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THE CEO LABOUR MARKET IN CHINA'S PUBLIC LISTED COMPANIES

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Abstract

Using panel data for all of China's public listed firms over the period 2001-2010 we examine how firms have recruited and rewarded their executives over a decade of huge growth and turbulence. CEO pay is sensitive to firm performance, although the elasticities are lower than for the United States and Europe, especially with respect to returns on assets (ROA). CEO pay rises with firm size and growth, with elasticities resembling those for the United States. We find no dramatic response to the stock market crash of 2007/08. The elasticity of pay to stock returns falls to zero after the crash, while elasticities with respect to sales and ROA remain significant. Executive cash compensation rose steeply throughout the period – in contrast to the United States. There are steep gradients in executive compensation within firms, consistent with tournament prizes, and around two-thirds of CEO appointments are internal promotions. Within-firm executive compensation rose at a faster rate than executive compensation across firms, helping to explain why CEO turnover rates declined a little over the decade. Turnover rates did not spike with the stock market crash. Privatisation and reforms to corporate governance contributed to growth in executive compensation. A picture emerges of an executive labour market in which firms are linking pay to performance and relying on incentive structures within firms to foster executive talent.

JEL Classification: G34; J31; J33; M12; M52; O16; P31

Key words: executive compensation; CEO's; corporate governance; tournaments; firm-specific human capital; China

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1. Introduction

A well-functioning market in corporate executives first emerged in China in the 1980s, prompted by state experimentation with an array of managerial incentives to accompany the gradual withdrawal of the state from its ownership of corporate enterprises (Xu, 2011). According to Groves et al. (1995) the state introduced reforms "directed at improving the efficiency of enterprises by replacing direct control from above with managerial incentives" (p. 874). This entailed the gradual commercialisation of state owned enterprises (SoE's) and their part privatization, with key innovations including experimentation with the auctioning of managerial contracts. By the late 1980s, this market was quite well-established but early evidence was confined to executives in the SoEs sector. A second related and dramatic development was the advent of a new publicly listed sector of companies in the early 1990s and its subsequent growth (from 53 firms in 1992 to 1163 in 2001 and 2126 in 2010). By 2001 the public listed sector accounted for 14 per cent of China's GDP. However, over the decade to 2010 the total output of the public listed sector increased eleven-fold such that, by 2010, it accounted for 43 per cent of China's GDP (Table 1).

[INSERT TABLE 1 HERE]

The public listed sector thus became the engine of China's growth in the first decade of the 2000s.² After a sluggish period in the first half of the decade the stock market responded with massive investment in listed firms. Market capitalization rose from 35 per cent of China's GDP in 2005 to 179 per cent in 2007 (Figure 1). This was followed by a stock market crash in late 2007, at around the same time as the US stock market started to falter and shortly before the on-set of recession in the United States.³ Although there has been some recovery since then the markets have not returned to their pre-crash levels. By 2010 market capitalization of the listed sector stood at 81 per cent of China's total GDP.

² As Xu (2011: 1117) points out: "The most important non-state sector until the mid-1990s was the Township-Village Enterprises...[which]...accounted for about four-fifths of the output of the non-state sector". These collectively owned enterprises continue to play an important role in production.

³ According to the National Bureau of Economic Research the US recession began in December 2007 (<http://www.nber.org/cycles/sept2010.html>).

[INSERT FIGURE 1 HERE]

How did the market for CEO's and top executives respond in this period of remarkable growth and turbulence? We answer this question using panel data for all of China's public listed firms, "benchmarking" results against studies for the United States and elsewhere. Despite differences between China and the West in the composition of the public listed sector and the governance of market relations, its executive labour market resembles executive markets elsewhere. CEO pay is sensitive to firm performance, although the elasticities are lower than for the United States and Europe, especially with respect to returns on assets (ROA). CEO pay rises with firm size and growth, with elasticities resembling those for the United States. We find no dramatic response to the stock market crash of 2007/08. The elasticity of pay to stock returns falls to zero after the crash, whilst elasticities with respect to sales and ROA remain significant. Executive cash compensation rose steeply throughout the period – in contrast to the United States. There are steep gradients in executive compensation within firms consistent with tournament prizes, and around two-thirds of CEO appointments are internal promotions. Within-firm executive compensation rose at a faster rate than executive compensation across firms, helping to explain why CEO turnover rates declined a little over the decade. Turnover rates did not spike with the stock market crash. Privatisation and reforms to corporate governance contributed to growth in executive compensation. A picture emerges of an executive labour market in which firms are linking pay to performance and relying on incentive structures within firms to foster executive talent.

Non-executive employees appear to receive their marginal product since their compensation rises at roughly the same rate as productivity. However, wage hikes for executives far exceed those received by non-executives, leading to substantial within-firm wage variance. The mean compensation of a top three executive was 61 times higher than that for other employees in the firm in 2001, rising to 136 times in 2010.

Our data are taken from CSMAR database produced by GTA Information Technology Company Ltd. This database comprises information disclosed by public listed companies in China under the rules and guidelines set out by the China Securities Regulatory Commission (see CSRC, 2007). This paper focuses on firm-level analyses for the 2,219 firms listed at any point between 2001 and 2010, providing us with 14,987 firm*year observations. The data include the firm accounting data and corporate governance information reported on in Section Two and the executive compensation and executive characteristics data discussed in Section Three. Average cash and bonus compensation for the top three executives in the firm is available throughout the period and, from 2005, the data include compensation of individual executives including the CEO. As well as total compensation, we observe executives' shareholdings in the firm, and whether they receive any payments in the form of stock options, restricted stock, or stock appreciation. Stock options were only legally available to executives from 2005 onwards, a point to which we return below. Finally, the data contain a range of items regarding the nature of the firm (such as ownership, industry, size, age, and time since listing) and individual executives (age, sex, tenure, how they were appointed). One of the chief drawbacks with the data is the fact that information on education is only disclosed for a minority of executives.

The remainder of the paper is set out as follows. Section Two discusses the development of the public listed sector in China over the last decade and identifies fundamental differences between the sector and its counterpart in the United States. The section also presents trends in the performance of the sector showing huge rises in productivity and profitability, together with increasing dispersion in performance across firms, and points to some big changes in corporate governance which have a bearing on executive pay setting. Section Three presents descriptive evidence of the way in which the market for top executives has developed over the course of the last decade. We consider the size and composition of the executive pool, the size and composition of their compensation packages, and growth in their compensation relative to non-executives and relative to one another. Section Four presents multivariate analyses of influences on executive compensation using OLS, differencing and firm fixed effects estimators. We explain our

model specifications, relating them to the previous literature, then present results, making explicit comparisons with the previous literature for the US and Europe. Section Five concludes with a discussion of the implications of our results for understanding the development of the market for top executives in China.

2. Another Great Leap Forward: The Phenomenal Development of China's Public Listed Sector

Although the Shanghai Stock Exchange first began operations in the 1920s, it was re-established in 1990 and, together with the Shenzhen Stock Exchange which was founded in the same year, comprises the listed sector of firms in China. The total number of listed firms has almost doubled in the decade through to 2010, their ranks being swelled by the new listing of over 1,000 firms (Table 1). This implies a substantial increase in the demand for top executive talent in China over the period. If this was not matched by a labour supply response, the implication is that the expansion may have led to a substantial increase in the bargaining power of senior executives.

The state has always played a fundamental role in the development of corporate enterprises in China. Regional government has been instrumental in experimenting with new corporate forms and incentive systems to build a market-oriented economy (Xu, 2011). The final stage in this process is the state withdrawing from large parts of the corporate sector. The percentage of listed firms that were majority-owned by the state almost halved between 2001 and 2010 to 45 per cent of the listed sector. This is not simply due to the arrival of new, predominantly privately owned firms: even among ever-present firms the percentage of state-owned firms has fallen from 85 to 60 per cent. However, the state has retained ownership in the larger firms - the "commanding heights" of the economy - such that in 2010 state-owned firms still accounted for four-fifths of output and three-quarters of employment in the listed sector.

[INSERT TABLE 2 HERE]

In spite of the volatility in the stock market, public listed firms experienced considerable growth in the past decade. Table 2 presents five growth indicators. Real mean firm output rose nearly four-fold, although the rate of growth is roughly half that at the median, indicating a growth in the dispersion of output across firms over time. The 90:10 ratio in firm output has doubled over the period such that, by 2010, those at the 90th percentile in the firm output distribution were producing 45 times more output than those firms at the 10th percentile in the firm output distribution. There has been a similar growth in the dispersion of firm size: median firm size has remained constant, whereas mean size has almost doubled and the 90:10 ratio has grown by 60 per cent. The return on assets (ROA) - that is, profits as a percentage of assets - has risen by 30 per cent at the median over the period but again, there has been a growth in the dispersion of ROA, albeit less pronounced than the growth in dispersion of output and employment.

Output has risen faster than employment, implying substantial productivity growth. Indeed, median real gross value-added per employee rose by 50 per cent over the decade. This was not a compositional effect arising from the entry of new firms: productivity rose at an almost identical rate among firms that were ever-present over the period. Yueh (2010) finds most of the recent productivity growth in China is due to increases in technical efficiency, as opposed to allocative efficiency.

There is considerable heterogeneity in productivity levels across listed firms throughout the period. Table 2 and Figure 2 Panel A show that the productivity gap between firms at the 90th and 10th percentile in the productivity distribution has grown in absolute terms, as indicated by the 90:10 range, and this is so for all firms and ever-present firms.⁴ However, the story is a little different with regards to productivity growth rates. Among all firms, the rate of productivity growth experienced by firms at the top and bottom of the productivity distribution is similar, such that the 90:10 ratio has remained constant (Table 2 and Figure 2 Panel B, left hand chart). But among ever-present firms

⁴ Faggio et al. (2007) show that productivity dispersion between firms rose in the UK and France during the 1980s and 1990s, but the growth in dispersion was much less pronounced in Norway. Barth et al. (2012) find substantial growth in across-plant productivity dispersion in the United States in the three decades through to 2007.

productivity has grown substantially among firms at the 90th percentile, whilst the 10th percentile has experienced very modest growth, such that the 90:10 ratio has grown. The implication is that new entrants are generally less productive such that they compress the distribution in productivity growth rates among all firms.

[INSERT FIGURE 2 HERE]

Labour has shared in the benefits of this increase in efficiency, in so far as the rate of growth in total labour compensation has been at least as high as that for productivity (Table 2). It would appear, therefore, that firms have improved their performance considerably over the decade, even when one accounts for compositional change in the population of listed firms, and that labour has benefited from this growth via improved labour compensation.

Some have marvelled at the spectacular growth of Chinese public listed companies in the face of what appear to be weak institutions. This is what Xu (2011) calls the "Chinese puzzle". In fact, as Xu (p.1095) notes, Chinese institutions are simply different to those in the west since, unlike most of the world, "China has neither been colonized by Europe nor adopted European institutions systematically before the 1950s when it adopted an institution from the Soviet Union. This is the underlying reason why, on many facets, China looks inconsistent with the regularities discovered in cross-country studies." Nevertheless, recognising the shortcomings of some corporate practices and structures, the state has been keen to promote good corporate governance in public listed firms and has regulated the sector in order to enforce other practices.⁵

[INSERT TABLE 3 HERE]

The size of the board is similar in the US and China, despite the fact that China's listed firms are smaller and despite the fact that Chinese firms have both a main board and a

⁵ The most recent example are the 219 articles contained in the Company Law of the People's Republic of China (Revision 2005) which came into effect on January 1st 2006.

board of supervisors (Conyon and He, 2011: 13). There are an average of 9 members on the main board and four on the board of supervisors (Table 3).⁶

In 2001 the CSRC issued a regulation requiring at least one-third of the board of directors to be independents (CSRC, 2001). Over the following two years, the mean percentage of board members that were independents rose from 6 per cent to 35 per cent, and the figure has remained roughly constant since then (Table 3). It remains well below the proportion of independents on US boards, which is around 60 per cent (Conyon and He, 2011: 13). The other remarkable change has been the appearance of Compensation Committees used by boards to advise them on setting executive compensation. In 2001, less than 0.5 per cent of the listed firms had such a committee whereas by 2010 they were nearly universal. On this measure there is therefore convergence with US listed companies, 98 per cent of whom had Compensation Committees in the first half of the Noughties (Conyon and He, 2011: 13). In one quarter of cases CEO's sit on the Compensation Committee and are thus able to exert direct influence over the board's CEO remuneration decisions. Bertrand and Mullainathan (2001) find CEO's ability to do this helps explain why they are able to "skim" profits from firms, particularly in "good" times.

In other respects corporate governance in Chinese listed firms continues to look quite different from corporate governance in US firms. Ownership concentration is much higher in China and has changed little over the last decade. Among ever-present firms, the proportion of all shares held by the largest shareholder has fallen from 43 per cent in 2005 to 35 per cent in 2010. The 2010 figure for all firms is a little higher because new entrants tend to have more concentrated ownership than incumbents. The proportion of publicly listed firms with a single individual acting as CEO and Chair (CEO "duality") is much lower in China than in the US. In the early 2000s the figure was 60 per cent in the US, compared to only 12 per cent in China (Conyon and He, 2011: 13). Although the figure had risen to 22 per cent in China by 2010 this is due to an increased likelihood of "duality" among new entrants. Among ever-present firms the figure was only 13 per cent

⁶ Articles 45 and 51 of the Company Law of the People's Republic of China (Revision 2005) stipulates that the board must consist of between 3 and 13 members unless the firm is small or has a small number of shareholders.

in 2010. We discuss the implications of these differences in corporate governance for executive compensation in Section Four.

Before turning to the size and composition of the executive pool and the issue of executive compensation it is worth noting two other important ways in which Chinese listed firms differ from those in the United States and Europe. First, a majority (56 per cent) are in manufacturing. Second, they are smaller. In 2010 median firm size was 1,608 employees and mean size was 5,942 employees. In the early 2000s median sales per firm were around one-sixth of those among American firms (Conyon and He, 2011: 13).

3. The Pool of Executives, Their Characteristics and Their Compensation

The total number of top executives in China's listed companies more than doubled in the decade to 2010. Although this was driven by the growth in the number of firms, the average number of executives per firm also rose by 5 per cent (Table 4). This implies a substantial increase in the demand for top executive talent in China over the period. If this was not matched by a labour supply response, the implication is that the expansion may have led to a substantial increase in the bargaining power of senior executives. One way in which firms may have sought to counter this would have been to grow the size of the pool from which they were drawing by searching for executive talent beyond their traditional talent pool, either by recruiting more females, more foreigners or perhaps younger people. Table 4 shows this did not happen: the proportion of top executives who are foreigners remains very small; the proportion female has grown a little; but the average age of executives has risen by two years over the period. Similar trends are apparent among CEO's.

[INSERT TABLE 4]

Faced with a growing shortage of top executive talent one might have anticipated an increase in the rate of CEO turnover. This could have occurred if firms got caught in bidding wars in efforts to poach one another's talented executives. In this case, an

increase in turnover might reflect an increase in voluntary quits. There is no evidence that this occurred. For the whole population of firms, CEO turnover actually declined over the period: in the early 2000s, around one-quarter of firms changed CEO each year. By 2010, the figure had dropped to 15 per cent. Part of this decline reflects compositional changes: new firms entered the population and we find that newly-listed firms tend not to replace their CEOs shortly after listing, perhaps giving them time to adjust to the new situation or judging that stability in the executive team is valuable in the transitional phase. Nevertheless, even among ever-present firms the annual rate of CEO turnover fell from 27 per cent in 2001 to 20 per cent in 2010. One may have anticipated a "shake-out" in CEO's after the stock market bubble burst in 2007/08 but there was no spike in turnover rates suggesting that, to the extent that CEO turnover reflects dismissals, CEO's were not held responsible for firms' fortunes during that period. Rather, it seems likely that corporations viewed the stock market slide as an exogenous shock which all firms faced.

The declining rate in CEO turnover is consistent with the proposition that China's listed firms were placing greater emphasis on firm-specific human capital over the course of the 2000s. China's listed firms seem to do this in any event. As Gabarro (2010) shows, an increase in the importance of firm-specific skills to a firm increases the probability of internal promotion. Throughout the 2000s, the proportion of CEO's recruited from within was typically between 55 per cent and 65 per cent. (The figure of 74 per cent in 2005 is unusually high). This is considerably higher than the internal promotion rate in Europe and the United States.⁷

It is against this backdrop that we turn to the compensation of executives in the public listed sector. First it is important to recognise that the incentive options available to firms in China in the 2000s differed somewhat from those used in the United States and Europe. CEO compensation in the United States is dominated by stock options and, more

⁷ We infer this from Fernandes et al. (2011: Table 2) who report internal promotions rates of 74 per cent and 54 per cent among US and European firms respectively, but for a sample of very large firms with annual revenues in excess of \$US100 million in 2005. Since larger firms are much more likely to promote from within, it seems likely that Chinese listed firms will have much bigger internal promotion rates than comparably sized listed firms in the West.

recently, restricted stock. In Europe, a substantial proportion of total compensation is based on Long-term Incentive Plans (LTIPs), although share options have become increasingly important there too (Conyon et al., 2012). In China, on the other hand, firms were unable to offer stock options until 2006 and the trading of stock holdings was tightly restricted until the early 2000s. Thus, cash compensation and bonuses constitute a greater proportion of total compensation in China than they do in the USA and Europe.

[INSERT TABLE 5]

Table 5 focuses on the average cash and bonus compensation for the top three executives in the firm, as reported in firms' disclosures to the CSRC, for the decade through to 2010. Typically these executives comprised the CEO, the Executive Vice-President and the Chief Finance Officer. Their compensation rose nearly four-fold, outstripping productivity growth in the firm and outstripping growth in the compensation of other employees in the firm by two-thirds. In contrast, average cash compensation for CEOs in S&P 500 firms in the United States was roughly flat over the same period and total compensation (including equity compensation) actually declined (Conyon et al, 2012). There was also increasing dispersion in top executive compensation across firms in China, as indicated by the absolute gap between those executives in firms at the 90th, 50th and 10th percentile of the compensation distribution (Figure 3 Panel A). However, the 90:10 ratio actually fell slightly because growth in compensation at the 10th percentile increased at a faster rate than it did at the 90th percentile. Figure 3 Panel B shows this more clearly by indexing earnings to 2001 values. These trends in absolute and relative pay were apparent in the ever-present firms too, indicating that the effects are not associated with compositional change in the population of listed firms.

[INSERT FIGURE 3 HERE]

Shareholdings in one's own firm are another potential source of executive wealth. Over the course of the decade the state regulator liberalised rules governing the trading of stock, making it potentially easier for executives to realise some of the value locked up in

their stock. In 2001 around one-third of top executives owned shares in their firm. This fell to 22 per cent in 2006 but rose a little to 28 per cent by 2010. CEO's tend to hold more stock than other top executives but their shareholdings exhibited similar trends, declining from 42 per cent in 2001 to 27 per cent in 2006 only to recover to 36 per cent by the end of the decade.

From 2005/06 public listed firms were able to offer new incentives to their top executives in the form of share options, restricted stock and stock appreciation rights. To date take up has been low, but there are indications that more firms were adopting incentive plans of this type by 2010 (Table 6).

[INSERT TABLE 6 HERE]

From 2005 onwards listed firms were required to disclose the pay of individual executives, including the CEO. During this period average (mean) pay among the top three executives nearly doubled in real terms to 368,110 yuan (Table 7), with the nominal value in 2010 (534,503 yuan) being equivalent to US\$135,902 on a purchasing power parity (PPP) basis.⁸ There is a sizeable gap between the pay of the top three executives and other disclosed executives in the firm: mean compensation for the top three is almost twice that for the other disclosed executives. However, the average compensation for disclosed executives outside the top three rose at the same rate as that for the top three executives, nearly doubling in real terms over the space of five years. Thus the ratio of the compensation for the top three relative to other disclosed executives remained constant.

[INSERT TABLE 7 HERE]

The CEO's compensation rose at a similar rate to other executives. By subtracting the CEO's compensation from the average for the top three executives one can see that in 2005 CEO's were paid 1.06 times the compensation of the next two executives, and that

⁸ Uses an implied PPP conversion rate of 3.933 for 2010 (source: IMF World Economic Outlook database).

this rose to 1.08 by 2010. Thus, although they are paid more than other top executives, and the gap opened up a little in the five years to 2010, the ratio is nowhere near the size of the ratios anticipated in tournament theory (Rosen, 1990), nor those reported in the literature for countries such as Denmark (Eriksson, 1999). However, contrary to popular belief, the CEO is not always the highest paid individual in the firm. In China the CEO is not the highest paid employee in between one-fifth and one-quarter of firms, a figure which is roughly comparable to the United States.⁹

In cases where the CEO is the highest paid executive in the firm, they earn considerably more than other executives. The convex nature of the incentive structure predicted by tournament theory is apparent in Figure 4. For the listed firms with at least six disclosed executives and where the CEO is the highest paid employee, we see the second most highly paid executive receives roughly three-quarters the compensation of the CEO. The gradient is roughly equivalent if one compares the compensation gap between the second and sixth most highly paid executive.

[INSERT FIGURE 4]

The picture portrayed in Table 7 is one of a thriving market for executives, one in which firms were offering tournament-like prizes for their top executives, and in which the tournament prizes were rising rapidly in real terms, in spite of the stock market collapse that occurred in the middle of this period.

4. Influences on Top Executives' Pay

To establish the influences on top executive compensation we ran multivariate analyses on two dependent variables. The first is the average of the top three executives' cash compensation which is available for the whole period 2001-2010. The second is CEO cash compensation which is only available for the period 2005-2010. We begin by

⁹ The CEO is among the top three highest paid executives in 92 per cent of cases in 2005 and 2010. Hallock and Torok (2010) found that of 2,108 US firms they studied, the CEO was the highest paid executive in 81 per cent of cases.

running OLS estimates with model specifications which are standard in the literature to recover the estimated pay-firm size elasticity for CEO pay. Then we run standard difference estimators to recover estimated pay-performance elasticities for CEO pay. Next we run more extended OLS and firm fixed effects models for average compensation for the top three executives' pay for the whole period 2001-2010, introducing a range of control variables such as corporate governance indicators, executive characteristics and firm characteristics. Finally we run similarly specified models for CEO pay confined to the period 2005-2010.

[INSERT TABLE 8]

Rosen's (1990) proposition that the market will allocate the most talented CEO's to the largest firms implies a positive link between CEO compensation and firm size. Size is usually proxied with firm sales in the literature. Reviewing the literature he finds

"the elasticity of executive annual-salary-plus-bonus with respect to sales of the firm is in the .2 to .25 range. Including firm fixed effects does not change things. The elasticity is the same in the time-series "within" firm comparison as in the cross-section "between" firm comparison. A firm that is 10 percent larger than another on average pays its top executives 2.5 percent more; and when the latter firm grows by 10 percent, its top executives are on average paid 2.5 percent more in salary and bonuses" (Rosen, 1990: pp. 8-9).

He goes on to say: "the relative uniformity of the elasticity of executive pay with respect to scale across firms, industries, countries and periods of time is notable and puzzling because the technology which sustains control and scale should vary across these disparate units of comparison. Thus the uniformity of estimates is a little too good to be true" (ibid. p. 9).

It is then, perhaps all the more remarkable to find that the elasticity of CEO pay with respect to lagged log sales is 0.23 in the case of China in 2008. We get very similar

results for other years and the pooled estimate across all years is 0.24.¹⁰ It turns out that this is actually lower than the elasticities in other countries for the same year estimated in an identical fashion (see Table 8). Even so, the resemblance to Rosen's findings some twenty years ago is striking.

In Table 9 we turn to the elasticity of CEO compensation with respect to firm performance. The first seven rows present Conyon et al.'s (2012) results for other countries. The final row presents our results for China using the identical methodology outlined in the notes to the table. The first three columns of the table are separate regressions incorporating three alternative measures of performance, namely changes in log stock returns, sales and ROA. The final three columns present the coefficients for these three performance measures when they are included simultaneously in a single regression.

[INSERT TABLE 9]

The elasticity of CEO cash compensation with respect to performance in China is positive and significant with respect to stock returns and sales, but is much lower with respect to ROA. When all three measures are included simultaneously, stock returns and sales remain large and significant, whereas the ROA coefficient halves and becomes statistically non-significant. All the estimated elasticities for China are considerably smaller than those estimated for the United States. Instead, the elasticities for stock returns and sales resemble those estimated by Conyon et al. (2012) for the United Kingdom. However, the Chinese elasticity with respect to ROA is considerably lower than that for all other countries in the table. Conyon and He (2011: 11) also find statistically small and non-significant ROA elasticities in their models for top executive

¹⁰ If we run the regression for other years we get: 2005 0.26; 2006 0.26; 2007 0.27; 2009 0.22; 2010 0.23. The pooled estimate for state-owned publicly listed firms is 0.25 and 0.26 for privately owned firms. If we run the regressions for the average pay of the top three executives elasticities range from 0.29 in 2006 to 0.24 in 2010. The pooled estimate controlling for year dummies is 0.26 (0.29 in privately owned firms and 0.26 in state owned firms).

cash compensation in the period through to 2005.¹¹ Although this result might be driven by measurement error in the ROA measure, it is also conceivable that it is a product of weak corporate governance: an issue to which we return below.

The estimates for China in Table 9 include years which may have been affected by the stock market crash, whereas Conyon et al.'s (2012) estimates for the US and other countries are for the period through to 2008. We therefore reran analyses for the period 2003-2008 as per Conyon et al. (2012), though we have to rely on a dependent variable capturing the pay of the top three executives because individual CEO pay was not reported before 2005. Entered separately, the performance coefficients are not markedly different from those presented in the first three columns of Table 9. The coefficients are all statistically significant and are 0.12, 0.09 and 0.05 respectively for stock returns, sales and ROA. When entered together all three coefficients are statistically significant and are 0.09, 0.06 and 0.03 respectively. In the models with all three performance measures the only statistically significant difference is the smaller ROA elasticity relative to that for stock returns.

Restricting the sample to 2010 so that we recover effects relating to changes in 2009 and 2010, we find the stock returns coefficient is statistically significant and rises to 0.11 in both models (that is, the model when it is entered as the only performance measure and the model where it is entered alongside the other two measures). ROA remains statistically non-significant. Thus, the stock returns elasticity is indeed depressed by the inclusion of the years in which stock market prices were highly volatile.¹²

¹¹ Bell and Van Reenen (2011) show that cash compensation for executives in the UK responds to performance primarily through adjustments made to bonuses, rather than salaries. It is possible that this is the case for China too, but our data do not allow us to distinguish between the salary and bonus components of cash compensation.

¹² This finding is even more apparent when we estimate by groups of years. We see that coefficients for sales and ROA are similar over time, whereas the stock returns coefficient is driven to zero post the stock market crash:

Years	N	Stock returns	Sales	ROA
2002-2005	2,584	0.119***	0.068**	0.045**
2007-2010	4719	-0.006	0.086***	0.036***

In Table 10 we estimate influences on the log average pay of the top three executives in Chinese public listed firms over the decade to 2010 using more fully-specified models. There are six model specifications. The first three are OLS estimates which, *inter alia*, contain fixed firm characteristics such as industry. The second three are firm fixed effects models so that firm-level variables relating to firm size, ownership and governance capture within-firm variance over time. The only model specification difference in Models (1) to (3) is the way in which firm performance coefficients enter the models. In Model (1) we include contemporaneous measures of firm performance. In Model (2) we add performance measures lagged one year and in Model (3) we also add two year lagged performance measures. The same approach is adopted in the firm fixed effects Models (4) to (6).

[INSERT TABLE 10]

The year dummies indicate substantial growth in executive compensation throughout the decade, with coefficients continuing to rise during and after the stock market crash. Part of the growth reflects firm performance, which is why the year dummy coefficients fall as we condition more completely on trends in firm performance moving from left to right in columns 1-3 and again in columns 4-6 with the firm fixed effects models. A comparison of the OLS and firm fixed effects models also reveals that growth in executive compensation was much greater within firms than it was across firms. This finding is consistent with firms investing in firm-specific human capital in order to reward and retain their executives at the top of the firm.

Executive compensation is sensitive to firm performance, as discussed above. In all models, firms pay lower cash and bonuses to executives in years where the regulatory commission issues a profit warning to the firm - as indicated by the ST/PT marker dummy.¹³ Log sales are positive and significant but the contemporaneous sales coefficient falls when lagged measures are introduced. These lagged measures are positive and statistically significant themselves, though smaller in size than the

¹³ The marker denotes firms that have experienced negative profits in at least two consecutive years.

contemporaneous measure. Precisely the same effects are apparent for ROA, but total stockholder returns (TSR) have a different relationship with executive pay. Contemporaneous TSR are negatively associated with executive compensation but this effect becomes positive and non-significant when lagged TSR are entered into the model. Lagged TSR is positive and statistically significant. Although many of the performance coefficients are smaller in the firm fixed effects models the pattern of results and their statistical significance is similar to the OLS models. Taken together, these results are strong confirmation that executive compensation is very sensitive to firm performance measured in a variety of ways.

Firms can also incentivize top executives through share holdings and incentive plans. These are positively associated with executive compensation in the OLS models, but the firm fixed effects models indicate that when executives start to hold shares in the firm this comes at the expense of their cash compensation, suggesting that shares may be substituting for cash compensation. Furthermore, the introduction of incentive plans does not result immediately in higher rewards, suggesting that incentive plans take a little while to deliver higher compensation for executives, as would ordinarily be the case with the sort of Long-term Investment Plans (LTIPs) used in Europe.

Corporate governance practices are strongly associated with executive compensation. Executives receive higher compensation where the CEO is also the chair of the Board of Directors, and executive compensation is higher in firms with larger Boards, where a larger share of the Board of Directors are independents and where there is a Compensation Committee. The firm fixed effects models show that executive compensation rises when a CEO also takes on the role of Chair, when the Board grows, when more independents are appointed, and where a Compensation Committee is introduced - especially if the CEO starts to sit on the Compensation Committee. Although firms with larger Boards, and those with more independent board members and Compensation Committees are, at least in principle, in a better position to monitor their top executives and reward them accordingly, it does appear that in these cases those top executives are rewarded more handsomely than in the absence of such governance

structures. This could be because top executives are capable of capturing governance arrangements such that they are able to "skim" profits from the firm in the way described by Bertrand and Mullainathan (2001). There is some evidence in favour of this hypothesis from the firm fixed effects models which show that the introduction of a Compensation Committee is associated bigger increases in top executive pay when the CEO sits on the Committee compared to instances in which the CEO does not sit on the Committee.¹⁴

Corporate ownership also plays a significant role in the way top executives are remunerated. Switching from state to private ownership results in a hike of around 5 per cent in top executives' cash compensation.

The growth in executive compensation associated with the growth in the pool of executives in the firm is consistent with tournament theory's prediction that larger prizes are offered when a larger number of individuals are challenging for the top prize.

[INSERT TABLE 11]

Finally, in Table 11 we run similar models to those presented in Table 10, but for CEO cash compensation. Thus the models are confined to the period 2005-2010. The first notable finding is that, whereas the year dummies indicate CEO compensation is rising over this period, the effect is not apparent within firms. The result is in stark contrast to that for the top three executives reported in Table 10. Unsurprisingly, CEO compensation is highly sensitive to firm performance, whether entered contemporaneously or as lagged arguments. The corporate governance effects are not as strong as in the case of top three compensation, except with respect to Board size and the presence of a Compensation Committee. In the firm fixed effects models there is compelling evidence that CEO pay is 10-12 per cent higher once a Compensation Committee has been introduced, *but only* when the CEO sits on that Committee. This is

¹⁴ It is the introduction of the corporate governance variables that renders the year dummies statistically non-significant in Model (6).

strong evidence that CEO's who capture the pay setting arrangements within the firm benefit accordingly.

From a tournament theory perspective it makes sense that the tournament prize - the CEO's pay - is higher where the pool of competitors is large but, equally, it is no surprise that growth in that pool has no impact on CEO pay once the CEO has already reached the top of the organization.

In contrast to compensation for the top three executives, share holding is positively correlated with CEO cash compensation, indicating that cash and shares may complement one another when rewarding the head of the organization.

CEO pay rises with both age and tenure, providing further confirmation that firms are seeking to retain those with firm-specific human capital. However, firms also appear to exercise gender discrimination since the adoption of a male CEO to replace a female results in a premium of almost 10 per cent.

5. Conclusions

Using panel data for all of China's public listed firms over the period 2001-2010 we examine how firms have recruited and rewarded their executives over a decade of huge growth and turbulence. CEO pay is sensitive to firm performance, although the elasticities are lower than for the United States and Europe, especially with respect to returns on assets (ROA). CEO pay rises with firm size and growth with elasticities resembling those for the United States. We find no dramatic response to the stock market crash of 2007/08. Although the elasticity of pay to stock returns falls to zero after the crash, elasticities with respect to sales and ROA remain significant. Executive cash compensation rose steeply throughout the period – in contrast to the United States. There are steep gradients in executive compensation within firms consistent with tournament prizes, and around two-thirds of CEO appointments are internal promotions. Within-firm executive compensation rose at a faster rate than executive compensation across firms,

helping to explain why CEO turnover rates declined a little over the decade. Turnover rates did not spike with the stock market crash. Privatisation and reforms to corporate governance contributed to growth in executive compensation. A picture emerges of an executive labour market in which firms are linking pay to performance and relying on incentive structures within firms to foster executive talent.

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Table 1: Size and Characteristics of the Chinese Listed Sector

	2001	2010	Ratio 2010:2001
Number of listed firms	1163	2126	1.8
Total output:			
China GDP (RMB, billions, 2001 prices)	10966	27409	2.5
Output of listed sector (RMB, billions, 2001 prices)	1543	11860	7.7
Output of listed sector as % of GDP	14	43	3.1
Market capitalisation:			
Market capitalisation of listed sector as % of GDP	40	81	2.1
Ownership:			
Percentage of listed firms majority owned by state	84	45	0.5
Percentage of output accounted for by state-owned firms	92	82	0.9
Percentage of employment accounted for by state-owned firms	91	73	0.8

Note: figures are authors' calculations from the CSMAR data described in the text. The exceptions are China's GDP (source: IMF World Economic Outlook Database) and market capitalization (source: World Bank Development Indicators).

Table 2: Performance of Listed Firms in China, 2001-2010

	2001	2010	Ratio 2010:2001
Output (RMB, millions, 2001 prices):			
Mean	1028	3683	3.6
Median	508	854	1.7
p90-p10 range	2267	6582	2.9
p90/p10 ratio	21	45	2.2
Firm size (number of employees):			
Mean	3119	5942	1.9
Median	1620	1608	1.0
p90-p10 range	5739	8978	1.6
p90/p10 ratio	20	33	1.6
Gross value-added per employee (RMB, 2001 prices):			
Mean	134701	179146	1.3
Median	50462	74546	1.5
p90-p10 range	263571	379552	1.4
p90/p10 ratio	19	19	1.0
Labour compensation per employee (RMB, 2001 prices):			
Mean	8395	15552	1.9
Median	3877	6293	1.6
p90-p10 range	17762	31374	1.8
p90/p10 ratio	27	26	1.0
Return on assets (%):			
Mean	6.3%	8.7%	1.4
Median	5.9%	7.5%	1.3
p90-p10 range	9.0%	13.5%	1.5
p90/p10 ratio	5.5	6.0	1.1

Note: figures for this table through to Table 7 are authors' calculations from the CSMAR data described in the text.

Table 3: Corporate Governance in China's Listed Firms, 2001-2010

	2001	2005	2010
Ownership concentration:			
Proportion of shares owned by largest shareholder*	na	0.40	0.37
CEO/Chair duality:			
Proportion of firms	0.12	0.12	0.22
Size of board of directors:			
Mean	9	10	9
Median	9	9	9
Interquartile range	4	2	1
Proportion of board members who are independent:			
Mean	0.06	0.35	0.37
Median	0.00	0.33	0.33
Size of board of supervisors:			
Mean	4	4	4
Median	5	3	3
Interquartile range	2	2	2
Compensation committee:			
Proportion of firms	0.00	0.44	0.93

* Ownership concentration only available from 2003.

Table 4: Executives of Listed Firms in China, 2001-2010

	2001	2005	2010
Number of executives	6,842	8,321	14,375
Average number of executives per firm	6.0	6.2	6.3
All executives:			
Proportion female	0.11	0.11	0.13
Proportion non-Chinese	0.001	0.001	0.002
Average age	43	44	46
Proportion for whom education disclosed	0.02	0.34	0.54
Proportion with a degree	0.76	0.80	0.83
CEOs only:			
Proportion female	0.04	0.04	0.06
Proportion non-Chinese	0.000	0.001	0.002
Average age	45	46	48
Proportion for whom education disclosed	0.02	0.34	0.53
Proportion with a degree	0.86	0.85	0.87
CEO turnover:			
Percentage of firms changing CEO	0.27	0.24	0.15
Of these: proportion recruiting new CEO from within	0.57	0.74	0.65

Table 5: Top Executive Pay in China's Listed Firms, 2001-2010

	2001	2010	Ratio 2010:2001
Average compensation of Top 3 executives within the firm (RMB, 2001 prices):			
Mean	98917	368110	3.7
Median	70390	268867	3.8
p90-p10 range	186467	605208	3.2
p90/p10 ratio	8.9	7.0	0.8
Ratio of average Top 3 pay to average of other employees in the firm:			
Mean	61	136	2.2
Median	21	46	2.3
Ratio of average Top 3 pay to sales/employee in the firm:			
Mean	0.34	0.81	2.4
Median	0.22	0.52	2.4
Share holding:			
Proportion of all executives holding shares	0.33	0.28	0.9
Proportion of CEOs holding shares	0.42	0.36	0.9

Table 6: Executive Incentive Plans in China's Listed Firms, 2005-2010

	2005	2006	2007	2008	2009	2010
Proportion of firms offering...						
Share options	0.00	0.01	0.01	0.02	0.02	0.03
Restricted stock	0.00	0.00	0.01	0.01	0.01	0.01
Stock appreciation rights	0.00	0.00	0.00	0.00	0.00	0.00
Any incentive plan	0.00	0.01	0.01	0.02	0.03	0.04

Table 7: Top Executive Pay in China's Listed Firms, 2005-2010

	2005	2010	Ratio 2010:2005
Average compensation of Top 3 executives within the firm (RMB, 2001 prices):			
Mean	197504	368110	1.9
Median	150155	268867	1.8
p90-p10 range	325483	605208	1.9
p90/p10 ratio	7.1	7.0	1.0
CEO cash compensation (RMB, 2001 prices):			
Mean	218548	412387	1.9
Median	170243	305564	1.8
p90-p10 range	378433	722386	1.9
p90/p10 ratio	7.9	8.1	1.0
Average compensation of disclosed executives outside Top 3 (RMB, 2001 prices):			
Mean	147196	286934	1.9
Median	108103	199410	1.8
p90-p10 range	253184	518728	2.0
p90/p10 ratio	8.3	9.3	1.1
Ratio of average top 3 pay to average pay of all other disclosed executives in the firm:			
Mean	1.8	1.9	
Median	1.5	1.6	
CEO pay ranking within the firm			
Mean	1.5	1.6	
Proportion of CEOs who are the highest paid executive <i>Where the CEO is the highest paid executive:</i>	0.78	0.74	
Ratio of CEO pay to average pay of other executives within Top 3:			
Mean	1.4	1.5	
Median	1.3	1.3	
Ratio of CEO pay to average pay of all other disclosed executives in the firm:			
Mean	1.6	1.7	
Median	1.5	1.5	

Table 8: Estimated pay-size elasticity for CEOs in 2008, by country

	Estimated pay-size elasticity	Number of firms
France	0.412	156
Germany	0.333	80
Netherlands	0.243	60
Sweden	0.346	51
United Kingdom	0.398	419
All Europe	0.348	892
United States	0.377	1,426
China	0.230	1,614

Notes:

1. The pay-size elasticity is defined as the estimated coefficient on Ln(Lag Sales) in a regression of Ln(CEO Pay) on Ln(Lag Sales) and 12 industry dummy variables (14 for China).
2. CEO pay includes base salary and annual bonus, plus the value of option and stock grants (except in China where equity incentives are rare and we rely solely on cash compensation).
3. Estimates for all countries except China are taken from Conyon et al (2012), Table 3.3, selecting those countries where the sample of firms is 50 or more.
4. Estimate for China is authors' calculation from the CSMAR data described in Section 1.
5. Each of the estimated pay-size elasticities is statistically significant from zero at the 1 per cent level.

Table 9: Estimated pay-performance elasticities, by country

	CEO- Years	Pay-performance elasticities from separate regressions for each performance measure			Pay-performance elasticities from a single regression including all three performance measures		
		Stock returns	Sales	ROA	Stock returns	Sales	ROA
France	643	0.111	0.151	1.045***	0.074	0.188	1.025***
Germany	213	0.314**	0.590***	2.136**	0.265**	0.600***	1.498*
Netherlands	279	0.120	0.225*	0.414	0.122	0.226*	0.347
Sweden	243	-0.107	0.448***	0.507	-0.193	0.464***	0.272
United Kingdom	2,082	0.096***	0.137***	0.641***	0.068***	0.134***	0.619***
All Europe	3,894	0.117***	0.067	0.651***	0.100***	0.046	0.602***
United States	6,596	0.405***	0.363***	0.784***	0.358***	0.203***	0.506***
China	2,623	0.080***	0.117***	0.037*	0.052*	0.104**	0.019

Notes:

1. Pay-performance elasticities are calculated from a regression of $\Delta\ln(\text{CEO Pay})$ on one or all three performance measures, namely $\ln(1+\text{Shareholder returns})$, $\Delta\ln(\text{Sales})$ and $\Delta\ln(\text{ROA})$.
2. The sample period is 2003-2008 for all countries except China (2005-2010). Regressions include 12 industry dummies (14 in China) and year dummies. Monetary values in constant prices.
3. CEO pay is measured as cash compensation (base salary plus bonus) and the CEO is required to be in office in both years.
4. Estimates for all countries except China are taken from Conyon et al (2012), Table 3.7, selecting those countries which appear in our Table 8.
5. Estimates for China is authors' calculation from the CSMAR data described in Section 1.
6. *, ** and *** indicate that the pay-performance elasticity is significantly different from zero at the 10%, 5% and 1% levels respectively.

Table 10: OLS and FE regressions of Log Average Top 3 Executive Pay in China's Listed Firms, 2001-2010

	[1] OLS Coeff.		[2] OLS Coeff.		[3] OLS Coeff.		[4] FE Coeff.		[5] FE Coeff.		[6] FE Coeff.
Year: 2001	ref.						ref.				
2002	0.139 *** [3.99]						0.252 *** [3.12]				
2003	0.294 *** [5.67]		0.154 *** [4.78]				0.482 *** [3.08]		0.249 ** [2.48]		
2004	0.409 *** [7.81]		0.283 *** [8.91]		0.128 *** [5.92]		0.674 *** [2.90]		0.465 ** [2.36]		0.145 [1.06]
2005	0.453 *** [8.33]		0.316 *** [8.97]		0.155 *** [5.84]		0.780 ** [2.53]		0.584 ** [1.99]		0.179 [0.66]
2006	0.548 *** [9.56]		0.384 *** [9.46]		0.208 *** [6.18]		0.938 ** [2.44]		0.747 * [1.91]		0.268 [0.66]
2007	0.606 *** [9.69]		0.406 *** [7.79]		0.194 *** [3.89]		1.068 ** [2.31]		0.863 * [1.76]		0.302 [0.56]
2008	0.667 *** [10.36]		0.514 *** [10.45]		0.285 *** [5.73]		1.167 ** [2.17]		1.010 * [1.72]		0.370 [0.54]
2009	0.830 *** [12.23]		0.650 *** [12.16]		0.415 *** [8.21]		1.364 ** [2.22]		1.244 * [1.82]		0.513 [0.63]
2010	0.812 *** [11.87]		0.664 *** [11.70]		0.474 *** [9.49]		1.443 ** [2.09]		1.321 * [1.69]		0.571 [0.60]
Firm performance:											
Ln(Sales)	0.258 *** [18.61]		0.176 *** [9.29]		0.168 *** [8.09]		0.146 *** [16.67]		0.113 *** [9.85]		0.107 *** [8.77]
L.Ln(Sales)			0.082 *** [4.50]		0.052 *** [2.83]				0.031 *** [2.67]		0.036 *** [2.61]
L2.Ln(Sales)					0.036 ** [2.01]						-0.013 [-1.10]
Ln(ROA)	0.190 *** [12.21]		0.148 *** [10.74]		0.139 *** [9.83]		0.133 *** [17.05]		0.108 *** [12.43]		0.094 *** [10.28]
L.Ln(ROA)			0.085 *** [6.74]		0.058 *** [5.03]				0.074 *** [8.96]		0.059 *** [6.55]
L2.Ln(ROA)					0.046 *** [3.31]						0.044 *** [5.09]
ROA missing	-0.255 *** [-9.32]		-0.240 *** [-8.46]		-0.233 *** [-7.60]		-0.193 *** [-12.49]		-0.164 *** [-9.87]		-0.138 *** [-7.93]
Ln(TSR)	-0.065 *** [-3.99]		-0.019 [-1.07]		0.003 [0.13]		-0.057 *** [-4.66]		-0.023 * [-1.72]		-0.008 [-0.57]
L.Ln(TSR)			0.016 [0.94]		0.048 ** [2.24]				0.033 ** [2.49]		0.049 *** [3.23]
L2.Ln(TSR)					0.042 ** [2.01]						0.031 ** [2.18]
TSR missing	0.040 [1.44]		-0.013 [-0.20]		-0.167 [-1.27]		-0.014 [-0.72]		-0.115 ** [-2.12]		-0.293 *** [-3.31]
ST/PT marker	-0.237 *** [-6.60]		-0.240 *** [-6.39]		-0.248 *** [-6.19]		-0.147 *** [-7.95]		-0.129 *** [-6.68]		-0.124 *** [-6.01]
Industry and ownership:											
Industry: Manuf.	ref.		ref.		ref.						
Agriculture, farming, fishing	-0.141 [-1.58]		-0.134 [-1.42]		-0.119 [-1.18]						
Mining	-0.070 [-0.74]		-0.110 [-1.18]		-0.132 [-1.41]						
Utilities	0.044 [0.72]		0.046 [0.73]		0.042 [0.68]						
Construction	0.088 [1.00]		0.104 [1.12]		0.084 [0.87]						

Continued

Table 10 continued

	[1] OLS Coeff.		[2] OLS Coeff.		[3] OLS Coeff.		[4] FE Coeff.		[5] FE Coeff.		[6] FE Coeff.
Transportation	0.234 ***		0.241 ***		0.254 ***						
	[3.90]		[3.99]		[4.01]						
IT	0.303 ***		0.295 ***		0.287 ***						
	[5.41]		[4.92]		[4.36]						
Retail and wholesale	0.141 **		0.157 ***		0.164 ***						
	[2.50]		[2.72]		[2.77]						
Finance and insurance	1.169 ***		1.223 ***		1.242 ***						
	[7.09]		[6.85]		[6.74]						
Real estate	0.267 ***		0.289 ***		0.313 ***						
	[4.04]		[4.33]		[4.56]						
Other services	0.423 ***		0.422 ***		0.435 ***						
	[5.30]		[5.15]		[5.09]						
News and media	0.268 **		0.239 *		0.212						
	[1.97]		[1.75]		[1.48]						
Misc	0.276 ***		0.280 ***		0.265 ***						
	[4.64]		[4.73]		[4.31]						
Ownership status in panel: Always state- owned	ref.		ref.		ref.						
Always privately owned	0.131 ***		0.132 ***		0.126 ***						
	[2.94]		[2.86]		[2.62]						
From state to private ownership	0.015		0.026		0.035						
	[0.38]		[0.66]		[0.87]						
From private to state ownership	0.226 ***		0.213 **		0.196 **						
	[2.67]		[2.52]		[2.26]						
Uncertain ownership	0.022		0.023		0.037						
	[0.43]		[0.45]		[0.70]						
Private ownership							0.063 ***		0.048 ***		0.028
							[3.67]		[2.64]		[1.42]
Firm size and age:											
Ln(Employment)	-0.099 ***		-0.098 ***		-0.095 ***		0.005		0.012		0.025 **
	[-7.13]		[-6.97]		[-6.55]		[0.59]		[1.34]		[2.49]
Years since listing	0.013 **		0.013 **		0.016 ***		-0.043		-0.062		0.011
	[2.53]		[2.41]		[2.81]		[-0.57]		[-0.63]		[0.08]
Age of firm	-0.005		-0.006		-0.006						
	[-1.08]		[-1.12]		[-1.13]						
Corporate governance:											
Chair-CEO duality	0.084 ***		0.077 **		0.065 *		0.055 ***		0.033 *		0.012
	[2.58]		[2.16]		[1.67]		[3.23]		[1.78]		[0.61]
Size of Board of Directors	0.031 ***		0.035 ***		0.035 ***		0.013 ***		0.018 ***		0.018 ***
	[4.71]		[4.87]		[4.51]		[3.91]		[4.54]		[3.91]
Share of BoD that are independent	0.542 ***		0.631 ***		0.673 ***		0.172 **		0.237 **		0.366 ***
	[3.42]		[3.23]		[2.98]		[2.09]		[2.28]		[2.99]
Size of Board of Supervisors	-0.014		-0.015		-0.013		0.023 ***		0.026 ***		0.029 ***
	[-1.41]		[-1.41]		[-1.17]		[3.36]		[3.51]		[3.52]

Continued

Table 10 continued

	[1]		[2]		[3]		[4]		[5]		[6]
	OLS		OLS		OLS		FE		FE		FE
	Coeff.		Coeff.		Coeff.		Coeff.		Coeff.		Coeff.
Compensation committee: None	ref.		ref.		ref.		ref.		ref.		ref.
CEO sits on compensation committee	0.073 **		0.074 **		0.089 **		0.108 ***		0.094 ***		0.093 ***
	[2.14]		[2.07]		[2.34]		[6.14]		[5.18]		[4.82]
CEO does not sit on compensation committee	0.088 ***		0.094 ***		0.106 ***		0.048 ***		0.037 **		0.038 **
	[3.18]		[3.23]		[3.43]		[3.41]		[2.53]		[2.45]
Executive incentives:											
Number of executives	0.038 ***		0.035 ***		0.033 ***		0.023 ***		0.022 ***		0.020 ***
	[6.34]		[5.62]		[5.13]		[8.62]		[7.65]		[6.54]
Executives hold shares	0.050 *		0.067 **		0.076 ***		-0.079 ***		-0.068 ***		-0.053 ***
	[1.96]		[2.48]		[2.69]		[-5.13]		[-4.18]		[-2.92]
Any incentive plan	0.201 ***		0.174 ***		0.184 ***		0.097 **		0.055		0.026
	[3.33]		[2.97]		[3.07]		[2.25]		[1.23]		[0.54]
Executive characteristics:											
Share of executives that are male	-0.066		-0.039		-0.008		0.009		-0.005		-0.003
	[-0.75]		[-0.43]		[-0.08]		[0.19]		[-0.10]		[-0.05]
Average age of executives	0.005		0.007 *		0.008 *		0.003 *		0.005 **		0.007 ***
	[1.32]		[1.68]		[1.86]		[1.69]		[2.09]		[2.58]
CEO is male	0.055		0.056		0.061		0.022		0.019		0.009
	[1.05]		[1.01]		[1.06]		[0.76]		[0.61]		[0.26]
Age of CEO	0.003 *		0.003		0.003		0.002 *		0.001		0.002 *
	[1.73]		[1.25]		[1.11]		[1.86]		[1.17]		[1.69]
CEO education: Masters degree	ref.		ref.		ref.		ref.		ref.		ref.
Below Masters degree	-0.087 ***		-0.091 ***		-0.094 ***		-0.006		-0.005		-0.010
	[-2.72]		[-2.66]		[-2.58]		[-0.36]		[-0.29]		[-0.51]
PhD	0.208 ***		0.209 ***		0.210 ***		-0.006		0.015		0.017
	[3.24]		[3.25]		[3.13]		[-0.16]		[0.39]		[0.44]
Education not reported	-0.060 **		-0.057 *		-0.056 *		-0.032 **		-0.030 *		-0.031 *
	[-1.97]		[-1.82]		[-1.73]		[-1.97]		[-1.79]		[-1.73]
CEO in post < 6 months	-0.093 ***		-0.095 ***		-0.100 ***		-0.062 ***		-0.076 ***		-0.078 ***
	[-5.00]		[-4.84]		[-4.85]		[-5.04]		[-5.94]		[-5.90]
Constant	6.325 ***		6.473 ***		6.577 ***		8.166 ***		8.584 ***		8.546 ***
	[21.95]		[21.03]		[19.69]		[28.74]		[18.96]		[11.10]
R-sq	0.463		0.448		0.438		0.488		0.438		0.388
Firms	1834		1685		1562		1832		1683		1560
rho							0.719		0.754		0.726
Obs	12719		10827		9092		12593		10759		9067

Notes:

1. Dependent variable is Ln(Average pay of a Top 3 Executive). Pay is measured as cash compensation (base salary plus bonus). The sample period is 2001-2010. All monetary values are in constant prices.
2. Columns 1 to 3 present OLS regressions in which the standard errors are adjusted at the firm level. Columns 4 to 6 present estimates using firm-level fixed-effects.
3. Estimates are authors' calculation from the CSMAR data described in Section 1.
4. T-statistics appear in brackets. *, ** and *** indicate that the coefficient is significantly different from zero at the 10%, 5% and 1% levels respectively.

Table 11: OLS and FE regressions of Log CEO Pay in China's Listed Firms, 2005-2010

	[1] OLS Coeff.		[2] OLS Coeff.		[3] OLS Coeff.		[4] FE Coeff.		[5] FE Coeff.		[6] FE Coeff.	
Year: 2005	ref.						ref.					
2006	0.072 [2.62]	***					-0.275 [-0.61]					
2007	0.146 [4.15]	***	0.032 [0.99]				-0.565 [-0.62]	-0.033 [-0.90]				
2008	0.207 [6.69]	***	0.194 [5.40]	***	0.106 [2.37]	**	-0.881 [-0.65]	-0.010 [-0.13]			0.042 [0.71]	
2009	0.324 [8.60]	***	0.250 [7.60]	***	0.210 [5.60]	***	-1.168 [-0.65]	-0.005 [-0.06]			0.092 [1.37]	
2010	0.323 [9.21]	***	0.301 [7.79]	***	0.273 [7.74]	***	-1.491 [-0.66]	-0.047 [-0.42]			0.124 [1.53]	
Firm performance:												
Ln(Sales)	0.251 [16.80]	***	0.193 [7.56]	***	0.188 [6.90]	***	0.126 [8.27]	***	0.115 [6.55]	***	0.093 [5.02]	***
L.Ln(Sales)			0.058 [2.30]	**	0.032 [1.16]				0.008 [0.44]		0.016 [0.78]	
L2.Ln(Sales)					0.026 [1.18]						-0.022 [-1.21]	
Ln(ROA)	0.187 [10.68]	***	0.134 [8.10]	***	0.132 [7.65]	***	0.113 [9.41]	***	0.091 [7.18]	***	0.088 [6.50]	***
L.Ln(ROA)			0.094 [5.86]	***	0.073 [4.81]	***			0.082 [6.71]	***	0.066 [5.00]	***
L2.Ln(ROA)					0.031 [1.76]	*					0.037 [2.84]	***
ROA missing	-0.297 [-9.02]	***	-0.260 [-7.49]	***	-0.259 [-7.08]	***	-0.191 [-8.16]	***	-0.157 [-6.43]	***	-0.150 [-5.80]	***
Ln(TSR)	-0.055 [-2.62]	***	0.012 [0.67]		0.023 [1.51]		-0.038 [-2.31]	**	-0.003 [-0.14]		0.013 [0.62]	
L.Ln(TSR)			0.012 [0.55]		0.053 [2.64]	***			0.020 [1.13]		0.044 [2.21]	**
L2.Ln(TSR)					0.036 [1.46]						0.034 [1.75]	*
TSR missing	-0.006 [-0.13]		-0.079 [-0.86]		-0.243 [-0.98]		-0.016 [-0.49]		-0.080 [-1.04]		-0.325 [-2.27]	**
ST/PT marker	-0.234 [-5.32]	***	-0.226 [-4.90]	***	-0.221 [-4.60]	***	-0.120 [-3.96]	***	-0.100 [-3.24]	***	-0.103 [-3.11]	***
Industry and ownership:												
Industry: Manuf.	ref.		ref.		ref.							
Agriculture, farming, fishing	-0.202 [-2.03]	**	-0.187 [-1.77]	*	-0.177 [-1.56]							
Mining	0.068 [0.75]		0.036 [0.40]		0.011 [0.12]							
Utilities	-0.049 [-0.85]		-0.062 [-1.04]		-0.063 [-1.00]							
Construction	0.106 [1.13]		0.114 [1.20]		0.108 [1.11]							

Continued

Table 11 continued

	[1] OLS Coeff.		[2] OLS Coeff.		[3] OLS Coeff.		[4] FE Coeff.		[5] FE Coeff.		[6] FE Coeff.
Transportation	0.217	***	0.222	***	0.230	***					
	[3.14]		[3.10]		[3.01]						
IT	0.212	***	0.228	***	0.246	***					
	[3.44]		[3.43]		[3.36]						
Retail and wholesale	0.144	**	0.144	**	0.158	***					
	[2.46]		[2.42]		[2.59]						
Finance and insurance	1.390	***	1.395	***	1.411	***					
	[11.06]		[9.49]		[8.61]						
Real estate	0.356	***	0.336	***	0.317	***					
	[4.68]		[4.27]		[3.91]						
Other services	0.352	***	0.357	***	0.354	***					
	[4.51]		[4.21]		[3.97]						
News and media	0.285	**	0.280	***	0.273	***					
	[2.46]		[2.77]		[2.63]						
Misc	0.269	***	0.262	***	0.257	***					
	[3.86]		[3.67]		[3.53]						
Ownership status in panel: Always state- owned	ref.		ref.		ref.						
Always privately owned	0.143	***	0.149	***	0.143	***					
	[2.99]		[3.01]		[2.71]						
From state to private ownership	0.056		0.059		0.059						
	[1.33]		[1.38]		[1.34]						
From private to state ownership	0.247	***	0.234	***	0.219	**					
	[2.76]		[2.58]		[2.29]						
Uncertain ownership	0.060		0.049		0.044						
	[1.08]		[0.86]		[0.76]						
Private ownership							0.027		0.029		0.029
							[0.96]		[1.03]		[0.99]
Firm size and age:											
Ln(Employment)	-0.094	***	-0.098	***	-0.096	***	0.035	**	0.038	**	0.052
	[-6.08]		[-6.11]		[-5.72]		[2.39]		[2.51]		[3.20]
Years since listing	0.012	**	0.015	***	0.021	***	0.383		0.091	***	0.061
	[2.23]		[2.62]		[3.29]		[0.85]		[3.71]		[3.07]
Age of firm	-0.005		-0.007		-0.009						
	[-0.96]		[-1.25]		[-1.53]						
Corporate governance:											
Chair-CEO duality	0.122	***	0.135	***	0.138	***	0.066	**	0.038		0.047
	[3.20]		[3.24]		[3.09]		[2.36]		[1.30]		[1.45]
Size of Board of Directors	0.038	***	0.040	***	0.040	***	0.013	*	0.018	**	0.017
	[4.66]		[4.69]		[4.49]		[1.89]		[2.50]		[2.24]
Share of BoD that are independent	0.379		0.407		0.457	*	-0.066		-0.073		-0.094
	[1.53]		[1.58]		[1.67]		[-0.36]		[-0.38]		[-0.46]
Size of Board of Supervisors	-0.012		-0.011		-0.011		0.011		0.012		0.007
	[-1.09]		[-0.97]		[-0.99]		[0.85]		[0.93]		[0.55]

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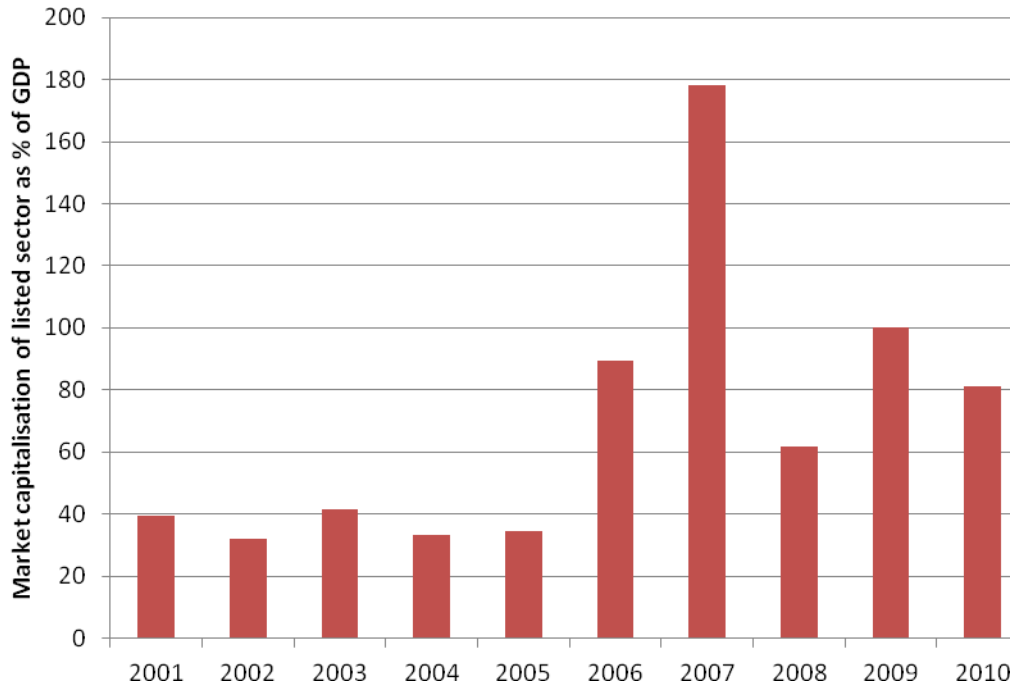
Table 11

	[1]		[2]		[3]		[4]		[5]		[6]	
	OLS		OLS		OLS		FE		FE		FE	
	Coeff.		Coeff.		Coeff.		Coeff.		Coeff.		Coeff.	
Compensation committee: None	ref.		ref.		ref.		ref.		ref.		ref.	
CEO sits on compensation committee	0.099	**	0.099	**	0.116	***	0.130	***	0.118	***	0.108	***
	[2.50]		[2.39]		[2.60]		[5.01]		[4.42]		[3.74]	
CEO does not sit on compensation committee	0.097	***	0.096	***	0.105	***	0.027		0.001		-0.012	
	[3.07]		[2.90]		[2.97]		[1.28]		[0.03]		[-0.49]	
Executive incentives:												
Number of executives	0.017	***	0.017	***	0.015	**	0.006		0.005		0.004	
	[2.88]		[2.71]		[2.30]		[1.37]		[1.02]		[0.82]	
Executives hold shares	0.126	***	0.126	***	0.123	***	0.057	**	0.073	**	0.093	***
	[4.00]		[3.86]		[3.58]		[2.02]		[2.55]		[3.02]	
Any incentive plan	0.210	***	0.188	**	0.197	**	0.094		0.100	*	0.054	
	[2.78]		[2.49]		[2.56]		[1.61]		[1.68]		[0.79]	
Executive characteristics:												
CEO is male	0.053		0.074		0.098		0.053		0.083	*	0.099	**
	[0.89]		[1.19]		[1.53]		[1.17]		[1.75]		[1.97]	
Age of CEO	0.010	***	0.009	***	0.009	***	0.011	***	0.010	***	0.009	***
	[4.82]		[4.13]		[3.81]		[6.59]		[5.77]		[5.24]	
CEO education: Masters degree	ref.		ref.		ref.		ref.		ref.		ref.	
Below Masters degree	-0.069	*	-0.060		-0.073		-0.008		-0.017		-0.010	
	[-1.74]		[-1.40]		[-1.60]		[-0.28]		[-0.55]		[-0.29]	
PhD	0.152	*	0.187	**	0.187	**	-0.048		-0.022		-0.018	
	[1.93]		[2.30]		[2.20]		[-0.77]		[-0.35]		[-0.26]	
Education not reported	-0.039		-0.032		-0.041		-0.101	***	-0.102	***	-0.099	***
	[-1.05]		[-0.82]		[-1.00]		[-3.28]		[-3.22]		[-2.90]	
Tenure (years)	0.048	***	0.049	***	0.049	***	0.054	***	0.056	***	0.056	***
	[4.91]		[4.74]		[4.61]		[8.75]		[8.94]		[8.43]	
Constant	6.838	***	6.996	***	7.072	***	6.551	**	8.417	***	9.297	***
	[22.61]		[21.68]		[20.07]		[2.46]		[21.69]		[20.87]	
R-sq	0.356		0.364		0.364		0.206		0.227		0.225	
Firms	1830		1657		1519		1829		1656		1517	
rho							0.954		0.751		0.708	
Obs	8413		7526		6746		8381		7501		6725	

Notes:

1. Dependent variable is Ln(CEO pay). Pay is measured as cash compensation (base salary plus bonus). The sample period is 2005-2010. All monetary values are in constant prices.
2. Columns 1 to 3 present OLS regressions in which the standard errors are adjusted at the firm level. Columns 4 to 6 present estimates using firm-level fixed-effects.
3. Estimates are authors' calculation from the CSMAR data described in Section 1.
4. T-statistics appear in brackets. *, ** and *** indicate that the coefficient is significantly different from zero at the 10%, 5% and 1% levels respectively.

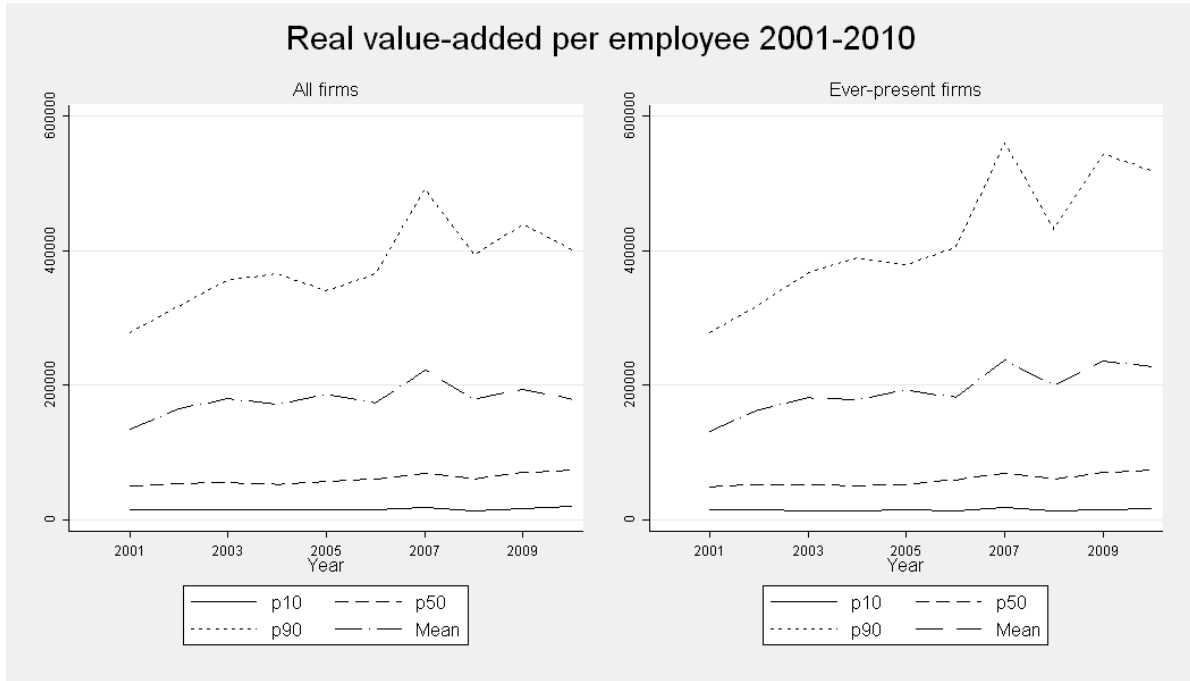
Figure 1: Market Capitalization of Chinese Listed Firms, 2001-2010



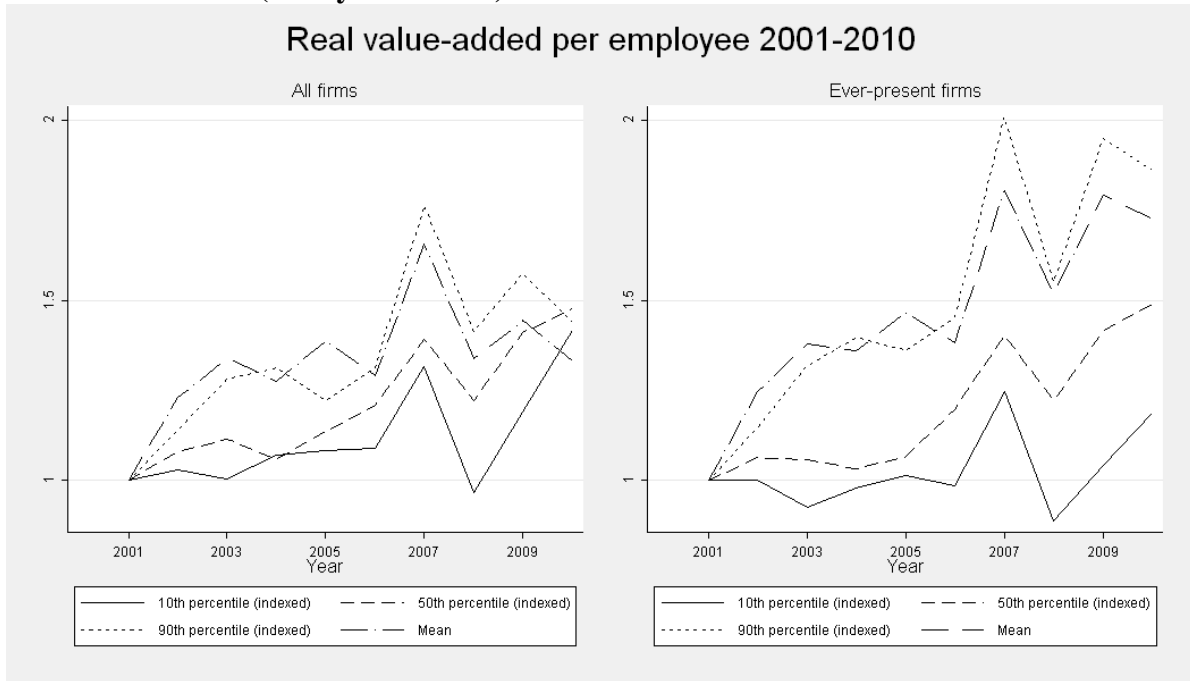
Source: Authors' calculations from data supplied by World Bank (market capitalisation) and IMF (GDP).

Figure 2: Labour productivity in China's listed firms, 2001-2010

A: Levels



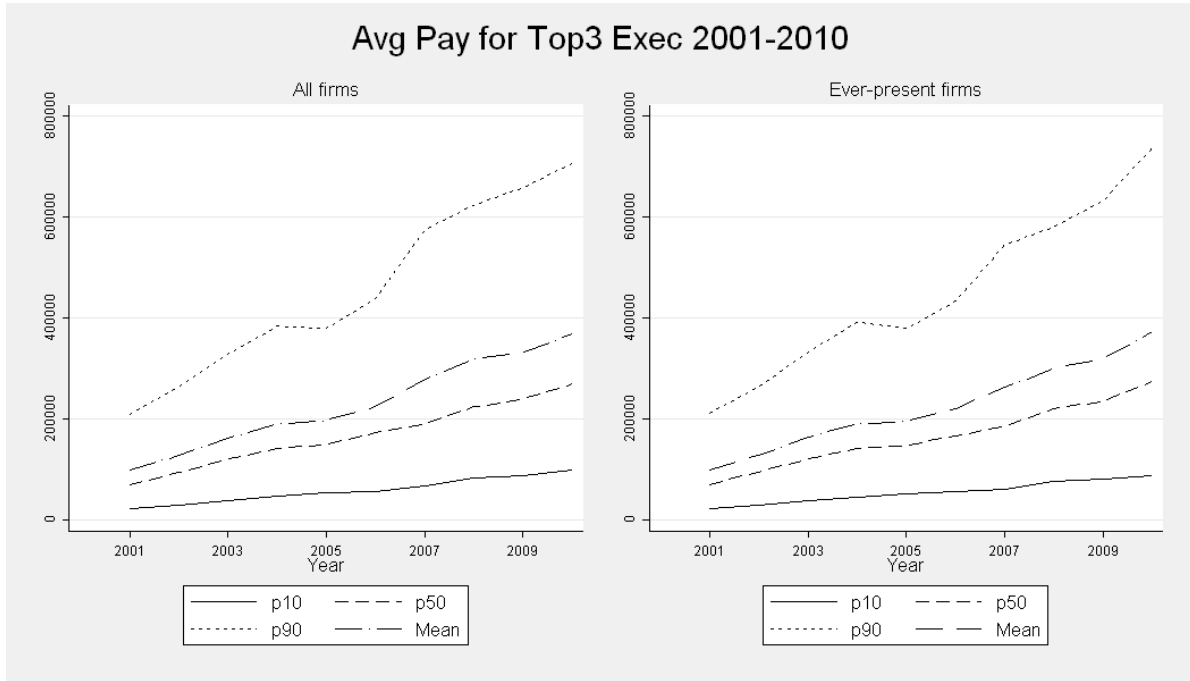
B: Indexed values (base year = 2001)



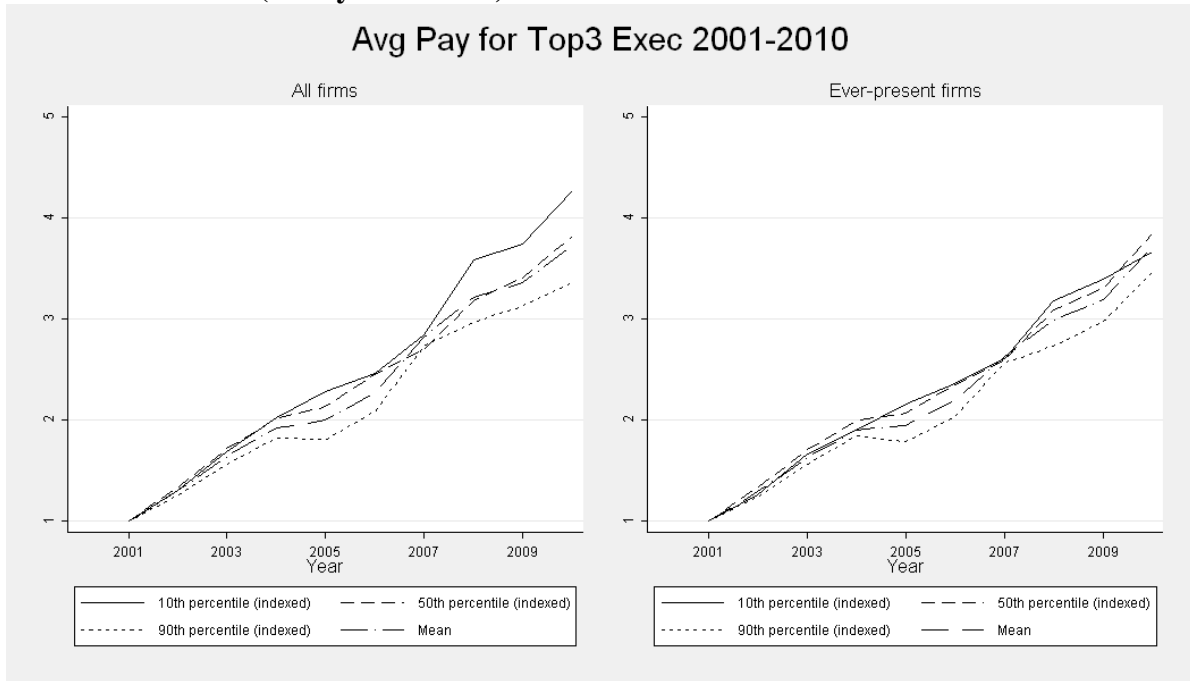
Note: figures are authors' calculations from the CSMAR data described in Section 1.

Figure 3: Top executive pay in China's listed firms, 2001-2010

A: Levels

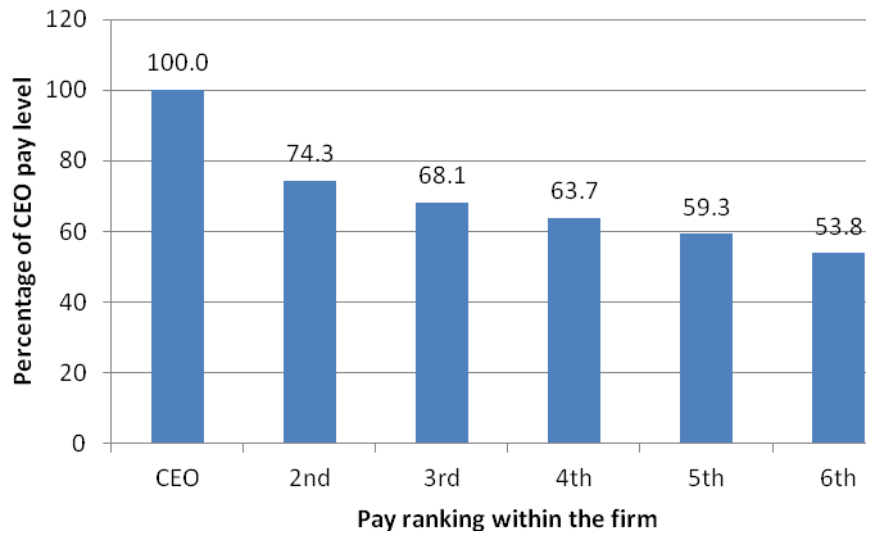


B: Indexed values (base year = 2001)



Note: figures are authors' calculations from the CSMAR data described in Section 1.

Figure 4: Tournament pay profile within Chinese listed firms, 2005-2010



Notes:

1. Bars show the average pay level of the executive ranked *i* in the pay distribution within firms where the CEO is the highest paid executive (see Table 7). Sample restricted to firms with 6 or more executives.
2. Pay is measured as cash compensation (base salary plus bonus). The sample period is 2005-2010. All monetary values are in constant prices.
3. Estimates are authors' calculation from the CSMAR data described in Section 1.