the second stage. The results in Panel B are consistent with those in the main text.

Following Larcker and Rusticus (2010) and Kusnadi et al. (2015), we conduct the following tests to check the validity of the instrument variable *Distance*. First, the p-values of the instrument's partial F-test for the first stage in all regressions of Table 12 are equal to 0.0000, which indicates high correlation between the instrument and the endogenous variable (*Intervention*). Second, the Kleibergen-Paap underidentification test statistic and the Cragg-Donald weak identification test statistic indicate that our selected instrument variable is relevant. These tests suggest that the instrument variable *Distance* is valid. Panel A shows that the coefficients of *Distance* are positive and highly significant in all regressions, suggesting that our findings are robust to endogeneity correction.

5.5. Control for other firm-level factors

Other firm-level factors such as dividends, R&D expenses, and the issuance of debt and equity are found to be important determinants of cash holdings in the literature. Therefore, we control for these factors and present the results in Table 13. We report the results for *Anti1* in Panel A and those for *Anti2* in Panel B.

The variable $Dividend_t$ is a dummy variable that equals 1 if the firm pays dividends and 0 otherwise in the year t . $R\&D_t$ is defined as the R&D expenditures scaled by the book value of total assets in the year t . $Issuance_t$ is calculated as the sum of annual total debt issuance minus debt retirement and equity sales minus equity purchases divided by the book value of total assets in the year t . These three variables are lagged one year in our regressions.

In Table 13, the coefficients of anti-corruption, government intervention and their interactive terms are consistent with those in the main text. The net issuances of debt and equity have a significantly positive impact on corporate cash holdings. However, dividend payouts and R&D expenses do not have significant effects on corporate cash holdings in our regressions.

5.6. Control for provincial and industrial characteristics

Provincial level government intervention and anti-corruption may correlate with other characteristics of the province (or industry). Therefore, we control for provincial economic development (*Per capita income* and *GDP Growth*), provincial fiscal revenues (*Fiscal Revenue*), provincial fiscal expenditures (*Fiscal Ex*), and industry concentration (*HHI*). *Per capita income_t* is calculated as the natural logarithm of province-level per capita income and *GDP Growth_t* is calculated as the yearly real GDP growth rate at the province level in the year t . *Fiscal Revenue_t* is calculated as the natural logarithm of province-level fiscal revenues and *Fiscal Ex_t* is calculated as the natural logarithm of province-level fiscal expenditures in the year t . *HHI_t* is defined as the firm's revenue scaled by all revenues of firms in the same industry in the year t . We use the industry classification codes from the China Securities Regulatory

Table 14
The effects of government intervention and anti-corruption on corporate cash holdings: Controlling for provincial and industrial characteristics.

Panel A: Results for Anti												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Cash1	Cash1	Cash1	Cash1	Cash1	Cash1	Cash2	Cash2	Cash2	Cash2	Cash2	Cash2
Intervention _t	0.0125*** (3.34)	0.0101** (2.18)	0.0152*** (4.16)	0.0108** (2.67)	0.0120** (2.67)	0.0113*** (2.88)	0.0197*** (3.47)	0.0163** (2.36)	0.0239*** (4.33)	0.0172*** (2.82)	0.0191*** (2.83)	0.0184*** (3.06)
Anti _t	-0.0336*** (-5.93)	-0.0274*** (-3.64)	-0.0324*** (-5.34)	-0.0348*** (-6.32)	-0.0302*** (-4.16)	-0.0350*** (-7.04)	-0.0499*** (-5.97)	-0.0408*** (-3.67)	-0.0483*** (-5.42)	-0.0515*** (-6.32)	-0.0449*** (-4.17)	-0.0520*** (-6.99)
Intervention _t *Anti _t	-0.0019** (-2.09)	-0.0023** (-2.43)	-0.0025*** (-2.82)	-0.0019* (-2.03)	-0.0026*** (-2.79)	-0.0018* (-1.94)	-0.0030** (-2.19)	-0.0036** (-2.57)	-0.0038*** (-2.93)	-0.0030** (-2.13)	-0.0040*** (-2.90)	-0.0029* (-2.04)
Per capita income _{t-1}	0.0208** (2.73)					0.0017 (0.14)	0.0309** (2.63)					0.0057 (0.31)
GDP Growth _{t-1}		0.0066*** (4.53)				0.0054*** (5.78)		0.0090*** (3.59)				0.0070*** (4.62)
Fiscal Revenue _{t-1}			0.0156** (2.71)						0.0238** (2.69)			
Fiscal Ex _{t-1}				0.0302*** (3.62)		0.0275** (2.11)				0.0436*** (3.16)		0.0358 (1.68)
HHI _{t-1}					-0.0610*** (-3.33)	-0.0596*** (-3.24)					-0.0951*** (-3.57)	-0.0932*** (-3.47)
Constant	0.2531*** (4.65)	0.311*** (6.92)	0.2842*** (5.87)	0.1781** (2.51)	0.354*** (9.01)	0.1912*** (2.90)	0.3341*** (4.08)	0.4212*** (6.43)	0.3768*** (5.24)	0.2281** (2.05)	0.4849*** (8.41)	0.2208** (2.05)
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.0162	0.0149	0.0158	0.0167	0.0200	0.0227	0.0155	0.0141	0.0151	0.0157	0.0197	0.0221
N	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130
Panel B: Results for Anti2												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Cash1	Cash1	Cash1	Cash1	Cash1	Cash1	Cash2	Cash2	Cash2	Cash2	Cash2	Cash2
Intervention _t	0.0121*** (3.18)	0.00973** (2.06)	0.0148*** (3.95)	0.0104** (2.54)	0.0117** (2.53)	0.0110*** (2.76)	0.0189*** (3.26)	0.0156** (2.18)	0.0232*** (4.05)	0.0164** (2.65)	0.0185** (2.63)	0.0177*** (2.90)
Anti _{2t}	-0.0316*** (-5.83)	-0.0257*** (-3.60)	-0.0304*** (-5.20)	-0.0324*** (-6.04)	-0.0283*** (-4.09)	-0.0324*** (-6.70)	-0.0469*** (-5.82)	-0.0382*** (-3.59)	-0.0452*** (-5.23)	-0.0477*** (-6.01)	-0.0420*** (-4.04)	-0.0481*** (-6.61)
Intervention _t *Anti _{2t}	-0.0017* (-2.09)	-0.0021** (-2.43)	-0.0023** (-2.82)	-0.0017* (-2.03)	-0.0024** (-2.79)	-0.0016* (-1.94)	-0.0027* (-2.19)	-0.0033** (-2.57)	-0.0035** (-2.93)	-0.0027* (-2.13)	-0.0033** (-2.90)	-0.0026* (-2.04)

(continued on next page)

Table 14 (continued)

Panel B: Results for AntiZ

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Cash1	Cash1	Cash1	Cash1	Cash1	Cash1	Cash2	Cash2	Cash2	Cash2	Cash2	Cash2
Per capita income _{t-1}	(-1.94) 0.0212*** (2.81)	(-2.31)	(-2.68)	(-1.90)	(-2.66)	(-1.77) 0.0044 (0.37)	(-2.00) 0.0314** (2.70)	(-2.41)	(-2.75)	(-1.98)	(-2.72)	(-1.84) 0.0096 (0.52)
GDP Growth _{t-1}		0.0068*** (4.64)				0.0058*** (5.89)		0.0093*** (3.67)	0.0235** (2.65)			0.0075*** (4.70)
Fiscal Revenue _{t-1}			0.0154** (2.69)									
Fiscal Ex _{t-1}				0.0293*** (3.42)		0.0235* (1.82)				0.0422*** (3.00)		0.0302 (1.42)
HHL _{t-1}					-0.0608*** (-3.30)	-0.0593*** (-3.19)					-0.0948*** (-3.54)	-0.0927*** (-3.42)
Constant	0.2501*** (4.65) Yes	0.3092*** (6.80) Yes	0.2831*** (5.84) Yes	0.1803** (2.54) Yes	0.3522*** (8.78) Yes	0.1724** (2.56) Yes	0.3283*** (4.04) Yes	0.4173*** (6.23) Yes	0.3744*** (5.17) Yes	0.2303** (2.05) Yes	0.4803*** (8.07) Yes	0.2656** (2.52) Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.0162	0.0149	0.0157	0.0165	0.0198	0.0225	0.0154	0.0140	0.0150	0.0155	0.0195	0.0219
N	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130	11130

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

Table 15

. The effects of government intervention and anti-corruption on corporate cash holdings: Controlling for the effect of China's 4 trillion plan.

	(1) Cash1	(2) Cash2	(3) Cash1	(4) Cash2
Intervention _t	0.0131*** (4.99)	0.0203*** (5.00)	0.0128*** (4.50)	0.0198*** (4.42)
Anti1 _t	-0.0237*** (-4.76)	-0.0355*** (-4.72)		
Intervention _t *Anti1 _t	-0.0023*** (-4.44)	-0.0036*** (-4.47)		
Anti2 _t			-0.0222*** (-4.73)	-0.0331*** (-4.63)
Intervention _t *Anti2 _t			-0.0022*** (-4.07)	-0.0033*** (-4.02)
Size _{t-1}	-0.0265*** (-16.49)	-0.0385*** (-14.77)	-0.0264*** (-16.51)	-0.0384*** (-14.77)
Leverage _{t-1}	-0.0147* (-1.84)	-0.0234* (-1.86)	-0.0146* (-1.81)	-0.0232* (-1.83)
BM _{t-1}	-0.0098*** (-4.58)	-0.0143*** (-4.96)	-0.0097*** (-4.60)	-0.0143*** (-4.98)
Cashflow _{t-1}	-0.0143** (-2.24)	-0.0170 (-1.64)	-0.0143** (-2.22)	-0.0170 (-1.63)
NWC _{t-1}	-0.0035* (-1.73)	-0.0058* (-2.02)	-0.0036* (-1.72)	-0.0058* (-2.02)
Capex _{t-1}	-0.2556*** (-6.69)	-0.4089*** (-7.61)	-0.2563*** (-6.69)	-0.4108*** (-7.61)
Age _{t-1}	-0.0008 (-0.22)	-0.0013 (-0.23)	-0.0008 (-0.21)	-0.0012 (-0.22)
Tangibility _{t-1}	0.2333*** (6.98)	0.3541*** (7.48)	0.2344*** (7.00)	0.3544*** (7.51)
ROA _{t-1}	0.2021*** (4.78)	0.2922*** (4.60)	0.2023*** (4.79)	0.2929*** (4.61)
Bankshare _{t-1}	-0.0143*** (-3.77)	-0.0219*** (-4.09)	-0.0143*** (-3.76)	-0.0219*** (-4.09)
Constant	0.3341*** (7.38)	0.4423*** (6.87)	0.3321*** (7.25)	0.4367*** (6.69)
Year control	Yes	Yes	Yes	Yes
Industry control	Yes	Yes	Yes	Yes
Adjusted R-square	0.1065	0.1040	0.1064	0.1039
N	11130	11130	11130	11130

Notes: *, ** and *** represent significance at the 10 %, 5% and 1% levels. The estimated standard errors are clustered at the provincial level to account for any possible correlations among provincial factors.

Commission (CSRC) to define the firms' industries. The manufacturing industry is identified by a two-digit industry code, whereas other industries are identified by a one-digit industry code. We obtain the macroeconomic data from the China Census Bureau website and the firms' revenue data from CSMAR. The five variables are lagged one year in our regressions and the results are shown in Table 14. We report the results for *Anti1* in Panel A and those for *Anti2* in Panel B.

Table 14 demonstrates that the coefficients of anti-corruption, government intervention, and their interactive terms are consistent with those in the main text. *Per capita income*, *GDP Growth*, *Fiscal Revenue* and *Fiscal Ex* are positively and *HHI* is negatively related to corporate cash holdings.

5.7. China's 4 trillion yuan stimulus package of 2008

Our sample covers the years 2009–2015, following China's 4 trillion yuan plan of 2008, and the monetary stimulation plan may determine large portions of cash holdings after its implementation. Following Zheng et al. (2018), we use the dummy variable *Bankshare* (an indicator variable that takes the value of 1 for firms that have banks or bank affiliations within their top 10 shareholders in 2008, and 0 otherwise) to control for the bank relationship and the effect of the 4 trillion yuan plan. The results are presented in Table 15.

The results in Table 15 show that the coefficients of anti-corruption, government intervention, and their interactive terms remain similar to those in the main text. Table 15 also shows that *Bankshare* has a significantly negative impact on corporate cash holdings, which is consistent with Zhang and Chan (2018). Zheng et al. (2018) indicate that bank-connected firms are more likely to obtain bank loans after the monetary stimulus plan. Zhang and Chan (2018) argue that bank shareholdings can provide an implicit guarantee to a firm in case of financial distress and that bank-connected firms tend to overinvest. Hence, bank shareholdings can act as a backup for bank-connected firms, and these firms view the readily accessible loans as an alternative for cash holdings and therefore hold less cash than their counterparts.

6. Conclusion

This study investigated the effect of government intervention and anti-corruption on corporate cash holding decisions using data of listed Chinese firms from 2009–2015. The main results reveal that firms in provinces with more government intervention have more cash holdings and those in provinces with strong anti-corruption intensity have less cash holdings. Moreover, the positive relationship between government intervention and corporate cash holdings tends to be alleviated as anti-corruption intensity increases, and this alleviation effect is more prominent for SOEs, firms in high intervention areas and firms without political connections.

Our results suggest that less government intervention could benefit firms in making decisions that are more suited to their practical demands and operating strategies with less consideration of potential political expropriation and policy changes related to short-term political achievements in official tenures. Meanwhile, this study provides some evidence that anti-corruption benefits firms because it promotes a corruption-free government with less likelihood of extraction. Furthermore, we argue that intensifying anti-corruption can act as an alternative to institutional protection to rectify official misconduct and may have a pronounced effect in less developed areas. Because it will be some time before China can make comprehensive progress in institutional development, consistent adherence to anti-corruption is necessary and can positively affect the corporate operating environment.

Intervention, the key variable in this study, is taken from the NERI marketization index, which consistently measures the marketization process across regions in China and provides a stable data source for observing the development of the country's market-oriented reforms. The NERI marketization index is widely used in research on the corporate finance field but still needs improvement. First, the NERI marketization index is updated slowly and the latest index is available only until 2014. This is also the reason we did not use the method of moving averages to compute the score for 2016, which may involve more measurement errors. Second, the NERI marketization index depends heavily on official data, which may not reflect the real situation of institutional development in China because government officials tend to present better numbers to further their political careers. Third, the information based on the questionnaire is affected by random errors because the sample is relatively small. Future research based on more delicately designed data may reveal more interesting results.

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