# Location and the Design of Executives' Compensation in China

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**Location and the Design of Executives' Compensation in China**

**Abstract:**

This article tries to find the effect of a firm's location on executives' compensation in China, especially for non-state-owned listed enterprises. Based on the data from 2013-2017, I find that there are significant gaps between executives' remuneration of companies in smaller cities and that of companies in mega cities. Companies in mega cities pay 33.5% more in equity and 28.4% more in cash to their top managers. After controlling for the cost of living, the gaps are narrowed. Executives in smaller cities earn only 3.7% less in equity compensation and 3.8% more in cash compensation. I also find that top managers in firms in smaller cities have lower pay-for-performance sensitivity. However, the influence of firms' location on equity-compensation-for-performance sensitivity is insignificant. This result may have some implications for the shareholders of companies in smaller cities as they can increase the proportion of equity-based compensation to connect their interests and executives' interests better.

Keywords: Executives' compensation, Pay-for-performance sensitivity, Firm location, China

JEL Classification: G30 J33 M52

## 1. Introduction

China has been introducing market reforms since 1978. The tremendous growth of the Chinese economy in the past 40 years indicates the great success of the reformation. The core principle of this reform is the transition from a planned economy to a market one. Private ownership and profit-oriented enterprises were revived in this reform after their demise in 1950s in China. Even some state-owned-enterprises (SOEs) have started to transform into joint stock companies. These companies would follow the principles of the free market rather than the government's instructions to produce and operate. Accordingly, the system will be transformed into a modern corporate system. In this case, top managers have more discretion in the operations of their companies. They are acting more like their peers in Western countries to make decisions on most of the major affairs of their organizations. As a result, effective incentives for executives play a more important role in corporate governance and become more practical in reforming the Chinese market.

Many Chinese researchers and researchers focusing on the Chinese market have realized the significance of executive compensation. They have made some effort to explore the factors in determining this compensation and the relationship between executives' pay and firm performance. Many of them prefer to combine executives' compensation with the Chinese market-oriented reform directly. They are more willing to compare the difference between SOEs and non-SOEs. Almost none of them take geographic influence on corporate governance or compensation into account. China has 9.6 million square kilometers of territory that crosses 5,500 kilometers from north to south and 5,200 kilometers from east to west. Geography is non-negligible when I attempt to probe the compensation system of listed companies located on this land. This paper investigates the effect of geographic location on executives' compensation and pay-for-performance sensitivity in Chinese listed companies.

Another deficiency of existing studies regarding Chinese executives' compensation is that almost all of them merely involve cash compensation. Equity compensation,

which occupies a large proportion in compensation of Western executives, remains an extremely limited concern in China. The function and importance of equity compensation has been demonstrated in a large number of articles. Jensen and Murphy (1990) find that compensation should be designed as an effective incentive for senior management to maximize shareholders' wealth, and that equity-based compensation is one of the most important incentives. Murphy (1999) focuses on the general motivation of stocks and options in mining and manufacturing industries, financial industries, and other industries (including wholesale and retail trade and service industries). He also affirms that stock-based compensation, rather than other types of compensation, increases pay-for-performance sensitivity. Carpenter (2000) also substantiates the incentive effect of stock options. Compensation packages containing out-of-money options will encourage managers to decrease their risk aversion and compensation packages containing in-the-money options will increase this risk aversion. Hanlon, Rajgopal, and Shevlin (2003) find that for every $1 value stock option granted to executives, operating income will increase by $3.71. Equity compensation is a significant part of executive pay and the system of incentives for executives, and it deserves more in-depth studies. However, until recently, scholars are less likely to have access to the statistical data of Chinese executives' equity compensation. I intend to add this element to my study to fill the gap in the research on the Chinese market.

Many studies have been undertaken regarding the relevance of employees' wages and geographic impacts. Most of this research has proved the positive effect of urban agglomeration on people's wages or CEOs' compensation. Urban agglomeration improves the workers' productivity and increases the price for workers' labor (Wheeler 2001; Ciccone 2002; Bacolod, Blum, and Strange 2009; Addario and Patacchini 2008). As for more skilled employees, like CEOs, this effect of agglomeration is also prominent (Francis, Hasan, John, and Waisman 2016). Furthermore, both Francis et al. (2016) and Zhang and Chung (2018) have found that equity-based compensation in rural areas makes up less of the total compensation when compared to their urban counterparts. However, Bhabra and Hossain (2018)

confirm that Canadian rural small and medium enterprises pay a higher proportion of equity compensation to executives and remunerate their executives almost the same after adjusting for the cost of living. Thus, the results of these studies on executive compensation and geographic impacts are not fully consistent. U.S. and Canada are both countries with vast territories. There is no way to predict that China will be similar to either of them. Moreover, the prevailing wisdom that income is significantly greater in urban areas than in rural areas even after adjusting for the cost of living is only shown to be true in the U.S. and several developed European countries including Germany, France, the U.K., and Italy. China is a different case considering its previous socialist economic system and unique economic development history. The market pricing mechanism for the labor market and equity compensation has a very short history in China. Dating back to the beginning of Chinese market reforms, the resurrection of private ownership made it possible to apply market-oriented management rather than government-oriented integrated management to Chinese companies. I find that modern enterprise system that provides companies greater discretion to determine executives' compensation was used in Chinese firms for the first time in 1978. On December 19, 1990, the Shanghai Stock Exchange opened for business and seven months later, the Shenzhen Stock Exchange opened. Listed companies did not appear until that time. Two years later, China Vanke Co. became the first company to pay stock options to its executives. The Chinese marketization and stock market are so young that it is difficult to conjecture whether the differences between rural and urban firms in China will be similar to the differences between rural and urban firms in the U.S., European developed countries, or Canada. For this reason, the Chinese market is still worthy of additional study when numerous papers out of China have focused on the issue.

In addition to the effect of geography on executive compensation, a large body of research has indicated that geography can affect companies and markets in many other respects. Pirinsky and Wang (2006) find that companies' stock returns co-move with that of companies in the same area. Geography is also identified as a pivotal element affecting stock liquidity (Loughran and Schultz 2005; Loughran 2008). Rural

stocks are much less liquid than urban stocks as rural companies find it hard to draw investors' attention. Likewise, as investors lack information regarding remote companies, rural companies adopt seasoned equity offerings much less frequently than their urban counterparts. Greater credit risk is found in Taiwan rural firms, and companies with high credit risk seek to raise funds in debt markets away from their headquarters (Chen 2016). As for investors, their portfolios are imperceptibly changed by geographic factors. Investors, whether they are individual investors or institutional investors, prefer to pursue local investment targets and earn greater profits from these local stocks (Brennan and Cao 1997; Coval and Moskowitz 1999, 2001; Brown, Ivković, Smith, and Weisbenner 2004; Stotz 2011; Ivković and Weisbenner, 2005; Kumar, Page, and Spalt 2013). All of the geographic influences above indicate information asymmetry as a factor. Specifically, when investors are physically closer to a company, they will obtain better information about the firm. They even can obtain confidential information that is not available to more distant investors. This trade informational advantage forms the basis of investors' excess returns and the propensity to trade local stocks. In 2010, the Chinese urban population surpassed its rural population. Moreover, according to statistics from the Mobdata database, more than 27.2% of investors come from China's nine largest cities (e.g., 45.8% investors live in Chinese first-tier cities that include the top 19 cities ranked by China Business News). We can infer that Chinese urban firms can diffuse their information faster and more widely to investors than rural firms with fewer local investors. Top managers' power can be reinforced by this information asymmetry between urban and rural areas. They can utilize this enhanced power to design a compensation package that is more beneficial to themselves (John, Knyazeva, and Knyazeva 2011). Alternatively, this lack of information transparency could damage the supervision of shareholders. Thus, I explore the potential differences in the compensation design of executives in smaller cities and the compensation design of executives in mega cities and compare the pay-for-performance sensitivity of executives in mega cities and those of the smaller cities in China. I do not use the regular definition of rural and urban areas as in prior papers as China's huge population makes zoning more difficult. In China, in an

underdeveloped city, it is still possible to gather millions of people. It is quite different from normal rural areas. Therefore, I use mega cities and smaller cities to distinguish the two kinds of areas in my study.

As the background and literature cited above inspire me, I set two major purposes in this paper. First, I attempt to examine the differences in the compensation of executives in smaller cities to that of executive compensation in mega cities including their amount and structure. I also investigate the role that smaller cities play in this difference. In addition, I compare the pay-performance sensitivity of companies in smaller cities and mega cities and try to narrow the gap between companies in these two areas. For meeting these objectives, I develop hypotheses correspondingly. First, I believe Chinese executives in mega cities will earn more than their peers in smaller cities. Wheeler (2001) finds that urban agglomeration can improve the productivity and increase the prices for labor. Francis et al. (2016) indicates that urban CEOs earn about 25% more due to urban agglomeration effects. Thus, it is reasonable to speculate that executives in mega cities can earn more than executives in smaller cities. After adjusting for the cost of living, this disparity should be eliminated. However, I am unsure how much of the distinction between the compensation of executives in these two areas will be erased. Additionally, executives in smaller cities should receive a greater portion of cash compensation that is more stable and less risky as they have more power to determine their pay and face weaker supervision from shareholders (Francis et al. 2016; Zhang, Chung 2018). When I adjust the data by the cost of living index, the reasons above should still hold. Consequently, executives in smaller cities should still earn a greater proportion of their compensation in the form of cash. Moreover, for the same reasons, I expect that companies in smaller cities will have lower pay-performance sensitivity. Since equity compensation is usually more dependent on performance, I also expect that equity compensation for performance sensitivity will not be influenced by geographic location. Finally, since I attribute lower pay-for-performance sensitivity of enterprises in smaller cities to the enhanced power of top management and weaker supervision from shareholders, I predict that more institutional investors and more members on the board of directors

can remedy this issue.

The empirical findings in the study are listed as follows. (1) Companies in mega cities pay 59% more in equity, 36% more in cash, and 40% more in total to their top managers. After the data is adjusted based on the cost of living index one by one, these gaps disappear. Executives of companies in smaller cities gain only 7.4% less equity compensation than their counterparts in companies in mega cities. They even receive 6.2% more in cash and 3.6% in total compensation. Compensation structures of top managers in mega and smaller cities also present little distinction. The former consists of 17.22% equity compensation and 82.78% cash compensation, while the numbers for the latter are 19.25% and 80.75% respectively. (2) After I adjust the compensation by the cost of living index, I find that smaller cities contribute more toward executives' total and cash compensation, but significantly depresses equity incentives. This is consistent with my prediction that executives in smaller cities can exert influence on their compensation. (3) The pay-for-performance sensitivity of companies in smaller cities is significantly lower than that of companies in mega cities in general representing the inefficiency of the contract between agents and shareholders. However, the factor of smaller cities is indistinguishable in equity compensation for performance sensitivity suggesting that equity-based compensation is less influenced by senior management. (4) Institutional investors and board size thought to be an effective method to reduce information asymmetry in other papers and to play an important and prominent role in developed countries do not influence executives' compensation as expected. They cannot mitigate the negative effect of smaller cities on the design of executive compensation. The number of the board directors is positively correlated to executive compensation. Both the number of board directors and the proportion of shares held by institutional investors are negatively correlated to total pay-for-performance sensitivity and cash compensation for performance sensitivity.

The paper proceeds as follows. In Section 2, I provide a literature review relevant to executives' performance and geography. I also briefly describe the background of the Chinese market in this section. Section 3 outlines my data and provides

descriptive statistics. Section 4 contains the main empirical results. In Section 5, I conduct the robustness tests, while Section 6 concludes my study and discusses the possible contributions and limitations of the study.

## 2. Literature Review

The literature review is made up of two major parts: (1) the study of executive compensation and the performance of companies, and (2) the geographic influence on firms and investors.

### 2.1. Executives' Compensation and the Performance of Companies.

Jensen and Meckling (1976) introduce "agency theory" to reveal the contradiction between managers and shareholders. Jensen (1986) also points out the conflict between managers' power and shareholders' interests. However, the concept of "agency costs," which includes compensation policies to control agents' behavior into the theory of the firm, predicts a positive correlation between compensation and firm performance. Fama (1980) further explains that managers who are separated from shareholders can run companies efficiently as their compensation was determined by their past performance. These three articles cast light upon the possibility of the separation of agents and shareholders and the importance of executive compensation to corporation governance. A number of studies investigate the relation between managers' compensation and firm performance. Jensen and Murphy (1990) contend that social equity and public opinion restrain the possibility to reward senior executives more. For this reason, companies fail to design a compensation system to inspire their CEOs effectively, leading to poorer performance by the firms. This paper identifies the importance of the incentive effect of executive compensation. Murphy (1999) further conducts a comprehensive summary of executive compensation and pay-performance sensitivity in the U.S. at that time. He pools approaches of measuring performance and huge volumes of data regarding compensation in stocks,

options, and cash. Then, he confirms that stock performance and option performance sensitivity are positive in mining and manufacturing industries, financial industries, wholesale and retail trade industries, and service industries and are more significant in small companies. Hanlon et al. (2003) gauge the impact of stock options for top managers on business performance in the future. They find that every dollar of option given to the top five managers will result in a $3.71 increase in operating income in next five years. Carpenter (2000) suggests that options can influence managers' risk preferences that can change their managerial behaviors. Managers receiving out-of-money options are inclined to increase the risk of assets, while those receiving in-the-money options tend to choose lower asset volatility. Spraggon and Bodolica (2011) investigate CEO behavior in acquisitions and find that stock option incentives are the key to optimizing financing choices and maintaining company performance after acquisition. While Western scholars try to determine the mechanism as to how compensation, especially equity-based compensation, stimulates senior managers and to better examine the compensation system, most Chinese scholars only concentrate on cash compensation and the relation between the ownership of enterprises and pay-performance sensitivity due to the background of the Chinese economic reformation and limited data source.

Many enterprises are owned by the Chinese government or used to be owned by the Chinese government. Most Chinese articles on this topic choose to compare the difference between SOEs and Non-SOEs inevitably. Firth, Fung, and Rui (2006, 2007) identify the positive pay-performance relation both in Chinese SOEs and Non-SOEs and find foreign investors can augment this relation. They also suggest that Non-SOEs and companies with foreign shareholders pay more to their executives. Kato and Long's results (2006) support the positive pay-performance relation in Chinese companies but suggest that government ownership will diminish the relationship between a company's performance and executive compensation. Buck, Liu, and Skovorodz (2008) investigate pay-performance and the performance-pay relationship. In their case, performance-pay elasticity is 0.25, which is similar to the data of the U.S. and UK, while the pay-performance elasticity is only 0.015. Conyon

and He (2011) go beyond cash compensation. They measure equity incentives by using the ratio of CEOs' shareholdings and the changes in the CEOs' equity value. They determine that CEOs' incentives are negatively correlated with company size and positively correlated with company performance and the ratio of the market value to book value. Adithipyangkul, Alon, and Zhang (2011) include perks that contain management perquisites and expenditures for meals, travel, and entertainment in their study and find a positive relation to performance. Conyon and He (2011) add independent directors to their model and find enterprises with more independent directors tend to replace CEOs during declining performance. Lam, McGuinness, and Vieito (2013) use gender as a key element in their study. However, the link between gender and pay-performance is insignificant.

### 2.2. Geographic Influence on Firms and Investors

The geographic influence on firms and investors is present in almost every respect. Brennan and Cao (1997) determine that investors perform much better when investing in domestic stocks. Stotz (2011) concur with their findings. Private equity can earn 10%-13% on domestic targets every year, while only 1%-3% on foreign targets. Coval and Moskowitz (1999) corroborate the advantage of U.S. investment managers on local portfolios. They attribute this advantage to easier information acquisition for local companies. They reinforce their opinion by researching U.S. fund managers. Their results demonstrate that fund managers can gain prominent abnormal returns in local investment managers who live in remote areas with small companies nearby can earn greater profits on the proximate investment (Coval and Moskowitz 2001). Ivković and Weisbenner (2005) record a similar phenomenon in U.S. general households. In their study, the average abnormal annualized return of households' local investment is 3.2%. Bae, Stulz, and Tan (2007) prove that analysts can predict the earnings of domestic companies more precisely providing a solid foundation in terms of earning abnormal returns. Brown et al. (2004) argue that community plays an influential role in investment. Investors, especially investors with less financial

knowledge, are inclined to imitate other members in the same community. This result implies that familiarity exists not only in investment targets, but in situations around investors affecting investment propensity dramatically.

As for enterprises, Loughran and Schultz (2005) compare the stock liquidity of urban and rural companies. They find that rural stocks are traded much less with higher trading costs, covered by fewer analysts, and held by fewer institutions. Loughran (2008) extended his study to seasoned equity offerings. He finds that rural companies issue new shares less frequently than urban companies due to the cost of information. Investors are willing to invest in stocks in which they are familiar. Rural companies do not have investors nearby. They must pay more to acquaint remote investors with their firms. Not only is the liquidity of stocks influenced by location, but stock price is also affected by location. Stock prices co-move with the stock prices of other companies in the same area (Pirinsky and Wang 2006; Kumar et al. 2013). When a company moves its headquarters to a new location, its stock price will move more synchronously with the stock prices of firms from the new location rather than with those from the old location. Barker and Loughran (2007) further quantized this co-movement and confirm the significance in their research. When two companies are 100 miles closer, the coefficient of their stock prices will increase 12 basis points.

Literature regarding the geographic effect on executive compensation has become more popular in recent years. However, research on the effect of urban agglomeration on employees' wages is not new. Productivity increases 4%-5% in urban areas of the U.S. and European developed countries (Ciccone 2002). It is natural to probe the relative level of wages of urban residents. Wheeler (2001) and Bacolod et al. (2009) find higher pricing for skilled workers in urban areas. Addario and Patacchini (2008) estimate that for every 100,000 additional people participating in the local labor market wages will increase by 0.1% in Italy. The population 12 kilometers away from the market will not contribute to this effect. Kedia and Rajgopal (2009) further demonstrate that enterprises adopt an option grants system, similar to the system of firms in the neighbor, for their general staff. Nonetheless, they do not find a geographic effect on executives' equity-based compensation. Bouwman (2012) and

Francis et al. (2016) examine the geographical effects on executives' salary respectively. Bouwman (2012) concentrates on the affects from other companies in the neighborhood, while Francis et al. (2016) focuses on the efficacy of the size of cities. In general, urban CEOs earn 25% more than rural CEOs after adjusting for the cost of living. A CEO's compensation will increase 0.3% when the compensation of other CEOs in their neighbor increases 1%. Zhang and Chung (2018) and Bhabra and Hossain (2018) further analyze the structure of executive compensation in the U.S. and Canada. In the U.S., rural executives tend to receive a lower proportion of incentive compensation and have lower pay-performance sensitivity. In Canada, rural executives receive a higher portion of equity-based compensation representing greater incentive function and higher pay-performance sensitivity.

### 2.3. Institutional Background

In order to make better understanding of the purpose of this paper and my selection of the subject of study, I provide a brief description of the background of Chinese capital markets and Chinese market reform. In the Third Plenary Session of the Eleventh Central Committee in December 1978, Deng Xiaoping put forward a policy of reforming the domestic economy and opening China to the world. The domestic reformation is a complex and huge project that contains millions of measures and tasks to improve industrial production, education, and medical treatment, etc. The most important and fundamental goal of the reformation is to bring a market-oriented economy back to China. In a planned economy era, not only did the Chinese government determine the production of enterprises, it also established a hierarchical salary system that was applied to all of the Chinese working people. The system ranked all of the positions into dozens of tiers and stipulated the salary for each tier. For example, a company has a manager in charge of production and another manager in charge of the purchase of raw material. In a modern company, these two managers may earn different wages as the importance of these two departments may be different. In a Chinese company at that time, it was highly possible to earn the same wage as

they are ranked in the same tier. Even two managers in different companies likely earned the equal wage as the salary system was universal throughout mainland China although it was adjusted slightly according to the location and industries. Some institutions, like schools and manufacturing shops, did not have many tiers in management. They would introduce skill or seniority rating systems to rank their employees. In junior schools, except for the support crews who maintained the infrastructure of the school, all of the staff would be classified into several positions, such as principal, director of teaching and discipline, leader of the grade, and ordinary teacher. Only about ten people took the first three positions above. The remaining 100-200 staff was ranked into eight tiers based on their seniority. Similarly, in manufacturing shops, workers were ranked by their skills into eight tiers. Workers in the same tier would earn equal salaries no matter how many products they could produce in a month. While the Chinese government criticized equalitarianism for many times and attempted to apply the principle that emphasizes better pay for more work and distribution according production until 1978, piece rate pay was not widely used in Chinese factories. In a planned economy, the country runs like a machine controlled by the central government, and firms act as components of the machine. All of the managers in the Chinese firms had to be concerned about were yield and quality. They did not focus on price, costs, revenue, and profit as the Chinese government would take all the profits and cover the deficit.

After the Third Plenary Session of the Eleventh Central Committee in December 1978, a private economy sprouted in China. Although the Chinese government did not acknowledge the legitimacy of the private economy at the time, the Responsibility Contract System produced a virtual existence of a private economy in China. The system permitted some small factories and small firms to be responsible for their own profits and losses. Companies could sign contracts with governments that predetermined the yield to be delivered to the government. These companies could sell the portion that exceeded the output quota in the markets. They also needed to purchase the missing parts when production was below the output quota. Meanwhile, the government expanded the autonomy of large SOEs and increased the quota

retention of overall profits. These companies started to manage their production and sales and to distribute the profits more independently. In 1980, the state implemented the profit retention system for enterprises. A certain proportion of the total wages of the workers and staff could extract rewards from the profits. The method of counting wages by points and floating wages by piecework was also tried in some local enterprises combining the production responsibility system with economic benefits. Since the end of 1984, the contracted output quota delivered to the state has been cancelled. To replace the Responsibility Contract System, the Chinese government introduced a tax on enterprises and started taking a 55% cut of the profits of firms. The reforms above were largely regional and simply laid the groundwork for a nationwide reform of the salary system. Chinese companies did not get rid of the salary system, which is primarily age- and seniority-based, until the beginning of 1985. At this time, the state council gave the internal wage distribution rights of enterprises back to the enterprises. Under the state's macro-control and policy guidance, enterprises could independently establish their compensation system in line with their strategic requirements and their production characteristics. Although political reasons impeded the marketization reform from 1988-1992, after Deng Xiaoping's southern tour in 1992, the reform and opening-up policy has been implemented to this day. The modern enterprise compensation system continues to exist and evolve in China, and Chinese enterprises retain discretion in the independent establishment of a compensation system. It is about time that the performance of Chinese enterprises administers executive compensation directly.

In the early 1990s, the basically established market economy and capital market and the relatively liberal policies expedited the evolution both of privately-owned and state-owned companies. The modern enterprise compensation system also burgeoned in China. However, equity-based compensation has been slow to develop. In 1993, China Vanke Co. firstly started its pilot scheme of compensation containing a stock option package in China. Shanghai INESA holding group was the first state-owned enterprise to implement a stock option incentive system in 1997. Tianjin Qinda Co., Ltd. also explored the implementation of stock option incentives in 1998. Since then,

stock ownership incentives have made relatively little progress. Only a few companies implemented an equity incentive plan. This may be the reason that previous scholars did not take equity-based compensation into consideration. In 2005, the China Securities Regulatory Commission (CSRC) formally introduced Equity Incentive Management Measures (trial implementation) for listed companies stimulating equity incentives. In 2011, the number of listed companies granting stock options surpassed 100 for the first time. In May 2016, the Equity Incentive Management Measures of Listed Companies was officially implemented opening the door for equity incentives in listed companies. In that year, the number of announcements implementing equity incentives increased to 272. Equity incentives took off and, in 2017, the number soared to 447. Such a vigorous development provides me with an opportunity for my research. However, it can also be said that the development of equity incentives in China is just beginning to get on track. It is not advisable to simply apply the situation of developed countries in Europe and America to the Chinese market. To understand the effect of equity incentives on Chinese enterprises, we must do a lot of research.

The explosive growth of equity incentives does not apply to SOEs. Of the 1, 000 or so SOEs, only about 30 had granted equity incentives in 2017. Due to the special nature of state-owned enterprises, they cannot operate completely on their own as private enterprises can. There are three main restrictions on executive compensation in SOEs. First, the reform of executive compensation for SOEs is incomplete. The multiple of executive compensation relative to the average salary of employees is an important indicator in determining executive compensation of the SOEs. The hierarchical wage system of the era of the planned economy is still in partial operation. In fact, the state council still made it the goal of reform to genuinely delegate the power of internal distribution of the total payroll to enterprises in 2018, implying the SOEs' lack of autonomy in their salary system. In addition, the executive compensation system of SOEs is under strict scrutiny by society, social media, and the public (Conyon and He 2008; Adithipyangkul et al. 2011). After the Chinese Ministry of Human Resources and Social Security introduced a wage restriction policy in 2015, SOE executive compensation has decreased about 50%. Private CEOs have been paid

more than twice as much as their state-owned counterparts, in general, in many industries. Even in this situation, the public still criticizes the level of SOE executive compensation. As a result, senior managers in SOEs are prone to be paid in some indirect ways using perks including a company car, a housing allowance, travel expenses and apparel expenses, etc. Perks, which don't have to be disclosed, account for 15%-32% of the total compensation package (Adithipyangkul et al. 2011). The preference for undisclosed compensation implies executives' attitudes as to what needs to be disclosed. Finally, equity incentives of SOEs are easily labeled as "the loss of state-owned assets." Equity incentives of SOEs must be reported to the State-owned Assets Supervision and Administration Commission (SASAC). SASAC is generally very cautious about the review and filing of equity incentive programs as management of SOEs are always concerned with the safety and efficiency of state-owned assets. Thus, it is almost impossible for equity incentives to be widely applied in SOEs until the government conducts a lot of experiments to ensure the safety of state-owned assets. Based on the background above, it is difficult to obtain effective data regarding compensation and abundant data concerning equity incentives from SOEs for research.

Apart from the lack of data, there are other issues with SOEs that could affect research. The main one is the potentially poor quality of information of SOEs. SOEs are owned by the Chinese government. Listed companies are also supervised by the Chinese government. The Chinese government is acting like a player and a referee in a game. It is hard to guarantee a high quality of information disclosed to investors. Some SOEs go public to show the company as a good asset and sell it for a good price. It is hard to imagine that the CSRC will stand in the way of the SASAC. Additionally, there is pressure on domestic audit institutions (Buck et al. 2008). Moreover, due to the demand for macro policies or some special strategy targets, the government will present specific requirements for the operation of SOEs. For example, they may have to hire new employees to increase the employment rate even when their performance does not warrant this. These potential problems will impair the link between executive compensation and the firms' performance. I hope to focus my study on the listed

Non-SOEs rather than SOEs.

## 3. Data and Descriptive Statistics

### 3.1 Sample and Data Sources

I obtain the data of executives' cash compensation, fundamental accounting statistics of companies, and basic characters of executives from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. The data of location and executives' equity-based compensation comes from financial statements on CNINFO. CNINFO is a website that was developed by Shenzhen Securities Information Co., Ltd. And has been the designated information disclosure website of CSRC since 2000. Chinese listed companies are regulated to calculate the value of equity compensation using the Black-Scholes Model. The data on air quality is acquired from the China air quality online monitoring and analysis platform. The cost of living index is derived from the Per Capita Consumption Expenditure of Urban Residents (PCCEUR) that is obtained in cities' local statistical yearbooks and the Statistical Bulletin on National Economic and Social Development.

I filtered my data using following steps. First, I selected 1,501 A-Share listed non-state-owned companies that provide data in all six years from 2012-2017. In order to get rid of the influence of the government more thoroughly, I excluded companies whose top three shareholders include government institutions and reduced the sample to 1,191 companies. I further deleted companies that traded their stock for less than six months in a year and had 1,063 companies remaining. Later, I compared the headquarters addresses of these companies from 2013-2017. Companies that moved their headquarters to different cities are eliminated. I delete them as they caused two problems that adversely affected subsequent research. The first issue is that companies moving their headquarters to different cities make it harder to classify them. For example, how to classify a company that moved its' headquarters from a

smaller city to a mega city in June 2015? Neither a small city company nor a mega city company is a good fit. Another problem is that a company may change its headquarters because it was acquired. Chinese stock market adopts authorization system. The acquirer will use the stock code of the acquired public company. In this case, the company corresponding to the stock code becomes another company completely, and it is unreasonable to use its data to calculate the changes in performance and salary for later research. Next, I used the GDP and population data from the National Bureau of Statistics of China to identify mega cities. Here, I selected the top 14 cities whose GDP exceeded one trillion RMB in 2017 as mega cities. And I also added one more city, Ningbo, as its GDP is 985 billion RMB, which is really close to the standard of one trillion yuan. Then, I divided the companies into companies in mega cities and companies in smaller cities according to the location of their headquarters. I use the definition of mega cities and smaller cities rather than rural and urban areas used in prior studies due to the large Chinese population. It is hard to call a city with millions of people a rural area even though its economy may be underdeveloped. Finally, I checked their operating revenue in 2017 and deleted several companies whose data is too far away from the overall data and kept 894 companies in my sample providing 4,470 firm-year observations for my study.

### 3.2 Descriptive Statistics

I first provide a general description of the cities' GDP, population, and the number of listed Non-SOEs. There are 435 Non-SOEs in 15 mega cities. In the three biggest cities, Beijing, Shanghai, and Shenzhen, there are 223 companies. The rest of the 459 companies are distributed in 133 smaller cities. The agglomeration of listed companies is obvious in this respect. I also find that the average population of mega cities is much larger than that of smaller cities (13.71 million vs. 5.41 million). Thus, at first glance, the idea that companies in mega cities can cover more investors is valid. I labeled the mega cities in Figure 1.

**Table 1.**

Basic Statistics of Cities

| Areas | City, Province | GDP (in Billion) | Population (in Million) | Number of Listed Non-SOEs |
|---|---|---|---|---|
| Mega Cities | Shanghai | 3,013.3 | 24.18 | 60 |
| | Beijing | 2,800 | 21.71 | 83 |
| | Shenzhen, Guangdong | 2,228.6 | 10.90 | 80 |
| | Guangzhou, Guangdong | 2,150 | 14.04 | 20 |
| | Chongqing, | 1,953 | 33.72 | 7 |
| | Tianjin | 1,859.5 | 15.47 | 9 |
| | Suzhou, Jiangsu | 1,700 | 10.65 | 30 |
| | Chengdu, Sichuan | 1,389 | 15.92 | 28 |
| | Wuhan, Hubei | 1,340 | 10.77 | 12 |
| | Hangzhou, Zhejiang | 1,255.6 | 9.19 | 52 |
| | Nanjing, Jiangsu | 1,171.5 | 8.27 | 10 |
| | Qingdao, Shandong | 1,125.8 | 8.71 | 7 |
| | Wuxi, Jiangsu | 1,051.1 | 6.53 | 9 |
| | Changsha, Hunan | 1,020 | 7.65 | 13 |
| | Ningbo, Zhejiang | 985 | 7.88 | 15 |
| | Total | | 205.59 | 435 |
| | Average | | 13.71 | 29 |
| Smaller Cities | Total (133 cities) | | 718.65 | 459 |
| | Average | | 5.41 | 3.45 |

Then, I divided China into regions according to the city map, and used different colors to indicate the density of A-share listed companies in China and population density in Figures 2 and 3, respectively. This approach illustrates the agglomeration of listed Non-SOEs visually. It is not difficult to see that the three pictures have great consistency. In particular, the areas covered by the deepest color in Figure 1 and the two deepest colors in Figures 2 and 3 have a high degree of consistency. Figure 2 indicates that most listed Non-SOEs are in the eastern half of China. Similarly, Figure 3 demonstrates that most cities with a population of over 4 million are also in the eastern half of China. If I raise the standard to 10 million people, which is the classification standard adopted by the Chinese government, all the metropolises in China, except Chengdu and Chongqing, are in eastern China. These metropolises either belong to mega cities as defined by me or are around mega cities defined by me. The concentration of the population in eastern China provides crude confirmation that

Chinese companies in mega cities can spread information more quickly and widely to investors than companies in smaller cities with fewer investors around.

**Figure 1.**

Map of Mega Cities and Smaller Cities

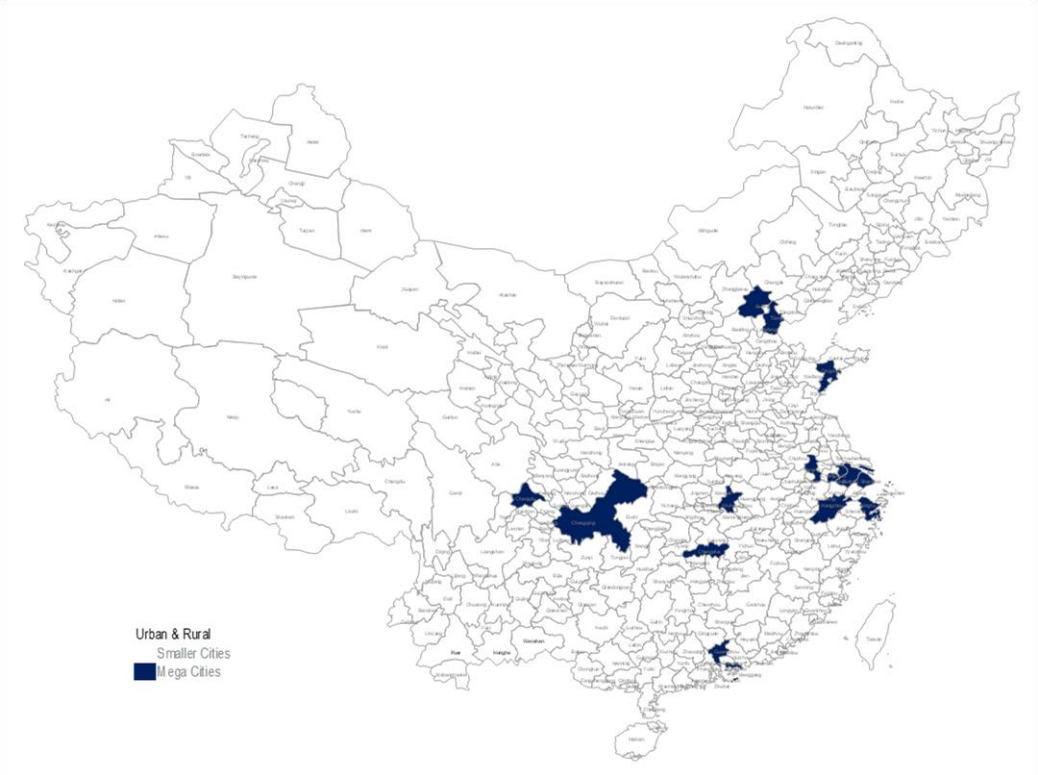


**Figure 2.**

Map of the Listed Non-SOEs in China

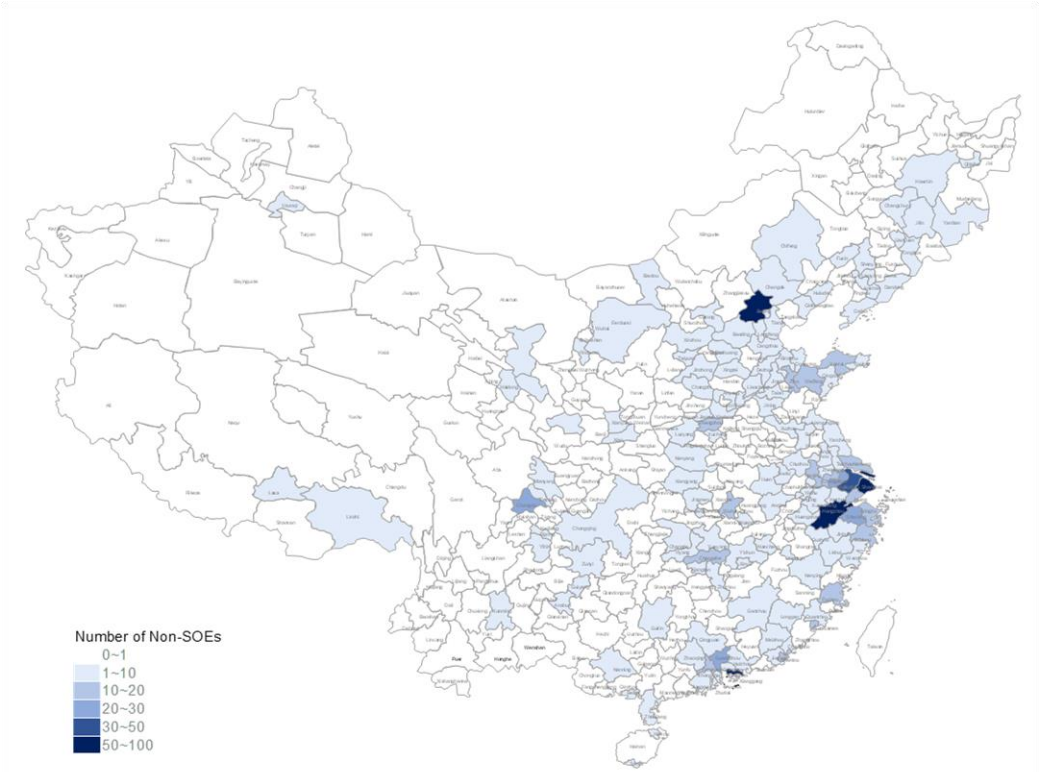
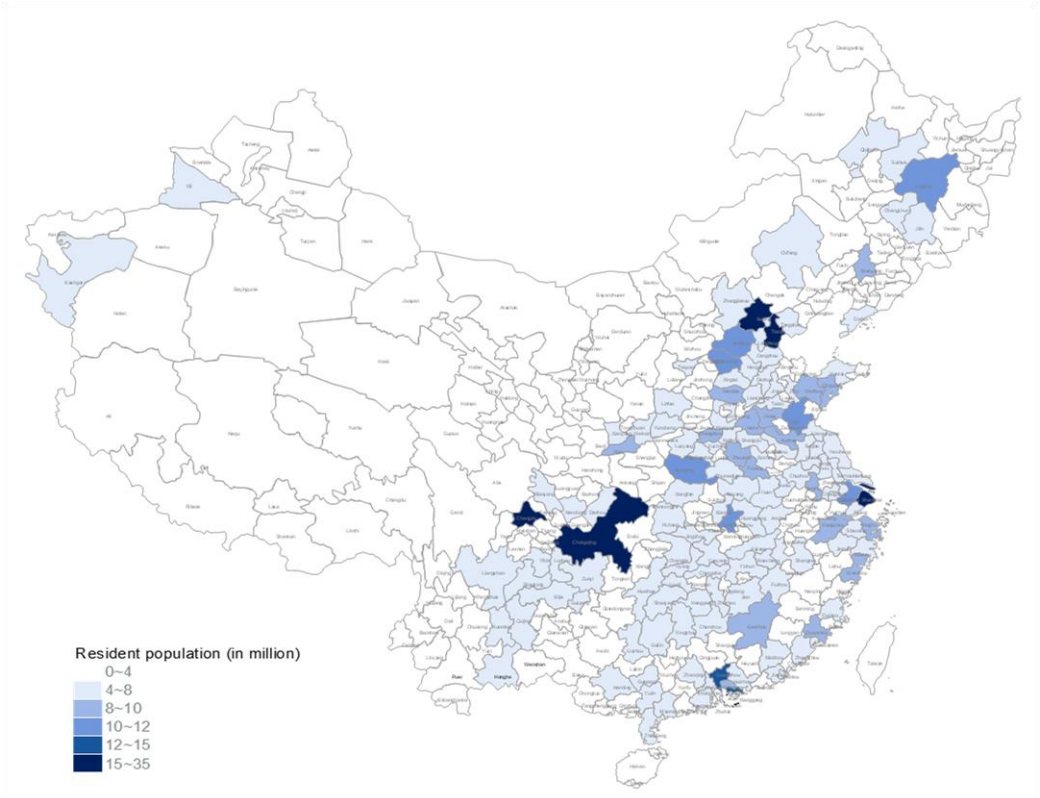



**Figure 3.**

Map of Population in China



For example, Beijing, a city of 20 million people and defined as one of the mega cities, is less than 100 kilometers away from one city of at least 15 million people, one city with population over 10 million, and three cities of at least four million people. A company establishing their headquarters in Beijing will cover more than 58 million people. Xi'an is one of the largest cities defined as smaller cities. Xi'an has a population of 9.6 million. Within a 100-kilometer radius of Xi 'an, there are two cities with a population of over four million. A Xi'an-based company will only cover about 20 million people. This difference in information dissemination provides executives in smaller cities with one of the prerequisites for more favorable salary design to themselves.

In Table 2, I present the descriptive statistics concerning my independent variables. I divide all of the data into two groups according to mega cities and smaller cities. As seen in the table, some statistical values of the independent variables of smaller cities are very close to their counterparts of mega cities. Statistics, such as total operating revenue (REV_GROWTH), return on assets (ROA), leverage (LEVERAGE), the ratio of market to book value (MKT-TO-BOOK), stock returns (STCK_RETURN), CEOs' gender (CEO GENDER), and the shareholding ratio of the largest shareholder (LARGEST_SH), show very small and insignificant gaps. The difference in air quality at headquarters' locations (AIR QUALITY) of mega cities and AIR QUALITY of smaller cities is only 2.472 but is statistically significant. The companies in mega cities only have 0.139fewer board directors, on average, but the difference is also significant. The remaining data presents more distinct and significant differences. In 32% of the companies in smaller cities, the same person holds the post of CEO and Chairman of the Board, while 37.3% of companies in mega cities have the same person as the CEO and Chairman of the Board. Enterprises in smaller cities make 3.09-billion-yuan total operating revenue (TOTAL REVENUE) in RMB, while enterprises in mega cities earn 3.35 billion yuan in RMB, on average. Similarly, enterprises in smaller cities earn 4.71 billion yuan earnings in RMB before interest, taxes, depreciation, and amortization (EBITDA), which is 8% less than the EBITDA of companies in mega cities. The total assets (TOTAL ASSETS) of

companies in smaller cities are 5.95 billion yuan in RMB. The total assets of enterprises in mega cities are 21.8% higher, reaching 7.25 billion yuan in RMB. Owners' equity (OWN_EQUITY) of companies in smaller cities is 2.82 billion yuan in RMB, 13.5% lower than that of enterprises in mega cities (3.26 billion yuan). The statistics in the cost of living index (LIV_COST_INDEX) and market value (MKT_VALUE) also show big differences. In smaller cities, the cost of living index is 114.32, but in mega cities, the number is as high as 160.766. The average market value of enterprises in smaller cities is 8.93 billion yuan in RMB, while that of enterprises in mega cities is 10.99 billion yuan in RMB. Companies in smaller cities and in mega cities also show some differences in terms of the ratio of shares held by institutional investors (INSTITUTION) and the consistency between the founder and the controller (FOUNDER). Institutional investors hold an average of 4.8% of the shares in firms in smaller cities and 5.2% of shares in firms in mega cities. In mega cities, 74.1% of the founders control their companies, while in smaller cities, only 66.9% of the founders are still in control.

**Table 2.**

Descriptive Statistics on Companies

| Variables | Smaller Cities | | Mega Cities | | Difference |
|---|---|---|---|---|---|
| | Number | Mean | Number | Mean | M-S |
| TOTAL REVENUE | 2,295 | 30.947 | 2175 | 33.502 | 2.554* |
| REV_GROWTH | 2,295 | 0.273 | 2175 | 0.288 | 0.015 |
| EBITDA | 2,295 | 4.711 | 2175 | 5.120 | 0.409* |
| TOTAL ASSETS | 2,295 | 59.488 | 2175 | 72.452 | 12.96*** |
| ROA | 2,295 | 0.078 | 2175 | 0.077 | -0.001 |
| OWN_EQUITY | 2,295 | 28.209 | 2175 | 32.614 | 4.405*** |
| LEVERAGE | 2,295 | 0.028 | 2175 | 0.030 | 0.002 |
| MKT_VALUE | 2,295 | 89.274 | 2175 | 109.923 | 20.649*** |
| MKT-TO-BOOK | 2,295 | 5.140 | 2175 | 5.486 | 0.346 |
| STCK_RETURN | 2,295 | 0.127 | 2175 | 0.132 | 0.005 |
| LIV_COST_INDEX | 2,295 | 114.320 | 2175 | 160.766 | 46.446*** |
| AIR QUALITY | 1,836 | 84.578 | 1740 | 87.050 | 2.472*** |
| CEO GENDER | 2,295 | 0.071 | 2175 | 0.072 | -0.001 |
| FOUNDER | 2,295 | 0.669 | 2175 | 0.741 | 0.071*** |
| CEO&CHAIR | 2,295 | 0.320 | 2175 | 0.373 | 0.053*** |

| | | | | | |
|---|---|---|---|---|---|
| LARGEST_SH | 2,295 | 0.312 | 2175 | 0.318 | 0.005 |
| INSTITUTION | 2,295 | 0.048 | 2175 | 0.052 | 0.004*** |
| NUM_DIRECTORS | 2,295 | 8.260 | 2175 | 8.121 | -0.139*** |

TOTAL REVENUE is defined as the total operating revenue. REV_GROWTH is the growth rate of a company's total operating revenue. EBITDA is the earnings before interest, taxes, depreciation, and amortization. Chinese companies do not provide this statistic in their financial statements. I use the formula EBITDA = Net Profit + Interest Expense +Income Tax +Depreciation + Amortization to calculate the data. ROA is the EBITDA divided by TOTAL ASSETS. OWN_EQUITY represents the owners' equity. LEVERAGE is the long-term debt divided by TOTAL ASSETS. MKT-TO-BOOK is the market value (MKT_VALUE) divided by the book value. STCK_RETURN is the stock return of the year before the financial statements. LIV_COST_INDEX is the cost of living index of 147 cities where 894 Non-SOEs are located. AIR QUALITY is calculated based on the average of the air pollution indices for each day of the year. CEO GENDER is the dummy variable set equal to one if the CEO is a female and zero otherwise. The value of FOUNDER is one when the founder is the same as the controller and zero otherwise. CEO&CHAIR is a dummy variable set equal to one if the CEO and the Chairman of the Board is the person and zero otherwise. LARGEST_SH stands for the shareholding ratio of the largest shareholder. INSTITUTION is the proportion of shares held by institutional investors. NUM_DIRECTORS is the number of directors of a company.

*, **, and *** stand for statistical significance at 10%, 5%, and 1% levels, respectively.

Table 3 reports the descriptive statistics on executives' compensation after winsorizing them at 1% level to avoid the influence of outliers. Due to the limitations of database used in this study, I had to choose the top three executives' cash compensation of each company at first. Then, I retrieved these executives' equity compensation and calculated their total compensation. The data of equity compensation is collected from the announcements of equity incentives plans. The value of equity compensation is calculated based on the Black-Scholes Model. This method is admissible by CSRC. Although the figure would differ from the actual top three executives' earnings, it will be valid given that executives with relatively high cash compensation also tend to have relatively high equity incentives. I will use CEO compensation in the robustness check to ensure the reliability of my study.

In this table, I find that executives in mega cities earn more in total compensation, equity compensation, and cash compensation than executives in smaller cities. The top three executives in mega cities earn 2,672,000 yuan in total, 391,000 yuan in equity, and 2,282,000 yuan in cash a year, while their counterparts in smaller cities earn 1,895,000 yuan (29.08% less), 260,000 yuan (33.50% less), and 1,635,000 yuan (28.35% less). After I adjusted their compensation by the cost of living index shown in Panel B, the gap narrowed considerably. I deflated compensation one by one

according to the annual price index for each city. The results presented in Panel C show the dramatically reduced gaps. Executives in smaller cities become overpaid by 2.69% in total compensation and 3.79% in cash compensation, but are still underpaid 3.67% in equity compensation. The differences in all three kinds of compensation become statistically insignificant and decrease dramatically.

Although the differences in compensation narrow after the adjustment, I still find that executives in mega cities earn more in equity-based compensation. This gap reflected in the compensation structure is about 0.9% and is small, but significant (e.g., shown in Panel D). Prior to the adjustment, the proportion of cash income of executives in smaller cities is 0.88% higher than that of executives in mega cities. After the adjustment, the difference becomes 0.91%. The result is in line with previous expectations that management in smaller cities can exert greater influence on the design of their compensation structure to increase the share of cash compensation that is more stable and low risk. However, this evidence alone cannot strongly prove that executives in smaller cities exert greater influence on their compensation structure. I conduct more empirical tests in the next section.

**Table 3.**

Descriptive Statistics on Compensation

Panel A Compensations

| | Smaller Cities | Mega Cities | Difference (S-M) | P-value |
|---|---|---|---|---|
| Number | 2,295 | 2,175 | | |
| Total Compensation (000s) | 1,895 | 2,672 | -777 (-29.08%) | 0 *** |
| Cash Compensation (000s) | 1,635 | 2,282 | -647 (-28.35%) | 0 *** |
| Equity Compensation (000s) | 260 | 391 | -193 (-33.50%) | 0 *** |

Panel B Living Cost Index

| | Smaller Cities | Mega Cities | Difference (S-M) | P-value |
|---|---|---|---|---|
| Number | 2,295 | 2,175 | | |
| Living Cost Index | 114.32 | 160.77 | -46.45 | 0 *** |

Panel C Compensation Adjusted by Living Cost Index (One-to-one correspondence)

| | Smaller Cities | Mega Cities | Difference (S-M) | P-value |
|---|---|---|---|---|
| Number | 2,295 | 2,175 | | |

| | | | | |
|---|---|---|---|---|
| Total Compensation (000s) | 1,716 | 1,671 | 45 (2.69%) | 0.367 |
| Cash Compensation (000s) | 1,480 | 1,426 | 54 (3.79%) | 0.133 |
| Equity Compensation (000s) | 236 | 245 | -9 (3.67%) | 0.778 |

Panel D Proportion of Compensation

| | Smaller Cities | Mega Cities | Difference (S-M) | P-value |
|---|---|---|---|---|
| Number | 2,295 | 2,175 | | |
| Total Compensation (000s) | 100% | 100% | 0% | |
| Cash Compensation (000s) | 86.28% | 85.40% | 0.88% | 0.01 *** |
| Equity Compensation (000s) | 13.72% | 14.60% | -0.88% | 0.01 *** |
| Number | | | | |
| Ad Total Compensation (000s) | 100% | 100% | 0% | |
| Ad Cash Compensation (000s) | 86.25% | 85.34% | 0.91% | 0.01 *** |
| Ad Equity Compensation (000s) | 13.75% | 14.66% | -0.91% | 0.01 *** |

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

## 4. Empirical Results

The descriptive results above have broadly shown differences in executive pay structures between mega cities and smaller cities indicating that executives in smaller cities use their power to earn a higher proportion of cash compensation. In this section, I conduct empirical research on the mechanism behind executive compensation and to understand the structure of executive compensation more deeply.

First, I calculate the correlation of the variables used in my regression model. Because cash compensation and equity compensation are highly correlated with total compensation, Table 4 just reports the results of the correlation based on total compensation for the sake of brevity. I find that with the exception of two variables, the AREAS variables and LIV_COST_INDEX variables are strongly correlated. None of the other variables show a strong correlation. These two variables are essential to my empirical research. Therefore, I decided to adjust executive compensation by LIV_COST_INDEX (cost of living index) first and then carry out a regression analysis on AREAS.

**Table. 4**

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LN (TOTAL_COM) | 1 | | | | | | | | | | | | | | |
| LN (TOTAL _REV) | 0.44*** | 1 | | | | | | | | | | | | | |
| AREAS | -0.21*** | -0.03* | 1 | | | | | | | | | | | | |
| LIV_COST_INDEX | 0.24*** | 0.06*** | -0.73*** | 1 | | | | | | | | | | | |
| ROA | 0.15*** | 0.20*** | 0.02 | -0.01 | 1 | | | | | | | | | | |
| LEVERAGE | 0.15*** | 0.20*** | -0.03* | 0.03 | -0.10*** | 1 | | | | | | | | | |
| MKT-TO-BOOK | -0.06*** | -0.14*** | -0.01 | -0.01 | -0.49*** | -0.04** | 1 | | | | | | | | |
| STCK_RETURN | -0.07*** | -0.12*** | -0.00 | 0.01 | 0.03 | -0.03* | 0.02 | 1 | | | | | | | |
| AIR QUALITY | -0.05*** | 0.03 | -0.06*** | -0.06*** | 0.02 | -0.01 | -0.01 | -0.03* | 1 | | | | | | |
| CEO GENDER | -0.01 | -0.01 | -0.00 | -0.00 | -0.01 | -0.02 | -0.01 | 0.00 | 0.04** | 1 | | | | | |
| FOUNDER | -0.07*** | -0.06*** | -0.08*** | 0.09*** | 0.07*** | -0.21*** | -0.05*** | -0.04** | 0.01 | 0.01 | 1 | | | | |
| LARGEST_SH | 0.03* | 0.17*** | -0.02 | 0.01 | 0.11*** | -0.05*** | -0.04** | -0.01 | -0.00 | 0.01 | 0.06*** | 1 | | | |
| CEO&CHAIR | -0.02 | -0.10*** | -0.06*** | 0.08*** | -0.02 | -0.06*** | -0.01 | 0.01 | -0.11*** | -0.06*** | 0.11*** | 0.03* | 1 | | |
| INSTITUTION | 0.06*** | 0.06 | 0.11*** | -0.03* | 0.03* | 0.02 | 0.14*** | 0.00 | 0.07*** | -0.01 | -0.05*** | -0.07*** | -0.03* | 1 | |
| NUM_DIRECTOR | 0.11*** | 0.19*** | 0.05*** | -0.05*** | 0.07*** | 0.02 | -0.03* | -0.03* | 0.10*** | -0.06*** | -0.07*** | -0.01 | -0.17*** | 0.01 | 1 |

Correlation matrix

LN (TOTAL_COM) is the natural log of executive total compensation. LN (TOTAL _REV) represents the log of the total operating revenue. AREAS is a dummy variable set equal to one if the company locates in a

smaller city and zero otherwise. LIV_COST_INDEX is the cost of living index of 147 cities where 894 Non-SOEs are located. ROA is the EBITDA divided by the total assets. LEVERAGE is the long-term debt divided by the total assets. MKT-TO-BOOK is the market value divided by the book value. STCK_RETURN is the stock return of the year before the financial statements. AIR QUALITY is calculated based on the average of the air pollution indices for each day of the year. CEO GENDER is a dummy variable set equal to one if the CEO is a female and zero otherwise. The value of FOUNDER is one when the founder is the same as the controller and zero otherwise. LARGEST_SH stands for the shareholding ratio of the largest shareholder. CEO&CHAIR is a dummy variable set equal to one if the CEO and the Chairman of the Board is the same person and zero otherwise. INSTITUTION is the proportion of shares held by institutional investors. NUM_DIRECTORS is the number of directors of a company.

### 4.1 Basic Executives' Compensation Regression

I adopt an Ordinary Least Squares (OLS) regression below to determine the basic relationship between executive compensation and geography

$$\begin{aligned} LN(COMPENSATION) = \beta_0 + \beta_1 * LN(TOTAL\_REV) + \beta_2 * AREAS + \beta_3 * ROA \\ + \beta_4 * LEVERAGE + \beta_5 * MKT\text{-}TO\text{-}BOOK + \beta_6 * EC \\ OR\ NOT + \varepsilon \end{aligned} \quad (1)$$

I use the natural log of executive compensation, which is widely used in the literature (Firth et al. 2006; Harford and Li 2007; Conyon and He 2011; Bhabra and Hossain 2018) including total compensation, cash compensation, and equity compensation, as my dependent variables. As the equity compensation may equal to zero, I add a value of one to ensure the availability of the natural log. LN(TOTAL_REV) is the natural log of total operating revenue for each company. AREAS is a dummy variable set equal to one if the headquarters of company is located in a smaller city and zero otherwise. ROA, LEVERAGE, and MKT-TO-BOOK are the same as the previous definition. ROA is EBITDA divided by total assets. LEVERAGE is long-term debt divided by total assets. MKT-TO-BOOK is the market value divided by the book value. EC OR NOT is a dummy variable that takes a value of one when the top three executives are given equity incentives and zero otherwise. As equity-based compensation did not become a regular form of compensation paid to executives by Chinese listed companies until 2017, many instances of equity compensation are zero. Equity compensation cannot be less than zero. Hence, I use a Tobit model to conduct regressions on equity compensation.

Table 5 reports the results for the regressions on total compensation, cash compensation, and equity compensation in Columns (1), (2), and (3), respectively. The results indicate that a company's operating revenue is positively related to the executives' total compensation, cash compensation, and equity compensation. When companies earn more operating revenue, they will pay more to their executives.

Analogously, a higher return on assets will prominently lead to greater compensation of all kinds. These results are consistent with the results in other articles focusing on the Chinese market (Conyon and He 2011; Firth et al. 2006).

**Table 5.**

Basic Executives' Compensation Regression

| | (1) | (2) | (3) |
|---|---|---|---|
| | LN(TOTAL_COM) | LN(CASH_COM) | LN(EQUITY_COM+1) |
| LN(TOTAL_REV) | 0.235 | 0.239 | 1.816 |
| | [30.2370]*** | [32.1832]*** | [2.7536]*** |
| AREAS | -0.245 | -0.262 | -4.814 |
| | [-13.4546]*** | [-15.1005]*** | [-3.2846]*** |
| ROA | 1.081 | 1.074 | 45.216 |
| | [7.7765]*** | [8.0931]*** | [3.4563]*** |
| LEVERAGE | 0.369 | 0.363 | -8.285 |
| | [2.0763]** | [2.1389]** | [-0.5541] |
| MKT-TO-BOOK | 0.0015 | 0.0015 | 0.005 |
| | [3.2299]*** | [3.3221]*** | [0.0695] |
| EC OR NOT | 1.036 | 0.022 | |
| | [34.1281]*** | [0.7755] | |
| Constant | 9.722 | 9.568 | -69.311 |
| | [46.2347]*** | [47.6789]*** | [-4.0187]*** |
| Industry dummies | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes |
| Observations | 4,470 | 4,470 | 4,470 |
| R-squared | 0.434 | 0.339 | |

LN (TOTAL_COM), LN(CASH_COM), and LN(EQUITY_COM+1) are the natural logs of executives' total compensation, cash compensation, and equity compensation, respectively. LN (TOTAL _REV) represents the natural log of the total operating revenue. AREAS is a dummy variable set equal to one if the company is located in smaller cities and zero otherwise. ROA is EBITDA divided by total assets. LEVERAGE is long-term debt divided by total assets. MKT-TO-BOOK is the market value divided by the book value. EC OR NOT is a dummy variable that takes a value of one when the top three executives are given equity incentives and zero otherwise.

For Columns (1) and (2), I use t-statistics to indicate significance. For Columns (3), I use z-statistics as the indicator.

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Common sense dictates that larger and better performing companies tend to pay their management more. AREAS is negatively associated with all kinds of executive compensation as predicted. In other words, companies in smaller cities will pay less compensation to their executives. The data is in accord with the summary statistics in

Table 3 implying that the effects of areas primarily come from the differences in the cost of living of each city. I also find that LEVERAGE and MKT-TO-BOOK have a positive effect on executives' total and cash compensation. Table 2 reports that the average leverage ratio of firms in my sample is only 0.028 and more than 50% of the sample has zero leverage. I infer that higher leverage at this low overall level represents better track records and greater strength of companies. A higher market-to-book ratio often means more growth potential. It is intuitive to expect that companies with higher leverage and market-to-book ratios may perform better and pay more to their executives. EC OR NOT is a control variable to indicate the equity compensation grants. Equity incentives constitute about 18% of the compensation of the top three executives. It is natural to observe the significance of EC OR NOT.

### 4.2 Executives' Compensation Regression Controlling for Living Cost Index

To estimate the effect of geography, I must eliminate the effect of the cost of living on executive compensation. The variable LIV_COST_INDEX is based on the following steps. First, I collect the PCCEUR from cities' local statistical yearbooks and the Statistical Bulletin on National Economic and Social Development of each city from 2013-2017. For several cities that did not publish complete data, I estimate the missing data based on past data and growth rates or chose data from neighboring cities or provincial averages data to substitute. Then, I calculate the median of the PCCEUR for every year and use the results as a benchmark for every year. The indices of the benchmark were set as 100. Finally, I divide the PCCEUR of each city by the median of PCCEUR of the same year and multiply it by 100 to derive the cost of living index. However, I cannot add the variable LIV_COST_INDEX into the model directly as it is highly correlated with the variable AREAS. Thus, I adjust compensation with LIV_COST_INDEX as the adjusted compensation and take the natural logarithm of the adjusted compensation as the dependent variable. LN (ADJUSTED TOTAL_COM), LN (ADJUSTED CASH_COM), and LN (ADJUSTED EQUITY_COM+1) are the natural log of executives' adjusted total compensation,

cash compensation, and equity compensation, respectively. As in Equation (1), I also add the value one to ensure the availability of the natural log of the adjusted equity compensation. Then, I use the regression model below to examine the relationship between the companies' location and executive compensation:

$$\text{LN(ADJUSTED COMPENSATION)} = \beta_0 + \beta_1 * \text{LN(TOTAL\_REV)} + \beta_2 * \text{AREAS} + \beta_3 * \text{ROA} + \beta_4 * \text{LEVERAGE} + \beta_5 * \text{MKT-TO-BOOK} + \beta_6 * \text{EC OR NOT} + \varepsilon \quad (2)$$

**Table 6.**

Controlling for the Living Cost Index

| | (1) | (2) | (3) |
|---|---|---|---|
| | LN (ADJUSTED TOTAL_COM) | LN (ADJUSTED CASH_COM) | LN (ADJUSTED EQUITY_COM+1) |
| LN(TOTAL_REV) | 0.224 | 0.228 | 1.778 |
| | [28.0636]*** | [29.8884]*** | [2.7567]*** |
| AREAS | 0.100 | 0.083 | -4.616 |
| | [5.3584]*** | [4.6363]*** | [-3.2199]*** |
| ROA | 1.137 | 1.129 | 44.186 |
| | [7.9732]*** | [8.2991]*** | [3.4525]*** |
| LEVERAGE | 0.389 | 0.383 | -8.007 |
| | [2.1339]** | [2.1997]** | [-0.5476] |
| MKT-TO-BOOK | 0.002 | 0.002 | 0.005 |
| | [3.4822]*** | [3.5874]*** | [0.0714] |
| EC OR NOT | 1.024 | 0.011 | |
| | [32.9211]*** | [0.3658] | |
| Constant | 9.442 | 9.288 | -67.903 |
| | [43.8041]*** | [45.1429]*** | [-4.0240]*** |
| Industry dummies | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes |
| Observations | 4,470 | 4,470 | 4,470 |
| R-squared | 0.3829 | 0.2777 | |

Adjusted LN(TOTAL_COM), Adjusted LN(CASH_COM), and Adjusted LN(EQUITY_COM+1) are the natural log of executives' adjusted total compensation, cash compensation, and equity compensation, respectively. For Columns (1) and (2), I use t-statistics to indicate the significance. For Column (3), I use z-statistics as the indicator.

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

In order to eliminate the effects of outliers, I use Studentized Residuals and Cook's

Distance to select the outliers. I delete all of the outliers and rerun the regression. For brevity, I only demonstrate the results of the regression on LN (ADJUSTED TOTAL_COM) after checking for outliers in Table 6.1. I find that the significance of the variables remains almost the same. Only MKT-TO-BOOK becomes insignificant after deleting the outliers. MKT-TO-BOOK is not the focus of my study, and its coefficient is very small. I find that outliers have little impact on the results and do not change my conclusions. I also have rerun the tests by excluding cities with missing data and the results are still the same. Thus, I still use the original data to continue my study.

Table 6 reports the results for Equation (2). Except AREAS, the relationship between all of the independent variables and the dependent variables remains basically the same as that in Equation (1). The relation between AREAS and executive compensation changes dramatically compared to the results in Equation (1). After I adjust executive compensation by the cost of living, the location of a firm's headquarters has a positive relation with adjusted total compensation and adjusted cash compensation, but still remains negatively related to adjusted equity compensation. To be more precise, smaller cities no longer represent lower total compensation and cash compensation. When I take the cost of living into consideration, companies in smaller cities pay more compensation in total and more cash compensation to their senior management. Companies in smaller cities still pay less equity compensation to their executives after the adjusting for the cost of living. Executives in smaller cities are granted more compensation in total, while less compensation in equity. The proportion of equity compensation to the total compensation of executives in smaller cities is low. This is consistent with the statistics in Table 3 that equity compensation accounts for 13.75% of the compensation of executives in smaller cities, while it's 14.66% of the compensation of executives in mega cities. It is also consistent with the previous prediction that executives in smaller cities face weaker supervision from shareholders giving them greater power to design compensation systems that include more cash, which is more stable and less risky.

**Table 6.1.**

Checking for outliers by Studentized Residuals and Cook's D

| | (1) | (2) |
|---|---|---|
| | LN (ADJUSTED TOTAL_COM) | LN (ADJUSTED TOTAL_COM) |
| | (Studentized Residuals) | (Cook's D) |
| LN(TOTAL_REV) | 0.211 | 0.208 |
| | [26.1410] *** | [26.3161] *** |
| AREAS | 0.085 | 0.085 |
| | [4.7333] *** | [4.9666] *** |
| ROA | 1.323 | 1.652 |
| | [8.9143] *** | [10.4250] *** |
| LEVERAGE | 0.533 | 0.313 |
| | [3.0554] *** | [1.8197] * |
| MKT-TO-BOOK | -0.001 | -0.001 |
| | [-0.2416] | [-0.3567] |
| EC OR NOT | 0.9615 | 0.945 |
| | [31.9890] *** | [32.1861] *** |
| Constant | 9.605 | 9.743 |
| | [44.2770] *** | [38.7467] *** |
| Industry dummies | Yes | Yes |
| Year dummies | Yes | Yes |
| Observations | 4,433 | 4,216 |
| R-squared | 0.3883 | 0.4115 |

*, **, and *** represent statistical significance at 10%, 5%, and 1% levels, respectively.

### 4.3 Executives' Compensation Regression Controlling for Management

In this section, I introduce managerial factors into my model to control for their effects on executive compensation. All of the managerial factors include management quality (STCK_RETURN), CEOs' gender (CEO GENDER), founder/controller duality (FOUNDER), CEO/Chairman of the Board duality (CEO&CHAIR), shareholding ratio of the largest shareholder (LARGEST_SH), shareholding ratio of the institutional investors (INSTITUTION), and the number of directors of a company (NUM_DIRECTOR).

### 4.3.1 Controlling for Management Quality

In general, I predict that higher management quality will intuitively increase executive compensation. Thus, I add this factor into my model to eliminate its effect. Chinese privately-owned enterprises and companies with foreign investors tend to use stock returns as a measure of performance (Firth et al. 2006). Bergh and Gibbons (2011) find that companies publicly hiring management consultants that are considered as the method to improve management quality will achieve higher stock returns. Demerjian, Lev, and McVay (2012) and Demerjian, Lev, Lewis, and McVay (2013) consider historical stock returns as a measure of managerial ability. As such, I define management quality as the prior year's stock returns (STCK_RETURN) rather than other common indicators like net profits and EBITDA. STCK_RETURN is the stock closed price at the end of the prior year divided by the stock opening price on the first trading day of the prior year. Then, I use the following model to conduct the regression:

$$\begin{aligned} \text{LN(ADJUSTED COMPENSATION)} = {} & \beta_0 + \beta_1 * \text{LN(TOTAL\_REV)} + \beta_2 * \text{AREAS} \\ & + \beta_3 * \text{ROA} + \beta_4 * \text{LEVERAGE} + \beta_5 * \\ & \text{MKT-TO-BOOK} + \beta_6 * \text{STCK\_RETURN} + \beta_7 * \text{EC} \\ & \text{OR NOT} + \varepsilon \end{aligned} \quad (3)$$

Table 7 reports the results for Equation (3). I do not find a significant relationship between management quality and adjusted total compensation or adjusted cash compensation. For adjusted equity compensation, management quality is statistically significant at the 10% level. The insignificance of management quality implies that Chinese listed Non-SOEs do not pay their executives cash compensation and compensation in total based on their management quality. Nonetheless, better management quality does not lead to greater equity compensation as expected. The data on equity compensation are manually collected from announcements of listed companies. I observe all of the announcements of equity and option incentive plans

and notice that equity grants are meant to motivate executives in most situations as most of these equity and option plans set performance growth targets in advance. That is, companies are prone to set up equity incentive plans when they are performing poorly to motivate executives to work harder, rather than to set up plans to reward executives when they are performing well. I conjecture that the purpose of equity issuance is mainly to encourage rather than reward. Meanwhile, the data of equity compensation is not the actual amount paid out to executives, but the planned rewards to executives due to defects in database and information disclosure of Chinese listed companies. This statistic does not reflect the performance after the announcement of issuing equity incentives. Hence, it is reasonable that there is a negative relation between management quality and equity compensation instead of the previously predicted positive relation.

**Table 7.**

Controlling for Management Quality

| | (1) | (2) | (3) |
|---|---|---|---|
| | LN (ADJUSTED TOTAL_COM) | LN (ADJUSTED CASH_COM) | LN (ADJUSTED EQUITY_COM+1) |
| LN(TOTAL_REV) | 0.224 | 0.228 | 1.725 |
| | [28.068]*** | [29.7823]*** | [2.6753]*** |
| AREAS | 0.100 | 0.083 | -4.580 |
| | [5.3572]*** | [4.6363]*** | [-3.1962]*** |
| ROA | 1.133 | 1.132 | 45.493 |
| | [7.9190]*** | [8.2906]*** | [3.5464]*** |
| LEVERAGE | 0.387 | 0.384 | -7.198 |
| | [2.1219]** | [2.2060]** | [-0.4922] |
| MKT-TO-BOOK | 0.0016 | 0.0016 | 0.012 |
| | [3.4532]*** | [3.5951]*** | [0.1746] |
| STCK_RETURN | 0.0063 | -0.0043 | -2.470 |
| | [0.3393] | [-0.2409] | [-1.6969]* |
| EC OR NOT | 1.025 | 0.011 | |
| | [32.9147]*** | [0.3590] | |
| Constant | 9.438 | 9.290 | -67.425 |
| | [43.7388]*** | [45.1022]*** | [-3.9956]*** |
| Industry dummies | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes |

| | | | |
|---|---|---|---|
| Observations | 4,470 | 4,470 | 4,470 |
| R-squared | 0.3829 | 0.2777 | |

STCK_RETURN is the stock return of the year before the financial statements. It is equal to the stock closed price at the end of the prior year divided by the stock opening price on the first trading day of the prior year.

For Columns (1) and (2), I use t-statistics to indicate the significance. For Column (3), I use z-statistics as the indicator.

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

### 4.3.2 Controlling for the Characters of Directors and Executives

In this section, I add several variables to control for the effects of the character of directors and executives on executive compensation. First, I introduce the gender of the CEOs into my model as Chinese female CEOs may earn less compensation than Chinese male CEOs (Chen, Ezzamel, and Cai 2011; Lam et al. 2013). Then, I choose founder as an independent variable. Founders who are also controllers of companies may despise incentive compensation and pay less of it to executives. He (2008) finds that founder-CEOs do not pay themselves total compensation and incentive compensation as much as professional managers. Thus, I predict that the same person who is a founder and a controller of a company will decrease executive compensation. Next, I include CEO and chairman duality into the model. When the CEO and the chairman is the same person in a firm, the CEO is likely to be less supervised by the board and develop a compensation system more favorable to themselves. The number of board members works in a similar way. Fewer directors on the board of directors will be unable to supervise the executives properly. Therefore, I hypothesize the same person serving as both CEO and chairman and smaller boards will increase executive compensation. I do not use the number of independent directors in my model as other scholars do in their papers because the number of independent directors in China is meaningless. CSRS asks listed companies to include at least 33% independent directors on their boards. Then, almost every listed companies appoint three independent directors to their boards to reach the standard. As a result, this number cannot indicate the supervisory effect in China. I run the model below:

$$LN(ADJUSTED\ COMPENSATION) = \beta_0 + \beta_1 * LN(TOTAL\_REV) + \beta_2 * AREAS$$

$$+ \beta_3 * ROA + \beta_4 * LEVERAGE + \beta_5 * MKT\text{-}TO\text{-}BOOK + \beta_6 * STCK\_RETURN + \beta_7 * CEO\ GENDER + \beta_8 * FOUNDER + \beta_9 * CEO\&CHAIR + \beta_{10} * NUM\_DIRECTOR + \beta_{11} * EC\ OR\ NOT + \varepsilon \quad (4)$$

There are four new variables in total: CEO GENDER, FOUNDER, CEO&CHAIR, and NUM_DIRECTOR. CEO GENDER is a dummy variable set equal to one if the CEO is a female and zero otherwise. The value of FOUNDER is one when the founder is the same as the controller and zero otherwise. CEO&CHAIR is equal to one when the CEO is also the chairman of the board of director and zero otherwise. NUM_DIRECTORS is the number of directors of a company.

The Table 8 demonstrates the results of Model (4). I find that the gender of CEOs and the duality of CEO/chairman do not have a significant effect on executives' pay. Founder/controller duality and the number of directors have a significant relation with executive compensation. However, both do not work as predicted. The same person who is both a founder and the controller of a firm will decrease executives' total and cash compensation, while increasing equity compensation. One possible explanation for the effect of FOUNDER is that when a founder is also the controller of the firm, they often also hold the position of CEO or their successor becomes the CEO. In both situations, CEOs do not need to be paid as much as professional managers because it is pointless to pay themselves with their own money. Alternatively, they do not need money to stimulate themselves to run the business more industriously. However, founders hope to maintain their control of the company or gradually hand over control to their heirs. Equity compensation can increase their shareholdings to maintain this control. They can also use equity compensation to transfer their control to their successors. As a result, they prefer equity compensation to cash compensation. As for the number of directors, it is positively related to executives' total and cash compensation although slightly. It is at odds with the studies of Firth et al. (2007) and Conyon and He (2011). The results of these two studies do not agree with each other. The function of the board on executive compensation needs to be further studied. I

conjecture that the result is related to the inefficient supervision of boards and the relation between board size and company size. Larger boards may lead directors to pass the buck. Moreover, larger companies tend to have bigger boards and pay more to their executives. Chinese listed companies must have at least seven directors on their boards. In my data sample, more than 80% of the companies choose to set boards less than or equal to nine. I infer that nine members boards do not exert much more pressure on executive compensation than seven members boards despite the fact that larger boards can reinforce the monitoring of executives. Since a company must have a board with more than nine people, it is prone to be larger and the effect of company size may surpass the effect of board size leading to a positive relation between board size and executive compensation. Hence, I further replace the NUM_DIRECTOR variable with the LARGE_BD variable and rerun the regression.

**Table 8.**

Controlling for the Character of Directors and Executives

| | (1) | (2) | (3) |
|---|---|---|---|
| | LN (ADJUSTED TOTAL_COM) | LN (ADJUSTED CASH_COM) | LN (ADJUSTED EQUITY_COM+1) |
| LOG(TOTAL_REV) | 0.216 | 0.220 | 2.046 |
| | [26.5981]*** | [28.3690]*** | [3.0981]*** |
| AREAS | 0.090 | 0.075 | -4.042 |
| | [4.7954]*** | [4.1810]*** | [-2.8101]*** |
| ROA | 1.113 | 1.113 | 45.810 |
| | [7.8034]*** | [8.1719]*** | [3.5227]*** |
| LEVERAGE | 0.348 | 0.365 | -1.784 |
| | [1.8972]* | [2.0890]** | [-0.1208] |
| MKT-TO-BOOK | 0.0015 | 0.0016 | 0.024 |
| | [3.2311]*** | [3.4335]*** | [0.3777] |
| STCK_RETURN | 0.002 | -0.007 | -2.023 |
| | [0.0996] | [-0.4062] | [-1.3969]* |
| CEO GENDER | -0.009 | -0.013 | -1.004 |
| | [-0.2552] | [-0.4014] | [-0.3759] |
| FOUNDER | -0.075 | -0.055 | 6.512 |
| | [-3.5420]*** | [-2.7016]*** | [3.7187]*** |
| CEO&CHAIR | 0.028 | 0.039 | -0.976 |
| | [1.4570] | [2.1290] | [-0.6644] |
| NUM_DIRECTOR | 0.030 | 0.030 | -0.656 |

| | | | |
|---|---|---|---|
| | [4.7928]*** | [5.1335]*** | [-1.3976] |
| EC OR NOT | 1.035 | 0.019 | |
| | [33.2949]*** | [0.6364] | |
| Constant | 9.362 | 9.193 | -68.863 |
| | [43.1815]*** | [44.4183]*** | [-4.0181]*** |
| LARGE_BD | 0.174 | 0.169 | -3.931 |
| | [4.7993]*** | [4.8871]*** | [-1.3648] |
| Industry dummies | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes |
| Observations | 4,470 | 4,470 | 4,470 |
| R-squared | 0.3881 | 0.2837 | |

CEO GENDER is a dummy variable set equal to one if the CEO is a female and zero otherwise. The value of FOUNDER is one when the founder is the same as the controller and zero otherwise. CEO&CHAIR is a dummy variable set equal to one if the CEO and the Chairman of the Board is the same person and zero otherwise. NUM_DIRECTORS is the number of directors of a company. LARGE_BD is a dummy variable set equal to one if the board size is greater than the median and zero otherwise.
For Columns (1) and (2), I use t-statistics to indicate the significance. For Column (3), I use z-statistics as the indicator.
*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Because the results of the new regression change very little, and for brevity, I add the coefficients of LARGE_BD to the end of the Table 8. I find that LARGE_BD is significantly positively related to executive compensation. The results imply that companies whose board size is greater than median will pay more to their executives, supporting my conjecture.

### 4.3.3 Executive Compensation Regression Controlling for Ownership

Ownership is also a common factor affecting executive pay. Many Chinese studies find that executives of Non-SOEs are paid more than those of SOEs. Considering that I have chosen Non-SOEs as my sample data, I introduce the shareholding ratio of the largest shareholder (LARGEST_SH) and the proportion of shares held by institutional investors (INSTITUTION) into my regression model.

Large shareholders are a double-edged sword to the agency problem as they have greater influence on management to reduce the conflict of interest between managers and shareholders and, at the same time, as better monitors will impede incentive plans (Burkart, Gromb, and Panunzi 1997). Bhabra and Hossain (2018) find that large

shareholders will exacerbate the agency problem and damage the structure of executive compensation. I think equity compensation will erode the control of large shareholders, which they do not want. Thus, I predict that LARGEST_SH may decrease equity compensation.

INSTITUTION is a variable representing external supervision. Institutional investors have more time and resources to investigate the quality of management and limit the power of executives to design their compensation. This monitoring effect can mitigate the agency problem (Hartzell and Starks 2003). Zhang and Chung (2018) also identify a positive effect of institutional investors on the structure of executive compensation. As a result, I predict that INSTITUTION will be negatively related to executive compensation. I run the following model:

$$\text{LN(ADJUSTED COMPENSATION)} = \beta_0 + \beta_1 * \text{LN(TOTAL\_REV)} + \beta_2 * \text{AREAS} + \beta_3 * \text{ROA} + \beta_4 * \text{LEVERAGE} + \beta_5 * \text{MKT-TO-BOOK} + \beta_6 * \text{STCK\_RETURN} + \beta_7 * \text{CEO GENDER} + \beta_8 * \text{FOUNDER} + \beta_9 * \text{CEO\&CHAIR} + \beta_{10} * \text{NUM\_DIRECTOR} + \beta_{11} * \text{LARGEST\_SH} + \beta_{12} * \text{INSTITUTION} + \beta_{13} * \text{EC OR NOT} + \varepsilon \quad (5)$$

**Table 9.**

Controlling for Ownership

| | (1) | (2) | (3) |
|---|---|---|---|
| | LN (ADJUSTED TOTAL_COM) | LN (ADJUSTED CASH_COM) | LN (ADJUSTED EQUITY_COM+1) |
| LOG(TOTAL_REV) | 0.218 | 0.222 | 2.143 |
| | [26.3931]*** | [28.1894]*** | [3.2008]*** |
| AREAS | 0.089 | 0.074 | -4.074 |
| | [4.7692]*** | [4.1579]*** | [-2.8277]*** |
| ROA | 1.128 | 1.130 | 47.186 |
| | [7.8766]*** | [8.2666]*** | [3.5993]*** |
| LEVERAGE | 0.337 | 0.347 | -2.414 |
| | [1.8291]* | [1.9788]** | [-0.1628] |
| MKT-TO-BOOK | 0.0016 | 0.0016 | 0.025 |
| | [3.2683]*** | [3.4732]*** | [0.3942] |

| | | | |
|---|---|---|---|
| STCK_RETURN | 0.001 | -0.008 | -2.045 |
| | [0.0698] | [-0.4585] | [-1.4102]* |
| CEO GENDER | -0.008 | -0.013 | -0.955 |
| | [-0.2386] | [-0.3783] | [-0.3578] |
| FOUNDER | -0.072 | -0.051 | 6.618 |
| | [-3.3879]*** | [-2.5083]*** | [3.7799]*** |
| CEO&CHAIR | 0.029 | 0.041 | -0.856 |
| | [1.5274] | [2.2236] | [-0.5820] |
| NUM_DIRECTOR | 0.029 | 0.030 | -0.692 |
| | [4.6797]*** | [4.9908]*** | [-1.4704] |
| LARGEST_SH | -0.001 | -0.001 | -0.068 |
| | [-1.6084] | [-2.0930]** | [-1.2779] |
| INSTITUTION | 0.001 | 0.001 | 0.050 |
| | [0.3777] | [0.7440] | [0.3302] |
| EC OR NOT | 1.033 | 0.017 | |
| | [33.2531]*** | [0.5857] | |
| Constant | 9.344 | 9.172 | -69.809 |
| | [42.9883]*** | [44.2165]*** | [-4.0652]*** |
| Industry dummies | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes |
| Observations | 4,470 | 4,470 | 4,470 |
| R-squared | 0.3885 | 0.2846 | |

LARGEST_SH represents the shareholding ratio of the largest shareholder. INSTITUTION is the proportion of shares held by institutional investors.

For Columns (1) and (2), I use t- statistics to indicate the significance. For Column (3), I use z-statistics as the indicator.

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9 reports the results of Equation (5). The coefficients of LARGEST_SH and INSTITUTION are both inconsistent with my previous predictions. Only the shareholding ratio of the largest shareholder is mildly negative when related to executive's cash compensation at 5% significance. However, I find no significant relation between the LARGEST_SH variable and total or equity compensation. The relationship between all kinds of compensation and the proportion of shares held by institutional investors are all insignificant. Overall, LARGEST_SH and INSTITUTION can be said to have no influence on executive compensation. It is reasonable and not unforeseen that the previously mentioned double-edged sword effect of LARGEST_SH can be offset. What is surprising is that the role of institutional investors is completely absent in executives' compensation. In previous

studies, external supervision, including institutional investors, foreign investors, and independent directors, often seems to work well. But Chinese institutional investors play no supervisory role in executives' compensation in Chinese listed Non-SOEs. Such a result may imply that we need to rethink the relationship between Chinese institutional investors and companies.

### 4.4 Controlling for Air Quality

Some scholars in the U.S. think that nonmonetary problems like crime rate, environmental issues will influence executives' compensation. Deng and Gao (2013) find that high crime rate and high pollution at headquarters locations will increase CEOs' compensation.

China, in general, is a safe country. The crime rate does not vary much from city to city. But the environmental pollution has always been an important issue that cannot be overlooked in China. In 2014, the total volume of industrial waste gas emission in China was 69,419,000 million cubic meters, the volume of Sulphur dioxide emission was 19.744 million tons, and the volume of Nitrogen dioxide emission was 20.78 million tons. These numbers are all in the top two in the world. Because there are no official figures, it is difficult to determine exactly how many foreigners have left China due to the pollution. And, I must admit that reports of environmental pollution in China do appear regularly in the media. Executives of listed companies are high income people and the marginal effect of an income increase on them is relatively low. They may be willing to sacrifice some income to work in areas with less pollution to obtain a better living environment. The air pollution index is the most popular figure to measure environmental pollution. The statistics covers almost all of the regions in China and provides almost complete data from 2014-2017. I adopt the index as the indicator of environmental pollution. The AIR QUALITY variable is calculated based on the average of the air pollution indices for each day of the year. The higher the index is, the worse the pollution. I predict that the AIR QUALITY variable is significantly positively related to executive compensation. To put it more bluntly,

when the air pollution indices decrease, executives will receive less compensation. I use the model below to estimate the effect of AIR QUALITY:

$$\begin{aligned} LN(ADJUSTED\ COMPENSATION) = {} & \beta_0 + \beta_1 * LN(TOTAL\_REV) + \beta_2 * AREAS \\ & + \beta_3 * ROA + \beta_4 * LEVERAGE + \beta_5 * \\ & MKT\text{-}TO\text{-}BOOK + \beta_6 * STCK\_RETURN + \beta_7 * CEO \\ & GENDER + \beta_8 * FOUNDER + \beta_9 * CEO\&CHAIR + \beta_{10} \\ & * NUM\_DIRECTOR + \beta_{11} * LARGEST\_SH + \beta_{12} * \\ & INSTITUTION + \beta_{13} * AIR\ QUALITY + \beta_{14} * EC\ OR \\ & NOT + \varepsilon \end{aligned} \quad (6)$$

Table 10 reports the results of Equation (6). Once again, the result is contrary to my expectations. I find that air quality is negatively related to total compensation and cash compensation. As pollution rises, executives' pay also falls. I put the data of unadjusted compensation into the model and achieve the same results. For the sake of brevity, I only report the results of adjusted compensation. Chinese executives do not choose enterprises in smaller cities for a better living environment. This is probably not because Chinese executives don't care about pollution. Table 2 provides the average air pollution indices for smaller cities and mega cities. I find that the air pollution index is 84.578 in smaller cities and 87.050 in mega cities. The gap between the two kinds of cites is about 3%, which is small enough to be ignored. Overall, I believe that working in smaller cities will not improve an executive's living environment. In addition, Chinese people and the government now place high a priority on economic development. People and the governments of poor areas are very

**Table 10.**

Controlling for Air Quality

| | (1) | (2) | (3) |
|---|---|---|---|
| | LN (ADJUSTED TOTAL_COM) | LN (ADJUSTED CASH_COM) | LN (ADJUSTED EQUITY_COM+1) |
| LOG(TOTAL_REV) | 0.224 | 0.228 | 2.286 |

| | | | |
|---|---|---|---|
| | [24.0996]*** | [25.8101]*** | [3.0911]*** |
| AREAS | 0.101 | 0.088 | -3.278 |
| | [4.7815]*** | [4.3529]*** | [-2.0728]*** |
| ROA | 1.033 | 1.037 | 47.959 |
| | [6.4960]*** | [6.8487]*** | [3.2250]*** |
| LEVERAGE | 0.385 | 0.375 | 9.640 |
| | [1.8487]* | [1.8936]** | [0.6039] |
| MKT-TO-BOOK | 0.0014 | 0.0014 | 0.030 |
| | [2.8248]*** | [3.0076]*** | [0.4936] |
| STCK_RETURN | -0.002 | -0.012 | -1.256 |
| | [-0.1214] | [-0.6200] | [-0.8481]* |
| CEO GENDER | -0.010 | -0.014 | -1.229 |
| | [-0.2622] | [-0.3731] | [-0.4112] |
| FOUNDER | -0.085 | -0.062 | 6.206 |
| | [-3.5929]*** | [-2.7521]*** | [3.3021]*** |
| CEO&CHAIR | 0.027 | 0.041 | -1.535 |
| | [1.2460] | [1.9488] | [-0.9417] |
| NUM_DIRECTOR | 0.030 | 0.030 | -0.690 |
| | [4.2517]*** | [4.5499]*** | [-1.3389] |
| LARGEST_SH | -0.002 | -0.002 | -0.098 |
| | [-2.0822]** | [-2.4236]** | [-1.6255] |
| INSTITUTION | -0.00045 | 0.0002 | -0.024 |
| | [-0.2008] | [0.0938] | [-0.1373] |
| AIR QUALITY | -0.001 | -0.001 | -0.033 |
| | [-2.3282]** | [-2.6480]*** | [-0.9475] |
| EC OR NOT | 1.032 | 0.026 | |
| | [29.7845]*** | [0.7753] | |
| Constant | 9.429 | 9.234 | -66.284 |
| | [38.3546]*** | [39.4484]*** | [-3.5512]*** |
| Industry dummies | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes |
| Observations | 3,576 | 3,576 | 3,576 |
| R-squared | 0.3876 | 0.2838 | |

AIR QUALITY is calculated based on the average of the air pollution indices for each day of the year.

For Columns (1) and (2), I use t- statistics to indicate the significance. For Column (3), I use z-statistics as the indicator.

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

likely to sacrifice the environment for economic development. This, in turn, can lead to more serious pollution problems in economically underdeveloped areas than in mega cities. According to the 2016 national air quality situation released by the Chinese ministry of environmental protection, the ten cities with the worst air quality are all in smaller cities. Thus, the negative coefficient of AIR QUALITY does not

indicate that Chinese executives are willing to work in mega cities and suffer more environmental pollution. The result is that Chinese executives earn less in economically underdeveloped regions and suffer more from pollution by doing so.

### 4.5 Pay-for-Performance Sensitivity

Pay-for-performance sensitivity is also an important criterion to measure the structure of executive compensation. It allows us to intuitively see the difference in executives' compensation between mega cities and smaller cities. The analysis above helps us to identify which factors contribute to executive compensation. However, we cannot measure the relationship between executive compensation and firm performance by the amount only. Jensen and Murphy (1990) find that a proper compensation system is more important than the amount of compensation. When the company's compensation system becomes more reasonable, the money they pay to their executives will have stronger incentives and constraints. In my sample data, companies in mega cities pay more to their executives than companies in smaller cities. It does not mean that executives in mega cities are overpaid. Similarly, after I adjust the compensation by the cost of living index, executives in mega cities are paid less by their companies than executives in smaller cities. It does not suggest that executives in mega cities are underpaid. I introduce pay-for-performance sensitivity as an indicator of the incentive effects of compensation on executives as in previous studies. I follow Bhabra and Hossain (2018) in defining pay-for-performance sensitivity as the changes in the top three executives' compensation of each company divided by the corresponding changes in shareholder wealth. The changes in the top three executives' compensation include changes in total compensation, changes in cash compensation, and changes in equity compensation. Since the investors of listed companies are not necessarily primarily local, I do not adjust shareholders' wealth by the cost of living index. However, the cost of living index is still an important variable. I use both the compensation data that is not adjusted by the cost of living index and data that is adjusted by the cost of living index to conduct my regression. The model

of the regression on pay-for-performance sensitivity is displayed as follows:

$$LN(PAY\_PERFORMANCE\_SENSITIVITY) = \beta_0 + \beta_1 * \Delta LN(TOTAL\_REV) + \beta_2 * AREAS + \beta_3 * \Delta ROA + \beta_4 * \Delta LEVERAGE + \beta_5 * \Delta MKT\text{-}TO\text{-}BOOK + \beta_6 * \Delta MKT\text{-}VALUE + \beta_7 * \Delta STCK\_RETURN + \beta_8 * THE\text{-}EQUITY\text{-}RATIO + \beta_9 * CEO\ GENDER + \beta_{10} * FOUNDER + \beta_{11} * CEO\&CHAIR + \beta_{12} * NUM\_DIRECTOR + \beta_{13} * LARGEST\_SH + \beta_{14} * INSTITUTION + \varepsilon \quad (7)$$

LN(PAY_PERFORMANCE_SENSITIVITY) is the natural log of pay-for-performance sensitivity including total compensation performance sensitivity (TCPS), cash compensation performance sensitivity (CCPS), and equity compensation performance sensitivity (ECPS). I use the nominal change in compensation to calculate the nominal pay-for-performance sensitivity. I also adjust the nominal change in compensation by the cost of living index to calculate the adjusted pay-for-performance sensitivity. I define nominal pay-for-performance sensitivity and adjusted pay-for-performance sensitivity as the dependent variable and conduct the regressions, respectively. ΔLN(TOTAL_REV) is the change in the natural log of total operating revenue for each company between this year and last year. ΔROA represents the change in ROA between this year and last year. ΔLEVERAGE is the change in LEVERAGE. ΔMKT-TO-BOOK is the change in MKT-TO-BOOK between this year and last year. ΔMKT-VALUE is the 1,000,000 RMB change in the market value. ΔSTCK_RETURN is defined as the change in STCK_RETURN. THE-EQUITY-RATIO represents the ratio of equity compensation to total compensation.

In this model, I only select the samples whose pay-performance sensitivity is non-negative. Garvey and Milbourn (2006) find that if CEOs gain $100 when companies perform well, they will only lose $55-$75 when companies perform poorly. This result implies that pay-performance sensitivity may be dysfunctional when

business declines. Moreover, when a business performs badly, companies tend to dismiss executives rather than decrease their compensation (Conyon and He 2008; Garvey and Milbourn 2006). As a result, I adopt non-negative TCPS, CCPS, and ECPS only to ensure that pay-performance sensitivity works well as a gauge of the incentive effects of compensation. Because equity compensation is not common in China, major statistics of equity compensation are zero in my samples. The change in ECPS equaling zero does not represent anything meaningful. I further delete samples whose equity compensation values zero in my regression. I use a Tobit model to conduct regression on TCPS and CCPS as they cannot be less than zero. I add one to TCPS and CCPS to ensure that the natural log of TCPS and CCPS always makes sense.

Table 11 reports the coefficients of the independent variables and their significance. Because the results of the regressions on adjusted pay-for-performance sensitivity do not show a significant difference in the factors on which I focus most in this paper, I only provide the results of the regressions on nominal pay-for-performance sensitivity for brevity. In the table, I find some expected results. ΔLOG(TOTAL_REV) is negatively related to pay-performance sensitivity in all models, and ΔROA is also correlated with TCPS and CCPS. These results are consistent with previous studies (Lippert and Porter 1997; Conyon and He 2011; Bhabra and Hossain 2018). The positive effect of the change in the market-to-book ratio (ΔMKT-TO-BOOK) and stock returns (STCK_RETURN) reinforce that companies with better stock market performance are willing to pay more to their executives. This is also consistent with the results above.

**Table 11.**

Pay-for-Performance Sensitivity Regression

| | (1) | (2) | (3) |
|---|---|---|---|
| | LN (TCPS+1) | LN (CCPS+1) | LN (ECPS) |
| ΔLOG(TOTAL_REV) | -0.301 | -0.241 | -0.911 |
| | [4.0442] *** | [-3.3878] *** | [-3.9803] *** |
| AREAS | -0.113 | -0.106 | -0.211 |

| | | | |
|---|---|---|---|
| | [2.1371] ** | [-2.1395] ** | [-1.1770] |
| ΔROA | 1.700 | 1.465 | -0.665 |
| | [3.4656] *** | [3.1042] *** | [-0.3770] |
| ΔLEVERAGE | 0.687 | 0.785 | 1.123 |
| | [1.0630] | [1.2876] | [0.4657] |
| ΔMKT-TO-BOOK | 0.045 | 0.042 | 0.067 |
| | [7.2105] *** | [7.0186] *** | [4.4054] *** |
| STCK_RETURN | 0.132 | 0.146 | 0.085 |
| | [2.7243] *** | [3.2531] *** | [0.4833] |
| ΔMKT VALUE | -0.000 | -0.000 | -0.000 |
| | [-4.6189] *** | [-4.3791] *** | [-3.1490] *** |
| EQUITY RATIO | 3.050 | -0.119 | 2.827 |
| | [25.7574] *** | [-0.9217] | [8.9001] *** |
| CEO GENDER | -0.027 | -0.020 | -0.394 |
| | [-0.2755] | [-0.2164] | [-1.1427] |
| FOUNDER | -0.036 | -0.074 | 0.165 |
| | [-0.6058] | [-1.3277] | [0.7357] |
| CEO&CHAIR | 0.010 | -0.013 | 0.003 |
| | [0.1831] | [-0.2614] | [0.0158] |
| NUM_DIRECTOR | -0.034 | -0.040 | -0.100 |
| | [-1.9811] ** | [-2.4517] ** | [-1.8171] * |
| LARGEST_SH | -0.009 | -0.008 | -0.006 |
| | [-4.3874] *** | [-4.4673] *** | [-0.9037] |
| INSTITUTION | -0.024 | -0.019 | -0.110 |
| | [-4.2484] *** | [-3.6725] *** | [-5.4167] *** |
| Constant | 2.186 | 2.091 | 4.197 |
| | [5.5366] *** | [5.5327] *** | [4.5563] *** |
| Industry dummies | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes |
| Observations | 2,160 | 2,285 | 318 |
| R-squared | - | - | 0.4115 |

LN (TCPS+1), LN (CCPS+1), and LN (ECPS) represent the natural log of total compensation performance sensitivity, cash compensation performance sensitivity, and equity compensation performance sensitivity, respectively. ΔLN(TOTAL_REV) is the change in the natural log of total operating revenue for each company between this year and last year. AREAS is a dummy variable set equal to one if the headquarters of company is located in a smaller city and zero otherwise. ΔROA represents the change in ROA between this year and last year, and ROA is equal to EBITDA divided by total assets. ΔLEVERAGE is the change in LEVERAGE, and LEVERAGE is long-term debt divided by total assets. ΔMKT-TO-BOOK is the change in MKT-TO-BOOK between this year and last year, and MKT-TO-BOOK is the market value divided by the book value. ΔMKT-VALUE is the 1,000,000 RMB change in market value. ΔSTCK_RETURN is defined as the change of STCK_RETURN, and STCK_RETURN is the stock closed price at the end of the prior year divided by the stock opening price on the first trading day of the prior year. THE-EQUITY-RATIO represents the ratio of equity compensation to total compensation. CEO GENDER is a dummy variable set equal to one if the CEO is a female and zero otherwise. The value of FOUNDER is one when the founder is the same as the controller and zero otherwise. CEO&CHAIR is a dummy variable set equal to one if the CEO and the Chairman of the Board is the same person and zero otherwise. NUM_DIRECTORS is the number of directors of a company.

LARGEST_SH represents the shareholding ratio of the largest shareholder. INSTITUTION is the proportion of shares held by institutional investors.

For Columns (1) and (2), I use z-statistics as the indicator. For Column (3), I use t-statistics as the indicator.

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

As for my core concerns, it is obvious that executives in smaller cities demonstrate lower total compensation performance sensitivity and cash compensation performance sensitivity than their counterparts in mega cities. This result suggests that compensation of executives in smaller cities has less incentive and restriction effects, and the contract between the agent and the owner is less effective. It is consistent with my expectation that executives in smaller cities have more influence over their pay, both in terms of structure and amount. But the negative effect of smaller cities on pay-performance sensitivity is not irreducible. In Columns (1) and (3), I find that the EQUITY RATIO variable is positively correlated to TCPS, and ECPS is not significantly related to the AREAS variable. I can infer that equity compensation is an effective incentive to increase pay-performance sensitivity. This also confirms previous studies that equity incentive plans are better suited to connect the interests of shareholders and executives. What is more important is that this compensation is not subject to regional differences. There is not enough evidence to suggest that executives in smaller cities are less motivated than executives in mega cities when they receive equity compensation. This phenomenon brings enlightenment to the design of the executive compensation system of Chinese listed Non-SOEs in smaller cities. Listed enterprises in smaller cities can introduce more equity incentives and improve the proportion of equity compensation in the total compensation to address the issue where pay-for-performance sensitivity is lower than that of companies in mega cities.

The coefficients of NUM_DIRECTOR and INSTITUTION are also noteworthy. In the study in Part 4, I find that the number of directors and the proportion of shares held by institutional investors do not show the correlation to compensation as expected. In this model, they are still not correlated to pay-for-performance sensitivity as expected. Both NUM_DIRECTOR and INSTITUTION are significantly negatively

correlated to all kinds of pay-for-performance sensitivity. Directors and institutional investors both play the role of a supervisor in prevailing wisdom. But in Chinese listed Non-SOEs, they not only fail to monitor executives, but also intensify the agency costs between the agent and the shareholders.

In regard to the effect of board size, the main problems may lie in the following aspects. First, the effect of board size may be exceeded by the effect of company size. Large companies tend to have larger boards, but they also tend to decrease pay-for-performance sensitivity. The effects of company size and board size counteract and make the size of the board appear negative to pay-for-performance sensitivity. In addition, the system of boards of directors has a short history in China. The boards of Chinese listed companies do not oversee the management efficiently (Hu, Tam, and Tan 2010). When the boards of Chinese listed companies get larger, free riding becomes more serious. These two views may possibly be the reason behind the dysfunction of the board.

For the negative effect of invalidation of institutional investors, I infer that institutional investors have not done their duty of supervision. It is consistent with the result of Aggarwal, Hu, and Yang (2013) that insurance companies and pension funds do not monitor listed companies effectively. Chinese institutional investors have a long way to go until they can play the role of their peers in developed markets. They are even younger than the Chinese stock market which is only about 30 years old. Institutional investors account for an extremely small proportion of the total number of accounts opened. The outstanding market value held by institutional investors, although growing rapidly, is still less than 40% as of 2018. It may take some time for this growing industry to play its part in Chinese listed companies. Also due to the youth of the capital market and the lack of a delisting system, I suspect that institutional investors may encounter similar problems with loan discrimination in Chinese banks. Lending to state-owned enterprises is less risky than to private ones thanks to government support (Lu, Zhu, and Zhang 2012). Similarly, institutional investors may know of the problems of listed companies and still choose to inject funds. Institutional investors do not have enough investing targets and the possibility

of delisting of listed companies is almost nonexistent in China leading to lower risks of investment.

## 5. Robustness Tests

I use the alternative definition or measure of several variables to conduct my robustness tests.

### 5.1 Alternative Definition of LEVERAGE

In the previous models, I calculated the LEVERAGE variable as long-term debt divided by total assets. Here, I define the total debt divided by shareholders equity as the LEVERAGE variable. Although the new LEVERAGE variable is no longer significantly related to executive compensation, the coefficients of rest of the variables stay almost the same.

### 5.2 Alternative Measure for Compensation

In the models above, I collect the top three executives' cash compensation as the Cash Compensation variable. I collect their equity compensation as the Equity Compensation variable and calculate the Total Compensation variable by adding cash compensation and equity compensation. CEOs' compensation is also widely used by researchers. Here, I alter the variables to CEOs' compensation. I collect CEOs' cash compensation as the new Cash Compensation variable. I also collect CEO's equity compensation to calculate the CEOs' total compensation as the new Total Compensation variable. Because the number of non-zero equity compensation of the CEOS is too small, I cannot obtain a reliable coefficient for it. Therefore, I only use Total Compensation and Cash Compensation in this robustness test.

The results of the test are presented in Table 12. I find that geographic location still plays an important role in CEO compensation and the relationship between the

location and the compensation is similar to the results in Table 9. As a result, the core findings of my study remain the same.

**Table 12.**

Alternative Measure for Compensation

| | (1) | (2) |
|---|---|---|
| | LN (ADJUSTED CEO_COM) | LN (ADJUSTED CEO_CASH_COM) |
| LN(TOTAL_REV) | 0.227 | 0.196 |
| | [7.8875]*** | [13.7672]*** |
| AREAS | 0.254 | 0.214 |
| | [3.8828]*** | [6.6037]*** |
| ROA | 0.926 | 1.776 |
| | [1.8538]* | [7.2096]*** |
| LEVERAGE | 0.760 | 0.920 |
| | [1.1838] | [2.8973]*** |
| MKT-TO-BOOK | 0.004 | 0.004 |
| | [2.2547]** | [4.7314]*** |
| STCK_RETURN | -0.010 | -0.037 |
| | [-0.1480] | [-1.1458] |
| CEO GENDER | -0.087 | 0.059 |
| | [-0.7204] | [0.9775] |
| FOUNDER | -0.050 | 0.085 |
| | [-0.6784] | [2.3255]** |
| CEO&CHAIR | 0.031 | 0.033 |
| | [0.4610] | [0.9891] |
| NUM_DIRECTOR | 0.063 | 0.045 |
| | [2.8782]*** | [4.2122]*** |
| LARGEST_SH | 0.000 | -0.003 |
| | [0.1421] | [-2.4000]** |
| INSTITUTION | 0.003 | -0.005 |
| | [0.3955] | [-1.5571] |
| EC OR NOT | 0.6575 | 0.024 |
| | [6.0671]*** | [0.4559] |
| Constant | -2.312 | 4.021 |
| | [3.0506]*** | [10.7214]*** |
| Industry dummies | Yes | Yes |
| Year dummies | Yes | Yes |
| Observations | 4,470 | 4,470 |
| R-squared | 0.5182 | 0.1160 |

LN (ADJUSTED CEO_COM) and LN (ADJUSTED CEO_CASH_COM) are the natural log of adjusted CEOs' total compensation and cash compensation, respectively.

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

## 6. Conclusion

A number of studies have shown that enterprises in smaller cities are more prone to information asymmetry leading to fierce conflict between agents and shareholders. Executives' compensation is one of the means to fix this agency problem. In this paper, I use the data of Chinese listed Non-SOEs from 2013-2017 to examine whether Chinese executives in smaller cities use information asymmetry to design compensation more favorable for themselves and, if so, whether there is a way to reduce the negative effect of smaller cites on the compensation design. I conduct my study on both cash compensation and equity compensation. My results demonstrate that executives in smaller cities earn more money and a higher proportion of cash compensation after I adjust for the effect of the cost of living. Further, I control other factors influencing executive compensation, like total revenue of companies, return on assets, leverage, the market value to book value ratio, stock returns, CEO's gender, duality of the founder and controller, duality of the CEO and chairman, board size, the proportion held by largest shareholders and institutional investors, and air quality. The conclusions remain the same. Moreover, I investigate the role of geographic location on pay-for-performance sensitivity and find that total compensation and cash compensation of executives in smaller cities has lower pay-for-performance sensitivity. This suggests that companies in smaller cities provide fewer incentives for their executives. It also implies that cash compensation, which is regularly paid to executives, has also been heavily interfered with by executives.

In addition to the two main findings above, I also find that board size and the proportion of shares held by institutional investors do not work as they do in developed countries and markets. Directors and institutional investors act as supervisors of publicly traded companies and usually their supervision has been found effective in previous studies. However, in Chinese listed Non-SOEs, they lose their magic. They fail to make a difference, both in terms of compensation and pay-for-performance sensitivity. Not only do they fail to significantly alleviate the influence of executives in smaller cities on the compensation system, they exacerbate

the problem.

The results above may have some implications for corporate governance in China. Executives in smaller cities exert more power on compensation design to benefit themselves than executives in mega cities. Enterprises in smaller cities need to take greater action to remedy this issue. In addition, enterprises in smaller cities can increase the proportion of equity compensation to improve the pay-for-performance sensitivity of their compensation efficiently. Moreover, enterprises should seek to improve the supervisory capacity of the board of directors rather than simply increase the number of members. The introduction of more directors cannot improve the management quality. I also suggest that enterprises should not treat institutional investors as an effective supervisor. Higher institutional investors' shareholdings will not improve the level of supervision over management. In contrast, it will decrease the level of supervision.

There are several potential limitations in my paper. First, I define equity compensation as the value of equity incentives announced to be granted to executives. It is calculated based on the Black-Scholes Model. This definition elicits two problems. Executives may not have received the equity compensation after the announcement. Enterprises can cancel their equity incentive plans for many reasons. Alternatively, these plans usually set goals in advance. Once executives do not reach the goal, they will not be rewarded. In addition, the Black-Scholes Model calculates the value of European options. But equity incentives are not the same as European options. Executives do not have to exercise the options on a certain day. As a result, the power of equity compensation and the related results in my paper is limited. Additionally, equity compensation is becoming more common in China. Even the government has encouraged SOEs to grant equity incentives to executives since 2018. In the future, the study of the relationship between equity compensation and performance in the Chinese market can be done more comprehensively and completely based on more detailed statistics on executive compensation.

My paper is one of the first to include geographic location as a factor in executive compensation in China. I have preliminarily confirmed the importance of this factor

for corporate governance. I hope further studies on this topic can pay greater attention to equity compensation.

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