Ultimate Control and Firm Performance

An Empirical Analysis of State Firms in China

Jiaxin Wang[1]*, Gulnur Muradoglu[2]*, Deven Bathia[3]*

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Abstract

We develop a new scheme to classify state ownership in terms of ultimate controllers and study performance issues in this framework. We use a rich sample of all listed Chinese firms and identify three types of state control based first on administrative level, and then further six classifications for each administrative level based on function and objective. We show state ownership cannot be generalised in their relation to firm performance. We show output is increased mainly by ultimate owners at Central and Provincial levels and SASACs. Employment is improved by ultimate owners at Central and Municipal Levels. We show market oriented targets such as profitability and labour productivity are met mainly by Central Asset Bureaus. Our findings indicate the role of state control is diverse and cannot be measured against market performance alone.

Keywords: ownership structure, ultimate control, China

JEL Classification: G30, G32

[1] School of Business and Management, Queen Mary University of London, Mile End Road, London E1 4NS, United Kingdom.

[2] School of Business and Management, Queen Mary University of London, Mile End Road, London E1 4NS, United Kingdom.

[3] School of Business and Management, Queen Mary University of London Mile End Road, London E1 4NS, United Kingdom.

*Corresponding Authors.
E-mails: jiaxin.wang@qmul.ac.uk (J. Wang), y.g.muradoglu@qmul.ac.uk (G. Muradoglu), d.bathia@qmul.ac.uk (D. Bathia).

1. Introduction

Previous literature clearly establishes the negative impact of state ownership on firm performance in China (Sun and Tong, 2003; Wei et al., 2005). However, state ownership remains a unique feature of Chinese firms' ownership characteristics. The question then is why is state ownership still so important despite its known damaging impact? There are two caveats in previous literature that to our knowledge this paper is the first in attempting to fill. First, the definition of state ownership has been broad without distinguishing between several layers of state. Our first contribution is to identify fourteen different types of state control based on ultimate controllers' administrative level, function and objective. We use hand collected data to develop a new classification that helps differentiate between state agencies. We use different administrative levels such as state, provincial and municipality level as one dimension and functionality and objective as another dimension of this classification. Second caveat in previous work is the performance measures being limited to mainly financial performance. This is in fact related to the first caveat that takes state ownership as one variable without due attention to layers of state organisation and their distinct objectives. The main assumption in previous work is the opening up of Chinese economy through financial markets and thus implicitly pursuing better financial performance measures as market economy objectives.

We, on the other hand, undertake our analysis with the understanding that Chinese governments have a wholistic view and use state apparatus carefully in integrating market economy to their other targets. Our hypotheses relate each administrative level of ultimate controllers to different firm objectives including not only financial performance but also output, employment, investments, efficiency and production. Our results are unique in showing how China uses state ownership at many administrative levels through ultimate owners at different capacity to satisfy multiple objectives and how each ultimate ownership category functions towards its set targets eventually leading to a successful overall development strategy.

The contributions of the paper are as follows. First, we employ a new classification scheme for state ownership structure in Chinese listed firms. We develop the classification scheme by following two principles: identifying the ultimate owners using manual data collection and distinguishing their objectives. In step one we identify the ultimate owner of each company and the intermediate owners in each level of the pyramid that leads to the ultimate owner. We in step two classify the ultimate owner and ownership in each level of pyramid into four major categories, state, foreign, private and other owners. In step three, we further classify state ownership into fourteen sub-categories based on the administrative level, function and objective. Each administrative level includes the following categories: government, department, asset bureau, State-owned Assets Supervision and Administration Commission (SASAC), state-owned enterprise and public institution.

Second, we use a broad range of performance measures including profitability, employment, labour productivity, investment, investment efficiency, operating efficiency and firm output. The use of broad range of performance measures enables us to investigate the objectives, various ultimate ownership categories of state pursue, whether it is profitability as studied extensively in previous literature or other targets which is new to this paper. The results show that the Chinese state ownership is not accidentally not enough market oriented and not profitable or not value enhancing but rather there is a division of labour among state agencies. While some state ownership categories and pyramid structures pursue profitability, other pursue employment or output increases. Various productivity and efficiency measures we use help us understand how firms pursue different objectives and how as a whole state ownership is used in China not as a single handed tool for transition to market economy but as a holistic tool to maintain stability in output and employment levels while transitioning to a market economy.

Third, state-controlled firms in previous literature are distinguished for the acute owner-manager agency problems as the interests of state-controller may not be aligned with those of outside shareholders (Firth et al., 2010). China is no exception. Sun and Tong (2003) for example, estimate the shifts in State-owned Enterprises' (SOE) performances in Chinese stock exchanges regarding the share issuing privatisations and find negative impact of state ownership but that legal person ownership is positively related to firms' performance implying that the legal person has the different incentive from the state. Wei et al. (2005) examine the relation between ownership structure and firm value in partially privatized former SOEs in China and show that state and intuitional shares are significantly negatively related to firm value. A recent paper by Liao et al. (2014) establish that the SOEs experience a quicker increase in output, profit, and employment than the non-SOEs after the split share reform. We take their paper as our starting point that the performances of Chinese listed firms vary with the type of ownership. We build a new classification scheme in the next section to identify each state owners rank in administrative hierarchy and functions and objectives assigned to them. We use this new classification scheme to relate company performances to state ownership rather than using a singular state that hides the diversity and breath of Chinese state system. With the help of the new classification, we could identify the characteristics of ultimate controllers of these listed firms and investigate their motivations when operating the listed firms.

Most previous literature adopted the classification used in annual reports for as indicators for ownership. There are three major classes of shares in the annual reports of listed companies in China. The state shares are held by the government, legal person shares are held by state-controlled or privately controlled legal persons and shares owned by individuals and institutions, most of which are tradable A shares (Conyon and He, 2011). However, this classification does not capture either the diversity among shareholders or the ultimate owners of the shares. For example, even among the legal persons state controllers may care more about

social stability and while private shareholders may focus on profitability. The issue is much more important for state ownership due to the widespread nature of it among listed companies. Our classification identifies the ultimate controller and the different administrative levels as well as functions of state ownership.

The rest of the study is organized as follows. Section 2 presents our classification of state ultimate owners into administrative level and functional categories. Section 3 reviews related literature and develops hypothesis. Section 4 describes the data and methodology. Section 5 provides the empirical findings. Section 6 concludes.

2. Classification of State Ownership in China

The Board of Supervisors of Key and Large State-owned Enterprises points out that the reform of SOEs is a complex system engineering, involving governments at all levels, multiple departments, the central enterprises and local enterprises, state assets supervision system to supervise enterprises, and other departments and units to supervise enterprises[4]. Bai et al. (2006) have provided a multitask theory of SOE reform in China. They argue that the divergence of interests among different levels of government increases with the amount of surplus labor. Lower-level (such as county or city) governments like to dump those SOEs that are laden with surplus labor and debts. This implies that, with privatization of SOEs affiliated with the county or city governments, there will be substantial layoffs of surplus workers and massive write-offs of bad loans. In contrast, higher-level (provincial or central) governments care more about social stability, and they are reluctant to let go those SOEs whose privatization would lead to labor layoffs and loan write-offs. This implies that there may not be any decrease in employment or debts with privatization of SOEs affiliated with the provincial or central governments. The third plenary session of the 18th CPC Central Committee also emphasized to define different capabilities of the state-owned enterprise. As the controller principally decides the operation mode of the firms, identification of roles of SOEs' controllers is necessary.

We identify the ultimate controller of each listed firm and categorize them based on first the administrative levels, and then on functions and objectives. We hand collect ultimate controller data from the information disclosed in the annual reports We use as our basis for manual data collection the Measures for the Administration of the Takeover of Listed Companies, whereby a person or an entity can actually control a listed firm if satisfying either of the following conditions[5]: the person/entity holds the largest number of shares of all

[4] Ji, X.N. (2017) People's Daily, the people's thesis: it is protracted battle to deepen the reform of state-owned enterprises. People's Daily Online. [Online] P.1. Available at: http://opinion.people.com.cn/n1/2017/0109/c1003-29006894.html [Accessed 25th, March 2018].
[5] CSMAR

registered shareholders unless there are evidences that can prove the opposite; or the person/entity has the power to exercise or control more voting rights than those of the largest shareholder; or the person/entity has the power to exercise or control 30% or more of the firm's shares or voting rights unless there are evidences that can prove the opposite; or the purchaser has the power to decide the election of more than half of the directors; or other circumstances as determined by the China Securities Regulatory Commission (CSRC). The ultimate controllers in China use pyramid structure, cross-holding and other methods to obtain the control rights over the listed firm. We trace the control chains to find the entity/person which dominates at the top of pyramid and identify them based on their characteristics.

2.1. Classification of State Ultimate Controllers according to Rank in Chinese Administrative Structure

To our knowledge this is the first paper that classifies controllers by identifying their different administrative levels and functionality. We use the current administrative regions in China that include three levels: Central State, Province, and Municipality as the administrative levels in the paper. The controllers directly affiliated to the State Council[6] or departments of the State Council are regarded as Central. Based on thee listed firms' information in CSMAR, the other controllers are treated as Province and Municipality. Thus, there are three administrative levels in the paper; Central, Provincial and Municipal. For example, the PetroChina Company Limited is directly under control of the state council and is treated as a central-level listed firm. The government of Jiangsu Province is classified as the provincial level, and the finance bureau of Jinan City Government is categorized as the municipal level. We use these administrative classifications for all firms that we later classify in the next section

[6] We also refer State Council as Central Government.

into Government, SASAC, Asset Bureau and Government Department, State-owned Enterprises and Public Institution.

State-owned Enterprises are difficult to distinguish at Provincial or Municipal levels. Some of the Municipal State-owned Enterprises may be directly owned by the Provincial Governments or other state entities at provincial level. For example, the ultimate controller of the listed firm Inner Mongolia Baotou Steel Union Co., Ltd. is Baotou Iron & Steel (Group) Co., Ltd. Baotou is a municipality of the Inner Mongolia autonomous region, but the Baotou Iron & Steel (Group) Co., Ltd is directly managed by the Inner Mongolia autonomous region instead of the Baotou city. Therefore, we combine the State-owned Enterprises at Provincial and Municipal Level into a Local State-owned Enterprise category. State owned enterprises are classified into two administrative levels, accordingly, central and local.

Government at the Central Level is the State Council which is the highest state administrative organ, and it does not own any listed firms. Therefore, our classification in this paper includes only two categories, Provincial Government (such as government of Zhejiang Province) and Municipal Government (such as government of Hangzhou city). Public Institutions (such as China Agricultural University) as social service organization and thus we do not further classify Public Institutions into state administrative levels.

The state controllers at different levels have diversified objectives. Central enterprises are the SOEs owned by the agencies or departments affiliated to the central government. The Chairman of the Board of State Development and Investment Corporation, Wang Huisheng, points out that the title of the central enterprise itself is the largest social responsibilities in the conference of 22nd June 2017[7]. The central enterprises have the political responsibility, social responsibility, economic responsibility and the responsibility of the enterprise development.

[7] Wang, J. and Du, Y.F. (2017) Hui-sheng wang: the title of the central enterprise itself is the biggest social responsibilities. People's Daily Online. [Online] P.1. Available at: http://ccnews.people.com.cn/n1/2017/0623/c142089-29358418.html [Accessed 25th, March 2018].

They must obey and serve the national strategy, develop in conformity with legal provisions, act as the representative and pioneers of the times. A central enterprise may fail in its obligations without the responsibilities. The third plenary session of the 18th CPC Central Committee also indicated that central enterprises should standardize employment system and eliminate the systematic obstacles and employment discrimination of area, industry, identity, gender and other factors affecting equal employment [8]. These central enterprises are constructing thousands of projects focusing on infrastructure construction, energy construction, capacity corporation parks and performing social responsibility, such as ecological environmental protection, employment problems, public welfare establishments.

The central enterprises contributed great wealth to the nation through taxes, state-owned capital gains, and transfers of state-owned shares into the social security fund. The state controllers at Central Level have the capacity to improve the output of listed firms under their control. In the first half of 2016, the total revenue of the central enterprises was 10.8 trillion yuan, the total profit was 623.5 billion yuan, increasing the total assets by 3 trillion yuan[9]. The state controllers also care about the public welfare, such as employment, price stability. They provide financial and political support to fulfil the social responsibility. They actively absorb employment, protecting the legitimate rights and interests of employees.

Unlike the central government focusing on social responsibility and people's livelihood, the provincial levels enjoy more flexibility to fulfil social responsibilities as the responsibilities are passed to the lower-level controllers to execute. The local levels have long gaming relationships with local SOEs and are the most sensitive agencies to policies demand of the microcosmic systems. They can also represent of microcosmic bodies to negotiate effectively

[8] Li, X.Y. (2014) Reforms of state-owned assets and state-owned enterprises are in parallel. FTChinese. [Online] P.1. Available at: http://www.ftchinese.com/story/001055298 [Accessed 25th, March 2018].

[9] SASAC Website. SASAC held a media exchange meeting about the central enterprises' operation situation and the progress of the reform of state-owned enterprises. [Online] P.1. Available at: http://www.sasac.gov.cn/n2588020/n2588072/n2591426/n2591428/c3734132/content.html [Accessed 18th, September 2019].

with the higher-level governments and strive for proper reforming spaces and resources. However, the low levels are also strictly supervised by the high levels and followed the instructions of the central levels. Within a 'level upon level' control mechanism, the municipal levels must obey the orders from central levels to fulfil the social responsibilities at the expense of the firm financial performances,

2.2. Classification of State Ultimate Controllers according to Functionality and Objectives

Among the governmental agencies, asset management entities and other governmental departments need to be distinguished by their functions and objectives. Some put their emphasis on market-oriented performance measures, but others have other diverse objectives. According to our knowledge, this is the first paper that attempts to capture this diversity. We use six categories in the following classification accordingly.

The State Asset Supervision and Administration Commission of the State Council (SASAC) is a governmental agency authorized by the State Council. The SASAC performs investors' responsibilities, supervises and oversees the management and operation of state-owned assets on behalf of the central government. The commission was established in 2003. The SASACs have strict supervision systems, such as the assets management budget mechanism, leverage reduction system, and serve in the front line of the SOEs reforms. SASAC must flourish state-owned assets and create wealth for society. The SASACs also care about the public welfare, such as employment, and price stability. They provide financial and political support to fulfil the social responsibility. SASAC actively absorbs employment, protecting the

legitimate rights and interests of employees. In 2009 the enterprises took the initiative to hire more two hundred thousand graduates, which increased by 7% as of 2008[10].

Using our administrative classifications, we further categorise them into Central SASAC, Provincial SASACs (such as Anhui Province SASAC), Municipal SASACs (such as Baotou Municipal SASAC). The SASACs at Central and Provincial Level have the target to improve the output of listed firms under their control. These enterprises are expected to make significant contributions to the domestic economy and therefore receive continued political support from Chinese governments that helps them hit their output targets However, the long-term political supports also lead to the lack of competitiveness.

Asset Bureaus are asset management and operation departments of the government that act as complements to SASAC. There are few asset management departments in the sample which are either reformed into asset management companies or merged into SASAC at some point or focused on the management of a certain type of activities, such as the culture. We cannot classify them into the SASAC, because they do not have the same political power to support the listed firms under their control as the SASAC. They aim at asset value appreciation. As asset management departments, they have the obligations to maintain and increase the value of state-owned assets and bear the social responsibilities at the same time. For example, the Beijing State-owned Cultural Assets Supervision and Administration office, which is established in 2012, focuses on the supervision and regulation of culture related assets. It does not act as the Provincial SASAC which provides sufficient support to the output targets of the listed firms. The Asset Bureaus as state-owned asset management agencies are further classified into the administrative level they belong, central, provincial and municipal level.

[10] SASAC Website. The Speech of Huang Shuhe in the media's meeting "Central State-owned Enterprises make efforts to undertake the social responsibility". [Online] P.1. Available at: http://www.sasac.gov.cn/n2588030/n2588939/c4297402/content.html [Accessed 20th, August 2018].

Government Departments are the non-asset management departments of the government, such as the finance bureaus, education bureaus, railway bureaus etc. at central, provincial and municipal levels. The listed firms owned by the Government Departments are high-tech companies (which are controlled by the education bureaus), financial companies (which are controlled by the finance bureaus), infrastructure companies (which are controlled by the railway bureaus) and so on. They also need to fulfil the social responsibilities such as maintaining the employment. In contrast to the SASAC, the Government Departments do not have the targets to promote firm output which is pursued by the SASAC. They focus more on firm profitability and efficiency rather than the social responsibilities. For example, Tsinghua Tongfang Co., Ltd. is a state-owned software company which is ultimately controlled by the Ministry of Education in 2010. As a state-owned listed firm, the company cannot avoid the social mission, but it also actively enlarged the investment in high-tech products, scattered its investment projects, reduced risk and increased efficiency.

The State-owned Enterprises are the state-owned companies acting as legal persons and ultimately control the listed firms. For example, the Central Huijin Investment Ltd. is the ultimate controller of the listed firm Bank of China. Compared to the SASAC, the State-owned Enterprise as the ultimate controllers of the listed firms are more profit oriented but less connections with the government. The disadvantages of State-owned Etherises as the controllers include lack of sufficient support to the listed firms and fewer capital resources for investment.

Government is the integration of governmental agencies and departments. A number of listed firms' annual reports in our sample indicate that the listed firms are ultimately controlled by the government, not the SASAC or Government Department. The reports do not show the specific entities by whom the listed firms are controlled. So we treat the ultimate controllers of these listed firms as the Government. The prime minister Li Keqiang said governments at all

levels must implement fair regulations and decentralize power to increase market vitality and social creativity[11], which means the government itself as the ultimate controllers of the listed firms need to consider as many as possible outcomes when implementing policies, such as absorbing employment and avoiding inefficiency at the same time. The Governments as the controllers do not set the firm output as targets, as the political supports are oriented to the large firms which are already owned by the SASAC, The Government at the Central Level is the State Council which is the highest state administrative organ and it does not own any listed firms, so we exclude the Government at the Central Level. The classification in the paper includes Provincial Government (such as government of Zhejiang Province) and Municipal Government (such as government of Hangzhou city).

A Public Institution is a social service organization established by the government operating in education, science and technology, culture, health, media and other activities, such as universities, press and television stations. These institutions are not profit-oriented. They undertake social responsibilities. For example a university can be classified ad a Public Institution and can own the shares of listed companies. These Public Institutions are not necessarily represented by professional managers. For example, the top management of the listed firm controlled by the universities may be elected from the staffs of the university who do not necessarily have enough knowledge to build market oriented operational mechanisms. This could in turn lead to low profitability, low productivity, low output levels and other inefficiencies. Most of the Public Institutions (such as China Agricultural University) are affiliated to the local authorities (ministry of education in this case), therefore we do not further divide them at administrative levels.

[11] Lu, Q. (2016) Li Kequiang: linking different levels, overcoming difficulties, deepening reform, speeding up the transformation of government function and improving administrative efficiency. Chinese Government Network. [Online] p.1. Available at: http://www.gov.cn/premier/2016-05/09/content_5071641.htm [Accessed 28 March 2018].

3. Literature Review and Hypothesis Development

We investigate the role of state owners with diverse functions and objectives on company performance in China. The negative impact from state ownership observed in previous literature has been explained by agency theory (Jensen and Meckling 1976) and the propensity of controlling shareholders to expropriate (Chen et al., 2011; Fan et al., 2011). On the other hand, Andres (2008) reports family firms, also with controlling shareholders, are more profitable than those with a dispersed ownership structure. The relation between having a controlling shareholder and performance therefore can be studied by identifying the objectives of the controlling owner rather than assuming they use their power to expropriate. In this paper we construct a framework and classify state ultimate owners so that we can investigate if their objectives can lead to different performance outcomes.

By analyzing the relation between government ownership and the value of European firms during the global financial crisis of 2008-2009, Beuselinck et al. (2017) show that government ownership helps alleviate financial shocks in countries with sufficient investor protection and low corruption. This is a good example for an understudied function of state ownership; providing a safe Heaven during financial crisis. Chen et al. (2017) on the other hand, find statistically and economically significant evidence that state ownership is negatively related to firm performance in 64 countries. There is further work that reports no effect on firm value such as Thomsen et al. (2006) in Anglo-American market-based economies and Adrian Cheung and John Wei (2006) in China. Our approach is to classify state ultimate owners into categories based on their rank in state hierarchy and functions and objectives. This enables us to relate performance to ownership without making additional assumptions and without overgeneralisations. Below we will briefly discuss Chinese state ownership in its historical context to lay the context of how we develop our hypothesis.

3.1. China Background

China's economy experienced a high growth phase over the past two decades. The average growth rate of GDP was 11% from 2000 to 2010 with a peak point of 14.2% in 2007[12]. The high growth rates and underlying productivity increases can be attributed to the economic reforms in this period. The economic restructuring process principally concentrates on the reform of state-owned enterprises (SOEs). From the economic liberalization in the 1970s to the recent split share reform in 2005, the reforms aim at deducting the state-owned shares and increasing the performance of SOEs. In 1978 the first round of the reform focused on decentralization of control rights and profits, completing the transition from planned economy to market economy. Afterward, the second round of the reform in 1992 established the modern enterprise system to improve the management of state-owned assets by reforming the shareholding scheme. The state-owned enterprises benefited from the policy and resources; then progressively grew into strong enterprises that they are now. However, rapid economic development concealed severe problems of SOEs. As China's economic growth is slowing down, low operational efficiency, disproportionate resource allocation and capacity expansion problem are gradually revealed. For example, many enterprises in steel, coal, cement, glass, petroleum, petrochemical, iron ore, non-ferrous metal, and other major industries suffered losses. In 2015, President Xi Jinping set the Supply-side Structural Reform as the main task for economic growth at the recent 19th National Congress of the Communist Party of China (CPC)[13]. The reform includes cutting excess capacity, destocking, deleveraging, reducing costs and shoring up weak areas, laying the base for future reforms. Still, SOEs bear the major economic, political, and social responsibility. President Xi stressed that the government must

[12] CSMAR

[13] Source: Xi jinping hosted the 11th meeting of the central finance leading group. Xinhua Net. [Online] Available at: http://www.xinhuanet.com//politics/2015-11/10/c_1117099915.htm [Accessed 6th, June 2018].

unswervingly deepen the reform of SOEs and make the SOEs act as leading roles in economic reform. The controllers of SOEs scatter among various agencies at different levels of state hierarchy, and each of them has different primary objectives. This paper addresses the question of how performance of listed firms in China related to different types of controllers in this context.

In China, the equity of listed companies is highly concentrated. The average share of ownership of the largest shareholder was 39.98% in 1995[14]. The rate increased in 2005 and was 40.10%, and then decreased to 34.65% in 2015. Non-tradable shares account for large proportion of equity in listed firms before 2005 and former state enterprises act as the holding company of the listed firm in a pyramid structure. The original enterprises are merged as group or high-quality assets of original enterprise group are integrated for listing and therefore ultimate controllers are important. We use La Porta et al. (1999) approach in defining ultimate controllers tracing the chain of ownership to find the state entities that have the most voting rights. As there is no official classification of the ownership structure in Chinese listed firm, most previous literature adopted an unofficial mechanism - share types - to represent each kind of ownership. For example, literature treated the owners who held state shares as the state ownership, those held legal person shares as the legal person ownership (some researchers treat the legal person shares as institutional ownership), and those held tradable A shares as individual/private ownership (Sun and Tong, 2003; Wei et al., 2005; Chen et al, 2008; Firth et al., 2010). Share types only indicate the category of shares rather than the ultimate owners of the shares. Using share types as the proxy of ownership obscures the actual effect of shareholders. Our classification defines the ultimate controllers by tracing the chain of ownership, and it will not only distinguish the actual owners who held the same type of shares,

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but also separate different government agencies based on the administrative level, function and objective.

3.2 Ownership Structures and Firm Performance

The effect of ownership structures on firm performance has been investigated extensively in the theoretical and empirical literature[15]. In listed firms, the separations of ownership and control always give rise to severe agency problems. The agency problem arises when there is a conflict of interests between the managers and owners. The agency problems can be decreased by close monitoring. Compared with small investors, large shareholders have the capabilities to monitor the actions of managers and reduce agency costs. However, large shareholders principally satisfy their own interests rather than that of minority shareholders. Such interests vary. For example, in the U.S., family-controlling firms tend to have higher valuations and profitability than nonfamily-controlling firms (Anderson and Reeb, 2003). In Europe, Maury (2006) shows that active family control increases firms' valuations and profitability. The results imply that family control can reduce the agency problem between owners and managers.

Empirical research about the effect of state ownership has mixed findings. Goldeng et al. (2008) find that the performance of SOEs is inferior to that of privately-owned enterprises in Norway. Similarly, Chen et al. (2017) report statistically and economically significant evidence for China that while state ownership is negatively related to investment efficiency Government is the most common dominant shareholder in Chinese listed firm. When the two major stock exchanges established in China, only one-third of all shares were tradable and the remaining two-thirds were non-tradable held by the state and legal persons. After the Split Share Reform in 2005 almost all firms prepared detailed timetables to convert non-tradable shares to tradable

[15] Anderson and Reeb (2003), Andres (2008), Benson and Davidson (2009), Himmelberg et al. (1999), Maury (2006), Pound (1991), Woidtke (2002).

shares yet the government still hold a significant proportion of the shares in listed firms. Studying this process, Sun and Tong (2003) report that SOEs' performance including profitability, productivity and sales is improved by the privatisation. Yet, state ownership is still negatively related to firm performance. They do not differentiate between state owners but use one category where state shares proxy for state ownership, regardless of the nature of the state owner.

Wei et al. (2005) study three types of concentrated ownership, specifically state, legal persons and foreign owners and also show state ownership is negatively related to firm performance. They discuss that legal person shares represent institutional ownership and commonly held by domestic mutual funds, insurance firms, some government agencies, and other companies that enable them improve firms' Tobin's Q. Chen et al. (2008) investigate performance changes in Chinese listed firms when there is an ownership transfer in the controlling shareholder. They conclude that firm performance is improved when the control is transferred to a private entity rather than a state entity. They employ only two categories state and legal person shares to proxy for state ownership. Liao et al. (2014) also study the split share reform in China and show that the SOEs experience a quicker boost in output, profit, and employment than the non-SOEs. They classify a firm as SOE if the ultimate controller is a state entity. Similarly, Lin et al. (2021) examine the impact of different forms of state ownership on firm innovation. They divide the ultimate controlling shareholders into three types: central government, local government, and private shareholders. Different from their research, we distinguish between fourteen different types of state ultimate owners instead of one or four types of ultimate controlling shareholders, according to their rank in state hierarchy and function and objective assigned to them.

Previous literature mainly adopts a narrow definition of share types to represent the ownership structure in Chinese firms. In this framework shares which are owned by the state

are treated as state ownership, legal person shares held by the legal person entities are classified as legal person ownership. However, legal person shares could be held by different entities. The legal person shares are not only held by privately-controlled legal persons but also the state-controlled legal persons. Using the share types as the indicators of ownerships fails to separate the state-owned legal person shares and private-owned legal person shares. The owners of these two shares may perform differently when managing the firms. For example, China National Petroleum Corporation is a central state-owned enterprise and also the ultimate controller of CNPC Jichai Power Equipment Company. Hangzhou Jinjiang Group Co., Ltd. is a private enterprise and owns Union Developing Group of China Co., Ltd. Both of these two enterprises hold the legal person shares and have the legal person status to manage the listed firms. However, the central state-owned enterprise not only tends to follow the instructions of government but also receives more benefits from the government than would the private enterprise. The performances of respective listed firms may be different.

Instead, we represent ownership by the ultimate owners. We trace the chain of ownership to define the ultimate controllers of the listed firms. The ultimate controller behind the legal person shares could be the state agencies or persons. Our ownership classification helps to identify the ultimate controller of the state and legal person shares, but also distinguishes the state controllers based on different administrative level and functions.

3.3 Hypothesis Development

The state-owned enterprise is born with the establishment of the People's Republic of China and has made great contributions to the country's economic construction. State-owned enterprises have certain administrative functions. The controllers of the state-owned enterprises vary from state assets management organs to public institution. They have different incentives and objectives when managing the state-owned enterprises. In the early years of the new China, the government gave the priority to the development of heavy industry and accelerate the

industrialization of the country. Nearly a half century later, with the establishment of the socialist economic system in China, the goals of state-owned assets and the development of state-owned enterprises are converted to maintain social stability and economic development. Large and super large state-owned enterprises will continue to be an important force and mainstay of the national economy in the country. In 2016, the state-owned assets had reached 131 trillion yuan, constituting an extremely large and complex system. State-owned and state holding enterprises almost dominate all industrial sectors[16].

Large state-owned enterprises are the main force of against multinationals. After China's accession to the WTO, the international well-known large multinational companies entered the Chinese market, and foreign products lashed the domestic products. Due to the significant gaps in aspects of technology, quality, scale, the private economy still cannot compete with multinational corporations. Only the large state-owned enterprises are the main force to compete with the multinational company. For example, the colour TV industry was the largest market for imported products. In 1996, the Sichuan Changhong and other large colour TV company started the marketing warfare in price, quality, service to the foreign brands, and broke the situation that the large screen colour TV market was dominated by foreign brands. After that, the large screen colour TVs of the Sichuan Changhong had accounted for one third domestic market share.

Large state-owned enterprises dominate the pillar industries in China. In petroleum, chemical, machinery, electronics, metallurgy, nonferrous metal and building materials and other important industries, China's seven major automobile group contribute 66% of the total output value of the industry; Jialing, North, the Light, Jincheng, the four big motorcycle group accounts for about half of the total national output; Shanghai, Oriental, Harbin, the three power

[16] National Economic Operation of the State owned and State holding enterprises in 2016. SASAC Website. [Online] Available at: http://www.sasac.gov.cn/n2588035/n2588330/n2588370/c3778802/content.html [Accessed 6th, June 2018].

equipment groups provide 70% of the total domestic power plant equipment.[17]These large state-owned enterprises are owned by the central- or provincial-level governmental agencies due to their significance to the economy. As a vital governmental organ, the SASAC has the responsibility to supervise and operate state-owned assets, especially the large state-owned enterprises[18]. Compared with other state controllers, the SASACs have strict supervision systems, such as the assets management budget mechanism, leverage reduction system, and serve in the front line of the SOEs reforms. SASAC must realize the maintain and increment of state-owned assets and creates wealth for society. From 2002 to 2009, the central enterprise's total assets increased from 7.13 trillion yuan to 21 trillion yuan, with the average annual growth of 16.74%; operating income increased from 3.36 trillion yuan to 13.63 trillion yuan, with the average annual growth of 20.8%; profits increased from 240.5 billion yuan to 815.1 billion yuan, with the average annual growth of 19%. The central enterprises also contributed great wealth to the nation through taxes, state-owned capital gains, and transfers of state-owned shares into the social security fund. The enterprises controlled by the SASACs are expected to make significant contributions to the domestic economy. Therefore,

H_a *The SASAC and high administrative-level governmental agencies as ultimate controllers have positive impacts on firm output.*

The SASACs also care about the public welfare, such as employment, price stability. They provide financial and political support to fulfil the social responsibility. SASAC actively absorbs employment, protecting the legitimate rights and interests of employees. The central enterprises positively response to the appeal “the key of ensuring people's well-being and

[17] National Energy Administration
[18] SASAC Website. Major Responsibilities of SASAC. [Online] P.1. Available at: http://www.sasac.gov.cn/n2588020/index.html#jgzn [Accessed 25th, March 2018].

maintaining stability is to protect the employment" from the state council. The companies take active measures absorbing as much as possible employment to ease the employment pressure. In 2009 central enterprises took the initiative to hire more two hundred thousand graduates, increased by 7% of 2008[19]. Central enterprises shall, in accordance with the requirements of "cutting salary but no layoff, suspending but no unemployment", stabilize employment, comply with the new labour law, sign labour contract with employees, cover five basics, namely insurance pension, unemployment, medical treatment, industrial injury and birth. The low-level governmental agencies are strictly supervised by the high levels and followed the instructions of the central levels. Within a 'level upon level' control mechanism, the municipal -level governmental agencies must obey the orders from central government. In the meanwhile, the provincial governmental agencies enjoy more flexibility to fulfil social responsibilities as the responsibilities are passed to the lower-level governments to execute. Therefore, we assume that:

H_b *The state controllers at central or municipal levels as ultimate controllers have positive impacts on firm employment.*

The SASAC regulates that the hand-in proportion of annual net profit of enterprises solely funded by the state is 10%/5%/delay/exempt based on different industries. The dividend of state investors in state holding enterprises and state shareholding enterprises is determined by the board of shareholders[20]. Besides, the state-owned enterprises need to carry out the national macroeconomic regulation and control policy to ensure a smooth economic and social

[19] SASAC Website. The Speech of Huang Shuhe in the media's meeting "Central State-owned Enterprises make efforts to undertake the social responsibility". [Online] P.1. Available at: http://www.sasac.gov.cn/n2588030/n2588939/c4297402/content.html [Accessed 20th, August 2018].

[20] State Council. (2008) The primary responsibilities, internal institutions, and regulation of personnel of state-owned assets supervision and administration commission. The Government of the People's R4epublic of China website. [Online] P.1. Available at: http://www.gov.cn/gzdt/2008-07/22/content_1052533.htm [Accessed 29th, March 2018].

development. For example, the petroleum and petrochemical enterprises actively support the national macroeconomic regulation and control to ensure the stability of the domestic oil supply and maintain China's fuel prices relatively stable. The refining plate of three central petroleum and petrochemical enterprises suffered a loss of 165.2 billion yuan due to the policy factors, of which the state provided financial subsidies about 63.2 billion yuan and companies used their own capital subsidy of more than 100 billion yuan[21]. Excepting the operating expenses, there is little left for the investment and product innovation which could further lead to low profitability. The political burdens are carried out by the Central-level state-controlled listed firms and also passed to the Municipal levels to execute. There are a few state controllers which have specific objectives such as maintaining the development of cultural assets rather than fulfilling the social responsibility. These state controllers, such as Central Asset Bureau, have stronger incentives to generate profits and improve firm profitability. Therefore,

H_c *The state controllers, especially at the Central and Municipal levels, as ultimate controllers have negative impacts on firm profitability. Some state controllers, such as Central Asset Bureau, have positive impacts on firm profitability.*

State-owned enterprises play an important role in people's life and the national economy, but the shortcomings of state-owned enterprises still cannot be ignored. The long-term government supports lead to the lack of competitiveness and innovation spirit of mostly state-owned enterprises. The main system of the state-owned enterprises was originally set up by confiscating bureaucratic capital and returning to the public, and in the next few years, it became the main source of income of the nation's fiscal and main channels of spending. Under

[21] SASAC Website. The Speech of Huang Shuhe in the media's meeting "Central State-owned Enterprises make efforts to undertake the social responsibility". [Online] P.1. Available at: http://www.sasac.gov.cn/n2588030/n2588939/c4297402/content.html [Accessed 20th, August 2018].

strong centralized planning management, the system basically does not have its own profit pursuit, become a virtual "national factory" or "workshop". There were extensive administrative interventions in the Auto industry in the past, such as highly administrative controls in the foreign investment, import and export, consumption policy etc. The taxes and administrative fees for foreign Auto brands are very high. The Chinese government regulates that the foreign capital cannot exceed 50% of the total shares in a company in the motor vehicle and special vehicle manufacturing industry and restricts the access of foreign capital to the automobile industry. At the same time, domestic citizens who wish to buy imported cars need to pay the duties up to twenty-five percentages. The long-term protection of the auto industry lead to low market competitiveness, efficiency and innovation ability. Long-term political protection does not benefit domestic brand competitiveness. State-owned companies excessively depend on foreign technology, which lead to the imbalance of state-owned enterprises structure, lack of innovation and investment efficiency. The political protection also exists in other industries. At present, oil and natural gas industry has the monopoly of state-owned enterprises. Foreign capital is limited to joint venture and cooperation for the exploration of oil and gas (including coal-bed methane, oil shale, oil sands, except for shale gas, etc) according to China's current regulations. In terms of the structure of distribution, in 2016 there were 136 oil and gas registered enterprises with total assets of 1.99957 trillion, including 83 state-owned and state holding enterprises with assets of 1.8895 trillion, account for 94.5% of the entire industry. In the oil processing and coking and nuclear fuel processing industry, the number state-owned economic enterprises accounted for 11.8%, with 50.7% of the total assets in the industry[22]. Similarly, the state-owned enterprises almost dominate in power generation, market operation, transmission, distribution and sell electricity. It is difficult

[22] Ren Zeping: History, Current Situation and Suggestions of State-owned Enterprises Reform. [Online] http://finance.sina.com.cn/zl/2018-11-15/zl-ihnvukff1170439.shtml. [Assessed on 26th, November 2019]

for private capital to participate. Even though the support and protection from the government help the output of the large state-owned enterprises, the controllers (SASAC) and managers of these large state-owned enterprises have few incentives to improve the firm inefficiency.

State-owned enterprise investment is still a "black hole" of fiscal expenditure and the major manufacturer of fiscal deficit. A large number of state-owned enterprises are listed for financing. The financing capital is used by the parent company or precipitating in the company's bank account. Little capital is used by the enterprises for the production and operation which leads to low investment efficiency. Statistics show that[23] in the third quarter 2003, 771 listed companies in Shanghai Stock Exchange have a weighted average earnings per share 0.159 yuan and the weighted average return on equity of 6.18%; 507 listed companies in Shenzhen Stock Exchange have the weighted average earnings per share 0.152 yuan and the weighted average return on equity of 5.85%. On October 28, 2003, 1254 A shares' closed weighted average share price is 6.98 yuan. The investor's gross yield is less than 2.25%. The yield just equals one-year bank deposit rates. But this does not stop the state-owned enterprises' financing in the stock market. The offering of the Yangtze power of financing scale even exceeded 10 billion yuan. Large state-owned enterprises become a huge sponge, constantly consuming national financial fund, constantly draw funds from securities markets and almost don't give any return. Moreover, state-owned enterprises undertake many social functions, which leads to redundant staffs, inefficiency. For example, although in recent years the Shanxi state-owned enterprises made a lot of efforts to decrease the number of employees and increase firm efficiency, the number of Shanxi state-owned enterprise employees is 1.903 million at the end of 2016, accounts for 46.2% of total employees in the province. At the same time, state-owned enterprise employees accounts for 34.5% of total employees in the country[24]. With such

[23] SSE and SZSE Website.
[24] Zhongtai Securities.

large number of employees, the labour productivity of the state-owned enterprises is very low. Therefore,

H_d *Ultimate controllers, such as SASACs and the Central and Municipal levels, have negative impacts on firm productivity, including operating efficiency, investment, investment efficiency, labour productivity.*

4. Data and Methodology

The ownership data is obtained from CSMAR database which is available from 2003 to 2016. The initial sample includes yearly data of up to 2,955 firms. The data set provides essential information, such as the name of ultimate controllers, which we use to develop our state ownership classification. We exclude firm year observations if ownership data is missing, and if the controller's nature cannot be identified. The resulting sample has 543, 332 firm year observations.

We identify the ultimate controller of all state-owned firms. Further, we classify the ultimate controller based on its administrative level in state hierarch first into three levels: central, provincial and municipal. It is worth mentioning here that there are four municipals directly under the central government, namely Beijing, Shanghai, Tianjin, and Chongqing. The municipals directly under the central government are treated as the provincial level. The controllers in Beijing, Shanghai, Tianjin and Chongqing cities are categorized into the provincial level.

We classify ultimate controllers according to functions and objectives first into four major categories: State, Foreign, Private and Other. Our main question relies on differentiating between different objectives and functions of state ultimate controllers. Accordingly, we classify state ultimate controllers into six categories: SASAC, Asset Bureau, Government Department, State-owned Enterprises, Government, Public Institution.

The State Asset Supervision and Administration Commission of the State Council (SASAC) is a governmental agency authorized by the State Council. The SASACs care about the public welfare, such as employment, and price stability. The SASACs at Central and Provincial Level have the target to improve the output of listed firms under their control. The Asset Bureaus are asset management and operation departments of the government that act as complements to SASAC. They have the obligations to maintain and increase the value of state-

owned assets and bear the social responsibilities at the same time, but they do not act as the SASACs which provide sufficient support to the output targets of the listed firms. The Government Departments are the non-asset management departments of the government, such as the finance bureaus, education bureaus, railway bureaus etc. at central, provincial and municipal levels. The Government Departments do not have the targets to promote firm output which is pursued by the SASAC. They focus more on firm profitability and efficiency rather than the social responsibilities. The State-owned Enterprises are the state-owned companies acting as legal persons and ultimately control the listed firms. The State-owned Enterprise as the ultimate controllers of the listed firms are more profit oriented but less connections with the government. The disadvantages of State-owned Etherises as the controllers include lack of sufficient support to the listed firms and fewer capital resources for investment. The Government is the integration of governmental agencies and departments. The government itself as the ultimate controllers of the listed firms need to consider as many as possible outcomes when implementing policies, such as absorbing employment and avoiding inefficiency at the same time. A Public Institution is a social service organization established by the government operating in education, science and technology, culture, health, media and other activities, such as universities, press and television stations. These institutions are not profit-oriented. They undertake social responsibilities.

Each of the firms in the six-functionality category are also classified into government hierarchy levels and using these three dimensions we classify state ultimate controllers into a total of fourteen subcategories, because the Government and State-owned Enterprise have two levels and the Public Institution only has one level. Further Foreign and Private ultimate controllers are categorised into two further classifications depending upon the owner being a private person or an enterprise. The Other category includes three sub-categories: Operating Unit, Collectively-owned Enterprise and Social Organization. We define a dummy variable for

each category that takes the value 1 if the ultimate owner falls into that category and zero otherwise. Firms without controllers are used as the baseline in regression analysis below. The classification we develop for ultimate owners is presented in Table 1.

Insert Table 1

The distribution of firms in each ultimate ownership category over time is presented in Table 2 and Figure 1. The listed firms controlled by the state accounted for 74.32% of all listed firms in 2003 and the proportion of these listed firms dropped gradually to 56.38% in 2009 and 37.89% in 2015. Meanwhile, the portion of listed firms privately controlled increased from 13.08% in 2003 to 55.19% in 2015 exceeding state listed firm. The proportion of foreign enterprises remained stable while the proportion of firms without ultimate controllers increases as ownership becomes dispersed.

Insert Table 2 and Figure 1 here

We use various measures of firm performance. To measure firm output, we use Operating Revenue. We measure employment by the number of employees. Our measure for profitability is ROA and we measure productivity with labour productivity (Operating Revenue per Employee), investments (Capital Expenditures), investment efficiency (ROI) and operating efficiency (ROS). We adjust all money units to inflation including Capital Expenditure and Operating Revenue based on Consumer Price Index[25] (CPI 2003 =100). We also winsorize the at 1% and 99% level to exclude extremum. Detailed definitions of performance measures are given in Appendix 1. We also use a number of controls variables, including managerial ownership, split share reform, firm size, leverage, firm age and financial crisis from 2007 to 2010. Detailed definitions of control variables are also given in Appendix 1.

[25] CPI data is obtained from National Bureau of Statistics of China.

We use the following equations to estimate the relation between the ultimate controller and performance. We use Hausman Test and accordingly use fixed effects for firms and time in all estimations and correct for heteroscedasticity.

$$Performance_{i,t} = \alpha_0 + \alpha_1 Controller_{i,t} + \alpha_3 Firm - level\ Vatiables_{i,t} + +\varepsilon_{i,t} \quad (1)$$

$$Performance_{i,t} = \alpha_0 + \alpha_1 Levels_{i,t} + \alpha_3 Firm - level\ Vatiables_{i,t} + +\varepsilon_{i,t} \quad (2)$$

Where

$Performance_{i,t}$ are the measures for firm performances of firm *i* in year *t*, namely firm output, employment, profitability, and productivity (labour productivity, investment, investment efficiency, operating efficiency)*;*

$Controller_{i,t}$ is the dummy variable indicating the type of ultimate controller of firm *i* in year *t* as defined above in a total of 14 state ultimate controllers in six-functionality categories;

$Level_{i,t}$ is the dummy variable indicating the administrative levels of ultimate controller of firm *i* in year *t* as defined above in a total of three levels;

$Firm - level\ Vatiables_{i,t}$ are the controls as defined above including *Director, Supervisor, Executive, Management, Size, Leverage, Firm Age at the firm level and SSR and Crisis at the macro level*.

5. **Empirical Findings**

5.1 Univariate Analysis

The section provides the empirical results of the study. We start with univariate analysis. Table 3 shows the mean value of firm output, employment, profitability, and productivity which include labor productivity, investment, investment efficiency, operating efficiency, of the listed firms with different ultimate controllers. We estimate the significance of differences in firm performance by using the ANOVA and Tukey-Kramer test[26]. Here, we discuss the differences significant at 5%.

The column 2 from left in Table 3 shows the mean value of firm output of the listed firms with different types of ultimate controllers. Among the state controllers, the listed firms controlled by the Central SASAC have the highest average firm output. The listed firms with the ultimate controllers at Central levels have higher average firm output than those at Provincial and Municipal levels. The column 3 from left in Table 3 shows the mean value of firm employment. The Central SASAC has larger average number of employees than other controllers. The average number of employees in the listed firms with ultimate controllers at Central and Municipal levels are higher than those at Provincial levels. The column 4 from left in Table 3 shows the mean value of firm profitability of the listed firms with different types of ultimate controllers. Among the state controllers, the listed firms controlled by the Central Asset Bureau have the highest average firm profitability. The column 5~8 from left in Table 3 shows the mean value of firm productivity, namely labor productivity, investment, investment efficiency, operating efficiency, of the listed firms with different types of ultimate controllers. The listed firms with Central Asset Bureau as ultimate controller have higher average labor productivity than other listed firms. The listed firms with Provincial Department as ultimate

[26] We use the Tukey-Kramer test from UCLA website: https://stats.idre.ucla.edu/stata/faq/faqhow-can-i-do-post-hoc-pairwise-comparisons-using-stata/. UCLA proves three methods post-hoc pairwise comparisons: Tukey HSD, Tukey-Kramer and Fisher-Hayter. The three methods will yield the same test statistic when the cell sizes are equal but will differ when cell sizes are unequal. The Tukey-Kramer or the Fisher-Hayter are usually preferred when the cell sizes are unequal

controller have higher average operating efficiency than other listed firms. The following sections apply the fix-effect regression to estimate the effects of the state controllers on firm performances.

Insert Table 3

5.2 State Ultimate Controllers and Firm Performance

We employ equation (1) to estimate the relationship between the state ultimate controllers in six-functionality categories and firm performance. We divided the results based on the targets assigned to the state ultimate controllers. The results of the relationship between the state ultimate controllers and firm output and employment are presented in the Table 4. The results of the relationship between the state ultimate controllers and firm profitability, productivity which includes labor productivity, investment, investment efficiency and operating efficiency are presented in the Table 5.

Insert Table 4 and 5

The column 1 in Table 4 presents the results of the effects of state ultimate controllers on firm output. The government gave the priority to the development of heavy industry and accelerate the industrialization of the country. The listed firms in the heavy industry are controlled and managed by the SASACs. One of the major missions for the SASACs is to realize the maintain and increment of state-owned assets which means increase of the output of the listed firms under their control. The results in column 1 of Table 3 have provided the evidence that output is one of the targets for the SASAC to fulfil. The results show that the SASACs as ultimate controllers can increase the firm output by 3.7%. The results are consistent with the hypothesis a. The Public Institutions are not profit-oriented. The management of the listed firm controlled by the public institutions do not have enough knowledge to build market oriented operational mechanisms. This could in turn lead to low output levels. The results in

column 1 of Table 4 show that when the Public Institutions control the listed firms, the output of the listed firms decreases by 9.3%.

The column 2 in Table 4 presents the results of the effects of state ultimate controllers on firm employment. The government also cares about the public welfare, such as employment, social stability. The listed firms controlled by the state ultimate controllers actively absorbs employment, protecting the legitimate rights and interests of employees. Increase and maintain employment is another mission for the state ultimate controllers. The results in column 2 of Table 4 present that the Government Department, Asset Bureau, SASAC, and SOE have positive effects on firm employment. When they control the listed firm, the employment of the listed firm increases by 8.1%, 6.9%, 7.0%, 8.0%, 6.8% respectively. Among these state ultimate controllers, Government and SASAC have the most positive effects on the firm employment. The results are in accord with hypothesis b. The Government itself as the ultimate controller should act as example to increase firm employment, and the SASACs owns large and super large listed firms also need to actively fulfil the social responsibility.

The column 1 in Table 5 presents the results of the effects of state ultimate controllers on firm profitability. The government gives no targets about the profitability, labor productivity, investment and efficiency, but the employment and social missions brought adverse effects to most of the state listed firms. The results in column 1 of Table 5 show that the Government, Department, Asset Bureau, SASAC, SOE and Public Institution have negative influences on firm profitability. They decrease the firm profitability by 1.7%, 0.8%, 2.3%, 1.8%, 1.6%, 1.9% respectively, which are in consistent with hypothesis c. The Chinese government regulates that the state-controlled listed firms must hand in a part of profit to the state and carry out the national macroeconomic regulation and control policy to ensure a smooth economic and social development, such as ensuring the stability of the domestic oil supply and maintaining China's fuel prices relatively stable at the cost of the listed firms' profitability.

The column 2~5 in Table 5 shows the results of the effects of state controllers on firm productivity, among which the column 2 presents the results of the effects of state ultimate controllers on firm labor productivity. The results show that when the Government, Department, Asset Bureau, SASAC, SOE and Public Institution control the listed firms, the firm labor productivity decreases by 10.6%, 9.9%, 7.9%, 5.0%, 8.0%, 8.4% respectively. The listed firms controlled by the state ultimate controllers have to fulfil the employment mission, which leads to redundant staffs and low labor productivity. The column 3 in Table 5 presents the results of the effects of state ultimate controllers on firm investment. The results show that the listed firms controlled by the SASAC will have a 7.0% lower investment than the listed firm with non-state controllers. The decrease percentage in investment for the listed firms controlled by the SOE is 9.0%. State-owned enterprise investment is still a "black hole" of fiscal expenditure and the major manufacturer of fiscal deficit. A large number of state-owned enterprises are listed for financing. The financing capital is used by the parent company or precipitating in the company's bank account. The column 4 in Table 5 presents the results of the effects of state ultimate controllers on firm investment efficiency. The SASACs acting as the ultimate controllers of the listed firms will decrease the firm investment efficiency by 11.8%. Little capital is used by the enterprises for the operation which leads to low investment efficiency. The column 5 in Table 5 shows the results of the effects of the state ultimate controllers on firm operating efficiency. The long-term government supports lead to the lack of competitiveness and innovation spirit of mostly state-controlled listed firms. The Government, Asset Bureau, SASAC, SOE and Public Institution as the ultimate controllers will decrease the firm operating efficiency by 4.4%, 8.3%, 5.7%, 4.4% and 6.7% respectively. The hypothesis d is in accordance. There were extensive administrative interventions in the core industries in the past, such as highly administrative controls in the foreign investment, import and export, consumption policy etc. The taxes and administrative fees for foreign brands are very high.

Long-term political protection does not benefit domestic brand competitiveness. Even though the support and protection from the government, the controllers and managers of these state-owned enterprises have few incentives to improve the firm inefficiency.

To sum up, the Chinese government has set the output targets for the SASACs developing large and super large state-controlled listed firm to stimulate the economy. The Government, Department, Asset Bureau, SASAC and SOEs as the ultimate controllers also need to fulfil the social responsibility to maintain and increase the employment of their listed firms. The employment missions lead to redundant worker and low labor productivity. As the parts of the government, the state ultimate controllers hand in profit and receive the protections from the government. The long-term government protections lead to the lack of competitiveness and innovation spirit of the state-owned enterprises. The state controllers of these state-owned enterprises have few incentives to improve the firm low profitability and inefficiency. The new classification helps us to find out that the output target is towards the SASACs and the employment missions are common among the state ultimate controllers. These results further explain the negative effects of state controllers on other firm performances. This is what previous literature do not provide.

5.2 Administrative levels and Firm Performance

We employ equation (2) to estimate the relationship between the administrative levels and firm performance. The administrative levels here capture the three levels (Central, Provincial and Municipal) of Government, Department, Asset Bureau and SASAC. Due to the limited information of the SOE, it is difficult to further divide the SOEs into three levels. The Public Institution is a social service organization and not market-orientated, so we do not categorize it into different levels. We also divided the results based on the targets assigned to the state ultimate controllers. The results of the relationship between the administrative levels and firm

output and employment are presented in the Table 6. The results of the relationship between the administrative levels and firm profitability and productivity which includes labor productivity, investment, investment efficiency and operating efficiency are presented in the Table 7.

Insert Table 6 and 7

The column 1 in Table 6 presents the results of the effects of administrative levels on firm output. The results show that the state ultimate controllers at Central or Provincial levels have positive effects on firm output. They increase the firm output by 4.7% and 3.6% respectively. The results are in consistent with hypothesis a. The government has set the output targets to the large and super large listed firms. These listed firms are owned and managed by the Central or Provincial state ultimate controllers. In other words, the targets are set to the controllers at Central or Provincial levels.

The column 2 in Table 6 presents the results of the effects of administrative levels on firm employment. The results present that the state ultimate controllers at Central or Municipal levels have positive effects on firm employment, which are in accord with hypothesis b. The employment of the listed firm controlled by the state controllers at Central or Municipal levels will be increased by 6.3% and 6.3% respectively, which are shown in hypothesis b. The Chinese government has built a 'level upon level' control mechanism. The high-level administrators set the targets and pass to the low levels to execute. The state ultimate controllers at Central level need to establish themselves as examples and maintain the employment actively. But the state controller at Provincial level is the mediation between the Central and Municipal levels. The Provincial controllers leave the employment mission to the Municipal level and focus on the improvement of the firm operation.

The column 1 in Table 7 presents the results of the effects of administrative levels on firm profitability. The state ultimate controllers at Central or Municipal level decrease the firm

profitability by 0.7% or 1.5% respectively. The results are in consistent with hypothesis c. The state ultimate controllers at Provincial level have no significant effects on firm profitability. The state ultimate controllers at Central level have fewer negative impacts than the Municipal level, which means the state controllers at Central levels do less harm to the Municipal level. Chen et al. (2018) discuss that the higher up are the managers of the Chinese listed firms in this labour market hierarchy (their political ranks), the more careful they are about the firm performances. Our results are consistent with Chen et al. (2018)'s finding.

The column 2~5 in Table 7 presents the results of the effects of administrative levels on firm productivity. The column 2 shows the results of the effects of administrative levels on firm labor productivity. Under the pressure of employment mission, the state controllers at Municipal level decrease the firm labor productivity by 5.8%. The column 3 and 4 in Table 7 shows the results of the effects of administrative levels on firm investment and investment efficiency. There is no state ultimate controller at any administrative level have effects on firm investment. The state controllers at Provincial or Municipal level decrease the firm investment efficiency by 18.2% and 17.6% respectively. The financing capital of the low-level firms is expropriated by the parent or higher-level companies, which lead to low investment efficiency. The column 5 in Table 7 shows the results of the effects of administrative levels on firm operating efficiency. The state ultimate controllers at Central or Municipal level have negative impacts on firm operating efficiency. They decrease the firm operating efficiency by 3.1% and 3.3% respectively. The results in table 6 are also in consistent with hypothesis d. The ultimate controllers at Central level also do less harm to the firm operating efficiency than the Municipal level. The higher-level managers of the listed firms care more about the firm efficiency than the low levels.

To sum up, Chinese government's output targets are towards the state ultimate controllers at Central and Provincial level. The employment missions are carried out by the state controllers at the Central and Municipal levels. The classification which divides the state ultimate controllers into three levels helps us to find that the state controllers tend to pass the social mission to low levels and use juggling strategies and collusions to skimp or weaken the policy implementation. They focus on the improvement of firm operation and management rather than fulfilling social responsibilities. This is new to the literature. Also, the state controllers at Central level are more careful about the firm profitability and operating efficiency than the Municipal level. Due to career and wealth concerns, the managers at Central level are cautious and risk-averse when managing firms. The finding is consistent with Chen et al. (2018)'s research.

5.3 Ultimate Ownership, Administrative Level and Given Objectives

We bring together administrative level and objectives assigned to ultimate owners and use all 21 types of ultimate controllers, which include 14 state sub-categories, 2 foreign sub-categories, 2 private sub-categories and 3 other sub-categories to estimate the effects of state ultimate controllers at different administrative levels and with different objectives on firm performance. The results are presented in Table 8.

The results in column 1 of Table 8 present the effects of 21 types of ultimate controllers on firm output. The Central SASAC and Central Asset Bureau can improve firm output by 6.7% and 6.2 % when obtain the control rights. The controllers at central level should obey and serve the national strategy, develop in conformity with legal provisions, act as the representative and pioneers of the times. In turn, the central enterprises could receive more benefits and supports from the central government, and then perform better than the enterprise on lower administrative level. The results about the effects of 21 types of ultimate controllers on firm output show that the listed firms with the ultimate controllers at central levels receive long-

term government supports. The large and super large state-owned enterprises have become an important force and mainstay of the national economy in China. The result is consistent with our previous finding. There is no previous literature showing the same finding. The new classification provides more accurate results about the effects of different types of ultimate controllers on firm output.

The results in column 2 of Table 8 present the effects of 21 types of ultimate controllers on firm employment. Among all the state controllers, the Central SASAC, Central Department, Central and Local State-owned Enterprises, Municipal Asset Bureau, Municipal Government, Municipal SASAC have positive impact on employment. The coefficients of the Central SASAC is significantly positive at 1% level and larger than that of other State Controllers. The results show that the employment missions are implemented by the state ultimate controllers at Central and Municipal levels. Employment is a primary objective of State-owned Enterprises, especially the central enterprise. The Central SASAC as the controller has greater responsibility on employment than the other state controllers.

In Table 8, column 3 shows the results for firm profitability. The Central Asset Bureau has positive effects on firm ROA, while Municipal Asset Bureau and Municipal SASAC are negatively related to ROA. Specifically, when the Central Asset Bureau controls the listed firm, the firm ROA would increase by 3% but decrease by 1.9% and 1.6% if Municipal Asset Bureau and Municipal SASAC controls. The asset bureau and SASAC at Municipal level have to comply with the requirements from high levels, such as turning over profit to the state and maintaining social stability at the cost of own profitability. The positive effects of Central Asset Bureau on firm profitability is inconsistent with previous studies. (Wei et al., 2003; Sun and Tong, 2005) Previous studies report a negative relationship between state ownership and firm profitability. The studies do not separate different governmental agencies and treat the state share as one type of ownership. There are two Central Asset Bureaus acting as the ultimate

controller in the sample, namely Orient Asset Management Bureau and State-owned Assets Administration Department. They are the professional state-owned assets management entities and aim at asset value appreciation. As asset management bureaus, they have the obligations to maintain and increase the value of state-owned assets. They do not have to fulfil the social responsibility which are mainly accomplished by the Central SASAC. They have stronger incentives to generate profits and improve firm profitability. It is necessary to separate different types of state ultimate controllers, as not all of them have to fulfil social responsibility at the cost of firm profitability.

In Table 8, column 4~7 show the results for firm productivity which include labor productivity, investment, investment efficiency and operating efficiency. The column 4 presents the results for labor productivity. The listed firm controlled by Central Asset Bureau have a 23.5% increase in the operating revenue per employee than widely-held companies. No other literature has shown the positive relationship between the Central Asset Bureau and firm productivity before. Local State Enterprise, Municipal Asset Bureau, Municipal Government, Municipal SASAC are negatively associated with the firm labor productivity. The negative impacts of these state ultimate controller on firm labor productivity are due to the abundant employees in their firms. In Table 8, column 5 presents the results for capital expenditure which is proxied for firm investment. The Provincial Department and Provincial SASAC can increase the firm investment by 20.7% and 14.2% respectively when they control the listed firms. The state controllers at provincial level can not only enjoy political benefits, there also exist numerous financing platforms helping the controllers raise capital and invest. Column 6 shows the results for investment efficiency. There is no controller affecting the investment efficiency. The results about the effects of 21 types of ultimate controllers on firm investment show that some types of ultimate controllers, Provincial Department and Provincial SASAC, have positive effects on firm investment. The positive relationship between Provincial

Department/SASAC and firm investment provide the evidence that the ultimate controllers at the provincial levels have the access to sufficient capital for investment. However, even the ultimate controllers at provincial level can improve firm investment, the financing capital is used by the parent company or precipitating in the company's bank account. Little capital is used by the enterprises for the production and operation which leads to the results that the state ultimate controllers have no effects on firm investment efficiency.

As another measure for firm productivity, the operating efficiency is presented in column 7 of Table 8. The Central Asset Bureau, and Provincial Department are positively related to firm operating efficiency. When the Central Asset Bureau controls the listed firms, the firm operating efficiency would be increase by 10.1%. And the Provincial Department can increase the firm operating efficiency by 7.1%. The provincial state controller is the mediation between the central and grassroots. Without direct supervision, the provincial controllers use juggling strategies and collusions to skimp or weaken the policy implementation. They focus on the improvement of firm operation and management rather than fulfilling social responsibilities. Bai et al. (2006) point out that the local governments capture only a fraction of the external benefits of social stability and therefore do not have sufficient incentives to maintain social stability. The results are inconsistent with previous study (Sun and Tong, 2003). Sun and Tong (2003) present that the state and foreign ownership are negatively related to firm operating efficiency (Return of Sales), but the legal person ownership has positive influences on firm operating efficiency. The conflicts can be attributed to the reason that previous study treats all types of ownership as one instead of separating them based on their motivation to operate the listed firms. The positive effects of Central Asset Bureau and Provincial Department show that these ultimate controllers have stronger incentive to improve firm inefficiency.

In sum, the results in Table 8 are consistent with our findings in previous sections but provide further insight that not only the governmental level but also objectives given to the ultimate state owners is important in firm performance. The government gives the output target to the SASACs at Central level, and the employment missions are implemented by the state ultimate controllers at Central and Municipal level. The results in Table 8 also show that the Central Asset Bureau has positive effects on firm output, profitability, labor productivity and operating efficiency. The Central Asset Bureau have stronger incentives to generate profits and improve firm inefficiency. Without separating different types of state ultimate controllers, we cannot get the positive effects of Central Asset Bureau on firm performances.

5.4 Reverse Causality Problem of SASAC

The SASAC may have its own interests to control which parts of listed firms. This would cause self-selection problem. The SASAC was established in 2003 and the number of SOEs controlled by the SASAC has been steadily increasing since then. As estimated in the previous part, the SASAC as the controller has less adverse impact on the performance of listed firms. There is reason to believe that the controlling rights by the SASAC is affected by the firms' performance to some extent. The Chinese government always attaches importance to the pillar firms and may select the firms with outstanding performances and transfer the controlling rights to SASAC. A potential concern with the regressions is that controlling rights may not be exogenous and some firm performances could result in fixed effects model's coefficients to be biased. The endogeneity lays on the existence of selection bias of SASAC.

To test whether the selection bias and reverse causality problem exist, we adopt the Heckman two-step selection model from Heckman (1979), Maury (2006) and Jiang et al. (2018)'s research. We model the control of SASAC as the endogenous variable. Following the

Maury (2006), we include the Tobin's Q[27] of previous year as the instrument variable in the first stage *Probit* model respectively as these performances may affect the SASAC's control over the listed firms. The *Probit* model also includes all control variables. Then we regress the performance measures on the SASAC dummy with all control variables and *lambda* from the first stage. The results are presented in the following table 9[28]. The SASAC is more likely to control the listed firms with low firm value. The *lambda*s in the second stage are not significant across the firm performances measure, which means the selection bias and reverse causality problem does not affects our previous estimations.

Inset Table 9

[27] The Tobin Q is calculated as (Market Value of Equity + Book Value of Debt)/ Book Value of Assets
[28] Control variables are not presented in the first-stage regression to conserve space.

6. Conclusion

The paper aims at investigating the effects of state ultimate controllers on the listed firm performance in China. The definition of state ownership in previous literature (Wei et al., 2003; Sun and Tong, 2005; Chen et al, 2008; Firth et al., 2010) is too broad to distinguish the different layers of state. We adopt hand collected data to develop a new classification that helps differentiate between state agencies. We also differentiate administrative levels such as state, provincial and municipality level, and functionality and objective in this classification. Our hypotheses relate each administrative level of ultimate controllers to different firm objectives including not only financial performance but also output, employment, and productivity. Our results are robust. We show state ownership cannot be generalised in their relation to firm performance. The output is increased by ultimate controllers at Central and Provincial levels and SASACs. Employment target is fulfilled by ultimate controllers at Central and Municipal Levels. We also show that with the social mission assigned by the government, the state controllers at Central and Municipal Levels have negative impacts on the firm profitability, but some state controller, such as Central Asset Bureaus, positively improve firm profitability. Our findings indicate the role of state control is diverse and cannot be measured against market performance alone.

We show that state ownership cannot be generalised into one category regardless of the objectives and functions given to state institutions. For example in terms of profitability decline we observe results similar to previous literature in firms with state ultimate controllers, such as Central SASACs and Municipal Controllers. In terms of state hierarchy, the first is at the central level and the second at municipal level, yet both reduce profitability. The state controllers at both levels need to fulfil social responsibilities at the expense of profitability. However, Central Asset Bureaus as ultimate owners improve not only firm profitability, but also labour productivity, operating efficiency and firm output. This finding is new. Central

Asset Bureaus is the professional state-owned assets management entity and aim at asset value appreciation. Previous studies that present negative relations between state ownership and firm performance (Wei et al., 2003; Sun and Tong, 2005) do not differentiate the functions and objectives assigned to them.

The state apparatus is complex and wants to fulfil multiple objectives. They can be conflicting with each other. Yet all of them necessary for high growth. One way is to assign each objective to a separate state institution. This is what China did and it is successful. So previous research that says state brings inefficiency must be taken with caution. Using the new classification, we can clearly separate the state controllers by levels and functionalities. Our results are unique in showing how China uses state ownership at many administrative levels through ultimate controllers at different capacity to satisfy multiple objectives and how each ultimate ownership category functions towards its set targets eventually leading to a successful overall development strategy.

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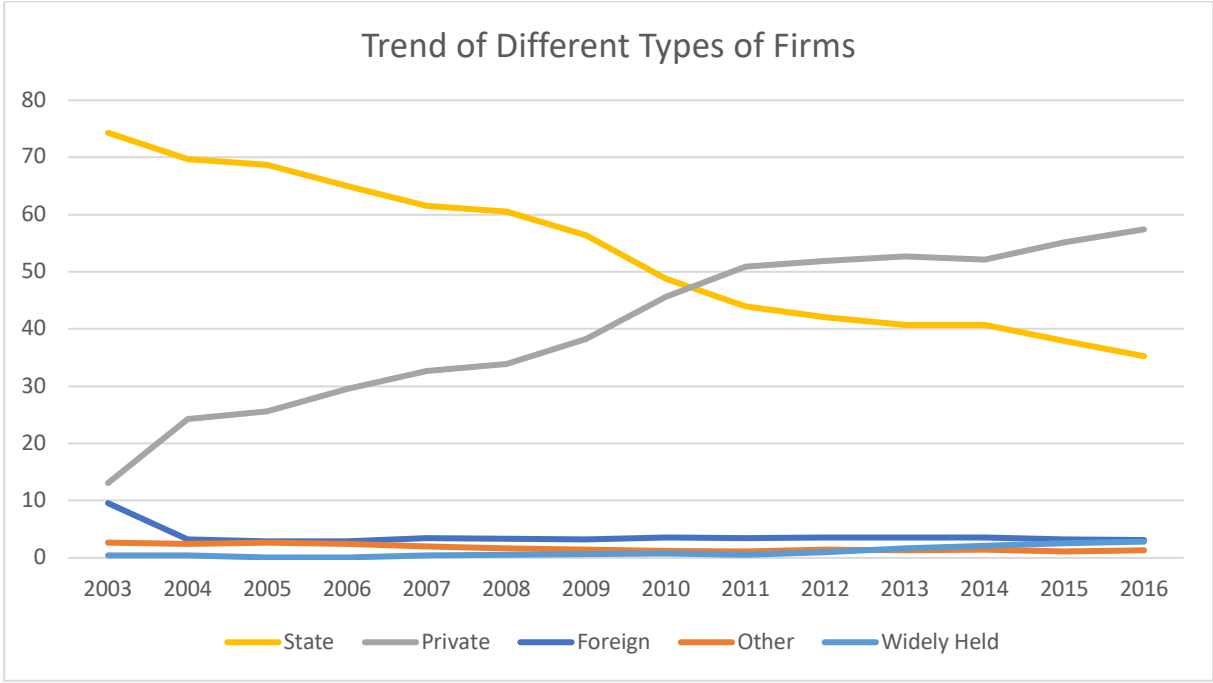
Figure 1 (Colours needs to be used in this figure)

Trend of Different Types of Listed Firms



This figure the trend of different types of firms. The types of firms are re-defined by using the classification in the paper. The firms with the state ultimate controllers are defined as the state firm. The firms with the private ultimate controllers are defined as the private firm. The firms with the foreign ultimate controllers are defined as the foreign firm. The firms with the other ultimate controllers are defined as the other firm. Vertical axis shows the proportion of the firms; Horizontal axis shows the year.

Table 1

Ownership Classification

Ownership	Definition
State Type	The State category includes all the types of state controller. The enterprises owned by state controller are State-Owned Enterprises.
Public Institution	Public Institution refers to the social service organization established by the government operate education, science and technology, culture, health, media and other activities. Public Institution is the legal person entity as the form of organization or institution. For example, China Agricultural University and Television Station are classified into this category.
Provincial Government	Provincial Government is the government at provincial level. It also includes municipal government directly under central government. For example, government of Zhejiang Province is classified into this category.
Municipal Government	Municipal Government is the government at municipal level. For example, government of Hangzhou is classified into this category.
Central Department	Central Department is the governmental department affiliated to central government, such as ministry, bureaus, commission, office et al. For example, Ministry of Finance is classified into this category.
Provincial Department	Provincial Department is the governmental department affiliated to provincial government, such as ministry, bureaus, commission, office et al. For example, Ministry of Finance of Zhejiang Province is classified into this category
Municipal Department	Municipal Department is the governmental department affiliated to municipal government, such as ministry, bureaus, commission, office et al. For example, Ministry of Finance of Hangzhou is classified into this category.
Central Asset Bureaus	Central Asset Bureaus is the asset management and operation department affiliated to central government, such as asset bureaus, department, office et al., excepting SASAC. For example, Orient Asset Management Bureaus is classified into this category.
Provincial Asset Bureaus	Provincial Asset Bureaus is the asset management and operation department affiliated to provincial government, such as asset bureaus, department, office et al., excepting SASAC. For example, Beijing Economic-Technological Development Area State-owned Assets Management Office is classified into this category.
Municipal Asset Bureaus	Municipal Asset Bureaus is the asset management and operation department affiliated to municipal government, such as asset bureaus, department, office et al., excepting SASAC. For example, Anshan State-owned Assets Administration Bureau is classified into this category.
Central SASAC	Central SASAC is the State-owned Assets Supervision and Administration Commission.
Provincial SASAC	Provincial SASAC is the State-owned Assets Supervision and Administration Commission affiliated to provincial government. For example, Anhui State-owned Assets Supervision and Administration Commission is classified into this category.
Municipal SASAC	Municipal SASAC is the State-owned Assets Supervision and Administration Commission affiliated to municipal government. For example, Baotou Municipal People's Government State-owned Assets Supervision and Administration Commission is classified into this category.

(continued)

(continued)

Central State-owned Enterprise	Central State-owned Enterprise refers to the controller is the SOE affiliated to central government (SOEs here are legal persons). For example, Air China Limited is classified into this category.
Local State-owned Enterprise	Local State-owned Enterprise refers to the controller is the SOE affiliated to local (provincial/municipal) government (SOEs here are legal persons). For example, Anhui Conch Group Co., Ltd. is classified into this category.
Foreign Type	The Foreign category includes foreign individual and foreign enterprise. The enterprises owned by foreign controller are Foreign Enterprises
Foreign Individual	Foreign Individual refers to the individuals who are not the citizens of China, including the individuals from Hong Kong, Macao and Taiwan
Foreign Enterprise	Foreign Enterprise is a common investment vehicle for mainland China-based business wherein foreign parties can incorporate a foreign-owned limited liability company. For example, American Airlines, Inc. is classified into this category.
Private Type	The Private category includes private individual and private enterprise. The enterprises owned by private controller are Private Enterprises.
Private Individual	Private Individual refers to the individuals who domestic citizens of China, excluding the individuals from Hong Kong, Macao and Taiwan
Private Enterprise	Private Enterprise refers to the business or company that is managed by independent companies or private individuals rather than being controlled by the state. For example, Beijing Haidian Technology Development Co., Ltd. is classified into this category.
Other Type	The Other category includes Operating Unit, Collectively-owned Enterprise and Social Organization
Operating Unit	Operating Unit is one type of economic organization with their own name, address, fixed operation place, institutional framework, financial system, and employees. Operating Unit cannot have legal person status, control and dispose of the property or bear civil liability independently. For example, Aluminum Corporation of China is classified into this category
Collectively-owned Enterprise	Collectively-owned Enterprise refers to the independent commodity-economy organization based on public ownership of the means of production which benefit all its members. For example, All China Federation of Supply and Marketing Cooperatives is classified into this category
Social Organization	Social organization is a pattern of relationships between and among individuals and social groups. For example Employee Joint Stock Fund of Yuxian Nanlou Group, Yangquan is classified into this category.

Table 2

Distribution of Firm Type

Year	State		Private		Foreign		Other		Wildly held		Total Number of Firms
	Weights in Total Firms (%)	Number of Firms	Weights in Total Firms (%)	Number of Firms	Weights in Total Firms (%)	Number of Firms	Weights in Total Firms (%)	Number of Firms	Weights in Total Firms (%)	Number of Firms	
2003	74.32	932	13.08	164	9.57	120	2.63	33	0.4	5	1254
2004	69.66	939	24.26	327	3.19	43	2.45	33	0.45	6	1348
2005	68.76	929	25.61	346	2.89	39	2.66	36	0.07	1	1351
2006	65.06	931	29.49	422	2.94	42	2.45	35	0.07	1	1431
2007	61.56	953	32.62	505	3.42	53	2	31	0.39	6	1548
2008	60.56	969	33.88	542	3.38	54	1.69	27	0.5	8	1600
2009	56.38	985	38.24	668	3.26	57	1.43	25	0.69	12	1747
2010	48.78	1019	45.67	954	3.59	75	1.24	26	0.72	15	2089
2011	44.02	1020	50.93	1180	3.41	79	1.12	26	0.52	12	2317
2012	42.1	1026	51.95	1266	3.57	87	1.4	34	0.98	24	2437
2013	40.76	1017	52.67	1314	3.57	89	1.32	33	1.68	42	2462
2014	40.7	1020	52.19	1308	3.59	90	1.4	35	2.11	53	2562
2015	37.89	1018	55.19	1483	3.28	88	1.12	30	2.53	68	2687
2016	35.26	1042	57.43	1697	3.15	93	1.32	39	2.84	84	2955

This table presents the distribution of firm types from 2003 to 2016. We identify the types of listed firms based on the ultimate controllers. The firms controlled by state controllers are identified as state-owned enterprises, the firms controlled by foreign controllers are identified as foreign enterprises, the firms controlled by private controllers are identified as private enterprises, the firms controlled by other controllers are identified as other enterprises, and the firms without controllers are treated as widely held firms. The weight of every type of listed firm is presented as the proportion among the total firms every year. The number of every type of listed firms and the total number of listed firms are also shown in the table.

Table 3
Summary Statistics of Firm Performances with Different Controller Types

Controller Types	Max. Obs.	Operating Revenue	Employees	ROA	Operating Revenue per Employee	Capital Expenditure	ROI	ROS
Panel A: State								
Public Institution	387	8.91	3.109	0.043	5.803	7.766	0.231	0.07
		(0.530)	(0.489)	(0.056)	(0.360)	(0.648)	(1.110)	(0.189)
Central Asset Bureau	3	8.807	2.673	0.047	6.134	7.877	0.493	0.056
		(0.665)	(0.859)	(0.037)	(0.207)	(0.906)	(0.679)	(0.065)
Central Department	358	9.116	3.343	0.028	5.794	7.939	0.305	0.033
		(0.632)	(0.629)	(0.056)	(0.479)	(0.916)	(1.381)	(0.262)
Central SASAC	2908	9.475	3.501	0.031	5.997	8.167	0.259	0.041
		(0.628)	(0.577)	(0.058)	(0.417)	(0.827)	(1.082)	(0.165)
Central State-owned Enterprise	891	9.158	3.333	0.034	5.856	7.977	0.156	0.048
		(0.652)	(0.591)	(0.060)	(0.473)	(0.870)	(0.715)	(0.198)
Local State-owned Enterprise	957	8.997	3.21	0.029	5.787	7.754	0.226	0.043
		(0.575)	(0.558)	(0.062)	(0.551)	(0.855)	(1.265)	(0.209)
Provincial Asset Bureau	74	9.067	2.893	0.028	6.12	7.714	0.265	0.024
		(0.444)	(0.701)	(0.076)	(0.590)	(0.850)	(1.278)	(0.347)
Provincial Department	317	8.886	3.134	0.03	5.791	7.91	0.158	0.104
		(0.490)	(0.512)	(0.054)	(0.393)	(0.827)	(0.950)	(0.281)
Provincial Government	334	9.3	3.287	0.036	5.999	8.071	0.139	0.075
		(0.619)	(0.698)	(0.058)	(0.554)	(0.943)	(0.371)	(0.232)
Provincial SASAC	3829	9.432	3.431	0.031	6.013	8.106	0.192	0.054
		(0.622)	(0.606)	(0.056)	(0.497)	(0.902)	(0.834)	(0.189)
Municipal Asset Bureau	344	8.967	3.274	0.019	5.695	7.822	0.125	0.026
		(0.516)	(0.426)	(0.059)	(0.423)	(0.814)	(0.493)	(0.199)
Municipal Department	397	8.905	3.178	0.028	5.743	7.853	0.142	0.064
		(0.491)	(0.471)	(0.060)	(0.448)	(0.656)	(0.999)	(0.219)
Municipal Government	430	9.074	3.31	0.028	5.763	7.943	0.206	0.062
		(0.455)	(0.383)	(0.052)	(0.401)	(0.673)	(0.844)	(0.152)
Municipal SASAC	2474	9.237	3.372	0.029	5.868	7.968	0.269	0.048
		(0.560)	(0.507)	(0.056)	(0.422)	(0.782)	(1.238)	(0.189)
Panel B: Foreign								
Foreign Enterprise	407	9.03	3.278	0.029	5.762	7.864	0.407	-0.002
		(0.721)	(0.584)	(0.075)	(0.573)	(0.933)	(1.603)	(0.347)
Foreign Individual	630	8.983	3.105	0.048	5.91	7.752	0.618	0.093
		(0.513)	(0.535)	(0.058)	(0.428)	(0.683)	(1.773)	(0.175)
Panel C: Private								
Private Enterprise	140	9.064	3.159	0.037	5.849	7.69	0.263	0.034
		(0.719)	(0.716)	(0.055)	(0.412)	(1.041)	(0.868)	(0.305)
Private Individual	12278	8.948	3.095	0.05	5.851	7.762	0.365	0.077
		(0.557)	(0.499)	(0.060)	(0.410)	(0.763)	(1.437)	(0.195)
Panel D: Other								
Operating Unit	39	9.045	3.129	0.035	5.917	7.862	0.44	0.066
		(0.559)	(0.489)	(0.057)	(0.368)	(0.800)	(1.739)	(0.190)
Collectively-owned Enterprise	164	9.132	3.381	0.054	5.791	7.906	0.401	0.085
		(0.527)	(0.462)	(0.063)	(0.411)	(0.604)	(1.640)	(0.126)
Social Organization	239	9.11	3.326	0.032	5.784	7.89	0.199	0.052
		(0.518)	(0.706)	(0.051)	(0.636)	(0.849)	(0.776)	(0.235)
Panel E: No Controller								
Widely Held Firms	331	9.168	3.371	0.037	5.951	8.068	0.283	0.05
		(0.758)	(0.663)	(0.055)	(0.376)	(0.953)	(0.951)	(0.256)

This table reports the summary statistics of the firm performances with all controllers' ownership types. Panel A presents the performances of state controllers; Panel B presents the performances of foreign controllers; Panel C presents the performances of private controllers; Panel D presents the performances of other controllers; Panel E presents the performances of widely held firms. In every panel, the maximum number of observations of different performance measures with every state controller and the mean value of every performance measure with standard diversion in parentheses are reported.

Table 4

Regression Results of the Effects of State Ultimate Controllers on Firm Output and Employment

	Firm Output	Employment
State Ultimate Controllers	Operating Revenue	Employee
Government	-0.018	0.078**
	(0.026)	(0.035)
Department	-0.018	0.067**
	(0.024)	(0.033)
AssetBureau	-0.0002	0.0674**
	(0.025)	(0.034)
SASAC	0.037**	0.077***
	(0.018)	(0.024)
SOE	-0.005	0.0661***
	(0.02)	(0.025)
PublicInstitution	-0.089***	-0.01
	(0.027)	(0.041)
Firm-level Control Variables		
Constant	1.090***	-2.109***
	(0.155)	(0.18)
Observations	23201	23381
Number of Firms	2845	2883
R-squared	0.709	0.364

This table presents the regression results about the effect of state ultimate controllers on firm output and employment. The firm performances include firm output (operating revenue) and employment (the number of employees). The table shows the coefficients of state ultimate controllers in six-functionality categories, namely government, department, asset bureau, SASAC, state-owned enterprise and public institution with standard deviation in the parentheses. The firm-level control variables comprise managerial ownership, split share reform, firm size, firm age, leverage and financial crisis.

The sample is yearly from 2003 to 2016.

*Significance at 10% level. **Significance at 5% level. ***Significance at 1% level.

Table 5

Regression Results of the Effects of State Ultimate Controllers on Firm Profitability and Productivity

	Profitability	Labor Productivity	Investment	Investment Efficiency	Operating Efficiency
State Ultimate Controllers	ROA	Operating Revenue per Employee	Capital Expenditure	ROI	ROS
Government	-0.017***	-0.101***	-0.002	-0.116	-0.043*
	(0.006)	(0.035)	(0.066)	(0.085)	(0.023)
Department	-0.008*	-0.094***	-0.026	-0.053	-0.026
	(0.005)	(0.033)	(0.049)	(0.068)	(0.023)
AssetBureau	-0.023***	-0.076**	-0.082	-0.109	-0.080***
	(0.006)	(0.036)	(0.061)	(0.068)	(0.024)
SASAC	-0.018***	-0.049*	-0.068*	-0.118**	-0.055***
	(0.004)	(0.025)	(0.041)	(0.054)	(0.015)
SOE	-0.016***	-0.077***	-0.086**	0.012	-0.043***
	(0.004)	(0.026)	(0.042)	(0.067)	(0.015)
PublicInstitution	-0.019***	-0.081*	-0.064	0.152	-0.065**
	(0.007)	(0.045)	(0.066)	(0.181)	(0.027)
Firm-level Control Variables		Included			
Constant	-0.045*	3.202***	-1.723***	1.372***	-0.865***
	(0.024)	(0.205)	(0.262)	(0.435)	(0.096)
Observations	23428	22984	23377	19180	23212
Number of Firms	2892	2840	2883	2597	2852
R-squared	0.048	0.201	0.284	0.009	0.038

This table presents the regression results about the effect of state ultimate controllers on firm profitability and productivity which includes labor productivity, investment, investment efficiency and operating efficiency. The firm performances include profitability (ROA), labor productivity (operating revenue per employee), investment (capital expenditure), investment efficiency (ROI), operating efficiency (ROS). The table shows the coefficients of state ultimate controllers in six-functionality categories, namely government, department, asset bureau, SASAC, state-owned enterprise and public institution with standard deviation in the parentheses. The firm-level control variables comprise managerial ownership, split share reform, firm size, firm age, leverage and financial crisis.

The sample is yearly from 2003 to 2016.

*Significance at 10% level. **Significance at 5% level. ***Significance at 1% level.

Table 6

Regression Results of the Effects of Administrative Levels on Firm Output and Employment

	Firm Output	Employment
Administrative Levels	Operating Revenue	Employee
Central Level	0.0457***	0.0608***
	(0.012)	(0.017)
Provincial Level	0.0349**	-0.00232
	(0.0156)	(0.0212)
Municipal Level	0.00438	0.0607***
	(0.0145)	(0.0198)
Firm-level Control Variables		
Constant	1.087***	-2.102***
	(0.155)	(0.179)
Observations	23,201	23,381
Number of Firms	2,845	2,883
R-squared	0.708	0.364

This table presents the regression results about the effect of state controllers at different administrative levels on firm out and employment. The firm performances include firm output (operating revenue) and employment (the number of employees). The table shows the coefficients of state controllers at 3 administrative levels, central, provincial, and municipal level respectively with standard deviation in the parentheses. The central state-owned enterprise, local state-owned enterprise and public institution are not included in the state controllers in the table. The firm-level control variables comprise managerial ownership, split share reform, firm size, firm age, leverage and financial crisis.

The sample is yearly from 2003 to 2016.

*Significance at 10% level. **Significance at 5% level. ***Significance at 1% level.

Table 7

Regression Results of the Effects of Administrative Levels on Firm Profitability and Productivity

	Profitability	Labor Productivity	Investment	Investment Efficiency	Operating Efficiency
Administrative Levels	ROA	Operating Revenue per Employee	Capital Expenditure	ROI	ROS
Central Level	-0.00686**	-0.019	-0.0249	-0.00166	-0.0309**
	(0.00305)	(0.0179)	(0.0293)	(0.0519)	(0.0122)
Provincial Level	-0.00118	0.0264	0.0514	-0.182***	-0.012
	(0.00355)	(0.0234)	(0.0381)	(0.0592)	(0.0125)
Municipal Level	-0.0148***	-0.0565***	-0.051	-0.176***	-0.0331***
	(0.00351)	(0.0192)	(0.0359)	(0.0519)	(0.0128)
Firm-level Control Variables		Included			
Constant	-0.0481**	3.191***	-1.731***	1.383***	-0.871***
	(0.0231)	(0.204)	(0.26)	(0.435)	(0.0963)
Observations	23,428	22,984	23,377	19,180	23,212
Number of Firms	2,892	2,840	2,883	2,597	2,852
R-squared	0.046	0.2	0.284	0.009	0.035

This table presents the regression results about the effect of state controllers at different administrative levels on firm profitability and productivity which includes labor productivity, investment, investment efficiency and operating efficiency. The firm performances include profitability (ROA), labor productivity (operating revenue per employee), investment (capital expenditure), investment efficiency (ROI), operating efficiency (ROS). The table shows the coefficients of state controllers at 3 administrative levels, central, provincial, and municipal level respectively with standard deviation in the parentheses. The central state-owned enterprise, local state-owned enterprise and public institution are not included in the state controllers in the table. The firm-level control variables comprise managerial ownership, split share reform, firm size, firm age, leverage and financial crisis.

The sample is yearly from 2003 to 2016.

*Significance at 10% level. **Significance at 5% level. ***Significance at 1% level.

Table 8

Regression Results of the Effects of Ultimate Controller on Firm Performance

	Firm Output	Employment	Profitability	Labor Productivity	Investment	Investment Efficiency	Operating Efficiency
Controller Type	Operating Revenue	Employee	ROA	Operating Revenue per Employee	Capital Expenditure	ROI	ROS
State Ultimate Controllers							
PublicInstitution	-0.081***	-0.002	-0.010	-0.067	0.085	0.242	-0.018
	(0.030)	(0.047)	(0.009)	-0.052	-0.083	-0.194	-0.035
CentralAssetBureau	0.067**	-0.154	0.030***	0.235*	-0.144	0.392	0.101*
	(0.027)	(0.126)	(0.008)	-0.125	-0.319	-0.359	-0.054
CentralDepartment	0.003	0.092*	-0.001	-0.082	0.121	0.178	-0.009
	(0.040)	(0.050)	(0.009)	-0.054	-0.083	-0.142	-0.053
CentralSASAC	0.062**	0.102***	-0.010	-0.031	0.055	0.040	-0.020
	(0.027)	(0.036)	(0.007)	-0.037	-0.072	-0.114	-0.029
CentralStateEnterprise	0.024	0.072*	-0.007	-0.035	0.066	0.081	-0.016
	(0.032)	(0.039)	(0.007)	-0.040	-0.075	-0.113	-0.030
LocalStateEnterprise	-0.013	0.063*	-0.005	-0.071*	0.066	0.049	0.025
	(0.027)	(0.035)	(0.007)	-0.037	-0.069	-0.116	-0.027
ProvincialAssetBureau	0.013	-0.015	0.001	0.027	0.191	0.182	-0.054
	(0.050)	(0.074)	(0.014)	-0.073	-0.121	-0.262	-0.067
ProvincialDepartment	-0.026	0.052	0.011	-0.079	0.207**	-0.065	0.071**
	(0.038)	(0.054)	(0.009)	-0.056	-0.101	-0.133	-0.033
ProvincialGovernment	0.023	0.043	-0.005	-0.020	0.169	-0.165	0.012
	(0.041)	(0.060)	(0.011)	-0.060	-0.121	-0.152	-0.044
ProvincialSASAC	0.040	0.031	-0.001	0.008	0.142*	-0.147	0.018
	(0.028)	(0.036)	(0.007)	-0.040	-0.074	-0.111	-0.028
MunicipalAssetBureau	-0.011	0.093**	-0.019**	-0.093**	0.024	-0.189	-0.019
	(0.031)	(0.042)	(0.008)	-0.045	-0.087	-0.136	-0.031
MunicipalDepartment	-0.017	0.050	-0.002	-0.060	0.076	-0.142	0.026
	(0.037)	(0.053)	(0.008)	-0.048	-0.088	-0.118	-0.035
MunicipalGovernment	-0.055	0.104**	-0.010	-0.141***	0.123	-0.045	0.019
	(0.035)	(0.044)	(0.008)	-0.044	-0.094	-0.125	-0.031
MunicipalSASAC	0.025	0.099***	-0.016**	-0.063*	0.039	-0.124	-0.006
	(0.026)	(0.035)	(0.007)	-0.036	-0.073	-0.104	-0.027

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Table 8 (continued)

Foreign Ultimate Controller							
ForeignEnterprise	0.019	0.079**	-0.001	-0.052	0.207***	0.056	0.027
	(0.030)	(0.036)	(0.008)	-0.041	-0.075	-0.159	-0.031
ForeignIndividual	-0.007	-0.039	0.028***	0.032	0.424***	0.154	0.095**
	(0.049)	(0.057)	(0.010)	-0.060	-0.092	-0.214	-0.039
Private Ultimate Controller							
PrivateEnterprise	-0.086*	-0.082	0.009	0.001	0.054	-0.094	0.048
	(0.047)	(0.073)	(0.011)	-0.063	-0.132	-0.122	-0.040
PrivateIndividual	0.010	0.001	0.010*	0.026	0.144**	0.055	0.060**
	(0.023)	(0.029)	(0.006)	-0.032	-0.062	-0.101	-0.024
Other Ultimate Controller							
CollectiveEnterprise	-0.009	-0.037	0.006	0.037	0.016	-0.445	0.053
	(0.037)	(0.064)	(0.011)	-0.065	-0.100	-0.275	-0.033
OperatingUnit	-0.051	0.077	0.011	-0.114	0.294***	-0.108	0.039
	(0.033)	(0.067)	(0.016)	-0.077	-0.108	-0.400	-0.051
SocialOrganization	-0.091	-0.161*	0.024**	0.083	0.090	-0.101	0.075*
	(0.067)	(0.094)	(0.010)	-0.076	-0.124	-0.142	-0.045
Firm-level Control Variables				Included			
Constant	1.087***	-2.102***	-0.058**	3.180***	-1.885***	1.318***	-0.924***
	(0.156)	(0.179)	(0.024)	-0.205	-0.265	-0.449	-0.097
Observations	23201	23381	23428	22984	23377	19180	23212
Number of Firms	2845	2883	2892	2840	2883	2597	2852
R-squared	0.710	0.368	0.051	0.204	0.287	0.010	0.040

Table 8 presents the regression results examining the effect of ultimate controllers on firm performance. The firm performances include firm output (operating revenue), employment (the number of employees), profitability (ROA), and productivity which includes labor productivity (operating revenue per employee), investment (capital expenditure), investment efficiency (ROI), operating efficiency (ROS), The table shows the coefficients of state, foreign, private, other and non-controllers respectively with standard deviation in the parentheses. The firm-level control variables comprise managerial ownership, split share reform, firm size, firm age, leverage and financial crisis. The sample is yearly from 2003 to 2016. *Significance at 10% level. **Significance at 5% level. ***Significance at 1% level.

Table 9

Heckman Two-step Selection Model of Firm Performances

	OperatingRevenue	Employment	ROA	OperatingRevenuePerEmployee	Capital Expenditure	ROI	ROS
First Stage Regression							
Tobin's Q_{t-1}	-0.0017**	-0.0017**	-0.0017**	-0.0017**	-0.0017**	-0.0017**	-0.0017**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Firm-Level Variable	Include	Include	Include	Include	Include	Include	Include
Second State Regression							
SASAC	0.0277	0.0715***	-0.0169***	-0.0495**	-0.0575	-0.102*	-0.0528***
	(0.0184)	(0.0244)	(0.00395)	(0.025)	(0.0419)	(0.0538)	(0.0149)
Government	-0.0225	0.0764**	-0.0153***	-0.101***	-0.000992	-0.117	-0.0363*
	(0.0262)	(0.0352)	(0.00555)	(0.0347)	(0.0664)	(0.0898)	(0.0213)
Department	-0.0249	0.0730**	-0.00786*	-0.101***	-0.0142	-0.0607	-0.0246
	(0.0241)	(0.0333)	(0.00444)	(0.0328)	(0.0498)	(0.0687)	(0.0207)
AssetBureau	-0.00986	0.0693*	-0.0228***	-0.0813**	-0.0715	-0.112	-0.0859***
	(0.0253)	(0.0355)	(0.00604)	(0.0372)	(0.0618)	(0.0701)	(0.0236)
SOE	-0.0104	0.0621**	-0.0146***	-0.0745***	-0.0786*	0.00341	-0.0419***
	(0.0202)	(0.0253)	(0.00424)	(0.026)	(0.0423)	(0.0676)	(0.0152)
PublicInstitution	-0.0906***	-0.0116	-0.0184**	-0.0774*	-0.0582	0.153	-0.0614**
	(0.0273)	(0.0412)	(0.00735)	(0.0443)	(0.0657)	(0.182)	(0.0274)
lambda	0.0297	0.0417	-0.0184	-0.00953	0.146	-0.181	-0.0771
	(0.0648)	(0.0769)	(0.0142)	(0.0876)	(0.142)	(0.298)	(0.0516)
Firm-Level Variable	Include	Include	Include	Include	Include	Include	Include
Constant	0.912**	-2.271***	0.0364	3.203***	-2.475***	2.17	-0.469*
	(0.378)	(0.426)	(0.0705)	(0.502)	(0.723)	(1.497)	(0.267)
Observations	22,768	22,945	23,009	22,570	22,950	18,854	22,781
Number of StockCode	2,841	2,879	2,889	2,835	2,879	2,594	2,848
R-squared	0.713	0.364	0.05	0.204	0.28	0.008	0.037

This table show the results of the Heckman two-step selection model. The first-stage probit model estimates the relation between SASAC control rights and Tobin's Q of previous year. The second-stage model estimates the relation between firm performances and state controllers with corrected self-selection.

*Significance at 10% level. **Significance at 5% level. ***Significance at 1% level.

Appendix 1

Table 10

Firm Performance Measures

Performance Measures	Definition
Output	
Operating Revenue	Logarithm of operating revenue
Employmeny	
Number of Employees	Logarithm of the number of employees
Profitability	
Return on Assets (ROA)	Net profits / Average total assets, where Average total assets = (Total assets of the start of this year+ Total assets of the end of this year) / 2)
Productivity	
Labor Productivity	
Operating Revenue per Employee	Logarithm of operating revenue per employee
Investment	
Capital Expenditure	Logarithm of capital expenditure (measured as change in gross property, plant, and equipment plus change in intangible assets)
Investment Efficiency	
Return on Investment (ROI)	Investment Gains/ (Long Term Equity Investment + Held-To-Maturity Investment + Trading Financial Assets + Available-For-Sale Financial Assets + Derivative Financial Assets)
Operating Efficiency	
Return on Sales	Operating Profit/Operating Revenue Where Operating revenue is the revenue arising from operating business of the company except interests income, net earned premiums, commissions and fees income

This table presents the proxies for firm performance. Firm profitability measures include ROA, followed by the definition of each proxy. Firm employment measure includes the number of employees, followed by the definition; Firm labour productivity measure includes operating revenue per employee, followed by the definition; Firm investment measure includes capital expenditure, followed by the definition; Firm investment efficiency measure includes ROI, followed by the definition; Operating efficiency measure includes ROS, followed by the definition; Firm output measure includes operating revenue, followed by the definition. Among the measures, capital expenditure, operating revenue, operating profit are adjusted based on Consumer Price Index (CPI 2003=100).

Table 11

Control Variable and Definition

Control Variable	Definition
Director, Supervisor, Executive and Management	The fraction of shares held by director, supervisor, executive and management to control the effect of managerial ownership
SSR	The dummy variable control the impact of Split Share Reform on listed firms. SSR equals 1 if the listed firms had state ownership transfer during the period from 2005 to 2010, otherwise 0.
Size	Logarithm of total assets to control firm size
Leverage	(Long-term debt + current portion of long-term debt (Non-current Long-term Liability due within one year)) divided by total assets
Firm age	The number of years since the firm's establishment.
Crisis	A dummy variable controls the impact of recent financial crisis on listed firms. SSR equals 1 if the sample year is from 2007 to 2010, otherwise 0.

This table presents the control variables and the definitions. We control firm-level factor, including the managerial ownership, Split Share Reform, firm size, firm leverage, firm age and financial crisis.