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Compensation Negotiation and Corporate Governance: The Evidence from China

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Compensation Negotiation and Corporate Governance: The Evidence from China

Abstract: This paper examines CEO pay dispersion for the listed companies in China. We apply a two-tier stochastic frontier model to the CEO compensation framework where asymmetric information generates a surplus between the minimum wage that CEOs accept and the maximum payment that firms offer. This surplus leads to CEO pay dispersion coming from the negotiation power between the CEO and the firm. We generate the surplus extracted by each CEO-firm pair and analyze how corporate governance affects them. An empirical analysis finds that: 1) On average, CEOs are paid 23.26% more than the benchmark; 2) Additionally, we examine the bargaining power in state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs). We find that CEOs in SOEs have less bargaining power due to the compensation regulation. We then examine compensation for new CEOs hired externally and find that CEOs hired externally have less bargaining power on average; and 3) Corporate governance has a significant effect on the salary bargaining power of each agent. More specifically, the CEO-Chairman dummy has a significant positive effect on the bargaining power of firms and CEOs, but the latter is larger. Board size has a negative effect on both. Independent directors help improve the bargaining power of the firms and board meeting times help enhance the bargaining power of the CEOs. Equity concentration has a significant negative effect on both sides.

Key words: Compensation Negotiation; Asymmetry Information; Corporate Governance; Two-tier Stochastic Frontier Model

JEL classification: C2; G30; G32; J33

1. Introduction

This paper exams the salary level of CEOs in the listed companies in China. Executive compensation in listed companies have a relationship with social justice, corruption, corporate governance and other social issues, and thus the salaries of senior management personnel have been a concern (Fang, 2009). With the current large income gap in China, income distribution has become the top priority. The Chinese central government conference on August 18, 2014 discussed problems existing in the current salary system in state-owned enterprises and put forward a clear reform policy requiring CEOs to be paid fairly with effective supervision. Knowing the efficiency of executive compensation contracts, without damaging the executive remuneration enthusiasm, will minimize the corruption.

There are two existing theories explaining unreasonable executive salaries. First, the efficiency contract theory states that executive pay is matched to executive ability based on market competition (Edmans and Gabaix, 2009; Frydman and Dirk, 2010; John et al., 2010; Tang, 2012; Lin et al., 2012, Pinto and Widdicks, 2014, Song and Wan, 2014).¹ However, CEO compensation in China has risen substantially in recent years and it appears there is no relation to firm performance, especially in large firms (Edmans and Gabaix, 2009). Bebchuk and Fried (2003) argued that these facts are evidence that compensation is decided by CEOs themselves, who seek to maximize their own wealth rather than shareholder value. The second theory of manager power argues that, due to the separation of ownership and control, the manager has substantial influence over salary design. The design of the manager power system is an important cause of excess remuneration of managers. Meanwhile, the agency problem between the shareholders and the board of directors may result in the board of directors not completely controlling the management compensation contract. As a result, the manager has rent-seeking power as evidenced by Wu and Wu (2010), Chhaochharia and Yaniv (2009), Dah and Frye (2017).² Song and Wan (2014) also argued that CEO influence did not play a role in explaining CEO pay when CEO employment contracts were explicit, which provided less room for powerful CEOs to rig their compensation. However, among CEOs without explicit employment agreements, more powerful CEOs received significantly higher total pay than less powerful CEOs. Still, conventional theories and existing empirical examinations of CEO compensation seem to be limited in their ability to explain the variation in executive compensation.

¹ Pinto and Widdicks (2014) assessed the effectiveness of compensation plans at attracting and providing incentives to executives, and their results showed that the different plans resulted in the same firm cost and executive valuation. Song and Wan (2014) argued that CEO compensation was mainly driven by fundamental economic factors under explicit employment agreements.

² Wu and Wu (2010) show that management control of power and the level of executive compensation are positively related in Chinese companies. Chhaochharia and Yaniv (2009) find supporting evidence of the managerial power theory using the United States listing corporations data during 2000-2005. However, their results are thought to be biased caused by outliers (Guthrie et al., 2012).

This paper contributes to the above debate by offering a new perspective. Executive salaries are the result of negotiation between the company and managers; for example, Hermalin and Weisbach (1998) found that a major determinant of CEO pay is the bargaining power between the CEO and the board of directors. Elsaid and Davidson (2009) find evidence that outside CEOs are paid more than insiders due to differences in bargaining power. Brockman et al. (2016) also argue that a CEO's wage premium is more likely to be caused by a temporary increase in bargaining power. But all these studies did not calculate the degree of the bargaining power during the contract negotiations. In an information symmetric situation, an effective compensation contract is helpful in encouraging executives to act in the maximizing interests of shareholders (Frydman and Dirk, 2010). However, in an information asymmetry situation, the shareholders cannot observe the talent and effort of the executive accurately and the effectiveness of the salary contract may be weakened (Liu, 2013). This may cause the phenomenon of "high effort and low wages" or vice versa. During the formation of the manager market in China, there was a positive attitude regarding the value of managers. However, there are tight regulations on manager salaries. For instance, the relative income of the managers may be distorted which hurts the incentive scheme between the effort of managers and firm performance. In addition, regulations reduced the salary negotiation power of managers, which resulted in alternative self-reward systems such as on-the-job consumption. Therefore, understanding the negotiation ability is helpful in understanding the formation mechanism of executive compensation and is also helpful in formulating a scientific and reasonable salary policy.

We apply a heterogeneous two-tier stochastic frontier model (Kumbhakar and Parmeter 2009; 2010) to analyze the factors of CEO salaries from the perspective of negotiation power. In particular, we investigate the degree of bargaining power during the negotiation process under information asymmetry and how corporate governance is accounting for these bargaining powers. The empirical results show that between 2005 and 2012, both firms and CEOs enhanced their surpluses through their respective bargaining power, but the CEOs have more power to enhance the salary. Specifically, the CEOs manage to enhance their pay by 57.4% using their power, but the firms lower the CEOs pay by extracting a share of the CEOs surplus by 34.15%; overall, the net surplus is 23.26% higher than benchmark pay. Additionally, we examine the bargaining power in state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), as extant studies find that executive compensation for Chinese listed firms (especially SOEs) is highly regulated by the China Securities Regulatory Commission and State-owned Asset Supervision and Administration Commission (Firth et al., 2006; Li et al., 2013), which may lower the CEOs bargaining power in negotiation. We then examine compensation for new CEOs, particularly those who are hired externally. This is because the relative bargaining power will be the most essential consideration for newly appointed CEOs, especially those hired from outside the firm. Our results show that, on average, CEOs hired externally have less bargaining power.

Finally, our estimation results present further qualitative evidence supporting the mechanism for corporate governance. Specifically, the CEO-Chairman dummy has a significant positive effect on the bargaining power of the firms and CEOs, but the latter is larger. Board size has a negative effect on both. Independent directors help improve the bargaining power of firms and board meeting times will help enhance the bargaining power of CEOs. Equity concentration has a significant negative effect on both sides.

The structure of the paper is as follows. The next session introduces the theoretical hypothesis and model. Session 3 introduces data and variables. The empirical analysis is conducted in Session 4. Session 5 provides a further robustness check and the conclusion follows in final session.

2. Theoretical Framework

2.1 The basic model

In an incomplete information market, the final executive compensation can be expressed in the following form:

$$Wage = \underline{Wage} + \eta(\overline{Wage} - \underline{Wage}) \quad (1)$$

where \underline{Wage} is the minimum compensation for the managers to accept. \overline{Wage} is the highest wage firms are willing to pay. $\eta(0 \leq \eta \leq 1)$ measures the information degree that firms and CEOs have in the pricing process, where $\eta = 0$ refers to the case of complete information for the firm, and $\eta = 1$ refers to the case of complete information for the CEO. Therefore, $\eta(\overline{Wage} - \underline{Wage})$ reflects the surplus that CEOs extract from the manager market with their executive power.

To show the surplus of managers and firms during the wage negotiation process, we further decompose equation (1) into a benchmark wage, the extracted surplus by the power of rent-seeking managers, and surplus extracted by the firms. First, we define the "benchmark wage" of executive pay level given the basic characteristics X of managers as $\mu(x) = E(\theta/x)$, where θ is an unknown parameter satisfying $\underline{Wage} \leq \mu(x) \leq \overline{Wage}$. Here $(\overline{Wage} - \mu(x))$ represents the firm's surplus during the wage negotiation process and $(\mu(x) - \underline{Wage})$ represents the manager's surplus. Who will "extract" more depends on the level of information (and thus the bargaining power) they have. Equation (1) is then rewritten as follows:

$$Wage = \mu(x) + \eta[\overline{Wage} - \mu(x)] - (1 - \eta)[\mu(x) - \underline{Wage}]. \quad (2)$$

Equation (2) means the CEO can raise their wage by extracting the share of the shareholders surplus, $\eta[\overline{Wage} - \mu(x)]$, while the firm can lower the wage paid by extracting the share of the executive's surplus, $(1 - \eta)[\mu(x) - \underline{Wage}]$. The size of the extracted surplus by the executive depends on the bargaining

power or the information he/she has, η , and the firm's expected surplus, $\overline{Wage} - \mu(x)$. Similarly, the level of the surplus extracted by the firm depends on the firm's bargaining power, $(1 - \eta)$, and the expected surplus of the executive, $\mu(x) - \underline{Wage}$. Therefore, the information owned by managers has a positive effect on salary level, while the firms' information factor has a negative effect.

Empirically, we can write the executive compensation pricing model (2) as follows:

$$Wage_{it} = Wage_{it}^* + \varepsilon_{it}, \quad Wage_{it}^* = x'_{it} \beta, \quad \varepsilon_{it} = w_{it} - u_{it} + v_{it}. \quad (3)$$

The model is a typical two-tier Stochastic Frontier Analysis (SFA) model (Kumbhakar and Parmeter, 2009, 2010), where, $Wage_{it}$ is the actual salary of the managers. $Wage_{it}^* = x'_{it} \beta$ is the reasonable salary level, x is a vector of company characteristics, such as size, growth rate, profit rate, debt ratio, ratio of tangible assets, and executive characteristics, such as age and education. $w_{it} = \eta_{it}[\overline{Wage}_{it} - \mu(x_{it})] \geq 0$, $u_{it} = (1 - \eta_{it})[\underline{Wage}_{it} - \mu(x_{it})] \geq 0$, v_{it} is the traditional residual error reflecting the unpredictable random factors leading to executive pay variation or random measurement error. Managers can improve their wage level by extracting the surplus, which can be reflected by w_{it} , while firms can reduce their wage level by extracting the surplus, which can be described by u_{it} . The extracted surplus size depends on the information degree of managers and firms, expected surplus of firms, $\overline{Wage}_{it} - \mu(x)$ and expected surplus of managers $\mu(x) - \underline{Wage}_{it}$.

The parameter β in equation (3) can be estimated via maximum likelihood (MLE), and then the surplus extracted by managers and firms can be estimated. According to the preceding analysis, the interference terms w_{it} and u_{it} both have the one-sided distribution feature. We assume that both follow the exponential distribution, i.e., $w_{it} \sim i.i.d \text{Exp}(\sigma_w, \sigma_w^2)$ and $u_{it} \sim i.i.d \text{Exp}(\sigma_u, \sigma_u^2)$. The error term v_{it} is assumed to be normally distributed, i.e., $v_{it} \sim i.i.d N(0, \sigma_v^2)$. At the same time, we assume that v_{it} , u_{it} and w_{it} are independent of each other, and are independent of individual characteristics. This setting is similar to Kumbhakar and Parmeter (2009) that shows the probability density function of ε_{it} under the above assumptions are:

$$f(\varepsilon_{it}) = \frac{\exp(a_{it})}{\sigma_u + \sigma_w} \Phi(c_{it}) + \frac{\exp(b_{it})}{\sigma_u + \sigma_w} \int_{-d_{it}}^{\infty} \varphi(z) dz = \frac{\exp(a_{it})}{\sigma_u + \sigma_w} \Phi(c_{it}) + \frac{\exp(b_{it})}{\sigma_u + \sigma_w} \varphi(d_{it}) \quad (4)$$

where $\varphi(\cdot)$ and $\Phi(\cdot)$ are the probability density function of the standard normal distribution and the cumulative distribution function, respectively. Other parameters are set as follows:

$$a_{it} = \frac{\sigma_v^2}{2\sigma_u^2} + \frac{\varepsilon_{it}}{\sigma_u}; b_{it} = \frac{\sigma_v^2}{2\sigma_w^2} + \frac{\varepsilon_{it}}{\sigma_w}; c_{it} = -\frac{\varepsilon_{it}}{\sigma_v} - \frac{\sigma_v}{\sigma_u}; d_{it} = \frac{\varepsilon_{it}}{\sigma_v} - \frac{\sigma_v}{\sigma_w}.$$

The paper focuses on the surplus extracted by the managers and firms through asymmetric information, therefore, we need to further derive conditional distribution of u_{it} and w_{it} , respectively:

$$f(u_{it} | \varepsilon_{it}) = \frac{\lambda \exp(-\lambda u_{it}) \Phi(u_{it} / \sigma_v + d_{it})}{\Phi(d_{it}) + \exp(a_{it} - b_{it}) \Phi(c_{it})} \quad (5a)$$

$$f(w_{it} | \varepsilon_{it}) = \frac{\lambda \exp(-\lambda w_{it}) \Phi(w_{it} / \sigma_v + c_{it})}{\exp(b_{it} - a_{it}) [\Phi(d_{it}) + \exp(a_{it} - b_{it}) \Phi(c_{it})]} \quad (5b)$$

where $\lambda = 1/\sigma_u + 1/\sigma_w$. Based on equations (5a) and (5b), which determine the conditional distribution, we can derive the conditional expectation of u_{it} and w_{it}

$$E(u_{it} | \varepsilon_{it}) = \frac{1}{\lambda} + \frac{\exp(a_{it} - b_{it}) \sigma_v [\Phi(-c_{it} + c_{it} \Phi(c_{it}))]}{\Phi(d_{it}) + \exp(a_{it} - b_{it}) \Phi(c_{it})} \quad (6a)$$

$$E(w_{it} | \varepsilon_{it}) = \frac{1}{\lambda} + \frac{\sigma_v [\Phi(-d_{it}) + d_{it} \Phi(d_{it})]}{\exp(b_{it} - a_{it}) [\Phi(d_{it}) + \exp(a_{it} - b_{it}) \Phi(c_{it})]} \quad (6b)$$

Equation (6a) and (6b) estimate the absolute deviation between the actual salary and benchmark compensation, but it is not comparable between enterprises. In order to obtain the relative deviation between actual pay and benchmark wage, we follow Kumbhakar and Parmeter (2009) to derive the following conditional expectation:

$$E(1 - \exp(-u_{it}) | \varepsilon_{it}) = 1 - \frac{\lambda}{1 + \lambda} \times \frac{[\Phi(d_{it}) + \exp(a_{it} - b_{it}) \exp(\sigma_v^2/2 - \sigma_v c_{it}) \Phi(c_{it} - \sigma_v)]}{\Phi(d_{it}) + \exp(a_{it} - b_{it}) \Phi(c_{it})} \quad (7a)$$

$$E(1 - \exp(-w_{it}) | \varepsilon_{it}) = 1 - \frac{\lambda}{1 + \lambda} \times \frac{[\Phi(c_{it}) + \exp(b_{it} - a_{it}) \exp(\sigma_v^2/2 - \sigma_v d_{it}) \Phi(d_{it} - \sigma_v)]}{\exp(b_{it} - a_{it}) [\Phi(d_{it}) + \exp(a_{it} - b_{it}) \Phi(c_{it})]} \quad (7b)$$

Further, the net effect in the salary negotiation process can be represented as follows:

$$NS = E(1 - \exp(-w_{it}) | \varepsilon_{it}) - E(1 - \exp(-u_{it}) | \varepsilon_{it}) = E(\exp(-u_{it}) - \exp(-w_{it}) | \varepsilon_{it}). \quad (8)$$

Note that σ_u and σ_w can both be estimated because the parameter σ_u appeared only in a_{it} and c_{it} , and σ_w appeared only in b_{it} and d_{it} . A subsequent inspection process cannot be performed with a priori grouping of samples, nor with prior assumptions about the relative information that managers and firms have, which is completely determined by the estimation results. This is the advantage of this method compared with traditional methods.³

³ For more information about the two-tier SFA model, see Kumbhakar and Parmeter (2009).

In addition, the model is very flexible: 1) we can quantitatively analyze the factor of the executive compensation of China's listed corporations; 2) the surplus extracted by executives and firms can be quantitatively calculated; and 3) we can analyze how the corporate governance affects the executive compensation through the total variance decomposition.

2.2 The mechanism of corporate governance on unreasonable compensation

We further exam how the corporate governance affects the negotiation power in the compensation bargaining process. Shleifer and Vishny (1997) argued that compensation contracts based on company performance were helpful to reduce the agency cost, optimize corporate governance, and regulate executive rent-seeking. Contracts should therefore attract talented CEOs and incentivize them to exert effort, exploit growth opportunities and reject wasteful projects. But these can only be realized with symmetric information, where the shareholders can observe the CEO's ability and effort. Under asymmetric information, shareholders cannot do that and therefore, the effectiveness of the contracts may be weak. In this situation, the compensation largely depends on the negotiation power between the CEO and shareholder. According to the optimal contract theory, the CEO compensation package should be designed by boards to maximize shareholders' value. But if a CEO also serves as the chair, it leads to less rent extraction to firms. Many empirical facts also show that if the CEO and chairman is the same person, their wage will be higher (Core et al.1999; Wu and Wu, 2010; Zheng et.al. 2012, Dah and Frye, 2017).

Board size has two types of effects on the bargaining power of CEOs and firms. On one hand, with the expansion of the size of board of directors, a CEO's ability and effort can be observed by more directors. During the bargaining process, CEOs find negotiation more difficult when there are a larger number of directors. Therefore, the negotiation power of CEOs will be lowered, while the power of firms will be enhanced. On the other hand, board size may have a negative effect on firm's bargaining power due to supervision efficiency problems. The board size is too large to organize and coordinate effective supervision and control of the managers. Meanwhile, according to Bebchuk and Fried (2003), larger board size may cause a free rider problem. CEOs play an important role in the nomination of the directors. In order to be nominated in the next session of the board of directors, directors tend to side with the manager.

The purpose of the independent director system is to prevent internal control of senior executives and reduce damage to the company's overall interests. Therefore, board independence should have a positive effect on the firm's bargaining power, depressing the CEO's excess compensation.

Board meetings may also have two types of effects on negotiation power. On the one hand, frequent meetings help strengthen the supervision of CEOs, suppressing the manager's excess compensation (Yermack, 1996; Core et al., 1999). On the other hand, frequent meetings can also lead to more compromise between CEOs and directors and provide mutual support.

Similar to the United States and other developed economies, China's concentrated ownership may reflect a good governance outcome as large shareholders have the power and financial incentive to monitor their firms (Shleifer and Vishny, 1997; Jiang and Kim, 2015). Higher equity concentration should have a positive effect on a firm's wage negotiation power. Higher equity concentration and lower equity balance generally mean that large shareholders have stronger authoritarian force and decision-making ability that will help depress executive excess compensation. Morck et al. (1988) also argued that a synergistic effect between large shareholders and firms can promote the supervision and control of executives that will help reduce the moral hazard in the compensation contract. However, there is also a possibility that concentrated ownership may represent a bad governance outcome, as it potentially reveals the existence of controlling shareholders who may expropriate wealth from minority shareholders. This type of expropriation is a significant agency problem in developing countries (Jiang and Kim, 2015).

According to the above analysis, we set up the following econometric model to analyze how corporate governance affects the bargaining power of CEOs and firms during the compensation negotiation process:

$$w_{it} = \beta_0 + \beta_1 Dual_{it} + \beta_2 Board\ size_{it} + \beta_3 Independence_{it} + \beta_4 Board\ meetings_{it} + \beta_5 Equity\ concentration_{it} + \varepsilon_{wit} \quad (9)$$

$$u_{it} = \delta_0 + \delta_1 Dual_{it} + \delta_2 Board\ size_{it} + \delta_3 Independence_{it} + \delta_4 Board\ meetings_{it} + \delta_5 Equity\ concentration_{it} + \delta_6 HHI_{it} + \varepsilon_{uit} \quad (10)$$

Where, HHI in equation (10) is a controlled variable, denoted industry Herfindahl-Hirschman index, which may affect the bargaining power of CEOs and firms.

3. Data and Variables

3.1. Variables

(1) CEO compensation

Considering the executive is most often the actual operator of the company, we define the compensation of the general manager in the listed corporation as executive compensation. Executive compensation normally includes a basic salary, annual bonuses and stock-based incentive compensation. According to the provisions of China's Securities Regulatory Commission (CSRC) information disclosure, listed corporations disclosed the compensation of executives, managers, supervisors and other directors through 2005. According to the Wind Financial Database which provides most of the information on stock trading and financing and controlling ownership of China IPO firms, as of March 16, 2012, 347 Chinese domestic companies have implemented stock-based incentive compensation plans, representing 15% of all A-share listed companies. As there is no requirement for listed companies to disclose the components of CEO compensation, we could not obtain detailed statics on the components for every company. So we calculate the compensation as monetary salaries and stock-based incentive compensation. We define stock-based incentive compensation as the difference between number of stocks a CEO had between last year and

this year, times the closing price of the stock. In the case of missing values, we use the average of the three highest executive salaries.

All data used in this paper are from the China Stock Market Accounting Research (CSMAR) database and the China Center for Economic Research (CCER) database. China Listed Firm's Shareholders Research database in CSMAR reported the ownership structure of China listed companies. Figure 1 presents the histogram of CEO compensation in SOEs and non-SOEs.⁴ We find they all show severe right-skewed distribution, which means only a few CEOs' compensation is higher than the reasonable level, and most of them seem lower than the average level. According to the distribution of CEO compensation in state-owned companies and non-state-owned companies, we can further find that executive compensation in non-state-owned listed companies is more concentrated.

(2) Unreasonable compensation

The negotiation power of CEOs and firms is ultimately reflected in the unreasonable compensation. There are mainly two ways to measure the executive unreasonable compensation. One measure is the difference between the actual compensation and the payment decided by economic factors (Firth and Peter, 2006; Core et al., 2008; Zheng et al., 2012). The benchmark compensation includes sales, investment opportunities, business performance, and economy. The part influenced by board characteristics and ownership structure is the unreasonable compensation. Another unreasonable compensation is measured by the regression residuals of the new manager compensation on former executive compensation, internal promotion, whether part-time, firm value, and debt ratio of fitting. The residuals of the regression reflect the "excess" capacity compensation (Ang et al., 2003). Following Ang et al. (2003), Brick et al. (2006) and Zheng et al. (2012) included more information such as the age and tenure of the managers in the regression, and the residuals were not the "excess" capacity compensation, but the "unreasonable" compensation that could not be explained by the reasonable factors. Following the literature, we regard the compensation decided by executive age and ability, sales volume, enterprise performance, company size and other economic determinants as the reasonable level of executive compensation and the remainder is the unreasonable compensation.

As transparency of information largely depends on the corporate governance, this paper mainly analyzes the factors of negotiation power of the firms and CEOs from the perspective of corporate governance. We consider the board structure, which includes board size, independence of board, the times of board meetings, a dummy variable equal to 1 if executive and board are the same person (0 otherwise),

⁴ We defined companies whose largest shareholder is state-owned enterprises (code 1100) or state institutions (code 2100) to be state-owned companies. If the largest shareholder of one company is a natural person, it is defined to be private-stated owned companies, with code 3000. Furthermore, financial listed companies are removed due to the difference in accounting systems.

and ownership structure that includes the ratio of the first firm, and the ratio of the largest firm to the sum of the second to the fifth largest shareholding.

3.2. Data

The sample consists of all the listed companies excluding financial listed companies during 2006-2012. Observations are winsorized by 1% and 99% percentile. Meanwhile, because of the difference in accounting systems of the financial companies, the financial listed companies have also been removed. Table 1 summarizes the descriptive statistics.

Panel A in Table 1 presents descriptive statistics regarding CEO cash compensation and total compensation. As the focus of our paper is on the effect of corporate governance on the bargaining power of CEOs and firms, we split our sample into over-compensated CEOs who receive positive net surplus in the compensation bargaining process and under-compensated CEOs who receive negative net surplus in the compensation bargaining process. Panel A demonstrates that during the sample period, mean CEO cash compensation is approximately ¥542,532. Among 2,704 over-compensated CEOs, mean cash compensation is approximately ¥653,760. For the rest of the under-compensated CEOs, they experience ¥216,327 mean compensation levels (the difference between the average over-compensated CEOs and under-compensated CEOs is significant). Moreover, our findings demonstrate that the difference of CEO stock holdings between year t and $t-1$ varies massively in different firms, with the lowest being -494,000 and the highest being 34,009.

Panel B presents the summary statistics of companies' characteristics as control variables for reasonable CEO compensation. Following the literature, we use return on assets as the firm's performance (Chen et al., 2011; Focke et al., 2017). In order to control the effects of firm size on CEO compensation, we include the number of employment and tangible asset ratios as measures of firm size (e.g. Baker et al., 1988). CEOs of firms with many growth opportunities can give up some current compensation in return for higher expected future compensation, the growth rate of the profit as the proxy of firm growth opportunities was included (Focke et al., 2017). We also include the debt ratio of firms to control the debt effects on CEO compensation (Zheng et al., 2012). In addition to the company's compensation determinants of CEO literature mentioned above, the Herfindahl-Hirschman index is also included to control for the amount of competition of firms in one industry. The sample construction process yields a sample of 3626 firm-year observations from 2006 to 2012. Different from previous studies (Kato and Long, 2010; Hu et al., 2013) using the top three CEOs' aggregate compensation, our sample contains all individual CEO's compensation. The summary statistics are comparable with Chen et al. (2011) who used a similar China listed companies sample from 1999 to 2009.

Panel C presents the descriptive statistics of CEO characteristics. The average age of CEOs is 47.29. Education represents the education degree of the CEO, 1 to 5 representing secondary vocational school education and lower, three-year college education, bachelor degree, master degree and PhD, respectively. Among them, the proportion of master degrees is 47.7%, which is the highest, followed by the undergraduate degree at 32.7%. CEOs having only one-year of executive experience was 31.8% and 23.8% having two years' experience.

Panel D presents the statistics of corporate governance variables. 23.4% of the companies have the same person as CEO and board director, of which state-owned enterprises is 9.1%, and non-state-owned enterprises is 31.9%. The average value of the board size, board independence, and the number of board meetings are 9.14, 0.36 and 9.42, respectively, which present insignificant difference in different nature of the enterprise. The difference in equity concentration of enterprises is large. The state-owned enterprise ownership concentration is approximately 40.9%, while non-state-owned enterprise ownership is approximately 32.9%.

4. Results

This session reports the regression results of a stochastic frontier model at equation (3). The stochastic frontier analysis allows us to decompose the total variance to assess the impact of bargaining on the overall wages between firm and CEO.

4.1 Variance decomposition: The bargaining power of the firm and CEO in salary negotiation

The main objective of estimating a two-tier stochastic frontier model is to obtain the extracted surplus by the executive officer and the firm, i.e. u_i and w_i from the composed error term ε_i , an estimate that is obtained from the residuals of the wage function, $y_i - x_i' \hat{\delta}$. Table 2 presents the results of variance decomposition. From the estimates of σ_w, σ_u and σ_v , the unexplained variation in log wage ($\sigma_v^2 + \sigma_u^2 + \sigma_w^2$) is 3.1534. Of this unexplained variation, 91.24% is due to the negotiation. During the bargaining process, 8.76% can be explained by the firm power and only 9.89% can be explained by the CEO. This means the CEO has more power to decide the benchmark wage than the firm and the CEO's salary is increased due to more bargaining power. From the estimate of $E(w-u) = \sigma_w - \sigma_u$, we can determine how the bargaining affects wages and in what direction. What should be noted is that if $E(w-u) = \sigma_w - \sigma_u = 0$, then the firm and CEO have equal bargaining power on average.

4.2 Agency conflict and CEO power effect

(1) The overall sample estimation results

The main objective of this section is to calculate extracted surplus by the firm and CEO during the wage negotiation process, based on equations (7a) and (7b). Following Kumbhakar and Parmeter (2009, 2010), we use $E(\exp(-z))$ for $z = w, u$ for computing the exact percentage decrease (increase) in wages due to bargaining of the firms and CEOs. Table 3 presents the estimated results of all the observations. On average, CEOs will increase the benchmark wage by approximately 57.40% with their bargaining power, but firms can decrease the wage approximately 34.15%. For example, if the benchmark salary is ¥100, CEOs will increase their wage to ¥157.40 due to the asymmetric information, but firms will decrease the benchmark wage to ¥65.85. Overall, the benchmark wage will be increased by 23.26%.

To show the dynamic change of the asymmetric information, Table 4 presents the net surplus of China's listed companies by year. According to the statistical results, during 2006-2008, executive compensation in listed companies is higher than the benchmark wages and presents an upward trend, which means the surplus extracted by the CEOs during the wage negotiation process is increasing. In 2009, the net surplus extracted by CEOs decreased because of the "limited salary act" issued by the Chinese government facing the public question about CEOs' "sky salary". According to Table 4, the "limited salary act" enhanced the surplus of firms. During 2009-2012, CEOs still had more power to increase the wages and presented an upward trend. Actually, from the "Interim Procedures for the Manager's Compensation in Central Enterprises" issued by State-owned Assets Supervision and Administration Commission (SASAC) in 2004, to the "Opinions on the Directors and Senior Managers Compensation in Listed Companies" in 2008, followed by the "Compensation Reform Program for the Managers in Centrally Governed Enterprises" issued by Central Leading Group for Comprehensively Deepening Reforms in 2014, there are all types of acts to restrict a manager's compensation. However, these acts are not well carried out.⁵

(2) The effect of individual characters on executive compensation

In order to deepen the investigation, we analyze the surplus of the firm and CEO in the negotiation by ownership and size. Table 5 presents the results of surplus extracted by firms and CEOs by ownership. First, according to panels A and B, the net surplus in both private-owned and state-owned companies is positive, where the net surplus extracted by CEOs in SOEs is 18.08%, and surplus extracted by CEOs in non-SOEs is higher, 26.63%. Comparing the surplus of the firms and CEOs in these two types of companies, the CEOs in SOEs have less negotiation power, 50.24 (vs.62.07). As a result, the net surplus extracted by state-owned companies is less. This is mainly because compensation of CEOs in state-owned companies is highly

⁵ See <http://theory.people.com.cn/n/2014/0821/c40531-25508614.html>.

regulated by the China Securities Regulatory Commission (CSRC) and State-owned Asset Supervision and Administration Commissions (SASAC) (Firth and Peter, 2006; Li et al., 2013). For example, since the implementation of the annual compensation system in 2002, the SASAC has required that CEO compensation in government-controlled companies must not be higher than 12 times the average employee salary in the firm. In 2006, SASAC imposes a mandate that top executive pay in SOEs cannot exceed 14 times the average employee salary. The Communist Party of China Central Committee Political Bureau issued “The Manager Remuneration System Reform Program in Central Government Controlled Companies” in August 29, 2014, indicating that executive compensation included three parts, basic salary, performance salary, and term incentive income. The program required that basic CEO salary shall be approximately twice the average wage of workers in the last year in the central enterprises; performance pay shall be no more than twice the basic salary, and incentive pay during the term is no more than 30% total annual salary in the term. All these regulations may lower the negotiation power of CEOs in SOEs. On the other hand, according to the limelight hypothesis, SOEs are exposed to more publicity and more likely to face public outrage (Kuhnen and Niessen, 2012; Focke et al., 2017). In that case, SOEs could be more reluctant to grant executives large compensation packages and could be inclined to reverse previously awarded excessive compensation.

4.3 Regression results of CEO pay based on the SFA model

Table 6 presents the results using Ordinary Least Square (OLS, see Model 1) and the two-tier SFA method (Model 2 – Model 6) under different constraint conditions. Model 2 has additional constraints, $\ln \sigma_u = \ln \sigma_w = 0$, which is similar to traditional OLS regression but using MLE without controlling the year effect and industry effect. Model 3 does not have any constraints. Model 4 and Model 5 consider industry effect and year effect, respectively. Model 6 considers both industry effect and year effect. The deterministic part of the frontier model is the same as the OLS model. Model 6 is the best of all as it has the highest log likelihood value, smallest value of Akaike information criteria (AIC) and Schwarz’s Bayesian information criteria (BIC). Thus, the following analyses are based on Model 6.

Panel A in Table 6 presents the regression results of control variables determining the benchmark wage. The significance and sign of the control variables are almost the same in Model 1 - Model 6. The return of assets (ROA), company size (lnSize), ratio of tangible assets, CEOs age, experience and education level have positive effects on executive compensation, while debt ratio and the growth rate of return on assets have an insignificant effect on executive compensation, which are consistent with Fernandes et al. (2013), Albuquerque et al. (2013), and Zheng et al. (2012).

Panel B and Panel C in Table 6 analyze the impact of corporate governance on the negotiating power of firms and CEOs. The coefficient of the dummy variable CEO-chairman in the CEO bargaining power

equation is significantly positive, which means if the CEO and chairman are the same person, it will enhance the CEO's bargaining power. We also find that this coefficient is significantly positive in the firm's equation, but the latter is much smaller (0.142 vs. 0.797). Overall, the dual variable helps improve the CEO's bargaining power. The result is consistent with several related literatures (Chen et al., 2011; Zheng et al., 2012; Dah and Frye, 2017). Zheng et al. (2012) found that if the CEO is also the chairman, the compensation of the CEO would be enhanced. Fernandes et al. (2013) and Dah and Frye (2017) also found that CEO/Chair duality, which may proxy for CEO power, led to less rent extraction by firms.

Board size has a significantly negative effect on the bargaining power of both firms and CEOs. Board size has different mechanisms on the bargaining power firms and CEOs. On one hand, with the number of boards increasing, the ability and effort of CEOs can be observed by more directors. Therefore, the negotiation power of CEOs may be lowered. On the other hand, board size may reduce the firm's bargaining power. Possible reasons follow: The first is due to supervision efficiency issues. The greater the number of board directors, the more difficult it is to organize and coordinate the effective supervision and control of the managers (Yermack, 1996; Jiang, 2010). The second is the free rider problem. According to Bebchuk et al. (2002) and Bebchuk and Fried (2003), CEOs play an important role in the nomination of the directors. The directors tend to side with the manager in order to be nominated in the next session of the board of directors. This negative incentive will increase with the expansion of the scale of the board of directors.

The literature argues that if companies have independent directors, they pay their CEOs significantly less (Focke et al., 2017). In Model 6, Panel B shows that independence has a positive relationship with a firm's bargaining power, which means the greater the independence of the board of directors, the executive ability to use the power to interfere with the ability of the directors to make decisions is smaller. Fang (2009) and Zheng et al. (2012) also showed that the independence of the board of directors of China's listed companies played an important role in the supervision of the excess remuneration. Overall, this supports the view that independent directors will enhance the supervision power and a firm's bargaining power.

The number of board meetings has a significantly positive relationship with the CEO's bargaining power. According to the former analysis, frequent meetings will strengthen the supervision of the manager director, and will suppress the manager's excess compensation (Yermack, 1996; Core et al., 1999). Nevertheless, our result is opposite, but consistent with Zheng et al. (2012) that frequent contact with each other forces the CEO and directors to compromise and provide mutual support.

The coefficients of equity concentration in the negotiation equations of firms and CEOs are both significantly negative, but the latter is larger (-0.013 vs. -0.005) which means overall equity concentration may help to a reduce CEO's excess compensation. Also, the equity concentration has different mechanisms on the firm's and CEO's bargaining power. According to the principal-agent theory, when the company's equity dispersion is large, the cost of CEO supervision will increase, and the small shareholders do not have

enough incentives to supervise the behavior of executives, so the executive supervision is weak. Usually, the shareholders will use a high salary to encourage the enthusiasm of the executives to maximize the interests of shareholders. On the contrary, when the company's ownership concentration increases, the correlation between the interests of major shareholders and corporate performance will be increased, so larger shareholders have a stronger power of supervision and negotiation with company executives, which will reduce the executive compensation payment. Morck et al. (1988) argued that when there were large shareholders in one company, the synergistic effect between large shareholders and firms can promote the supervision and control on the executives that will help reduce the moral hazard in the compensation contract. The results are also consistent with Zheng et al. (2012) who showed that increasing equity concentration means stronger authoritarian force and decision-making ability of large shareholders in the salary negotiation and it will more easily depress executive excess compensation.

The control variable HHI has a positive effect on the firm's negotiation power, which means with the decrease of the competition of industry, the bargaining power of the firm will be enhanced, however the result is not significant.

5. Robustness Checks

Extant studies find that CEO pay in the U.S. is determined mostly by the market force (Hu et al., 2013). A major determinant of CEO pay is the bargaining power between the CEO and the board of directors (Hermalin and Weisbach, 1998). The bargaining power is a relevant consideration in the U.S. because the labor market for managerial talent is active (Murphy and Zabojnik, 2004, 2007). However, the pay-setting process for CEOs in China is different. Extant studies find that executive compensation for Chinese listed firms (especially SOEs) is highly regulated by the China Securities Regulatory Commission and State-owned Asset Supervision and Administration Commissions (Firth et al., 2006; Li et al., 2013). In order to further examine the influence mechanism of corporate governance on negotiation under different scale and types of control, we group all the firms by different methods.

Comparing model 7 and model 8 in Table 7, we find that the CEO and Chairman Dual dummy will significantly enhance the CEO's bargaining power in non-SOEs but not in SOEs. Board size is negatively related with SOEs' bargaining power, which means the larger the board size, the lower the SOEs' bargaining power. The number of board meetings will significantly enhance CEO's excess compensation in both SOEs and non-SOEs and only significantly depress a firm's bargaining power in SOEs. A CEO's bargaining power will be significantly depressed by equity concentration in SOEs and non-SOEs, but only the SOEs' bargaining power can be influenced by equity concentration.

Panel D in Table 7 shows the surplus of firms and CEOs in different models. The CEOs' net surplus in SOEs and non-SOEs is positive which means that CEOs in both kinds of firms have more bargaining

power and will get more surplus from the firms. Furthermore, we find that net surplus in SOEs is much lower than in non-SOEs. This result is also consistent with the limelight hypothesis that SOEs exposed to more publicity are under higher public scrutiny, and could pay their CEOs less, because they are more likely to face public outrage (Kuhnen and Niessen, 2012, Focke et al., 2017).

Previous studies show that CEOs who are appointed from outside the firm receive significantly higher compensation than CEOs inside the firm (Murphy and Zabochnik, 2004; Frydman and Saks, 2010; Brockman et al., 2016). These studies attribute the compensation increase in outside CEOs to a higher demand for CEOs with general skills. It is often implicitly or explicitly assumed that outsiders possess general skills, while insiders tend to possess special skills (Brockman et al., 2016). According to Fee and Hadlock (2003), CEOs with outside job opportunities have better bargaining power on their pay because would-be employers compete each other for their managerial talents. Similarly, a firm with many potential successors for the leadership position has better bargaining power and can lower CEO pay because the incumbent CEO can be easily replaced. The CEO's bargaining power is significantly enhanced in two types of companies. Model 9 and Model 10 investigate the bargaining surplus of CEOs hired internally and externally. We find our results are slightly different from previous studies where CEOs hired externally have less net surplus. There are three main reasons to explain this phenomenon: 1) Older CEOs have an intimate knowledge of companies including company business, firm culture, and so on. They even have more knowledge about the relationship with directors that may help to enhance their compensation. 2) That boards decide to promote from within is a kind of motivational approach. The bottom manager will work harder in order to have the opportunity to be promoted. 3) CEOs hired externally take more time to become familiar with new firms that may raise costs and present new risks for the companies.

6. Conclusions

This paper studies the CEO pay dispersion in Chinese listed companies. We generate the extracted surplus due to the different bargaining power of the firm and CEO during the process of the salary negotiation using the two-tier stochastic frontier approach. Furthermore, the analysis proceeds to investigate the negotiation power channels from the perspective of corporate governance. Based on the comprehensive study of CEO pay across firms in 2006-2012, the results indicate that Chinese CEOs are, on average, overpaid. Specifically, we provide the following findings.

First, CEOs have more bargaining power to enhance the benchmark compensation in the compensation negotiation process. During the pay bargaining process, the CEOs will manage to enhance their pay by using the power by 57.4%, but the firm will lower CEO pay by extracting a share of CEO surplus by 34.15%. Overall, the net surplus will be 23.26% higher than benchmark pay.

Second, according to our results, the net surplus of CEOs in non-SOEs is 26.63%, but the net surplus of CEOs in SOEs is only 18.08%. Although CEOs in SOEs and non-SOEs have more bargaining power in

the negotiation process, but compared with CEOs in non-SOEs, CEOs in SOEs have less power to enhance their pay due to the compensation regulation by the China Securities Regulatory Commission and State-owned Asset Supervision and Administration Commissions.

Third, we calculate the net surplus of CEOs hired externally. We find that it is different from the U.S. and CEOs hired externally in China listed companies will have less net surplus in the bargaining process.

Finally, further estimation results show that the CEO-Chairman dummy has a significant positive effect on the bargaining power of firms and CEOs, but the latter is larger. Larger board size will depress both sides' bargaining power. More independent directors will help improve a firm's bargaining power and more board meeting times will help enhance the CEO's bargaining power. Equity concentration has significant negative effects on both sides.

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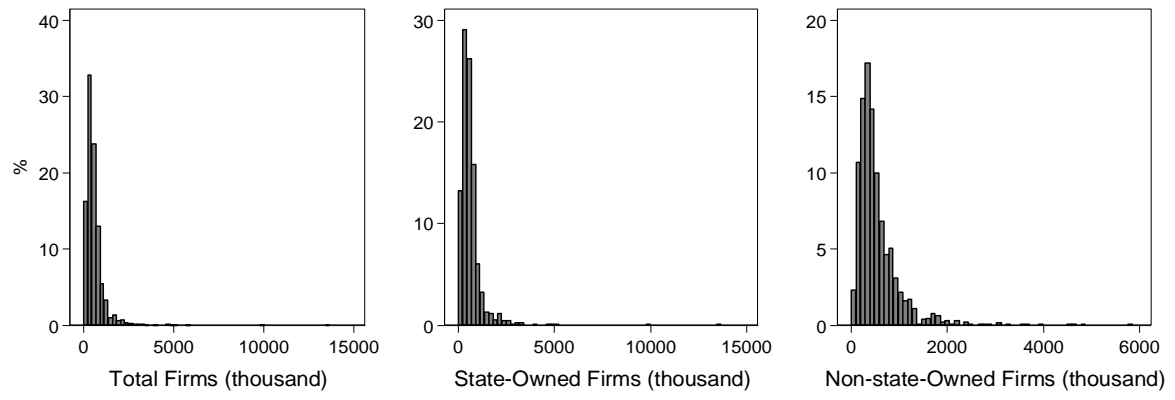


Fig 1 Histograms of CEO Compensation

Table 1 Descriptive Statistics

Variables	N	Mean	Std. dev.	Min	Max	Definition
Panel A: Dependent variable						
compensation	3,626	542,532	464,066	22,600	2,427,700	CEOs cash compensation
Over-Paid CEOs cash compensation	2,704	653,760	4,828,016	25,200	2,427,700	CEOs cash salaries
Under-Paid CEOs cash compensation	922	216,327	1,438,042	22,600	1,087,000	CEOs cash salaries
Stock holdings difference	3626	2028	6690	-494	34009	Difference of CEOs stock holding between t and t-1
log of total compensation	3,626	13.78	2.221	10.17	20.05	total compensation = Cash salaries + Δ stock holdings * closing price
Panel B: Companies characteristics						
ROA	3,626	0.053	0.046	-0.339	0.209	Total Profit divided by total assets
Size	3,626	4,935	8891	24	50,909	The number of employment in the company
Tangible	3,626	0.953	0.057	0.649	1	Tangible assets divided by total assets
Debt ratio	3,626	0.446	0.229	0.044	1.867	Total debt divided by total assets
Growth	3,626	-0.117	5.997	-39.84	29.89	Growth rate of the profit
HHI	3,626	0.112	0.112	0.021	0.553	Herfindahl-Hirschman index
Panel C: CEOs' characteristics						
Age	3,626	47.29	6.378	28	75	Age of CEO in years
Education	3,626	3.521	0.823	1	5	Education degree of CEO
Experience	3,626	3.099	1.725	1	8	Working experience of CEO
Panel D: Corporate governance characteristics						
Dual	3,626	0.234	0.424	0	1	Dummy that equals one if CEO and chairman of board are the same person
Board size	3,626	9.140	1.838	4	18	Number of directors
Independence	3,626	0.365	0.053	0.125	0.800	Ratio of the number of independent directors to board size
Board meetings	3,626	9.422	3.733	3	57	Number of board meetings
Equity concentration	3,626	37.77	15.49	8.991	75	Ratio of the largest shareholder

Note: Δ stock holdings represent the difference of number of stocks CEOs had between last year and this year

Table 2 The Asymmetric Information in the Process of Pay Negotiation

	Definition	Variable	Estimated Coef.
Asymmetric Information	Residuals Effects	σ_v	0.1860
	CEOs Effects	σ_w	1.6869
	Firms Effects	σ_u	0.5227
Variance Decomposition	Total Variance	$\sigma_v^2 + \sigma_u^2 + \sigma_w^2$	3.1534
	Corporate Governance Effects Ratio	$(\sigma_u^2 + \sigma_w^2) / (\sigma_v^2 + \sigma_u^2 + \sigma_w^2)$	9.89%
	CEOs Effects Ratio	$\sigma_w^2 / (\sigma_u^2 + \sigma_w^2)$	91.24%
	Firms Effects Ratio	$\sigma_u^2 / (\sigma_u^2 + \sigma_w^2)$	8.76%

Table 3 Surplus Extracted by Firms and CEOs

Surplus	Mean(%)	Std. Dev. (%)
CEO Surplus: $\hat{E}(1 - e^{-w} \varepsilon)$	57.40	25.93
Firms Surplus: $\hat{E}(1 - e^{-u} \varepsilon)$	34.15	13.83
Net Surplus: $\hat{E}(e^{-u} - e^{-w} \varepsilon)$	23.26	34.24

Table 4 Net Surplus – By Year

Year	Mean (%)	Std. Dev. (%)
2006	18.88	32.58
2007	19.74	33.43
2008	22.63	34.62
2009	20.55	32.98
2010	22.49	33.88
2011	26.55	35.56
2012	25.37	34.28
Total	23.26	34.24

Table 5 Surplus Extracted by Firms and CEOs – By Ownership

Surplus	Mean (%)	Std. Dev. (%)	Q1 (%)	Q2 (%)	Q3 (%)
Panel A: Non-State-Owned Companies (N=2196)					
CEOs Surplus: $\hat{E}(1 - e^{-w} \varepsilon)$	62.07	27.46	35.22	59.22	92.38
Firms Surplus: $\hat{E}(1 - e^{-u} \varepsilon)$	35.44	13.53	27.26	31.25	37.29
Net Surplus: $\hat{E}(e^{-u} - e^{-w} \varepsilon)$	26.63	35.93	-0.390	30.64	61.79
Panel B: State-Owned Companies (N=1430)					
CEOs Surplus: $\hat{E}(1 - e^{-w} \varepsilon)$	50.24	21.51	30.38	47.08	65.63
Firms Surplus: $\hat{E}(1 - e^{-u} \varepsilon)$	32.16	14.05	24.34	27.31	32.95
Net Surplus: $\hat{E}(e^{-u} - e^{-w} \varepsilon)$	18.08	30.76	-1.200	21.13	40.71

Table 6 Regression of the CEO Pay Based on the SFA Model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Panel A:						
ROA	7.758*** (9.661)	5.353*** (12.676)	4.204*** (10.750)	4.475*** (11.639)	4.648*** (11.223)	4.750*** (12.036)
lnSize	0.003 (0.118)	0.053*** (4.076)	0.075*** (5.369)	0.125*** (8.339)	0.073*** (5.395)	0.125*** (8.529)
Tangible	1.817*** (2.993)	1.359*** (4.936)	0.810*** (2.969)	0.584** (2.087)	1.175*** (4.145)	0.886*** (3.249)
Debt ratio	-1.083*** (-6.042)	-0.314*** (-3.381)	-0.269*** (-3.026)	-0.377*** (-4.408)	0.120 (1.350)	-0.050 (-0.595)
Growth	-0.003 (-0.445)	0.002 (0.871)	0.005* (1.653)	0.004 (1.167)	0.005* (1.833)	0.004 (1.270)
CEOs age	0.019*** (3.418)	0.016*** (5.575)	0.021*** (6.823)	0.020*** (6.585)	0.017*** (6.344)	0.018*** (6.688)
CEOs experience	-0.128*** (-6.133)	0.059*** (6.001)	0.087*** (8.788)	0.084*** (8.740)	0.033*** (3.224)	0.026*** (2.536)
CEOs Education	0.080* (1.911)	0.122*** (5.370)	0.159*** (6.955)	0.159*** (6.889)	0.159*** (7.401)	0.154*** (7.089)
C	15.285*** (11.413)	9.880*** (32.188)	9.355*** (29.273)	9.752*** (20.842)	8.723*** (27.000)	9.203*** (22.093)
sigma_v _cons		-3.021** (-2.126)	-1.739*** (-6.236)	-1.894*** (-4.945)	-1.749*** (-6.655)	-1.682*** (-7.953)
Panel B : sigma_u						
Dual			0.136* (1.898)	0.127* (1.753)	0.155** (2.132)	0.142* (1.897)
Board size			-0.062*** (-3.751)	-0.057*** (-3.422)	-0.071*** (-4.051)	-0.065*** (-3.708)
Independence			-0.020 (-0.038)	0.316 (0.601)	0.669 (1.226)	0.937* (1.707)
Board meetings			-0.019** (-2.477)	-0.017** (-2.214)	-0.013 (-1.633)	-0.011 (-1.391)
Equity concentration			-0.005*** (-2.985)	-0.005*** (-2.906)	-0.005*** (-2.811)	-0.005*** (-2.647)
HHI			0.449** (2.105)	0.507** (2.388)	0.313 (1.406)	0.408* (1.834)
C			0.325 (1.082)	0.096 (0.324)	0.008 (0.025)	-0.205 (-0.662)
Panel C: sigma_w						
Dual			0.799*** (18.421)	0.806*** (18.597)	0.789*** (18.181)	0.797*** (18.361)
Board size			-0.053*** (-4.839)	-0.060*** (-5.312)	-0.046*** (-4.213)	-0.054*** (-4.809)
Independence			0.266 (0.663)	0.200 (0.497)	0.356 (0.883)	0.230 (0.566)
Board meetings			0.028*** (5.242)	0.021*** (4.008)	0.025*** (4.815)	0.018*** (3.436)
Equity concentration			-0.011*** (-9.356)	-0.012*** (-9.627)	-0.012*** (-9.868)	-0.013*** (-10.175)
C			0.833*** (3.902)	0.977*** (4.523)	0.762*** (3.571)	0.942*** (4.357)
Observations	3671	3671	3626	3626	3626	3626
Year Effect	YES	NO	NO	NO	YES	YES
Industry Effect	YES	NO	NO	YES	NO	YES
Log Likelihood		-7568.736	-6523.565	-6453.960	-6390.403	-6323.456
AIC		15157.47	13093.13	12983.92	12838.81	12734.91
BIC		15219.56	13235.64	13219.36	13018.49	13007.53

Notes: 1. t value in parentheses. 2. ***, **, *: significant at 1%, 5% and 10%.

Table 7 Regression of the CEO Pay Based on the SFA Model-by Subsample

	Model 7	Model 8	Model 9	Model 10
	Non-state-owned companies	State-owned companies	CEOs hired internally	CEOs hired externally
Panel A:				
ROA	5.107*** (8.635)	4.932*** (9.022)	2.441*** (4.727)	2.904*** (6.219)
lnSize	0.084*** (3.415)	0.054*** (3.482)	0.035* (1.764)	0.063*** (2.953)
Tangible	1.106** (2.064)	0.861*** (2.971)	1.476*** (3.742)	1.506*** (3.903)
Debt ratio	-0.582*** (-4.912)	0.238** (2.132)	-0.150 (-1.101)	-0.165 (-1.322)
Growth	0.001 (0.246)	0.005 (1.273)	0.006 (1.547)	-0.001 (-0.174)
CEOs age	0.020*** (4.818)	0.017*** (4.193)	0.011** (2.227)	0.010** (2.142)
CEOs experience	0.052*** (3.052)	0.095*** (8.613)	0.126*** (8.512)	0.069*** (4.488)
CEOs Education	0.123*** (3.494)	0.169*** (6.012)	0.147*** (4.357)	0.136*** (4.301)
C	9.132*** (15.205)	9.518*** (25.769)	9.633*** (20.393)	8.245*** (15.184)
sigma_v				
_cons	-1.205*** (-5.686)	-1.582*** (-6.564)	-1.394*** (-6.839)	-1.512*** (-6.010)
Panel B: sigma_u				
Dual	0.041 (0.416)	-0.061 (-0.479)	0.420** (2.543)	0.443*** (2.637)
Board size	-0.023 (-0.708)	-0.046** (-2.326)	-0.151*** (-4.547)	-0.134*** (-3.999)
Independence	1.239 (1.397)	-0.924 (-1.276)	1.035 (1.036)	1.709* (1.656)
Board meetings	-0.004 (-0.324)	-0.052*** (-4.259)	0.008 (0.544)	0.001 (0.108)
Equity concentration	-0.002 (-0.612)	-0.005** (-2.130)	-0.008** (-2.298)	-0.006* (-1.788)
HHI	0.511 (1.515)	0.434 (1.467)	0.602 (1.204)	0.361 (0.702)
C	-0.915 (-1.644)	0.803** (2.129)	0.557 (0.987)	0.060 (0.104)

Panel C: sigma_w

Dual	0.680*** (13.712)	-0.011 (-0.098)	0.605*** (4.092)	0.613*** (4.117)
Board size	-0.005 (-0.333)	-0.011 (-0.635)	-0.052** (-2.005)	-0.061** (-2.244)
Independence	0.489 (0.939)	0.562 (0.856)	0.943 (0.952)	1.094 (1.085)
Board meetings	0.025*** (3.652)	0.021** (2.369)	0.048*** (3.481)	0.020 (1.440)
Equity concentration	-0.005*** (-3.240)	-0.014*** (-6.479)	-0.001 (-0.376)	-0.002 (-0.656)
C	0.384 (1.305)	-0.004 (-0.011)	-0.773 (-1.473)	-0.525 (-0.961)
Observations	2196	1430	1568	758
Log Likelihood	-4474.748	-1852.315	-2359.290	-882.720

Panel D: Surplus

CEOs Surplus:				
$\hat{E}(1 - e^{-w} \varepsilon)$	66.43 (25.82)	41.63 (20.95)	48.96 (23.36)	36.81 (18.92)
Firms Surplus:				
$\hat{E}(1 - e^{-u} \varepsilon)$	33.59 (11.09)	34.96 (17.59)	35.91 (15.96)	33.72 (18.49)
Net Surplus:				
$\hat{E}(e^{-u} - e^{-w} \varepsilon)$	32.84 (33.15)	6.67 (33.54)	13.05 (34.07)	3.09 (31.12)

Notes: 1. t value in parentheses in Panel A, B and C. 2. Standard deviation in parentheses in Panel D. 3. ***, **, *: significant at 1%, 5% and 10%.