Essays on entrepreneurship, worker mobility and firm performance

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DOI:
10.33612/diss.100589231

Chapter 5

How does government control affect firm value? New evidence for China*

* This paper is joint work with Zhi Wang and Jakob de Haan and is forthcoming in Kyklos..

5.1 Introduction

The role of government involvement in firms has received a lot of attention both from policymakers and academics in the last few decades. Government involvement could result in a 'supporting hand' and a 'grabbing hand' (Shleifer (1998)). To be more specific, government interventions could address problems such as natural monopolies, externalities and information asymmetries, thus tackling market failure ('supporting hand'). However, politicians could also pursue their own political or private goals at the cost of sacrificing public interests and distorting market allocation ('grabbing hand') (Shleifer and Vishny (1994)). So far, the impact of government involvement on the financial performance of listed firms in emerging economies has received scant attention. This paper examines the relationship between government control of firms and firms' financial performance for the case of China. The Chinese central government has reduced its control over firms both by (partially) privatizing state-owned corporations and by transferring ownership rights. But these measures do not necessarily imply less control by the central government. Furthermore, the influence of other types of government on firms may have increased. We therefore examine how government control of firms, measured by the direct and indirect shareholdings controlled by the government (be it central or local), influences the financial performance of firms publicly traded on the stock exchanges of Shanghai and Shenzhen. [1]

An important contribution of this paper is that we measure government control by the fraction of outstanding shares held either directly or indirectly by the government. In our view, this is the most appropriate measure for two reasons. First, as firms are listed the government is, by definition, not the only shareholder. Second, direct ownership of firms is not always decisive in determining the degree of control of a shareholder (Liu et al. (2003); Xia and Fang (2005)). There are various types of ownership that affect the concentration of control, such as differential voting rights, cross-

[1] There is a related line of research examining how political connections of private business owners enhance firm performance. A recent example is the work by Kung and Ma (2018), who also provide an extensive discussion of this line of research. These authors find that Chinese private firms were able to experience growth in a weak property rights environment, because their owners respond to official discrimination in access to scarce inputs and the 'grabbing government hand' by fostering political connections with government officials. Our work is also related to research about the relationship between the political regime in place and economic growth; see Tang and Tang (2018) for a recent contribution and De Haan (2019) for an extensive discussion of this literature.

shareholding and pyramid structures (La Porta et al. (1999); Claessens et al. (2000)). Previous studies generally measured concentration of control by identifying the largest direct shareholders (Xu and Wang (1999); Sun et al. (2002); Tian and Estrin (2008)). In contrast, this study includes the effect of pyramid structures and examines how direct and indirect government control affects firm performance.[2] To illustrate, consider two companies, A and B. Suppose that the government is the largest shareholder of A, while firm A owns the majority of shares of company B. When using direct ownership, company B would be defined as non-government controlled. However, the government has indirect control on company B via its voting rights in A, and it would therefore be inaccurate to recognize company B as a non-state-controlled company. To avoid the bias caused by using direct ownership, this study adopts the ownership theory proposed by Liu et al. (2003) to determine whether a Chinese listed company is state-controlled or non-state-controlled. We classify firms as state-controlled whenever the government is the shareholder with the largest number of shares held either directly or indirectly through pyramid structures.

Our empirical results suggest that firm performance is generally lower for firms where the government is the shareholder with the largest number of (direct and indirect) shares. Specifically, the return on assets, the return on equity and the market-to-book ratio are, on average, 1.3%, 2.0% and 8.2% lower for government-controlled firms. Both central and local government control is undermining firm performance. These findings provide support for the 'grabbing hand' theory of the government. In establishing this result, we make sure the estimates are not driven by differences in the size, age and leverage of the firms. Importantly, we also control for industry-region-year fixed effects, and therefore compare firms within the same industry in the same province during the same year, further enhancing the credibility of our estimates. In addition to studying the extensive margin of government control, we also examine its intensive margin, i.e. whether a firm with more shares held (directly or indirectly) by the government performs differently from a firm with fewer shares held by the government. We find that the return on assets and the return on equity are negatively related to the control rights of the government. In contrast, the market-to-book ratio is

[2] In China, the company law stipulates that each share should hold equal rights and that investors should pay the same price for shares that are offered at the same time.

positively related to the number of government-owned shares.

Apart from measuring government control by including indirect ownership, this paper contributes to research into government involvement in firms in three additional ways. Firstly, most previous studies investigating government influence on company performance use dummies capturing government control (see Megginson and Netter (2001)). This paper adds to this literature in that it measures government influence more accurately with both dummies and concentration of control rights. Secondly, this paper contributes to databases on government control, by manually collecting more effective information about government shareholdings from annual reports of Chinese listed companies and building a new database of government control from 2009 to 2013 with 5501 observations. Finally, our study extends the literature on the relationship between government control and corporate performance by investigating the influence of government control on firm performance for firms with different levels of profitability. Our results suggest that the negative effect of government control is stronger for profitable firms than for non-profitable firms. Firms with a poor financial performance benefit from government control, which supports the 'supporting hand' theory of the government (Shleifer (1998)).

The remainder of this chapter is structured as follows. Section 5.2 presents a review of related literature and formulates hypotheses on the relationship between government control and corporate performance. This is followed by an explanation of the data collection process, definitions of variables and descriptive statistics in Section 5.3. Section 5.4 presents and explains the main results, and shows the robustness of the estimates. The final section draws conclusions, discusses the limitations of our study and indicates directions for further research.

5.2 Literature Review

There is an extensive literature on firm performance under government and private ownership. Typically, government-owned firms are found to be less efficient and less profitable than privately owned firms. This difference is often attributed to principal-agent deficiencies, such as less monitoring of management and the lack of incentives

to maximize profits (Vining and Boardman (1992); La Porta et al. (1999)). The nature of the relationship between government ownership (or control) and firm performance is essentially an empirical question. The results based on the case of China are rather mixed. Several authors argue that government ownership in China is negatively related with firm performance because of goal incongruence between the government and firms (Xu and Wang (1999); Qi et al. (2000); Sun and Tong (2003); Xia and Fang (2005); Wei (2007); Huang and Wang (2011)). At the same time, some authors report that government ownership boosts the development of firms (Che and Qian (1998)). Others find a non-linear relationship. For instance, Yu (2013) reports that state ownership has a U-shaped relationship with firm performance. Sun et al. (2002) and Wei (2007) find a concave relationship between state ownership and firm performance. Finally, some authors (like Wang (2005) and Sun and Tong (2003)) find no significant association between government ownership and firm performance.

Compared to non-government-controlled firms, firms under government control face the issue that politicians have both the motives and the power to impose their social and political goals on affiliated companies. This may result in poorer performance (Xu and Wang (1999); Hanwen et al. (2011); Yu (2013)). Politicians are motivated to accomplish their own political goals such as enhancing their political capital and promotion potential, through their involvement in government-controlled firms (Lin et al. (1998); Hanwen et al. (2011)). In addition, the economy of China is in a transitional phase. The institutional system, including government administration, legislation and the judiciary system, are immature and incomplete. As a result, the protection of investors is quite weak, which makes it easier for politicians to pursue their own interests. This leads to our first hypothesis:

Hypothesis 1: *In China, government-controlled firms have a worse financial performance than non-government-controlled firms.*

The Chinese economy has gone through a restructuring of power distribution from the central government to the local government, which promotes local governments to compete for resources in order to achieve their own social goals such as regional economic development, healthy public finances and social stability (Lin et al. (1998); Hanwen et al. (2011)). Qian (1996) argues that local governments generally have a

strong incentive to impose policies on their listed firms, especially during periods with fiscal difficulties (Wang and Xiao (2009)). According to the 'grabbing hand' theory, government-controlled enterprises deviate from economic efficiency, when the government uses firms under its control to serve political objectives (Shleifer and Vishny (1994)). The study of Cheung et al. (2010) reports support for the 'grabbing hand' theory only for listed firms owned by local governments; for firms owned by the central government, their findings are more consistent with the 'helping hand' model. Based on these arguments we expect differences between firms under ultimate control by the central and the local government:

Hypothesis 2: *In China, local government-controlled firms have a worse financial performance than firms controlled by the central government.*

As the criteria for political promotion of officials in China include both political and economic achievements (Li and Zhou (2005)), politicians have incentives to ensure that firms under their control perform well. A solid and steady performance of affiliated firms is one of the most principal and self-evident indicators of successful governance. Bankruptcy or the delisting of firms could both damage the reputation of government officials, but also worsen the performance of the (local) economy, which could further jeopardize the possibility of personal promotion for government officials. Therefore, politicians will always try to find the proper balance between grabbing from and delivering benefits to firms under their control. The better firms are performing, the more politicians have the possibility to exploit them for their own benefit and to achieve social and political goals. So, we hypothesize the following:

Hypothesis 3: *In China, the grabbing influence of government control on firms increases as corporate performance increases.*

5.3 Research Method and Data

5.3.1 Data

The data used in this study is obtained from the main Board A-share[3] PLCs (Public Listed Companies) of both the Shanghai and Shenzhen Stock Exchanges are considered over the period 2009 to 2013. Consistent with Xia and Fang (2005), we select our sample by: (1) Dropping the firms containing B shares or H shares[4]; (2) Dropping the firms whose controllers' identity and control rights are ambiguous and/or information was missing. After these procedures, our remaining unbalanced panel dataset includes 5501 firm-year observations (see Table 5.1 for details).

Table 5.1. Sample selection

Criterion	Number of Firms in different years					
	2009	2010	2011	2012	2013	Total
Main Board A-share PLCs	1336	1365	1395	1414	1418	6928
of which: Shanghai Stock Exchange	863	892	923	944	950	4572
of which: Shenzhen Stock Exchange	473	473	472	470	468	2356
Less: Firms containing B-share or H-share	154	160	163	166	166	809
Less: Firms whose controllers' identity and control rights are ambiguous	108	100	87	101	103	499
Less: Firms with missing values	29	25	24	22	19	119
Total	1045	1080	1121	1125	1130	5501

We determine the nature of firm ownership, ultimate control and control rights from the firms' annual reports. These variables have been manually collected from the annual reports of PLCs listed at the Shanghai and Shenzhen Stock Exchanges. We determine the concentration of control based on the control relationships. Although it is required by the CSRC (China Securities Regulatory Commission) that every listed company should disclose specific information about the concentration of control[5] in the annual reports, there are some inaccuracies or even mistakes in revealing this important information. We deleted those firms if we found mistakes about such data in the annual reports, or if no reliable information was provided by which we could

[3] A shares are shares (in Renminbi) that are traded on the Shanghai and Shenzhen stock exchanges. This is in contrast to Renminbi B shares which are owned by foreigners who cannot purchase A-shares due to Chinese government restrictions.

[4] H shares refer to shares of companies incorporated in mainland China that are traded on the Hong Kong Stock Exchange.

[5] This means disclosure of the identity of the shareholder with the highest number of shares, and also the shareholding percentage of every controller in the pyramid structure.

identify the shareholder with the highest concentration of control. We manually collect direct and indirect shareholdings to identify the concentration of control. We define concentration of control rights (*UC*), as the percentage of the shares controlled by the shareholder with the highest share of direct and indirect shares (voting rights). This shareholder can be a private person or firm or the government. [6] The variable *Goverment* is a dummy variable equal to one if the concentration of control lies with the government and zero otherwise (Xia and Fang (2005); Wang et al. (2008)). Similarly, the dummy variables *Central* and *Local* indicate whether a firm's biggest shareholder is the central government or a local government, respectively.

The firm-level financial information and characteristics are downloaded from the China Stock Market and Accounting Research (CSMAR) database. We use three widely used proxies for firm performance: return on assets (ROA), return on equity (ROE) and Tobin's Q (TQ). [7] We calculate ROA (ROE) as the ratio of net income to average total assets (equity) of firm i at time t and Tobin's Q as the stock market value of the firm divided by total assets.

5.3.2 Descriptive statistics

Table 5.2 presents descriptive statistics for the 5501 firm-year observations for the period of 2009 to 2013 in our sample. Panel A shows the yearly distribution of the identity of the shareholder with the highest number of (direct or indirect) shares, divided into central government, local government and private parties. In most firms (66%) the concentration of control lies with the government, and the distribution across government and private control remains relatively stable over the five sample years. The central government controls 21% of all firms in our sample while local governments have control over more companies (45%). Panel B presents the distribution of the identity of the biggest shareholder among all sectors. Although the government controls many firms in all sectors, in key sectors such as industry and public utilities, government control is higher (66% and 79 % respectively).

[6] Appendix A provides more details and offers an example to illustrate our procedure.

[7] Earlier studies, such as Xu and Wang (1999); Qi et al. (2000); Sun et al. (2002); Gunasekarage et al. (2007); Tian and Estrin (2008); Jiang et al. (2008); Ng et al. (2009); Kang and Kim (2012) and Yu (2013), used similar

Table 5.2. Concentration of control

Panel A. Yearly distribution of the largest shareholder								
	Central government		Local government		Non-government		Total	
	N	%	N	%	N	%	N	%
2009	223	21	491	47	331	32	1045	19
2010	233	22	496	46	351	32	1080	20
2011	236	21	490	44	395	35	1121	20
2012	234	21	489	43	402	36	1125	20
2013	229	20	488	43	413	37	1130	21
Total	1155	21	2454	45	1892	34	5501	100
Panel B. The distribution of the largest shareholders across industries								
	Central government		Local government		Non-government		Total	
	N	%	N	%	N	%	N	%
Industry	849	24	1462	42	1182	34	3493	63.5
Finance	2	7	10	37	15	56	27	0.5
Real estate	91	14	282	44	264	42	637	11.6
Commercial	54	10	258	50	209	40	521	9.5
Comprehensive	20	9	97	46	94	45	211	3.8
Public Utility	139	23	345	56	128	21	612	11.1
Total	1155	0.21	2454	0.45	1882	0.34	5501	100

Table 5.3 presents summary statistics of the main variables used in the regression analysis. The corporations in our samples have an average Tobin's Q of 2.26. This average is very similar to that reported by Gunasekarage et al. (2007) (i.e. 2.48) for the period 2000 to 2004 and Wei et al. (2005) (i.e. 2.92) for the period 1991 to 2001.[8] Profits are around 3.7% (6.2%) of assets (equity). On average Chinese enterprises have assets of 22 billion CNY, which are mostly funded by debt (54%) but also by equity to a great extent.

Table 5.3. Summary Statistics

Variables	Definition	Mean	SD	25%	75%
ROA	Net income to average assets	0.037	0.072	.010	.062
ROE	Net income to average equity	0.067	0.206	.024	.137
Tobin's Q	Market value of equity to total assets	2.260	1.841	2.547	12.787
CC	Concentration of control	0.386	0.167	.25	.51
Government	=1 if the government is the largest shareholder	0.656	0.475	0	1
Central	=1 if the central government is the largest shareholder	0.210	0.41	0	1
Local	=1 if the local government is the largest shareholder	0.448	0.497	0	1
Size	Log of total assets	21.991	1.425	21.13	22.83
Age	Number of years since IPO	12.75	4.42	10	16
Leverage	Liabilities to assets	0.537	0.211	.386	.689

variables.

[8] The average *Tobin'Q* of firms in this sample is however substantially higher than the *Tobin'Q* ratio reported by Demsetz and Villalonga (2001) (i.e. 1.13) for a sample of US companies during 1976 to 1980. The difference between *Tobin'Q* for the Chinese and US sample suggests that a much higher growth rate is priced into the valuation of Chinese companies compared to their more mature US counterparts.

5.3.3 Modeling financial performance

We investigate the relationship between government control and financial performance using regression models. We include several control variables into the regression. Many scholars argue that a firm's size affects its performance (e.g. Tan and Peng (2003); Yuri et al. (2004)). Larger firms might exploit economies of scale and may have better access to bank credit and other resources, which could improve corporate profitability. On the other hand, larger companies can be involved in more government bureaucracy and bigger agency problems which may negatively affect firm performance. Therefore, we add the natural logarithm of total assets to control for firm size. Older firms might have better experience in capital management. Moreover, older firms might have better networks and links to better sources. Therefore, we include the control variables Age_{it}, measured as the duration since initial public offering, and its square Age_{it}^2. Jensen (1986) suggests that firms with higher leverage pay more interest and are likely to obtain additional debt financing, which affects its investment. In order to control for any possible leverage effect, we include the leverage ratio, which is calculated as total liabilities divided by total assets. We expect a negative effect of leverage on firm performance.

In addition to helping explain firm performance, the inclusion of these control variables also makes sure that we measure the effect of government ownership separately from possible correlations between government ownership and, for instance, firm size and leverage. To ensure that we measure a pure effect of government ownership, we also include a full set of industry-time-region (τ_{kjt}) fixed effects. These fixed effects absorb any variation in financial performance between industries and regions and over time. In effect, we are therefore comparing government-owned enterprises to private firms in the same industry in the same province during the same year. To test whether government control influences the performance of companies we first estimate the following model:

$$Performance_{it} = \beta_0 + \beta_1 Government_{it} + \beta_2 Age_{it} + \beta_3 Age_{it}^2 + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \tau_{kjt} + \varepsilon_{it} \quad (5.1)$$

The coefficient of interest is β_1, which measures the average difference in performance of government-controlled firms compared to other firms of similar size, age and leverage and being active in the same industry and residing in the same province for a given year. Hypothesis H1 boils down to testing whether β_1 is significantly negative.

The above regression measures the extensive margin of government control. To be able to test whether firms with a larger government share are performing differently from firms with fewer shares controlled by the government (but which still have the government as largest shareholder), we extend the model by adding the interaction between the concentration of control rights (CC), i.e. the direct and indirect shares controlled by the largest shareholder, and the government control dummy:

$$Performance_{it} = \beta_0 + \beta_1 Government_{it} + \beta_2 (Government \times UC)_{it} + \beta_3 CC_{it} + \beta_4 Age_{it} + \beta_5 Age_{it}^2 + \beta_6 Size_{it} + \beta_7 Leverage_{it} + \tau_{kjt} + \varepsilon_{it} \quad (5.2)$$

The coefficients of interest are β_1 and β_2. The latter measures the differential effect of more government control rights within the subset of government-controlled firms. To test hypothesis H2, we expand equation 5.2 by differentiating between central and local governments as the largest shareholder:

$$Performance_{it} = \beta_0 + \beta_1 Central_{it} + \beta_2 Local_{it} + \beta_3 (Central \times CC)_{it} + \beta_4 (Local \times CC)_{it} + \beta_5 CC_{it} + \beta_6 Age_{it} + \beta_7 Age_{it}^2 + \beta_8 Size_{it} + \beta_9 Leverage_{it} + \tau_{kjt} + \varepsilon_{it} \quad (5.3)$$

The coefficients of interest are β_1, β_2, β_3 and β_4. β_3 measures the differential impact of more voting rights of the central government, and β_4 measures the same for the local government. Hypotheses H2 is tested by examining whether there is a significant difference between the performance of listed firm under control of a local and the central government, respectively.

We estimate all equations using OLS. Further, we test our model using Quantile

regressions, where quantiles are defined based on firm performance. An advantage of this approach is that it is easy to compare the values of the coefficients and standard errors with OLS estimates. Additionally, Quantile regressions are an appropriate method to test the effect of a small increase in the location of the distribution of the explanatory variable X on the ιth quantile of the unconditional distribution of Y (Firpo et al. (2009)). With Quantile regressions we examine how government control influences firms with different corporate performance (i.e different effect of government control on financially healthy and distressed firms). According to Hypothesis H3, the negative coefficient should be increasing in the percentiles of the distribution of performance.

5.4 Results

5.4.1 Main findings

Table 5.4 reports the regression results corresponding to hypothesis 1. Columns (1), (3) and (5) show regression outcomes for model 5.1 for ROA, ROE and Tobin's Q, respectively. For each of these performance metrics, our results suggest that government-controlled firms perform worse than non-government-controlled firms. Compared to firms of similar age, size and leverage, government-controlled firms earn 1.3% (2.0%) lower profits relative to assets (equity), and have 8.2% lower market valuation. These results confirm hypothesis 1, and provide support to theories conjecturing that management of firms controlled by the government have fewer incentives to maximize profits and shareholder value.

Columns (2), (4) and (6) of Table 5.4 present the estimation results for equation 5.2, which includes the interaction between the concentration of control rights (CC), i.e. the direct and indirect shares controlled by the largest shareholder, and the government control dummy. CC is positively and significantly associated with ROA and ROE, indicating that a more concentrated control structure is beneficial to boosting corporate performance. This result is consistent with that of Shleifer and Vishny (1986), Megginson et al. (1994), Xu and Wang (1999), Lemmon and Lins (2003), Chen et al. (2004), and Kang and Kim (2012). However, the interaction between the government dummy and

CC is significantly and negatively related to ROA and ROE, indicating the worsening effects of government control. For example, if government control increases by one standard deviation, the return on assets will drop by 0.83 percent, which is roughly 23 percent of the average firm's ROA. In contrast to ROA and ROE, the effect of more shares controlled by the government is positive for Tobin's Q. Based on this estimate, we find that firms with more than 60% of shares controlled by the government perform better than average, whereas firms with fewer shares controlled by the government have below-average market valuation. A firm with 25% of shares controlled by the government is predicted to be valued at 2.14.

Table 5.4. Financial performance and government control

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	ROA	ROA	ROE	ROE	ln(TQ)	ln(TQ)
Government	-0.013***	0.002	-0.020**	0.047**	-0.082***	-0.206***
	(0.003)	(0.008)	(0.008)	(0.018)	(0.026)	(0.053)
Government × *CC*		-0.050**		-0.208***		0.342***
		(0.021)		(0.047)		(0.121)
CC		0.081***		0.249***		-0.252**
		(0.017)		(0.038)		(0.099)
Age	-0.054***	-0.039***	-0.122***	-0.078***	0.354***	0.331***
	(0.011)	(0.011)	(0.026)	(0.026)	(0.086)	(0.086)
Age^2	0.022***	0.017***	0.054***	0.040***	-.122***	-0.118***
	(0.005)	(0.005)	(0.012)	(0.012)	(0.038)	(0.038)
$Size_{it}$	0.012***	0.010***	0.034***	0.030***	-0.206***	-0.203***
	(0.002)	(0.002)	(0.004)	(0.004)	(0.012)	(0.012)
Leverage	-0.126***	-0.125***	-0.215***	-0.213***	-0.131*	-0.117*
	(0.010)	(0.011)	(0.024)	(0.025)	(0.068)	(0.068)
Constant	-0.113***	-0.108***	-0.496***	-0.513***	5.052***	5.098***
	(0.034)	(0.036)	(0.077)	(0.078)	(0.259)	(0.260)
Observations	5,501	5,501	5,501	5,501	5,501	5,501
R^2	0.266	0.276	0.207	0.218	0.488	0.495

Notes: Columns (1), (3) and (5) in this table show OLS regression results for equation 5.1. Columns (2), (4) and (6) of this table show OLS regression results for equation 5.2. In the table, *Age* is rescaled and is measured in decades. All specifications include industry-year-province dummies.
Clustered (by firm) standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

We extend the model by differentiating between central and local government shareholdings in Table 5.5. In columns (1), (3) and (5), in which we do not consider the concentration of control, the coefficients on the central and local government control dummies are statistically significantly different at the 5 % confidence level. The coefficient on the interaction of *UC* and the central government control dummy is negatively associated with ROA while the coefficient of *Local* × *CC* is insignificant (column 2). The Wald test indicates that the coefficients on *Central* × *UC* and *Local* × *CC* are statisti-

cally significantly different albeit only at the 10 % confidence level.[9]. The coefficients on *UC* and the central and local government control dummies in the regressions for ROE and Tobin's Q are not significantly different from each other. To sum up, while control by the central and local governments have mostly a negative effect on firm performance, we only find mixed evidence favoring hypothesis (2).

Table 5.5. Financial performance and central vs. local government control

Dependent variable:	(1) ROA	(2) ROA	(3) ROE	(4) ROE	(5) ln(TQ)	(6) ln(TQ)
Central	-0.017***	0.011	-0.034***	0.048*	-0.057*	-0.176**
	(0.004)	(0.011)	(0.011)	(0.027)	(0.032)	(0.074)
Local	-0.011***	-0.002	-0.014*	0.046**	-0.094***	-0.219***
	(0.003)	(0.009)	(0.008)	(0.020)	(0.027)	(0.057)
Central × *CC*		-0.078***		-0.240***		0.313**
		(0.026)		(0.063)		(0.156)
Local × *CC*		-0.036		-0.190***		0.353***
		(0.023)		(0.050)		(0.135)
CC		0.080***		0.247***		-0.250**
		(0.017)		(0.038)		(0.099)
Age	-0.0538***	-0.041***	-0.121***	-0.079***	0.352***	0.329***
	(0.011)	(0.011)	(0.026)	(0.026)	(0.086)	(0.085)
Age^2	0.021***	0.017***	0.054***	0.040***	-0.120***	-0.116***
	(0.005)	(0.005)	(0.012)	(0.012)	(0.038)	(0.038)
Size	0.012***	0.010***	0.034***	0.030***	-0.206***	-0.203***
	(0.002)	(0.002)	(0.004)	(0.004)	(0.012)	(0.012)
Leverage	-0.126***	-0.124***	-0.215***	-0.211***	-0.132*	-0.117*
	(0.010)	(0.011)	(0.024)	(0.025)	(0.068)	(0.068)
Constant	-0.114***	-0.110***	-0.499***	-0.517***	5.056***	5.101***
	(0.034)	(0.036)	(0.076)	(0.078)	(0.259)	(0.260)
Observations	5,501	5,501	5,501	5,501	5,501	5,501
R^2	0.266	0.278	0.208	0.219	0.488	0.495
Central = *Local*	2.17	1.42	4.28**	0.01	1.90	0.35
Central × *UC* = *Local* × *CC*		3.35*		0.67		0.07

Notes: Columns (1), (3) and (5) in this table show OLS regression results for equation 5.1. Columns (2), (4) and (6) of this table show OLS regression results for equation 5.2. In the table, *Age* is rescaled and is measured in decades. All specifications include industry-year-province dummies. *Central* = *Local* and *Central* × *UC* = *Local* × *CC* are F statics for the tests $H_0 : \beta_1 = \beta_2$ and $H_0 : \beta_3 = \beta_4$, respectively. Clustered (by firm) standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

5.4.2 Quantile regression estimates

Next, we turn to hypothesis (3). To test this hypothesis, we use quantile regressions, which measure the impact of government control across firms' performance distribution. Table 5.6 reports the results of quantile regressions of equation 5.2. We perform regressions for the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} quantile for each measure of firm performance. Panels A and B of Table 5.6 show that the effect of more shares being

[9] We perform the Wald test for $H_0 : \beta_1 = \beta_2$ (coefficients of Central and local) and $H_0 : \beta_3 = \beta_4$ (coefficients of *Central* × *CC* and *Local* × *CC*) to test whether their difference are statistically significant.

controlled by the government on firm performance becomes more negative when performance increases. In other words, the negative interventional effect of government control becomes stronger as the profitability of firms increases. This finding supports the 'supporting hand' and 'grabbing hand' theory of government. The government supports non-profitable firms to prevent them from being delisted or going bankrupt. However, if firms become profitable, the government exploits them to achieve its social and political goals. For the market valuation regression in Panel C, we find that the positive impact of government control increases for higher-valued firms.

Table 5.6. The effect of government control across the performance distribution

Quantiles	10%	25%	50%	75%	90%
Dependent variable:			ROA		
Government	0.014*	0.012**	0.005	0.006	0.013
	(0.008)	(0.005)	(0.004)	(0.005)	(0.010)
CC	0.050***	0.047***	0.055***	0.075***	0.139***
	(0.018)	(0.010)	(0.008)	(0.011)	(0.020)
Government × *CC*	-0.052**	-0.039***	-0.035***	-0.053***	-0.103***
	(0.021)	(0.012)	(0.009)	(0.014)	(0.024)
PseudoR^2	0.341	0.172	0.165	0.206	0.285
Dependent variable:			ROE		
Government	0.039	0.031**	0.032***	0.033***	0.043**
	(0.034)	(0.012)	(0.008)	(0.013)	(0.022)
CC	0.120*	0.112***	0.165***	0.213***	0.316***
	(0.071)	(0.026)	(0.017)	(0.026)	(0.046)
Government × *CC*	-0.149*	-0.109***	-0.136***	-0.169***	-0.236***
	(0.085)	(0.031)	(0.021)	(0.031)	(0.055)
PseudoR^2	0.304	0.144	0.124	0.146	0.222
Dependent variable:			ln(Tobin's Q)		
Government	-0.032	-0.096***	-0.208***	-0.274***	-0.305***
	(0.033)	(0.028)	(0.030)	(0.043)	(0.051)
UC	-0.152**	-0.160***	-0.239***	-0.281***	-0.217**
	(0.069)	(0.058)	(0.064)	(0.089)	(0.108)
Government × *CC*	0.077	0.162**	0.332***	0.406***	0.398***
	(0.082)	(0.070)	(0.076)	(0.107)	(0.129)
PseudoR^2	0.268	0.312	0.367	0.406	0.455
Observations	5,501	5,501	5,501	5,501	5,501

This table shows quantile regression results for equation 5.2. The quantiles are based on firm performance. All specifications include firm-level controls and industry-year -province dummies.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5.7 repeats the same quantile regression models but using model 5.3 instead, differentiating between firms controlled by local governments and those controlled by the central government. In panels A and B, we find stronger negative effects if the central government has more control rights than when the local government has more control rights, although for both owners the effect of government control increases with firm profitability. The Wald tests suggest that the effects of central and local government control on ROA are significantly different for all levels of firm performance.

However, for ROE, the Wald tests indicate significant different effects only for firms with high performance. For Tobin's Q, we find that the positive effect of government shareholdings is only present for local government-controlled higher-valued firms, but not for lower-valued firms. The coefficients also suggest a U-shaped pattern for the effect of firms controlled by the central government, with more negative valuation effects for intermediate-valued firms compared to either more or less valued firms.

5.4.3 Robustness Checks

To check the robustness of our findings, we re-estimated our model and added the past value of performance to equation 5.2. Firm performance tends to be highly correlated with performance in previous years. A firm with a poor financial performance in the previous year is more likely to be financially distressed in the current year than those with a financially healthy history. As shown in Table 5.8, ROA_{t-1} and $ln(Q)_{t-1}$ are highly and significantly correlated to current year performance. Nevertheless, we still find that government-controlled firms have lower performance in these regressions, although the coefficients on government control and its interaction with *CC* are smaller than those in Table 5.4. The interaction terms appear insignificant for Tobin's Q. So in general, the findings are robust to including the past performance measures.

Next, we examine whether our results are different for firms of different size. For this purpose, Table 5.9 presents the estimation results corresponding equation 5.1 for small firms (firms' assets below the 50% percentile) and large firms (firms' assets above the 50% percentile). Columns (1), (3) and (5) shows results for the small firms, while columns (2), (4) and (6) present the results for the large firms. The results suggest that government control has a negative impact on the performance of smaller and larger firms, although the effect seems to be more significant in larger firms.

Finally, Appendix B shows the results if we split our sample depending on whether firms are located in special economic zones. The results do not suggest that there is a systematic differential impact of government control on firm performance across these

Table 5.7. The effect of central and local government control across the performance distribution

Quantiles	10%	25%	50%	75%	90%
Dependent variable:			ROA		
Central	0.027**	0.019***	0.013**	0.010	0.032**
	(0.012)	(0.007)	(0.005)	(0.008)	(0.013)
Local	0.007	0.009*	0.003	0.003	0.003
	(0.009)	(0.005)	(0.004)	(0.006)	(0.010)
Central × *CC*	-0.094***	-0.069***	-0.057***	-0.071***	-0.150***
	(0.028)	(0.016)	(0.012)	(0.018)	(0.031)
Local × *CC*	-0.025	-0.030**	-0.028***	-0.042***	-0.080***
	(0.023)	(0.013)	(0.010)	(0.015)	(0.025)
CC	0.047***	0.046***	0.055***	0.073***	0.136***
	(0.017)	(0.010)	(0.008)	(0.011)	(0.019)
PseudoR^2	0.344	0.174	0.165	0.208	0.286
Cental = *Local*	2.67	2.08	3.31*	0.87	4.50**
Cent × *UC* = *Loc* × *CC*	6.28**	6.05**	5.94**	2.77*	5.34**
Dependent variable:			ROE		
Central	0.034	0.034*	0.036***	0.035*	0.101***
	(0.049)	(0.018)	(0.012)	(0.018)	(0.030)
Local	0.029	0.026*	0.027***	0.029**	0.035
	(0.037)	(0.014)	(0.009)	(0.014)	(0.023)
Central × *CC*	-0.162	-0.134***	-0.153***	-0.182***	-0.372***
	(0.114)	(0.042)	(0.028)	(0.042)	(0.070)
Local × *CC*	-0.109	-0.094***	-0.121***	-0.150***	-0.213***
	(0.093)	(0.034)	(0.023)	(0.034)	(0.056)
CC	0.114	0.108***	0.164***	0.212***	0.323***
	(0.071)	(0.026)	(0.017)	(0.026)	(0.043)
PseudoR^2	0.305	0.145	0.125	0.146	0.224
Cental = *Local*	0.01	0.19	0.61	0.10	4.59**
Cent × *CC* = *Loc* × *CC*	0.22	0.96	1.35	0.62	5.42**
Dependent variable:			ln(Tobin's Q)		
Central	-0.011	-0.110***	-0.225***	-0.245***	-0.267***
	(0.047)	(0.039)	(0.043)	(0.061)	(0.072)
Local	-0.050	-0.095***	-0.188***	-0.284***	-0.321***
	(0.036)	(0.030)	(0.033)	(0.047)	(0.055)
Central × *CC*	0.089	0.240***	0.439***	0.376***	0.276
	(0.110)	(0.092)	(0.101)	(0.143)	(0.168)
Local × *CC*	0.084	0.118	0.267***	0.412***	0.476***
	(0.089)	(0.074)	(0.082)	(0.116)	(0.137)
CC	-0.164**	-0.155***	-0.224***	-0.281***	-0.247**
	(0.069)	(0.057)	(0.063)	(0.089)	(0.105)
PseudoR^2	0.269	0.313	0.368	0.407	0.456
Cental = *Local*	0.65	0.13	0.72	0.39	0.52
Cent × *CC* = *Loc* × *CC*	0.01	1.83	2.99*	0.07	1.47
Observations	5,501	5,501	5,501	5,501	5,501

This table shows quantile regression results for equation 5.2. The quantiles are based on firm performance. All specifications include firm-level controls and industry-year-province dummies. *Cent* = *Loc* and *Cent* × *UC* = *Loc* × *CC* are F statics correspond to $H_0 : \beta_1 = \beta_2$ and $H_0 : \beta_3 = \beta_4$ respectively. The rejection of H_0 is shown by stars.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5.8. Dynamic Model

Dependent variable:	(1) ROA	(2) ROA	(3) ROE	(4) ROE	(5) ln(Q)	(6) ln(TQ)
ROA_{t-1}	0.269***	0.262***				
	(0.039)	(0.040)				
ROE_{t-1}			0.034	0.023		
			(0.035)	(0.035)		
$ln(Q)_{t-1}$					0.601***	0.594***
					(0.025)	(0.025)
Government	-0.009***	0.002	-0.019**	0.034*	-0.020	-0.063**
	(0.003)	(0.007)	(0.008)	(0.019)	(0.014)	(0.029)
Government × *CC*		-0.034*		-0.169***		0.107
		(0.018)		(0.048)		(0.070)
CC		0.058***		0.207***		-0.041
		(0.015)		(0.038)		(0.061)
Observations	4,328	4,328	4,328	4,328	4,328	4,328
R^2	0.317	0.325	0.197	0.203	0.689	0.690

Notes: This table shows OLS regression results for equation 5.2, adding the lagged dependent variable. All specifications include industry-year-province dummies.
Clustered (by firm) standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5.9. Large firms vs. small firms

Dependent variable	(Small) ROA	(Large) ROA	(Small) ROE	(Large) ROE	(Small) ln(Q)	(Large) ln(Q)
Government	-0.018***	-0.007*	-0.019	-0.024**	-0.058	-0.062*
	(0.005)	(0.004)	(0.012)	(0.010)	(0.039)	(0.032)
Age	-0.090***	-0.031**	-0.203***	-0.063**	0.639***	0.385***
	(0.021)	(0.013)	(0.051)	(0.029)	(0.147)	(0.091)
Age^2	0.031***	0.014**	0.082***	0.030**	-0.219***	-0.151***
	(0.009)	(0.006)	(0.023)	(0.013)	(0.065)	(0.042)
Size	0.014***	0.009***	0.034***	0.032***	-0.296***	-0.078***
	(0.004)	(0.002)	(0.008)	(0.006)	(0.033)	(0.015)
Leverage	-0.099***	-0.186***	-0.214***	-0.253***	-0.061	-0.599***
	(0.013)	(0.014)	(0.034)	(0.037)	(0.087)	(0.114)
Constant	-0.145	-0.041	-0.444**	-0.440***	6.711***	2.371***
	(0.091)	(0.046)	(0.178)	(0.127)	(0.703)	(0.328)
Observations	2,863	2,844	2,863	2,844	2,863	2,844
R^2	0.300	0.411	0.254	0.284	0.462	0.398

Notes: This table shows OLS regression results for equation 5.2. In the table, *Age* is rescaled and is measured in decades. Columns (1), (3) and (5) shows results for the smaller firms and columns (2),(4) and (6) present the results for the larger firms. All specifications include industry-year-province dummies.
Clustered (by firm) standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

subsamples.

5.5 Conclusion

The results reported in this study broaden our understanding of the role of government influence on firm performance. Our findings suggest a significant effect of government control on corporate performance of Chinese listed companies. Our empirical results indicate that government-controlled firms have a worse financial performance than non-government-controlled firms. In addition, we find that, in general, firms controlled by both central and local governments, have such negative interventional effects on the performance of Chinese listed firms. These conclusions support the 'grabbing hand' theory proposed by Shleifer and Vishny (1994).

Additionally, our results based on quantile regressions show that the negative interventional effect of government-control becomes stronger if firms get more profitable. This implies that for distressed firms, government control is positively associated with firm performance. This finding supports the 'supporting hand' theory of the government. In order to prevent non-profitable firms from being delisted or going bankrupt, the government supports non-profitable firms. However, profitable firms are used by the government to achieve social and political goals.

This study has a number of limitations. First, the way we define the government control dummy ignores any possible influence of government in firms which are defined as non-government controlled. Since, the concentration of control is based on the biggest shareholder only, there may be non-government controlled firms in which the government is one of the larger (but not the biggest) shareholders. Government might still influence such firms even if it is not the largest shareholder. Future studies may come up with measures that take this influence into account. Second, the distribution of authorities in the pyramidal ownership structure is complex. Although our measurement of the concentration of control is an improvement, there exist other factors in the pyramidal structure that could influence the actual implementation of control rights. Future research could focus on differentiating the intricacy of these influential factors and construct even better measures of government control.

5.A Data

Table 5.A.1. Definition of variables

Variables	Definition	N
ROA	Return on assets, computed as net income divided by average total assets.	6,119
ROE	Return on equity, computed as net income divided by shareholders' equity.	6,119
TQ	Tobin's Q, computed as market value divided by total assets.	6,117
CC	Concentration of control. It is the voting rights of the ultimate controller over the controlled firm. It is the weakest shareholding percentage among the ownership pyramidal structure. It includes both direct and indirect voting rights. A legal entity is considered as the ultimate controller of a listed company if it has the largest voting rights over the company.	5,618
Government	Government control dummy. If the ultimate controller is the government, the value is 1; 0 otherwise.	5,752
Central	Central government control dummy. If the ultimate controller is the central government, the value is 1; 0 otherwise.	5,752
Local	Local government control dummy. If the ultimate controller is the the local government, the value is 1; 0 otherwise.	5,752
Size	Firm scale, computed as the natural logarithm of total assets.	6,119
Age	Duration from IPO to the sample year.	6,119
Leverage	Leverage ratio, computed as total liabilities divided by total assets.	6,117

5.B Definition of Concentration of Control

The control structures of privatized firms can be very complex. Figure 5.B.1 provides two examples. As shown in figure 5.B.1(a), company Y has four direct shareholders: Government, and private entities E, G and H. The government controls a majority of voting rights in company G and H. Firm E has two principal shareholders D and C, who each hold 44% of the firm's voting rights. D, in turn, is 50% controlled by the government and 50% by shareholder A. B has 22% voting rights of C. Three entities hold large ultimate power in company Y: shareholder B, who indirectly controls 10% of votes (min[10% , 22%, 44%]), the shareholder A, who controls 10% of the votes (min[10% ,44% ,50%]) and the government, which controls 51% of votes(min[37%, 100%]+ min[2%,60%] + min[10%, 44%,50%]+2%). Therefore, the government is firm Y's largest shareholder. Note that if we would consider only direct ownership, as most previous studies do, then we would define the government voting rights as only 2% of shares.

Figure 5.B.1. The Voting Right

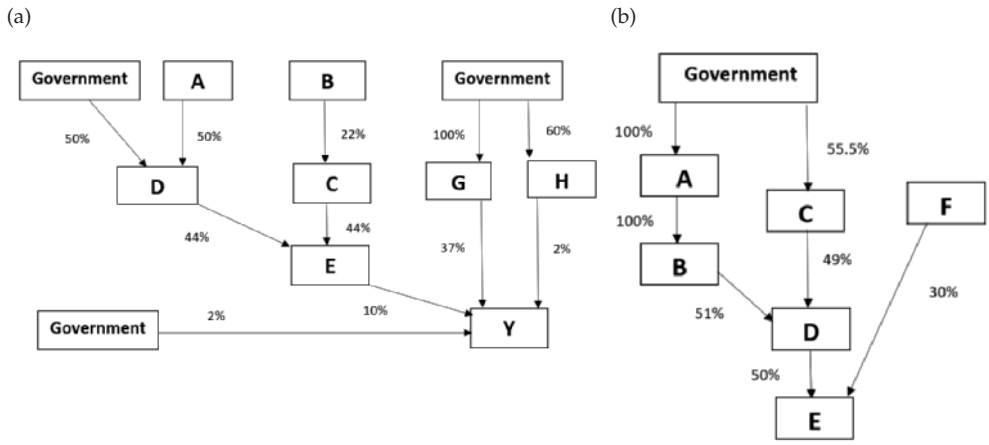

Figure 5.B.1(b) illustrates company E's control structure. The government indirectly controls company E through two government controlled firms: firm A with 100% voting rights and C with 55.5% voting rights. Firm A, through firm B, controls 51% of D's voting rights. Therefore, the government indirectly holds 51% control in firm D(min[51%,100%,100%]) via B and similarly controls the remaining 49% (min[49%, 55.5%]) of firm D via C. D directly controls 50% of company E and thus, the government controls 50% of E's voting rights.

5.C Special Economic Zones

During the 1980s, China established special economic zones (SEZs) to reform its economy and to attract foreign direct investment. China's special economic zones are defined as small geographical areas on the east coast (provinces: Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujan, Shandong, Guandong, Hainan and Liaoning) in which business and trade are treated differently from the rest of the country (see e.g Yeung et al. (2009); Zeng (2012); Crane et al. (2018)). Since firms located in SEZs operate under more liberal economic laws and are therefore perhaps less controlled by

the government, we estimate equation 1 for firms located in provinces with special economic zones and those located in the rest of country.

Table 5.C.1 present the results. Columns (1), (3) and (5) show the estimation results for firms located in provinces with SEZs and columns (2), (4) and (6) present the estimation results for firms located in all other provinces. Our results do not suggest that there is a systematic differential impact of government control on firm performance across these subsamples.

Table 5.C.1. Special Economic Zones vs. other regions

	(1) SEZs	(2)	(3) SEZs	(4)	(5) SEZs	(6)
Dependent variable:	ROA	ROA	ROE	ROE	ln(Q)	ln(Q)
Government	-0.009**	-0.017***	-0.004	-0.040***	-0.062*	-0.108***
	(0.004)	(0.006)	(0.009)	(0.013)	(0.035)	(0.040)
Age	-0.053***	-0.058***	-0.116***	-0.158***	0.435***	0.124
	(0.014)	(0.020)	(0.031)	(0.046)	(0.108)	(0.154)
Age^2	0.018***	0.028***	0.044***	0.083***	-0.161***	-0.015
	(0.006)	(0.010)	(0.014)	(0.021)	(0.046)	(0.073)
Size	0.009***	0.015***	0.029***	0.039***	-0.206***	-0.209***
	(0.002)	(0.003)	(0.004)	(0.007)	(0.017)	(0.017)
Leverage	-0.110***	-0.144***	-0.176***	-0.258***	-0.089	-0.181*
	(0.012)	(0.018)	(0.029)	(0.039)	(0.093)	(0.099)
Constant	-0.050	-0.177***	-0.398***	-0.568***	4.985***	5.291***
	(0.035)	(0.064)	(0.079)	(0.139)	(0.360)	(0.383)
Observations	3,210	2,497	3,210	2,497	3,210	2,497
R^2	0.229	0.302	0.173	0.237	0.468	0.513

Notes: This table shows OLS regression results for equation 1. Columns (1), (3) and (5) show the estimation results for firms located in provinces with SEZs and columns (2), (4) and (6) present the estimation results for firms located in all other provinces. All specifications include include industry-year-province dummies.
Clustered (by firm) standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1