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Pay incentives and firm efficiency in a socialist capitalist system

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Abstract

In this study, we examine the impact of top management pay and relative pay (manager pay divided by average worker pay) on a firm's productivity. We use data from China, which is an interesting setting for our research as it is transitioning from a centrally planned economy with professed egalitarian pay to a free market system, albeit with socialist characteristics. We find that top management pay is positively associated with high productivity while relative pay is negatively associated. Our results provide support for the view that workers are alienated when their incomes are far lower than that of top management and this leads to lower productivity. This effect is most pronounced in labor intensive firms. We also find some evidence that the negative impact of relative pay on a firm's productivity is reduced in private controlled listed firms.

JEL classification: D60, J4

Keywords: productivity, top management pay, relative pay, transitional economy

Pay incentives and firm efficiency in a socialist capitalist system

1. Introduction

Plato: *The income of the highest paid should never be more than five times that of the lowest paid.*

Effective reward systems that relate pay to performance will enhance a firm's efficiency and economic value. Whether compensation systems are effective in practice has been the subject of much debate and academic study. While there are sound arguments for relating top management pay to a firm's performance, the magnitude of the rewards have led to increasing pay disparities with other employees in the organization. This raises the interesting research question of whether the widening pay differences between top management and other employees within an organization have an impact on a firm's efficiency. The widening pay differences within a firm's workforce, mirrors the widening income disparities within society as a whole (OECD, 2011).

There are several theories on the impact of pay disparities between top managers and other employees in the organization on workers' behaviors and these lead to conflicting predictions on the effects of relative pay on firm efficiency. One theory argues that large differences between the pay of managers and workers[1] will lead to feelings of inequity, which in turn spawn destructive behaviors that reduce an organization's efficiency (Akerlof and Yellen, 1990; Deutsch, 1985). A contrasting theory is that high pay disparities may be a signal to low earning workers that their compensation will increase in the future and this will make them work harder (Clark et al., 2009; Card et al., 2011). Tournament theory posits that high wage disparity is a useful motivator of work effort and encourages healthy competition among employees to achieve

[1] To ease exposition, we use the term 'management' for the top executives in the firm and 'workers' (or 'average worker') for other employees. Workers can include middle and lower level managers, engineers, and technicians, as well as unskilled labor.

higher levels of both rank and pay (Lazear and Rosen, 1981). Empirical studies have purported to provide evidence for each of these theories.[2]

The purpose of this study is to examine the impact of compensation policies on the productive efficiency of listed firms in China. China is a particularly interesting setting for our research because it is transitioning from a centrally-planned economy to a free market system. Life-time employment practices have been abandoned and labor markets have developed rapidly. This transition represents a major challenge to China's socialist principles. Two forces are at play. In adopting a market economy, firms have been encouraged, or forced by competition, to adopt incentive pay systems that mirror those in Western countries. Under capitalism, one way to 'solve' the agency problem created by the separation of ownership of listed companies from their control, is through executive remuneration contracts that provide an *ex ante* incentive for managers to create shareholder value by allowing the manager to share *ex post* in the gains thus obtained (Holmström, 1999). On the other hand, given its historical socialist principle of egalitarianism, China's government is very concerned about social unrest as it relaxes that principle. This juxtaposition of socialism and capitalism has led to China's economic system being labeled as 'capitalism with socialist principles' or 'socialist capitalism'.

Using data from the period 2001 to 2006, we find that top management pay has grown at a compound rate of 16% per year. During the same period there has been an increase in average relative pay (top management pay divided by the average worker's pay) from 4.94 in 2001 to 6.01 in 2006. However, these averages hide a wide range of relative pay. In some firms the relative pay approaches 50. While pay disparities in China have increased in recent years they are still far below those seen in developed countries.

We show that top management compensation is positively associated with firm performance

[2] Some differences in the results across studies are due to the way reference groups are formed.

measured by total factor productivity and sales per employee. However, top management pay relative to the average worker's pay is negatively correlated with firm performance. This negative relationship is more pronounced for those firms with higher labor costs in their cost structure. The negative relation between relative pay and productivity is lessened in private controlled listed firms. We find no statistical evidence that the negative impact of relative pay on productivity is attenuated for firms located in those provinces where government intervention is high.

Our paper makes several contributions to the literature on CEO compensation. We examine the absolute and relative executive compensation on firm performance simultaneously. The results show a sharp tension between top management interests and other workers' feelings in an organization. Managers work hard to improve firm performance when they are rewarded for doing so. However, high top management pay without reciprocal increases in pay for other employees leads to a reduction in firm efficiency. The results are consistent with increases in relative pay leading to feelings of injustice, which may alienate some workers and lead to lower productivity.

We provide evidence that is consistent with the findings in the happiness and relative income literature. Individuals may derive utility not from their absolute level of own income but rather from their level of income relative to others. Some prior research has found that the higher pay of others has a negative effect on one's reported well-being after controlling for one's own income (Clark and Oswald, 1996; Luttmer, 2005). Our results indicate that wider disparities in pay hurt morale and productivity and result in poorer firm performance.

Finally, our analyses of what types of firms are more affected by relative pay add to the literature on the ways that firms are organized. We find some evidence that the type of ownership,

private or state, matters. As expected, we find that productivity in labor intensive firms is more negatively affected by high top management to worker pay differentials.

The paper proceeds as follows. Section 2 outlines the literature review and hypotheses development. This section describes the general framework for setting top executive pay in China and introduces the research questions that we investigate. We present the research design in section 3 and describe the sample, variable selection, and the regression models. Section 4 describes the empirical results. Section 5 presents conclusions.

2. Literature review and hypotheses development

2.1. Theories on relative pay

High pay disparities between different ranks of employees and managers, as exist in many firms in the U.S., can be explained by tournament theory (Lazear and Rosen, 1981; Lazear, 1991; Main et al., 1993; Lynch, 2005; Lee, Lev, and Yeo, 2008; Kale, Reis, and Venkateswaren, 2009). Here, pay disparities increase in the upper hierarchies of an organization. This creates strong incentives for lower level managers and employees to compete hard for promotion and they will exert substantial effort and commitment to win the tournament prize (the large increase in compensation that goes with the promotion). The increase in effort will benefit the firm's stockholders.

Low pay disparity can be explained by relative depravation and distributive justice theories, which say that lower level managers and employees feel aggrieved at the high pay of their superiors and therefore cooperation declines in the organization (Deutsch, 1985; Henderson and Fredrickson, 2001). The resentment created by high pay disparities can jeopardize the firm's profitability and efficiency (Dye, 1984; Lazear, 1989; Siegel and Hambrick, 2005). Research on

the impact of wage differences within an organization has shown evidence that increased disparity is associated with lower productivity, less cooperation, and increased turnover (Bloom and Michel, 2002, Finkelstein, 1996, Pfeffer and Langton, 1993). To remedy this, an egalitarian approach, where pay differences between top managers and other workers are small, may lead to greater productivity (Bloom, 1999; Drago and Garvey, 1998; Levine, 1991). However, there are counter-arguments that compressed pay levels reduce incentives and lead to poor corporate performance (Hibbs and Locking, 2000; Lallemand, Plasman, and Rycx, 2004).

The relative income hypothesis states that relative income, instead of, or in addition to absolute income, is what determines utility. It is social norms, social comparisons, and reference values that influence individuals' subjective evaluations of their economic situations and weaken the relation between income and happiness that one would observe based only on absolute income. Clark and Oswald (1996) show, using regression analysis that controls for standard individual and demographic characteristics, that utility depends on income relative to some reference or comparison income. Ferrer-i-Carbonell and Frijters (2004) find that the income of the reference group is as important as own income for an individual's happiness. In contrast, Charness and Kuhn (2007) find the workers' efforts are not related to relative pay.

While many studies, including those referenced above, show that high wage differences between employees in an organization can lead to feelings of inequity (Brown et al., 2008; Clark et al., 2008; Ferrer-i-Carbonell, 2005), other research has reached an opposite conclusion (Card et al., 2011). High wage disparities among employees of an organization can be a signal that future wages of the lower paid employees will increase. Here, the positive future pay signal outweighs the negative status effect of low relative pay (Clark et al., 2009). One reason for the differences in the empirical results reported to date is the different reference groups used in

calculating relative pay.[3] In our study, we compare top management pay and the pay of other employees within the same organization.

2.2. Caps on top management pay

There is increasing public outrage over the seemingly excessive compensation packages granted to top executives. Some people view the "Wall Street bonus culture" as a root cause of the recent financial crisis. "Excessive" top management pay can also affect morale within an organization. Bok (1993) argues that the huge size of executive salaries and bonuses, even if they can be justified on economic grounds, can have a negative impact on others in the organization by engendering feelings of inequity that can weaken loyalty and increase dysfunctional conflict.

In some countries, governments have recently imposed stringent limits on executive compensation after the financial crisis of 2008/2009. In February 2009, the Obama Administration announced that executive compensation in firms that received funds from the Troubled Asset Relief Program (TARP) should be limited as a condition of the bail-out from the distress caused by the financial crisis in 2008. On July 31, 2009, the United States House of Representatives passed the Say-on-Pay Bill, which requires a non-binding vote by shareholders to approve executive compensation (Seitzinger, 2009). The German Financial Markets Stabilization Act (Finanzmarktstabilisierungsgesetz) that became effective on 18 October 2008 empowers the government to formulate and enforce restrictions on executive compensation for all firms that receive government aid from the stabilization fund. These regulations reflect public outrage over what are perceived as excessive compensation packages granted to executives despite the failure of their firms. However, the empirical evidences on the effectiveness of compensation restrictions are mixed. Cai and Walkling (2011) find a positive market reaction for

[3] There are various ways that reference groups could be formed. McBride (2001) uses people in the same age group, within 5 years younger or older than the individual concerned, as a reference group, while Easterlin (1995) implicitly assumes that individuals compare themselves with all the other citizens of the same country.

firms with high excess compensation when the U.S. House passed the first Say-on-Pay Bill in 2007. Ferri and Maber (2010) argue that, in the United Kingdom, Say-on-Pay legislation decreases the possibilities for "rewards for failure." However, Verret (2009) posits that limiting manager compensation in the U.S. may harm the economy in the globalized environment. Clementi and Cooley (2009) argue that many CEOs, in fact, are not excessively paid since the compensation distribution is highly skewed. They show that the median CEO compensation in U.S. firms in 2006 was only $4.85 million, while the average is much higher, $10.8 million, suggesting that the income inequality problem may be exaggerated. Macey (2009) argues that the legislative salary limits could lead to even higher levels of compensation as was the case with the 1993 compensation tax code reforms, which were intended to limit excessive growth in executive compensation.

China's government has an ambivalent attitude toward top management pay. While encouraging firms to make top managers more accountable and make pay depend on performance, the government is acutely aware that other employees may feel aggrieved by high pay disparities. In light of this, the local and central government have issued a variety of regulations and guidance that limit managers' compensation. In 1986, the government stated that top managers could receive up to three times the average worker's pay if they met performance targets. In 1988 and 1992, regulations were changed such that the performance targets were explained in more detail. The effective cap on top executive pay under the revised regulations was still three times the average wage. In 2002 and 2006 state regulations allowed pay relativities to increase to 12 and 14, respectively. These pay differences had to be justified by performance. The above-mentioned pay regulations relate to government controlled firms and the increases in maximum relativities over time reflect the need of these firms to compete with

the privately controlled firms for top managers.

There is public unrest about the increasing compensation of executives at listed firms in China (SCMP 2006, 2009) and the government is becoming more concerned with the growing wealth gap (SCMP 2010).[4] The State-owned Assets Supervision and Administration Commission (SASAC), which is a government unit that administers many of the state's stockholdings in listed firms, announced plans to investigate the salary increases of senior executives of state controlled listed firms (SCMP 2007). This concern over high pay mirrors, to some extent, the 'say-on-pay' and 'caps on pay' debates in the developed world.

2.3. Hypotheses

The prior literature and anecdotal evidence has given conflicting evidence on whether top management pay and high pay relativities affect a firm's performance. However, this evidence comes from developed countries with stable economic systems. In order to address the question of incentive pay and relative pay in China we develop four hypotheses. The first hypothesis is:

Hypothesis 1: there is a positive association between the absolute level of top management compensation and firm productivity and a negative association between the relative level of top management compensation and firm productivity.

Our hypothesis assumes a positive impact of top management pay on performance (incentive impact) and a negative impact for relative pay on performance (large relative pay leads to conflict and a loss of morale within the workforce, which has a negative impact on performance). As our reference groups are top management pay and the average pay of all other workers in the firm, we believe high pay disparities will alienate the workers and productivity will decline. Hence we formulate our theory based on this view of the world. In contrast, if we

[4] This public unrest also occurs in the developed economies. For example, there is widespread outrage in the U.S. and Europe at the increases in top executive pay at firms that concurrently or subsequently report large losses, fire large parts of the workforce, and that receive financial assistance from the state.

find that there is a positive relation between relative pay and performance this will give support to tournament theory and the signaling effect theory of higher future earnings. We expect that tournament theory and the signaling theory will be more relevant when the reference groups are closer.

A striking characteristic of the listed firms in China is that there is a single dominant owner, be it the state or private person, which has effective control of the company. On average, the largest single investor owns 46% of a listed firm and the second largest investor owns about 7% (Chen, Firth, and Xu, 2009). We are therefore able to characterize a listed firm as state controlled or privately controlled depending on who the major stockholder is. Workers in state controlled listed firms are likely to have always worked in the state sector and are used to egalitarian pay and socialist principles. In comparison, workers in private controlled firms may be more accepting of wide pay disparities. Thus, workers in state controlled listed firms will feel more aggrieved at highly disparate pay and this translates into poorer work attitudes and lower firm efficiency. Our second hypothesis is:

Hypothesis 2: the negative association between relative compensation and firm performance should be more pronounced for state controlled listed firms.

Amason (1996) finds that affective conflict is significantly and negatively related to both decision quality and affective acceptance of decisions while Jehn (1995) finds that interpersonal conflict creates problems with decision-making and hence affects performance. Lazear (1989) and Levine (1991) use equity-based (fairness-based) arguments to conclude that less pay dispersion is necessary in groups to reinforce desirable social behaviors, such as cooperation, communication, and effort. High wage differences within an organization can hurt morale and productivity. In particular, large disparities in pay can lead to a lack of motivation, increased

turnover and absenteeism, and increased anti-management activity. Pay dispersion will be associated with higher dysfunctional affective conflict and lower useful cognitive conflict especially when the interdependence or team work among jobs is important. Based on the above arguments, our third hypothesis is:

Hypothesis 3: the negative association between relative compensation and firm performance should be more pronounced for those firms requiring more team work.

Prior literature documents that governments have incentives to intervene in the operations of firms and this is especially so in socialist or transitional economies. For example, Fan, Wong, and Zhang (2007) find that the Chinese government drives SOEs to diversify into unprofitable industries and expand production to promote the local economy. However, government intervention in a local economy varies across the different regions of China and this will have an impact on how pay incentivizes managers and how pay disparity affects workers' behaviors. High government involvement in a local economy may reduce the negative impact of high pay disparities. Here, the workers are either intimidated by government and do not complain about high pay relativities or else they believe government intervention will benefit them. Using an index of government intervention in the economy, we examine these effects in the next hypothesis:

Hypothesis 4: the negative association between the relative compensation and firm performance should be attenuated in regions where there is higher government intervention.

3. Data and empirical design

3.1. Sample

Our sample is non-financial companies listed on the Shanghai and Shenzhen stock

exchanges (China's two stock markets) in the period 2001 to 2006. We start in 2001 as that is the year that firms were required to publish executive pay information; prior to 2001, some firms did not disclose this information even though they were strongly recommended to do so. We end our sample period in 2006 for two reasons. First, there were major changes in accounting standards beginning in 2007 that make comparisons with earlier years more difficult. Second, there were changes in the way the average employee wage is reported from 2007 onwards, which leads to data compatibility problems. We exclude financial firms because they are heavily regulated. The data on compensation and company characteristics come from the CSMAR database and annual reports. The CSMAR database is marketed by GTA Corporation, one of the largest and most established data vendors of security prices and accounting data in China. Our sample is 5,744 firm-year observations.

Executive directors' compensation has to be disclosed in a firm's financial statements. Compensation consists of salary and bonus although most firms do not distinguish between the two and instead they report one lump sum. From 2005 the pay of the CEO or managing director is disclosed but the data are incomplete in the earlier years. Since 2001, firms have disclosed the collective pay of the three highest paid directors and we use the average of this pay as an independent variable (there are more data on the pay of the three highest paid directors than the pay of the CEO and so we use the former).[5] In China, the top executives sit on the firm's board and so the three highest paid directors will be the three highest paid managers.

3.2. Regression models

The general form of the regression models is as follows:

$$PERF = \beta_0 + \beta_1 COMP + \beta_2 RelPay + \beta_3 COMP * RelPay + controls \quad (1)$$

[5] The average is computed as the total pay of the three highest paid directors, divided by three.

We employ two variables to measure a firm's performance, *TFP* and *SaleLab*. *TFP* is total factor productivity. Here, we regress a firm's natural logarithm of total sales on two factors, the logarithms of labor and capital, within each industry for each year, to arrive at the annual Cobb-Douglas production function for an industry. The number of employees is used as a proxy of a company's labor input and the value of fixed assets is used as a proxy of its capital input. We then use the estimated industry-level production function to predict a firm's expected production level and take the difference between it and the actual production as the *TFP* of the firm. *SaleLab* is sales to number of employees (divided by 1,000,000). *Comp* is the average annual compensation of the three highest paid directors (divided by 1,000,000). *RelPay* is the ratio of average annual compensation of the three highest paid directors to the average annual salary of an employee.

We also include the following control variables. *LnBSize* is the log value of the number of directors on the board. *IndDir* is the proportion of the number of independent directors to the total number of directors on the board. *Post* is a dummy variable coded 1 if the chairman and the general manager are different persons and 0 otherwise. *LnAsset* is the log value of total assets. *LivExp* is the family living expenditure level (i.e., a cost of living index) of the province where the firm is located (divided by 1,000). *LnFirmAge* is the log value of the number of years the firm has been listed. *DA* is debt to total assets. *MB* is the market value of equity to the book value of equity. *ROA* is return on assets. *Private* is a dummy variable that is coded one if the controlling stockholder is a private entity or person; *Private* is coded zero if the dominant stockholder is the state (central, regional, or municipal government or an associated ministry or agency). State controlled firms may be more subject to political interference and the managers are more likely to be political appointees or former civil servants. Furthermore, state controlled

listed firms may be given a variety of objectives to follow (Shleifer, 1998) and managers will be rewarded for achieving these objectives. This may affect a firm's productivity. Industry and year dummies are additional controls. Industry is based on the expanded list of industries as designated by the China Securities and Regulatory Commission (CSRC).

We run the regressions with both contemporaneously and lagged independent variables. As both sets of results are similar, we just report the results using contemporaneously measured independent variables. We do not use panel models because some of the variables (e.g., governance and ownership variables) do not change over time and so their impact will be washed-out in panel models. We use robust standard errors to correct for firm clustering, heterogeneity, and autocorrelation.

We also use change in performance from one year to the next as the dependent variable. The independent variables include the change in compensation and relative pay. The model is:

$$\Delta PERF = \beta_0 + \beta_1 \Delta COMP + \beta_2 \Delta RelPay + \beta_3 \Delta COMP * \Delta RelPay + controls \quad (2)$$

Equation (2) is used to measure sensitivities. *PERF* is total factor productivity or sales per employee.

4. Results

4.1. Basic statistics

Table 1 Panel A shows the means, medians, and standard deviations of the variables. The mean and median compensation for the highest paid executive directors are 173,000 RMB and 123,500 RMB, respectively (this is the total pay for the three highest paid directors of a firm divided by three). RelPay has a median of 5.74 which indicates that the average top management pay is nearly six times the wage of the average worker. This is much lower than in the U.S.

where Kim and Lu (2009) report that for the average S&P 500 firm in 2003 the CEO earned 300 times what the average production worker earned. This was up from 30 times more in the 1970s. Based on developed countries' norms, pay disparity is low in China and this is consistent with the government's avowed intent to avoid social disharmony created by wide wealth gaps.

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Table 1 here

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The mean of total factor productivity is 0.0031. About 29% of firms have a private individual or family as the controlling stockholder with the other firms being controlled by local or central government, state ministry, or a wholly-state owned enterprise. Approximately 13% of firms have a single person occupying both the chair and CEO positions. On average, a firm's return on assets is low indicating modest to low profitability. *GQ* measures the government involvement in the local economy and is used in testing Hypothesis 4. Here, each province is given a score ranging between 1 and 10 with 10 indicating a strong involvement. The data are from a World Bank survey. The mean and median of *GQ* are 5.10 and 4.75, respectively.

In Table 2, Panel A, we show the mean and median of top management compensation for each year in our sample period. The mean pay increased from 104,300 RMB in 2001 to 222,000 in 2006. The Table also shows the mean and median pay in each year for firms controlled by the government and for firms controlled by private investors. Both types of firm have seen increases in top management pay.

The annual breakdown of mean and median relative pay is shown in Table 2, Panel B. Relative pay has grown over time. However, relative pay is lower in state controlled listed firms. This may reflect government influence to keep pay disparities low. Nevertheless, relative pay has still increased in state controlled companies.

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Table 2 here
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4.2. The relations between the absolute and relative top management compensation and firm performance

We report the regression results on the relations between top management compensation, pay relativity, and firm performance (total factor productivity (*TFP*) and sales per employee (*SaleLab*)) in Table 3. The results of the *TFP* and *SaleLab* regressions are reported in Panels A and B, respectively. Model 1 of Panel A shows that there is a positive relationship between top management compensation and *TFP*. Model 2 shows that there is a negative association between top management compensation relative to the average worker wage (*Relpay*) and *TFP*. We include *Comp, RelPay* and the interaction between *Comp* and *RelPay* in Model 4. We still find a positive coefficient on *Comp* and a negative coefficient on *RelPay*. The coefficient on the interaction term is negative and significant. This suggests that the negative association between *RelPay* and performance dominates the positive association between *Comp* and performance. When we replace *TFP* by *SaleLab* (see Panel B) as a measure of corporate performance, the results are consistent with those of Panel A. In particular, we find a positive relation for *Comp* and negative relations for *RelPay* and *Comp*RelPay*.

To test the stability of our findings, we rerun the regressions each year. The results (untabulated) show that the positive association between *Comp* and performance holds for each year, and the negative association between *RelPay* and performance also holds for each year. Overall, our findings indicate that higher top management compensation can incentivize executives to work hard and improve firm performance. The results also indicate that high wage disparities between top management and the average worker can hurt firm performance. The negative effect of disparities in pay dominates the positive effect of top management pay when

we use sales per employee as our measure of firm performance.

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Table 3 here
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Following Murphy (1999), we examine pay-performance sensitivities. For the sensitivity analyses, we regress change in absolute pay (*CompChg*) and change in relative pay (*RelPayChg*) on change in performance. The results are reported in Table 4. We find that the coefficient on *CompChg* is positive and the coefficient on *RelPayChg* is negative. Based on the results in model 4 (model 8), we find that a 1% increase in top management pay will lead to an increase in TFP (SaleLab) of 0.429% (2.44%). Similarly, a 1% increase in RelPay will lead to a reduction in TFP (SaleLab) of 0.01% (0.07%).

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Table 4 here
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4.3. The impact of ownership on the relations between the absolute and relative top management compensation and firm performance

In order to see if the relations between the relative top management pay and firm performance are different between private controlled and state controlled firms we use the interaction of *RelPay* with *Private*, which is a dummy variable coded one if the listed firm is controlled by a private investor. The results are reported in Table 5. The dependent variables are *TFP* and *Salelab* in Panels A and B, respectively. Panel A shows that the interaction terms (with Private) attenuate the influence of *RelPay* on firm performance. *RelPay* has a negative coefficient while *RelPay*Private* has a positive coefficient in Model 4. However, the interaction term is not significant at conventional levels. In Panel B, we also see that private controlled firms have less negative coefficients for *RelPay*. In contrast to Panel A, the interaction terms in Panel B are statistically significant. The evidence in Table 5 gives some support for hypothesis 2. Employees in private controlled firms appear to be less concerned about high pay disparity

between top managers and the average worker compared to their counterparts in state controlled firms.

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Table 5 here
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4.4. The impact of cost structure on the relations between the absolute and relative top management compensation and firm performance

The operations of different firms require different levels of interdependence or team work. In order to examine how the relations between the absolute and relative top management compensation and firm performance are affected by a firm's cohesiveness and interpersonal cooperation, we use the interaction between *Comp* and *Cost* and *RelPay* and *Cost*, where *Cost* is the total labor cost to sales. If the total labor cost accounts for a high proportion of sales, it represents a labor intensive industry, which requires a high level of cooperation among its employees. If wage disparity indeed hurts morale and productivity, firms with higher labor costs should be impacted the most. We report the results of our analysis in Table 6. We find the coefficients on *RelPayCost* are significantly negative regardless of whether *TFP* or *Salelab* is used as the dependent variable. The results are consistent with our hypothesis 3 that the negative association between the relative compensation and firm performance should be more pronounced for those firms requiring more team work. *CompCost* has a negative coefficient in panel A and a negative and significant coefficient in Panel B. This implies that top executive pay has less influence on productivity in labor intensive businesses.

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Table 6 here
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4.5. The impact of government intervention on the relations between the absolute and relative top management compensation and firm performance

Finally, we examine how government intervention affects the relations between the absolute and relative top management compensation and firm performance. Our government intervention data come from the World Bank survey report "Governance, Investment Climate, and Harmonious Society — Competitiveness Enhancements for 120 Cities in China". This survey covers 12,400 firms in 120 cities all over China and provides detailed city-level data on city characteristics, government effectiveness and progress towards a harmonious society. The 120 cities are distributed across all provinces except Tibet and the GDP of the 120 cities represents 70%-80% of total GDP in China, depending on the year. The data are representative and relatively complete.

To operationalize our measure of government intervention, we first rank each of the four variables of intervention for each year and form deciles. We formulate an aggregated index of government quality or intervention (*GQ*) by averaging the rankings of the four variables for each city. Our first variable is effective taxation and administrative fees paid by firms, calculated as the percentage of taxation and fees to total sales. Taxation and administrative fees are the principal means by which governments extract resources from firms. The second variable is expenditure on travel and entertainment by enterprises, calculated as the expenditure on travel and entertainment divided by total sales. These costs can be regarded as informal payments to government officials and used as a measure of the corruption within the government. The third variable is the average annual bureaucratic interaction days, which reflects the amount of time firms must spend to interact with government bureaucracies. This variable measures both the degree of government intervention and the efficiency of government. Confidence in courts reflects whether entrepreneurs have confidence in local courts when they seek a legal solution for business disputes. This variable serves as the measure of protection of property rights and the

degree of impact by the government through the legal system. The higher *GQ* is, the higher the government intervention is.

Hypothesis 4 states that employees may feel less aggrieved about high pay disparities in firms that are located in cities where government intervention is high. The main variable of interest is the interaction of government intervention (*GQ*) and *RelPay*. The results in Table 7 show negative coefficients on *GQ*, which indicates that productivity is lower for firms located in cities where government intervention is high. However, the result is only significant in Panel B. The interactions of *GQ* with *RelPay* are not significant. Thus, there is no support for hypothesis 4. WHY DO WE INTERACT *GQ* WITH *Comp* AND *CompRelPay*? THIS IS NOT PART OF THE HYPOTHESIS. *GQ* RANGES FROM 0 TO 10. IS IT BETTER TO DO ABOVE MEAN (MEDIAN) AND BELOW MEAN (MEDIAN) – i.e., SIMILAR TO COST. NOTE THAT *Comp* BECOMES NOT SIGNIFICANT IN TABLE 6.

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Table 7 here
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5. Conclusion

China is transitioning from a centrally planned economy to a market economy. This includes the opening up of labor markets where managers and workers can change jobs freely. One challenge faced by firms is how to alleviate agency costs and this leads to a greater use of incentive pay to reward top managers. However, increased rewards to top management results in widening pay disparities between them and other employees, which may have an impact on workers' behaviors and, ultimately, on a firm's productive efficiency. China's government recognizes the need to adequately reward managers but, at the same time, it is acutely aware that an increasing gap in incomes between managers and workers might alienate the workers and

even lead to social unrest. Under the rigid communist system that operated up to the 1980s there was very little difference in cash compensation between the workers and top managers. People were indoctrinated with the concepts of egalitarian pay and working for the common good. The change to free markets with increasing pay and wealth disparities is a major shock to the economic system that can lead to dysfunctional worker behaviors.

There are several theories that relate to pay disparities, or relative pay, and they give different predictions as to the effects of pay differences on a firm's productivity. The aim of this study is to examine the relative pay between managers and workers within a firm and to investigate the impact of *RelPay* on total factor productivity (*TFP*) and sales per employee (*SaleLab*), which are measures of a firm's efficiency. In doing so, we test which theory best explains the impact of relative pay on efficiency in China.

We find that top executive pay is positively related to a firm's productivity measured by both total factor productivity and by sales per employee. Pay disparity, measured as the ratio of top management pay divided by the average worker's pay in the same organization, is negatively related to productivity. It appears that high manager to worker pay disparities lead to workers' resentment over the high pay of their bosses and consequently a firm's productivity declines. There is some evidence that the negative impact of relative pay is more influential on productivity than is the positive impact of top management pay-performance sensitivity.

There is some statistical evidence that private controlled listed firms are different from state controlled listed firms when it comes to the impact of top executive pay and pay relativity on productivity. Thus, it appears that the workers' views on pay relativities somewhat depend on the ownership of the firm they work for. We do, however, find that high pay disparity elicits lower productivity in labor intensive firms. There is no statistical evidence that the negative impact of

pay relativities on productivity is attenuated for firms located in provinces where there is a lot of government intervention in the local economy.

While the finance literature gives a lot of attention to the design of management incentive systems our study is a timely reminder that high pay disparity between the top management and the average worker can lead to lower productivity. The resentment created by high pay disparities should not be underestimated. Although our results are specific to China we believe they may have resonance in other transitional economies that are going through major economic and ideological changes.

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Table 1

Descriptive Statistics

TFP is total factor productivity. SaleLab is sales to number of employees (divided by 1,000,000). Comp is average annual compensation of the three highest paid directors (divided by 1,000,000). RelPay is the ratio of average annual compensation of the three highest paid directors to the average annual salary of an employee. LnBSize is the log value of the number of directors on the board. IndDir is the percentage of the number of independent directors to total number of directors on the board. Post is a dummy variable coded 1 if the chairman and the general manager are different persons and 0 otherwise. Private is a dummy variable coded 1 if the firm is a privately-owned enterprise and 0 otherwise. LnAsset is the log value of total assets. LivExp is the living expenditure level of the province where the firm is located (divided by 1,000). LnFirmAge is the log value of the number of years the firm has been listed. DA is debt to total assets. MB is market value of equity to book value of equity. ROA is return on assets. COST is total compensation for employees to sales. GQ is the aggregate measure of government quality. GQ is the average of the decile ranks (from 1 to 10) of 4 measures including Taxes and Fees, Entertainment Cost, Bureaucratic Interaction and Confidence in Courts. TFPChg is change in total factor productivity. SaleLabChg is change in sales to number of employees (divided by 1,000,000). CompChg is change in average annual compensation of the three highest paid directors (divided by 1,000,000). RelPayChg is change in the ratio of the average annual compensation of the three highest paid directors to the average annual salary of an employee. AssetChg is change in total assets (divided by 1,000,000,000). LivExpChg is change in living expenditure level of the province where the firm is located (divided by 1,000). DAChg is change in debt to total assets. MBChg is change in market value of equity to book value of equity. ROAChg is change in return on assets.

	Dummy (1)	Dummy (0)	Mean	Median	Maximum	Minimum	Standard Deviation
TFP			0.0031	-0.0606	12.0199	-7.2978	0.9164
SaleLab (1,000,000)			0.8202	0.3975	25.8376	0.0002	1.5707
Comp (1,000,000)			0.1730	0.1235	1.7792	0.0060	0.1640
RelPay			5.7461	4.0824	53.5652	1.0008	5.2933
LnBSize			2.2651	2.1972	2.9444	1.3863	0.2181
IndDir			0.2875	0.3333	0.6000	0.0000	0.1137
Post	5002	742					
Private	1639	4105					
LnAsset			21.2004	21.1067	27.1111	18.1572	0.9296
LivExp (1,000)			7.9219	7.0328	14.8254	4.1102	2.7212
LnFirmAge			1.7462	1.9459	2.8332	0.0000	0.6637
DA			0.4753	0.4861	0.8994	0.0117	0.1757
MB			2.7405	2.1623	20.7750	0.3875	1.9995
ROA			0.0239	0.0285	0.4250	-0.7359	0.0630
Cost			0.0853	0.0709	0.6794	0.0013	0.0629
GQ			5.0962	4.7500	9.7500	1.5000	2.0345

Table 2

Top Management Pay and Relative Pay Over Time and by Type of Firm Ownership

Panel A: Top Management Pay

Year	All Firms			State Controlled Firms			Private Controlled Firms		
	N	Mean	Median	N	Mean	Median	N	Mean	Median
2001	747	0.104	0.073	550	0.104	0.077	197	0.103	0.067
2002	881	0.132	0.097	654	0.129	0.100	227	0.142	0.090
2003	921	0.161	0.119	674	0.158	0.120	247	0.169	0.117
2004	1063	0.187	0.138	746	0.185	0.136	317	0.193	0.146
2005	1039	0.200	0.148	728	0.194	0.144	311	0.214	0.160
2006	1093	0.222	0.172	753	0.219	0.166	340	0.226	0.174

Panel B: Relative Pay

Year	All Firms			State Controlled Firms			Private Controlled Firms		
	N	Mean	Median	N	Mean	Median	N	Mean	Median
2001	747	4.942	3.429	550	4.613	3.221	197	5.859	4.158
2002	881	5.389	3.926	654	5.004	3.779	227	6.501	4.279
2003	921	5.803	4.181	674	5.353	3.881	247	7.030	4.860
2004	1063	6.105	4.327	746	5.611	3.946	317	7.269	5.427
2005	1039	5.929	4.270	728	5.360	3.743	311	7.260	5.585
2006	1093	6.010	4.367	753	5.502	3.868	340	7.136	5.646

Relative pay is top management pay divided by the average worker's pay.

Table 3

Multivariate Analysis for Level Compensation

TFP is total factor productivity. SaleLab is sales to number of employees (divided by 1,000,000). Comp is average annual compensation of the three highest paid directors (divided by 1,000,000). RelPay is the ratio of average annual compensation of the three highest paid directors to the average annual salary of an employee. LnBSize is the log value of the number of directors on the board. IndDir is the percentage of the number of independent directors to total number of directors on the board. Post is a dummy variable coded 1 if the chairman and the general manager are different persons and 0 otherwise. Private is a dummy variable coded 1 if the firm is a privately-owned enterprise and 0 otherwise. LnAsset is the log value of total assets. LivExp is the living expenditure level of the province where the firm is located (divided by 1,000). LnFirmAge is the log value of the number of years the firm has been listed. DA is debt to total assets. MB is market value of equity to book value of equity. ROA is return on assets. t-statistics are computed using robust standard errors.

Panel A: The dependent variable is TFP

	Model 1		Model 2		Model 3		Model 4	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	1.143	2.15	0.092	0.17	0.352	0.64	1.649	2.92
Comp	0.512	3.77**					1.559	6.22**
RelPay			-0.020	-6.60**			-0.033	-6.26**
Comp*RelPay					-0.009	-2.38*	-0.022	-2.56**
LnBSize	-0.071	-0.80	-0.026	-0.29	-0.054	-0.60	-0.034	-0.39
IndDir	0.320	1.52	0.405	1.96*	0.405	1.96*	0.346	1.70
Post	0.042	0.77	0.018	0.34	0.027	0.49	0.021	0.40
Private	-0.105	-2.07*	-0.052	-1.02	-0.078	-1.51	-0.051	-1.01
LnAsset	-0.089	-3.42**	-0.037	-1.35	-0.050	-1.89	-0.112	-4.08**
LivExp	0.055	5.84**	0.059	6.41**	0.061	6.62**	0.038	4.08**
LnFirmAge	-0.168	-5.16**	-0.178	-5.27**	-0.180	-5.52**	-0.157	-4.73**
DA	0.702	4.84**	0.692	4.89**	0.679	4.68**	0.799	5.70**
MB	0.017	1.54	0.022	1.97*	0.022	2.00*	0.009	0.78
ROA	3.184	10.34**	3.462	11.14**	3.354	10.83**	3.093	10.13**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.099		0.105		0.093		0.131	
F-statistics	20.744		22.629		20.083		27.254	
p-value	0.000		0.000		0.000		0.000	

Table 3 (continued)

Multivariate Analysis for Level Compensation

Panel B: The dependent variable is SaleLab

	Model 5		Model 6		Model 7		Model 8	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	-1.704	-2.11	-3.873	-5.18	-5.178	-6.89	-1.104	-1.42
Comp	1.403	3.94**					4.758	6.79**
RelPay			-0.046	-10.38**			-0.073	-8.32**
Comp*RelPay					-0.032	-5.25**	-0.105	-3.70**
LnBSize	-0.508	-3.98**	-0.399	-3.31**	-0.450	-3.89**	-0.400	-3.86**
IndDir	-0.318	-0.86	-0.021	-0.06	-0.092	-0.27	-0.277	-0.81
Post	0.010	0.08	-0.065	-0.54	-0.052	-0.45	-0.100	-0.86
Private	-0.124	-1.71	0.024	0.36	-0.070	-1.03	-0.027	-0.45
LnAsset	0.136	3.53**	0.255	6.49**	0.286	7.45**	0.088	2.37*
LivExp	0.074	4.18**	0.078	4.68**	0.083	5.04**	0.038	2.15*
LnFirmAge	-0.036	-0.75	-0.049	-1.02	-0.137	-2.78**	-0.011	-0.26
DA	1.161	4.16**	1.077	4.11**	0.736	3.30**	1.200	4.69**
MB	0.002	0.12	0.012	0.82	0.032	2.14*	-0.011	-0.79
ROA	2.542	5.96**	3.364	6.80**	2.867	6.26**	2.356	5.99**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.146		0.169		0.192		0.244	
F-statistics	31.670		38.611		44.982		57.274	
p-value	0.000		0.000		0.000		0.000	

* for significance at 0.05 level.
** for significance at 0.01 level.

Table 4

Multivariate Analysis for the Change in Compensation

TFPChg is change in total factor productivity. SaleLabChg is change in sales to number of employees (divided by 1,000,000). CompChg is change in average annual compensation of the three highest paid directors (divided by 1,000,000). RelPayChg is change in the ratio of the average annual compensation of the three highest paid directors to the average annual salary of an employee. LnBSize is the log value of the number of directors on the board. IndDir is the percentage of the number of independent directors to total number of directors on the board. Post is a dummy variable coded 1 if the chairman and the general manager are different persons and 0 otherwise. Private is a dummy variable coded 1 if the firm is a privately-owned enterprise and 0 otherwise. AssetChg is change in total assets (divided by 1,000,000,000). LivExpChg is change in living expenditure level of the province where the firm is located (divided by 1,000). LnFirmAge is the log value of the number of years the firm has been listed. DA is debt to total assets. MB is market value of equity to book value of equity. ROA is return on assets. DAChg is change in debt to total assets. MBChg is change in market value of equity to book value of equity. ROAChg is change in return on assets. t-statistics are computed using robust standard errors.

Panel A: The dependent variable is TFPChg

	Model 1		Model 2		Model 3		Model 4	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	-0.169	-1.56	-0.178	-1.57	-0.148	-1.47	-0.170	-1.58
CompChg	0.143	1.72					0.429	3.63**
RelPayChg			-0.004	-1.97*			-0.009	-2.96**
CompChgRelPayChg					-0.012	-1.87	-0.008	-1.27
LnBSize	0.003	0.08	0.009	0.26	0.019	0.54	0.011	0.31
IndDir	-0.024	-0.19	-0.029	-0.23	0.024	0.22	-0.027	-0.22
Post	0.006	0.31	0.009	0.44	0.005	0.22	0.010	0.49
Private	-0.008	-0.47	-0.006	-0.35	-0.012	-0.67	-0.009	-0.52
AssetChg	-0.022	-2.22*	-0.020	-2.10*	-0.019	-1.96*	-0.022	-2.21*
LivExpChg	-0.012	-0.56	-0.008	-0.34	-0.009	-0.39	-0.014	-0.63
LnFirmAge	0.066	3.47**	0.065	3.47**	0.062	3.30**	0.066	3.52**
DAChg	-0.450	-2.77**	-0.450	-2.79**	-0.458	-2.83**	-0.435	-2.70**
MBChg	0.004	0.43	0.004	0.47	0.005	0.55	0.003	0.35
ROAChg	1.055	4.52**	1.068	4.56**	1.061	4.55**	1.055	4.50**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.033		0.035		0.033		0.038	
F-statistics	5.966		6.051		6.605		6.450	
p-value	0.000		0.000		0.000		0.000	

Table 4 (continued)

Multivariate Analysis for the Change in Compensation

Panel B: The dependent variable is SaleLabChg

	Model 5		Model 6		Model 7		Model 8	
	Coeff	T	Coeff	t	Coeff	t	Coeff	t
Intercept	0.823	2.77	0.763	2.64	0.793	2.68	0.774	2.72
CompChg	0.596	2.19*					2.441	4.09**
RelPayChg			-0.033	-3.26**			-0.065	-3.67**
CompChgRelPayChg					-0.028	-1.71	0.004	0.18
LnBSize	-0.161	-1.80	-0.141	-1.63	-0.147	-1.65	-0.161	-1.82
IndDir	-0.330	-1.04	-0.330	-1.03	-0.301	-0.96	-0.363	-1.17
Post	-0.003	-0.03	0.007	0.07	-0.007	-0.06	0.010	0.09
Private	0.005	0.13	0.009	0.21	0.006	0.15	0.009	0.22
AssetChg	-0.017	-0.54	-0.007	-0.23	-0.012	-0.36	-0.026	-0.84
LivExpChg	-0.034	-0.63	-0.018	-0.34	-0.017	-0.33	-0.026	-0.49
LnFirmAge	-0.134	-2.52*	-0.128	-2.51*	-0.118	-2.35*	-0.104	-2.22*
DAChg	0.268	0.58	0.281	0.61	0.268	0.57	0.374	0.80
MBChg	0.005	0.25	0.007	0.38	0.007	0.37	0.001	0.06
ROAChg	0.776	3.55**	0.860	3.77**	0.824	3.64**	0.786	3.41**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.002		0.010		0.001		0.024	
F-statistics	1.347		2.566		1.082		4.409	
p-value	0.095		0.000		0.348		0.000	

* for significance at 0.05 level.
** for significance at 0.01 level.

Table 5

Multivariate Analysis for Level Compensation with Interaction Term of Private

TFP is total factor productivity. SaleLab is sales to number of employees (divided by 1,000,000). Comp is average annual compensation of the three highest paid directors (divided by 1,000,000). RelPay is the ratio of average annual compensation of the three highest paid directors to the average annual salary of an employee. LnBSize is the log value of the number of directors on the board. IndDir is the percentage of the number of independent directors to total number of directors on the board. Post is a dummy variable coded 1 if the chairman and the general manager are different persons and 0 otherwise. Private is a dummy variable coded 1 if the firm is a privately-owned enterprise and 0 otherwise. LnAsset is the log value of total assets. LivExp is the living expenditure level of the province where the firm is located (divided by 1,000). LnFirmAge is the log value of the number of years the firm has been listed. DA is debt to total assets. MB is market value of equity to book value of equity. ROA is return on assets. t-statistics are computed using robust standard errors.

Panel A: The dependent variable is TFP

	Model 1		Model 2		Model 3		Model 4	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	1.270	2.30	0.128	0.23	0.386	0.72	1.652	2.95
Comp	0.578	3.65**					1.603	5.71**
RelPay			-0.017	-4.76**			-0.035	-5.52**
RelPayPrivate			-0.006	-1.01			0.003	0.25
CompRelPay					-0.006	-1.12	-0.017	-1.63
CompRelPayPrivate					-0.007	-1.11	-0.007	-0.42
LnBSize	-0.081	-0.92	-0.029	-0.33	-0.051	-0.58	-0.044	-0.50
IndDir	0.333	1.58	0.411	1.99*	0.380	1.84	0.350	1.72
Post	0.043	0.78	0.021	0.39	0.031	0.57	0.023	0.44
Private	-0.069	-1.09	-0.006	-0.09	-0.074	-1.37	-0.046	-0.52
LnAsset	-0.094	-3.52**	-0.041	-1.48	-0.050	-1.86	-0.109	-3.97**
LivExp	0.054	5.75**	0.059	6.36**	0.059	6.32**	0.038	4.02**
LnFirmAge	-0.171	-5.36**	-0.174	-5.22**	-0.183	-5.34**	-0.149	-4.70**
DA	0.712	4.89**	0.713	5.12**	0.692	4.95**	0.760	5.41**
MB	0.016	1.45	0.020	1.77	0.022	1.90	0.009	0.85
ROA	3.173	10.30**	3.469	11.25**	3.377	10.92**	3.098	10.21**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.099		0.104		0.093		0.132	
F-statistics	20.781		20.514		20.688		24.536	
p-value	0.000		0.000		0.000		0.000	

Table 5 (continued)

Multivariate Analysis for Level Compensation with Interaction Term of Private

Panel B: The dependent variable is SaleLab

	Model 5		Model 6		Model 7		Model 8	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	-1.196	-1.47	-5.427	-7.31	-5.432	-7.24	-0.438	-0.53
Comp	2.032	4.02**					5.932	6.09**
RelPay			-0.057	-8.74**			-0.087	-6.76**
RelPayPrivate			0.020	2.13*			0.037	2.19*
CompRelPay					-0.042	-4.42**	-0.151	-3.93**
CompRelPayPrivate					0.020	1.62	0.093	2.06*
LnBSize	-0.494	-3.95**	-0.409	-3.65**	-0.443	-3.90**	-0.398	-3.89**
IndDir	-0.337	-0.92	-0.087	-0.26	-0.110	-0.32	-0.358	-1.06
Post	-0.019	-0.15	-0.070	-0.60	-0.051	-0.44	-0.107	-0.93
Private	0.065	0.72	-0.128	-1.27	-0.106	-1.50	0.088	0.76
LnAsset	0.092	2.34*	0.305	8.03**	0.301	7.88**	0.061	1.53
LivExp	0.087	4.68**	0.077	4.88**	0.079	4.84**	0.030	1.65
LnFirmAge	-0.027	-0.56	-0.136	-2.82**	-0.141	-2.87**	-0.019	-0.46
DA	1.068	3.91**	0.800	3.55**	0.694	3.00**	1.239	4.79**
MB	0.004	0.27	0.030	2.06*	0.037	2.45*	-0.015	-1.06
ROA	2.473	6.00**	3.035	6.50**	2.908	6.22**	2.306	5.93**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.142		0.213		0.193		0.254	
F-statistics	32.742		49.691		41.470		52.480	
p-value	0.000		0.000		0.000		0.000	

* for significance at 0.05 level.
** for significance at 0.01 level.

Table 6

Multivariate Analysis for Level Compensation with Interaction Term of COST

TFP is total factor productivity. SaleLab is sales to number of employees (divided by 1,000,000). Comp is average annual compensation of the three highest paid directors (divided by 1,000,000). RelPay is the ratio of average annual compensation of the three highest paid directors to the average annual salary of an employee. COST is total compensation for employees to sales. LnBSize is the log value of the number of directors on the board. IndDir is the percentage of the number of independent directors to total number of directors on the board. Post is a dummy variable coded 1 if the chairman and the general manager are different persons and 0 otherwise. Private is a dummy variable coded 1 if the firm is a privately-owned firm and 0 otherwise. LnAsset is the log value of total assets. LivExp is the living expenditure level of the province where the firm is located (divided by 1,000). LnFirmAge is the log value of the number of years the firm has been listed. DA is debt to total assets. MB is market value of equity to book value of equity. ROA is return on assets. t-statistics are computed using robust standard errors.

Panel A: The dependent variable is TFP

	Model 1		Model 2		Model 3		Model 4	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	3.388	6.74	1.942	3.81	2.815	5.47	4.091	7.98
Comp	0.596	3.37**					2.071	5.19**
RelPay			-0.021	-2.98**			-0.030	-4.29**
CompRelPay					-0.015	-2.50*	-0.038	-2.18*
Cost	-6.333	-15.08**	-5.954	-11.47**	-6.600	-16.97**	-5.732	-9.24**
RelPayCost			0.028	0.33			-0.155	-2.54*
CompRelPayCost					0.143	3.17**	0.291	1.67
LnBSize	-0.035	-0.44	0.027	0.33	-0.010	-0.12	0.020	0.27
IndDir	0.181	0.92	0.289	1.46	0.233	1.18	0.197	1.06
Post	0.026	0.53	0.002	0.04	-0.001	-0.03	-0.012	-0.26
Private	-0.156	-3.39**	-0.096	-2.07*	-0.133	-2.89**	-0.100	-2.23*
LnAsset	-0.165	-6.82**	-0.098	-3.94**	-0.140	-5.47**	-0.205	-8.21**
LivExp	0.055	6.44**	0.065	7.68**	0.068	8.03**	0.044	5.25**
LnFirmAge	-0.162	-5.46**	-0.165	-5.47**	-0.142	-4.57**	-0.109	-3.78**
DA	0.320	2.42*	0.286	2.16*	0.330	2.53*	0.415	3.31**
MB	0.031	3.21**	0.036	3.72**	0.033	3.29**	0.017	1.75
ROA	1.894	7.08**	2.290	8.49**	2.092	7.81**	1.813	6.98**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.247		0.242		0.246		0.301	
F-statistics	56.481		56.587		56.017		67.788	
p-value	0.000		0.000		0.000		0.000	

Table 6 (continued)

Multivariate Analysis for Level Compensation with Interaction Term of COST

Panel B: The dependent variable is SaleLab

	Model 5		Model 6		Model 7		Model 8	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	-0.235	-0.27	-1.952	-2.74	-2.197	-2.98	1.681	1.87
Comp	2.660	4.40**					8.126	6.21**
RelPay			-0.077	-8.66**			-0.091	-6.75**
CompRelPay					-0.043	-4.33**	-0.244	-4.08**
Cost	-4.813	-5.55**	-8.229	-10.45**	-7.256	-11.27**	-3.085	-1.98*
RelPayCost			-0.348	-5.24**			-0.198	-2.00*
CompRelPayCost					0.160	2.38*	1.895	3.05**
LnBSize	-0.474	-4.00**	-0.348	-3.21**	-0.442	-3.69**	-0.313	-3.40**
IndDir	-0.167	-0.50	-0.182	-0.55	-0.298	-0.85	-0.182	-0.60
Post	-0.049	-0.43	-0.076	-0.66	-0.054	-0.46	-0.112	-1.05
Private	-0.143	-2.17*	-0.041	-0.64	-0.133	-1.92	-0.046	-0.84
LnAsset	0.070	1.67	0.239	6.49**	0.188	5.02**	0.037	1.01
LivExp	0.083	4.93**	0.085	5.32**	0.101	5.72**	0.038	2.41*
LnFirmAge	-0.045	-0.95	-0.105	-2.30*	-0.031	-0.67	-0.040	-0.99
DA	0.419	1.84	0.387	1.83	0.664	2.69**	0.463	2.30*
MB	0.024	1.72	0.042	2.97**	0.038	2.56**	0.008	0.65
ROA	1.119	2.95**	1.713	4.15**	1.887	4.31**	0.955	2.77**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.235		0.266		0.191		0.385	
F-statistics	52.867		57.140		40.914		86.549	
p-value	0.000		0.000		0.000		0.000	

* for significance at 0.05 level.
** for significance at 0.01 level.

Table 7

Multivariate Analysis for Level Compensation with interaction term of Government Quality

TFP is total factor productivity. SaleLab is sales to number of employees (divided by 1,000,000). Comp is average annual compensation of the three highest paid directors (divided by 1,000,000). RelPay is the ratio of average annual compensation of the three highest paid directors to the average annual salary of an employee. GQ is the aggregate measure of government quality. LnBSize is the log value of the number of directors on the board. IndDir is the percentage of the number of independent directors to total number of directors on the board. Post is a dummy variable coded 1 if the chairman and the general manager are different persons and 0 otherwise. LnAsset is the log value of total assets. LivExp is the living expenditure level of the province where the firm is located (divided by 1,000). LnFirmAge is the log value of the number of years the firm has been listed. DA is debt to total assets. MB is market value of equity to book value of equity. ROA is return on assets. t-statistics are computed using robust standard errors.

Panel A: The dependent variable is TFP

	Model 1		Model 2		Model 3		Model 4	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	1.372	2.50	0.181	0.32	0.474	0.85	1.726	3.04
Comp	0.428	1.28					1.152	1.83
RelPay			-0.017	-2.06*			-0.026	-1.92
CompRelPay					-0.004	-0.49	-0.023	-0.89
GQ	-0.018	-1.30	-0.006	-0.43	-0.011	-0.99	-0.016	-0.92
RelPayGQ			0.000	-0.29			-0.002	-0.72
CompRelPayGQ					-0.001	-0.48	0.001	0.12
LnBSize	-0.080	-0.90	-0.042	-0.47	-0.063	-0.71	-0.036	-0.41
IndDir	0.343	1.63	0.422	2.06*	0.395	1.90	0.349	1.70
Post	0.044	0.81	0.021	0.40	0.028	0.52	0.031	0.58
Private	-0.095	-1.86	-0.044	-0.83	-0.076	-1.49	-0.045	-0.92
LnAsset	-0.097	-3.69**	-0.038	-1.37	-0.052	-1.92	-0.109	-4.04**
LivExp	0.056	6.08**	0.060	6.58**	0.062	6.74**	0.038	4.18**
LnFirmAge	-0.171	-5.35**	-0.179	-5.39**	-0.178	-5.33**	-0.164	-5.29**
DA	0.718	4.90**	0.706	4.86**	0.697	4.87**	0.810	5.64**
MB	0.016	1.50	0.021	1.89	0.022	1.92	0.006	0.54
ROA	3.196	10.37**	3.477	11.19**	3.428	11.11**	3.113	10.23**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.101		0.105		0.095		0.134	
F-statistics	21.701		20.860		18.706		26.412	
p-value	0.000		0.000		0.000		0.000	

Table 7 (continued)

Multivariate Analysis for Level Compensation with interaction term of Government Quality

Panel B: The dependent variable is SaleLab

	Model 5		Model 6		Model 7		Model 8	
	Coeff	t	Coeff	t	Coeff	t	Coeff	t
Intercept	-2.175	-2.39	-4.705	-5.65	-4.149	-5.62	0.030	0.04
Comp	1.098	1.26					3.807	2.31*
RelPay			-0.064	-4.80**			-0.079	-3.58**
CompRelPay					-0.041	-1.98*	-0.111	-1.53
GQ	-0.017	-0.90	-0.010	-0.41	-0.011	-0.64	-0.058	-2.13*
RelPayGQ			0.003	1.31			0.001	0.32
CompRelPayGQ					0.002	0.60	0.000	0.04
LnBSize	-0.587	-4.35**	-0.453	-3.47**	-0.482	-3.91**	-0.465	-4.03
IndDir	-0.164	-0.46	0.073	0.21	-0.061	-0.18	-0.186	-0.55
Post	0.001	0.01	-0.064	-0.55	-0.041	-0.34	-0.052	-0.45
Private	-0.096	-1.35	0.066	1.00	-0.071	-0.98	0.011	0.17
LnAsset	0.174	4.11**	0.278	6.71**	0.290	7.55**	0.066	1.71
LivExp	0.069	4.00	0.087	5.08**	0.080	4.59**	0.029	1.70
LnFirmAge	-0.096	-1.97*	-0.084	-1.63	-0.085	-1.79	0.004	0.09
DA	0.923	3.45**	1.024	3.82**	0.758	3.08**	1.399	4.96**
MB	0.016	1.09	0.016	1.10	0.029	1.88	-0.018	-1.30
ROA	2.418	5.49**	3.086	6.15**	3.131	6.31**	2.492	5.90**
Industry Dummy included								
Year Dummy included								
Adjusted R^2	0.171		0.175		0.165		0.240	
F-statistics	34.823		37.888		34.319		51.487	
p-value	0.000		0.000		0.000		0.000	

* for significance at 0.05 level.
** for significance at 0.01 level.