



The impact of pay on CEO turnover: A test of two perspectives

Wei Shen^{a,b,*}, Richard J. Gentry^c, Henry L. Tosi Jr.^a

^a University of Florida, United States

^b Skolkovo Institute for Emerging Market Studies, Beijing, China

^c West Virginia University, United States

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ABSTRACT

We investigate the impact of pay on CEO turnover from two perspectives. One is managerial power perspective that focuses on power in the setting of CEO pay. The other is tournament theory that treats CEO pay as a top prize designed to motivate executives to work hard for the top position. Building on research that highlights the impact of power dynamics at the top of the firm on CEO turnover, we propose that managerial power perspective suggests a negative impact of CEO pay on CEO turnover, while tournament theory suggests a positive impact. Using data from a sample of 313 large U.S. companies from 1988 to 1997, we find that both the level of CEO pay and its ratio over the average pay of the firm's four other highest paid executives have a negative impact on CEO turnover.

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1. Introduction

Chief executive officers (CEOs) draw a great deal of attention in organizational research (Finkelstein et al., 2009). One stream of research focuses on CEO pay, particularly regarding its size and relation with performance (Canyon et al., 2001; Henderson and Fredrickson, 2001; Kaplan, 2008; Khan et al., 2005). The size of CEO pay tends to be extremely large, not only in absolute value, but also in comparison to the pay of the other workers and senior executives (Gomez-Mejia, 1994; Kaplan, 2008). However, in a meta-analysis, Tosi et al. (2000) conclude that performance on average accounts for less than 5% of the variance in CEO pay.

Many theories explain the large size of CEO pay and its weak relation with performance. Among them, two theories have different views about CEO power in the setting of CEO pay. One is tournament theory, proposing that CEO pay is not contingent on the productivity of the CEO, but serves as the top prize designed to motivate lower-level executives to work hard for the top position (Lazear and Rosen, 1981; Rosen, 1986). In tournament theory, CEO power has no role in setting CEO pay. The other is managerial power perspective, proposing that CEO power plays a central role in setting CEO pay in that powerful CEOs can increase their pay and decouple it from performance (Tosi and Gomez-Mejia, 1989; Hambrick and Finkelstein, 1995).

Another stream of research investigates CEO turnover and finds that power dynamics between the CEO, board directors, and other executives of the firm influence CEO turnover. For example, CEOs face the risk of power contests by directors and other executives, especially when performance declines (Fredrickson et al., 1988; Ocasio, 1994;

Shen and Cannella, 2002). Meanwhile, research shows that powerful CEOs face a lower risk of turnover than less powerful CEOs (Finkelstein et al., 2009).

Despite the extensive study of CEO pay, CEO turnover, and the role of CEO power in both of them, little research bridges these two streams of research by directly examining how CEO pay affects CEO turnover. Moreover, tournament theory and managerial power perspective of CEO pay do not provide an unequivocal prediction about the impact of CEO pay on CEO turnover. If CEO pay reflects CEO power as managerial power perspective suggests, highly paid CEOs are more powerful and thus face a lower risk of power contests and turnover than less paid CEOs. However, if CEO power has no role in setting CEO pay as tournament theory assumes, highly paid CEOs should not face a lower risk of turnover than less paid CEOs. They may even face a higher risk of turnover because the high pay they receive, serving as a top prize, is likely to attract more competent and aggressive executives to participate in the tournament.

To fill this gap, our study examines the impact of CEO pay on CEO turnover. Using data from a sample of 313 large U.S. companies from 1988 to 1997, we find that CEO pay and its ratio over the average pay of the firm's four other highest paid executives have a negative effect on CEO turnover and dismissal. This finding is consistent with managerial power perspective and contradicts tournament theory of CEO pay.

2. Literature review and hypotheses development

2.1. CEO pay as a reflection of CEO power

Managerialism theory (Berle and Means, 1932) proposes that separation of ownership and control in modern corporations gives

* Corresponding author. Department of Management, University of Florida, Gainesville, FL 32611-7165, United States.

E-mail addresses: wei.shen@cba.ufl.edu, wshen@skolkovo.org (W. Shen).

managers almost absolute power to pursue personal objectives. Scholars taking this perspective pay special attention to the influence of power on CEO pay (Finkelstein and Hambrick, 1989; Hambrick and Finkelstein, 1995; Tosi and Gomez-Mejia, 1989; Westphal and Zajac, 1995). CEO pay decisions are made by boards of directors. To maximize their gains, CEOs negotiate with boards. The ability of CEOs to exert their wills on compensation decisions is a function of their power (Finkelstein and Hambrick, 1989; Tosi and Gomez-Mejia, 1989).

According to managerialism theory, boards are ineffective in controlling powerful CEOs. Scholars emphasize firm ownership structure as well as the leadership structure and composition of the boards in studying CEO power and pay (Finkelstein et al., 2009). Research shows that because CEOs are more powerful in management-controlled firms in which there is no single major outside owner, their pay is higher and decoupled from performance (Tosi and Gomez-Mejia, 1989). CEOs can also increase their influence over compensation decisions by holding the board chair position and by selecting directors who follow their desires to increase their pay and reduce their pay risks (Westphal and Zajac, 1995).

2.2. CEO pay as a top tournament prize

Lazear and Rosen (1981) develop tournament theory to explain corporate compensation schemes that pay individuals, especially executives, on the basis of organizational ranks rather than productivity. Tournament theory proposes that when it is difficult to monitor individual outputs, it is efficient to pay individuals on the basis of organizational ranks, with more pay at higher levels, just like the prize scheme of a sports tournament. The performance incentives of such a rank-order compensation scheme come from individuals' attempt to win the contests for promotion to higher ranks.

Rosen (1986) later proposes that tournament theory explains the high concentration of rewards in the top ranks of organizations, especially the large pay gap between the CEO and the executives at the next highest level. Because fewer rounds of tournament remain as executives move up the hierarchy, the inter-rank pay gaps must be increasingly larger to maintain the incentives for executives to stay in the game. Furthermore, because there is no bigger prize to win at the top, firms must give CEOs an extra large prize to compensate for the "no tomorrow" aspects at the final stage of the tournament. Thus, a large top prize of a disproportionate size is theoretically necessary to motivate tournament survivors to enter the final contest and compete for the top position.

Much of the research on tournament theory demonstrates that pay structures at firms in both the U.S. and other countries are convex and that the pay gap between the CEO and those at the next highest level is substantially larger than pay gaps between adjacent levels lower in the hierarchy (e.g., Bognanno, 2001; Conyon et al., 2001; Eriksson, 1999; Main et al., 1993).

However, the literature remains inconclusive about the incentive effect of tournament-like pay structure. Although Eriksson (1999) and Main et al. (1993) report that pay dispersion has a positive impact on performance, Conyon et al. (2001) and Henderson and Fredrickson (2001) find no impact. Wright et al. (2005) find that greater inter-rank gaps in salary boosts performance of unrelated diversified firms, but lowers performance of single-product firms and related-diversified firms. Moreover, Bloom and Michel (2002) find that pay dispersion promotes workforce turnover among lower level managers, rather than motivate them to work hard to win the prize of advancement in the corporate hierarchy as tournament theory predicts.

Lastly, although Lazear (1989) points out that tournament-like pay structure can induce political sabotage among participants, especially among executives who tend to be aggressive in pursuing personal interests, little research examines whether CEO pay, as a top prize of corporate tournament, affects power dynamics at the top of the firm

and CEO turnover. The only exception is a recent study by Ensley, Pearson, and Sardeshmukh (2007), which finds that pay dispersion increases conflict and reduces cohesion in top management teams (TMTs).

2.3. The Impact of CEO Pay on CEO Turnover

The above literature review shows that managerial power perspective and tournament theory provide distinct explanations for the large size of CEO pay and its weak relation with performance. Although managerial power perspective emphasizes the influence of CEO power, tournament theory gives it no role in the setting of CEO pay. Instead, it treats CEO pay as a top prize designed to motivate executives at lower levels. These distinct treatments of CEO power in the setting of CEO pay have important implications for the impact of CEO pay on the power dynamics at the top of the firm and CEO turnover.

Research reveals several findings about the power dynamics at the top of the firm. One is that powerful CEOs tend to get entrenched in the position, even when performance declines (Finkelstein et al., 2009; Fredrickson et al., 1988). Many firms have a mandatory or custom retirement age for the CEO to ensure a smooth succession process (Vancil, 1987). However, powerful CEOs can postpone retirement or even dismiss their potential successors (Cannella and Shen, 2001; Dahl, 1994). When performance declines, powerful CEOs can blame and dismiss other executives to protect their positions (Boeker, 1992).

Another finding is that, contrary to the widespread view that the other members of the TMT are allies of the CEO, senior executives can challenge the CEO and become an important force in CEO turnover. In an early study of social movements in corporations, Zald and Berger (1978) discuss the occurrence of CEO turnover due to power contests by other senior executives. They argue that some situations such as poor performance attributable to the CEO and providing senior executives access to board members, induce power contests against the CEO. Fama (1981) also suggests that lower-level executives can perform internal monitoring of higher-level executives if they can gain by stepping over less competent or shirking executives above them.

In a qualitative study, Vancil (1987: 97–101) gives a detailed description of a power contest at Dow Chemical Company during the late 1970s that led to CEO turnover. Empirically, Ocasio (1994) finds that more inside directors on the board increases CEO turnover under poor performance. By comparing factors that affect CEO dismissals followed by inside succession versus those followed by outside succession, Shen and Cannella (2002) find evidence indicating that CEO turnover can be caused by power contest by senior executives. Thus, research suggests that CEOs are not sheltered from power contests by other executives of the firm (Finkelstein et al., 2009).

The literature also suggests that power contest against the CEO is a double-edged sword for those who engage in the action (Zald and Berger, 1978). When it is successful, the CEO steps down and the rewards are high for the contestants (career advancement and promotion). However, if the CEO fends off the power contest, those involved are often forced to leave. Because of the reputation as contestants against the CEO, these executives may have difficulty to join another firm. Although little empirical research examines the employment of executives who are involved in failed power contests against their CEOs, research on board interlocks shows that CEOs tend to avoid selecting individuals who have experience as directors on boards that adopt governance reforms to limit CEO power (Zajac and Westphal, 1996).

Because of the high stakes involved, for senior executives to initiate a power contest, they must foresee a good chance of winning. Given that powerful CEOs often get entrenched in the position, senior executives are unlikely to challenge them. Power contests by senior

executives are more likely to happen against CEOs whose power is relatively weak (Ocasio, 1994; Shen and Cannella, 2002).

According to managerial power perspective, because CEO pay reflects the influence CEOs have over board decisions (Hambrick and Finkelstein, 1995; Tosi and Gomez-Mejia, 1989; Westphal and Zajac, 1995), CEOs receiving more pay are more powerful than CEOs receiving less pay. Senior executives are unlikely to challenge CEOs receiving more pay because they perceive these CEOs to have strong influence over board decisions. Without board support, power contests against CEOs are unlikely to succeed (Zald and Berger, 1978). In contrast, CEOs receiving less pay are perceived to be less powerful and thus face a higher risk of power contests by senior executives. Therefore, managerial power perspective suggests the following hypothesis.

H1a. CEO pay has a negative impact on the likelihood of CEO turnover.

On the other hand, if CEO pay serves as a top prize as tournament theory suggests, it will not have a negative impact on CEO turnover because it does not reflect CEO power. Instead, it will likely have a positive impact on CEO turnover. When senior executives perceive that the large pay CEOs receive is a top prize designed to motivate them to join the tournament, they may not only compete with each other for it, but also initiate a power contest against the CEO. The larger CEO pay is, the more competent and aggressive executives it will likely attract to join the tournament, increasing the chance that a better CEO candidate will emerge.

Although Bloom and Michel (2002) find that a tournament-like pay structure increases the turnover of lower-level managers, this finding may not be applicable to senior executives. Tournament-like pay structures promote dissatisfaction and tournament among lower-level managers because lower-level managers are forced to accept both lower status and substantially less pay. Unlike lower-level managers who are far from getting the top prize, senior executives, especially the most competent ones, are right within the range. If they are dissatisfied with pay and feel that they are under paid relative to the CEO, they have incentives to initiate a power contest against the CEO in the hope of getting the top prize (Zald and Berger, 1978).

In addition to increasing efforts and performance to make them look good to the board of directors, contending executives can engage in political sabotage to make the CEO look bad. Lazear (1989) points out that pay structures designed like a tournament induce political sabotage at the top of the firm – executives take actions to adversely affect the output of others in an effort to enhance their own chance of winning the top prize. Because a tournament-like pay structure is most used when monitoring individual performance is difficult (Lazear and Rosen, 1981), executives engaging in political sabotage are difficult to spot and penalize (Lazear, 1989). To increase their chance of winning, contending executives can withhold vital information from the CEO and engage in covert influence attempts with other executives, directors, and powerful shareholders without the awareness of the CEO, attempting to damage the CEO's reputation while polishing their own (Zald and Berger, 1978).

Thus, if CEO pay serves as a top prize as tournament theory suggests, we expect it to provide incentives for competent and aggressive executives to participate the tournament for the CEO position, increase the likelihood of a power contest against the CEO, and have a positive impact on CEO turnover.

H1b. CEO pay has a positive impact on the likelihood of CEO turnover.

3. Methods

3.1. Sample and data

We select from COMPUSTAT a random sample of 365 large U.S. firms that reported at least \$200 million in sales for 1988. We collect

annual data over the period from 1988 to 1997. We collect data on executive pay from *ExecuComp* and company annual reports, which contain compensation information for each firm's five highest-paid executives. A primary source for information on CEO age, tenure, and the board of directors is the officer-and-director list in each firm's annual reports, complemented by Dun and Bradstreet's *Reference Book of Corporate Management* and Dow Jones's *Factiva*. We collect data on ownership from proxy statements, firm size and performance from COMPUSTAT. After data collection, we have a total of 313 firms with needed information, covering 20 industries at the two-digit SIC level. Our *t*-tests indicate no significant difference between the remaining and the dropped firms regarding sales ($t=0.24$, $p=0.81$) and return on assets (ROA) ($t=0.41$, $p=0.68$). Our final sample has 549 CEOs and 2775 CEO-year observations.

3.2. Dependent variable – CEO turnover

We create two measures of CEO turnover to examine the impact of CEO pay on it. One is coded 1 if the CEO left the firm during a fiscal year and 0 if the CEO was still in office at the end of the fiscal year. We identify 239 such events, and name this measure *CEO turnover*. The other is more restrictive and coded 1 only if the turnover is involuntary. We name this measure *CEO dismissal*. We analyze news reports and identify 46 dismissals, using the three criteria suggested by Shen and Cannella (2002): (1) the CEO was directly reported as being fired or forced out; (2) the CEO resigned unexpectedly or immediately, due to poor performance, undisclosed personal reasons, or a desire to pursue other interests; or (3) the CEO took early retirement due to poor performance. In both measures, we exclude CEO turnovers due to health reasons, mergers and acquisitions, or taking a similar job at another organization. We treat these observations as censored.

3.3. Independent variable – CEO pay

Executive pay normally includes both cash (salary and bonus) and long-term incentives. We decide to focus on cash compensation for several reasons. First, cash compensation is easy to calculate and is the measure of choice in previous studies of executive compensation structures using a tournament theory framework (O'Reilly et al., 1988; Main et al., 1993; Eriksson, 1999; Bognanno, 2001). In contrast to cash compensation, the total pay that executives ultimately receive from most long-term incentives is uncertain at the time they are awarded. For example, there is little consensus among financial economists, accountants, and compensation consultants regarding the valuation of stock options because of the imprecision and the potential inaccuracy of tools for pricing options such as the Black-Scholes options pricing model (Kroll et al., 1997).

Second, according to managerial power perspective, CEOs tend to have strong influence over cash compensation (Carpenter and Wade, 2002). In contrast, because long-term incentives depend on long-term performance, they increase compensation risk and are not the type of compensation most CEOs prefer (Tosi and Gomez-Mejia, 1989). There is evidence that firms often decouple the adoption of long-term incentive plans from their actual use when CEOs are powerful (Westphal and Zajac, 1994).

Lastly, research shows that cash compensation is a good proxy of total pay for CEOs (Finkelstein and Hambrick, 1989; Henderson and Fredrickson, 2001). The correlations of CEO total pay with cash compensation and long-term incentives in our sample are 0.74 and 0.86, respectively. To check the robustness of our findings based on cash compensation, we conduct analysis using total pay and long-term incentives. We provide more details later in the robustness tests section.

We create two measures of CEO pay. First, we calculate the absolute level of CEO cash compensation as the sum of annual salary and bonus (in millions), and name it *CEO cash compensation level*.

Second, we calculate the ratio of CEO cash compensation to the average cash compensation of the firm's four other highest-paid executives, and name it *CEO cash compensation ratio*. This measure captures the relative cash compensation between the CEO and the other members of the TMT. From managerial power perspective, it reflects the relative power of the CEO within the TMT (Finkelstein, 1992). From tournament theory perspective, it indicates the relative size between the top and the second prize (Rosen, 1986).

3.4. Control variables

We include a number of control variables that may influence CEO turnover. The first is performance, which research consistently finds to have a negative impact on CEO turnover (Finkelstein et al., 2009). We measure it using ROA, calculated as net income divided by total assets at the end of each fiscal year. To minimize industry effects, we adjust each firm's ROA by subtracting industry average ROA at the firm's primary 2-digit SIC level. We name this measure *industry-adjusted ROA*.

3.4.1. CEO characteristics

We include two widely used measures of CEO power – CEO ownership and duality (Finkelstein et al., 2009). We measure *CEO ownership* as the proportion of firm shares owned by the CEO and his/her family. We measure *duality* as a dummy variable, coded 1 when the CEO held the board chair position and 0 otherwise. Additionally, whether the CEO is newly appointed or recruited from outside the firm can affect turnover (Ocasio, 1994; Shen and Cannella, 2002). We measure *New CEO* as a dummy variable, coded 1 for the first 5 years of CEO tenure and 0 otherwise. We code the dummy variable *outsider CEO* as 1 if the CEO joined the firm less than 2 years before the appointment and 0 otherwise.

We use *Year of hire* to indicate the year (minus 1900) the CEO took office. We use it to control for the historical trend in the rates of CEO turnover because CEOs appointed in more recent years might face a higher risk of turnover than those appointed in earlier years (Ocasio, 1994). Lastly, to control for the impact of age on turnover, we create three dummy variables for CEO age 60–62, 63–64, and 65 and over. CEOs below 60 years old are the comparison group in the analysis.

3.4.2. Governance characteristics

We include board composition and stock ownership by outside directors, large block shareholders, financial institutions, and the

other senior executives as controls for governance characteristics. We calculate the *proportion of inside directors* as the number of directors who are employees of the firm, excluding the CEO, divided by the total number of directors. We measure *outside director ownership* as the proportion of firm shares owned by directors who are not current or former employees of the firm. We create a variable *outside 5% ownership* to measure ownership by large block shareholders, calculated as the proportion of shares held by outside investors who own 5% or more of firm stocks. We measure *institutional ownership* as the proportion of stocks owned by institutional investors. We calculate *non-CEO executive ownership* as the proportion of stocks held by non-CEO executives.

3.4.3. Industry and firm characteristics

Because *industry instability* influences top management turnover (Wiersema and Bantel, 1993), we include it as a control and calculate it as the variance of the industry's four-firm sales concentration ratio over a three-year period (from $t-3$ to $t-1$) at each firm's primary 2-digit SIC level. To control for any additional potential industry effect on CEO turnover, we create a set of industry dummy variables at the 2-digit SIC level. Because of space constraints, we do not report their coefficients in the results section. Lastly, we measure *firm size* as the natural logarithm of annual sales to control for the potential impact of firm size on the power dynamics at the top.

3.5. Modeling procedure

We test our hypotheses using event history analysis estimated by maximum likelihood. We use CEO tenure, measured in years, as the duration measure, and specify turnover as a non-repeatable failure event for each CEO. We have 299 CEOs who took office before 1988. These CEOs are subjected to left truncation. According to Tuma and Hannan (1984), exclusion of these CEOs can lead to an upward bias in the hazard rate. We thus include all CEOs in the analysis. For the left-truncated CEOs, we record their tenures starting in 1988. For the rest, we record their tenures starting in the year when they took office. In separate robustness test, we exclude the left-truncated CEOs and obtain similar results.

To estimate the likelihood of CEO turnover during fiscal year t , we use the values at the end of fiscal year $t-1$ for CEO pay and all the control variables except for industry dummies. In choosing between proportional hazard model and accelerated failure-time model, our analysis shows that the proportional hazard assumption is violated

Table 1
Variable means, standard deviations, and correlation coefficients.

| Variable | Mean | s.d. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|----------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1. Turnover | .10 | .35 | | | | | | | | | | | | | | | | | | | |
| 2. Dismissal | .02 | .13 | .33 | | | | | | | | | | | | | | | | | | |
| 3. CEO cash comp. level | .75 | .51 | .00 | -.03 | | | | | | | | | | | | | | | | | |
| 4. CEO cash comp. ratio | 2.18 | .74 | -.00 | -.03 | .37 | | | | | | | | | | | | | | | | |
| 5. Ind. Adjusted ROA | 1.48 | 5.52 | -.30 | -.07 | .07 | .09 | | | | | | | | | | | | | | | |
| 6. New CEO | .26 | .44 | -.10 | .04 | -.00 | -.14 | -.09 | | | | | | | | | | | | | | |
| 7. Outside CEO | .05 | .22 | -.02 | .04 | -.01 | -.00 | -.14 | .38 | | | | | | | | | | | | | |
| 8. CEO ownership | .04 | .10 | -.08 | -.04 | -.25 | -.09 | .02 | -.14 | -.05 | | | | | | | | | | | | |
| 9. CEO duality | .84 | .37 | .02 | -.08 | .18 | .10 | .09 | -.28 | -.13 | .05 | | | | | | | | | | | |
| 10. CEO year of hire | 82.65 | 9.15 | -.04 | .05 | .12 | -.03 | -.12 | .57 | .21 | -.43 | -.21 | | | | | | | | | | |
| 11. CEO age 60–62 | .18 | .38 | .04 | .03 | .06 | -.00 | .02 | -.05 | -.05 | -.07 | .03 | -.00 | | | | | | | | | |
| 12. CEO age 63–64 | .09 | .28 | .17 | -.02 | .04 | .00 | -.00 | -.12 | -.07 | -.02 | .05 | -.09 | -.15 | | | | | | | | |
| 13. CEO age 65 and over | .14 | .35 | .08 | -.04 | -.04 | .09 | .05 | -.21 | -.09 | .29 | .11 | -.52 | -.19 | -.13 | | | | | | | |
| 14. Prop. of inside direc. | .28 | .18 | -.04 | -.02 | -.09 | -.10 | -.00 | -.03 | -.05 | .25 | -.08 | -.10 | -.09 | -.00 | .21 | | | | | | |
| 15. Outside. direc. own. | .03 | .07 | .02 | .02 | -.09 | -.00 | .10 | -.01 | .02 | .00 | -.11 | -.01 | -.02 | -.02 | .00 | .03 | | | | | |
| 16. Outside 5% own. | .17 | .20 | .00 | -.00 | -.11 | -.05 | -.04 | -.03 | .01 | .10 | -.06 | -.00 | .02 | .04 | .03 | .03 | .16 | | | | |
| 17. Institutional own. | .46 | .19 | .03 | -.02 | .36 | .12 | .14 | .03 | -.03 | -.35 | .06 | .18 | .09 | .04 | -.13 | -.11 | -.15 | .10 | | | |
| 18. Non-CEO exe. own. | .07 | .10 | .00 | .01 | -.16 | -.06 | .08 | .02 | -.02 | .03 | -.18 | .01 | -.06 | .00 | .03 | .15 | .67 | .23 | -.18 | | |
| 19. Ind. instability | .01 | .01 | -.02 | .00 | -.06 | -.05 | -.02 | -.02 | -.02 | .03 | -.01 | -.10 | -.02 | .01 | .04 | .00 | .01 | .00 | -.05 | -.00 | |
| 20. Firm size | 7.11 | 1.42 | .04 | -.00 | .67 | .07 | -.00 | .09 | -.06 | -.30 | .16 | .19 | .09 | .07 | -.12 | -.07 | -.19 | -.14 | .43 | -.26 | -.00 |

$N = 2775$. Correlation coefficients greater than .04 or less than $-.04$ are significant at $p < .05$.

($\chi^2 = 25.93, p < .05$). To select the best accelerated failure-time model, we start with generalized gamma model. The hazard function of generalized gamma distribution is extremely flexible, allowing for a large number of possible shapes, including as special cases the lognormal, Weibull, and exponential distributions (Stata, 2003: 207). Our results from the generalized gamma model suggest that none of the lognormal, Weibull, and exponential distributions is adequate for our data. Further comparisons suggest that the log–logistic model fits our data better than the generalized gamma model, although the results obtained from these models are essentially the same.

4. Results

Table 1 reports variable means, standard deviations, and correlation coefficients. Table 2 reports results from our event history analysis of the likelihood of CEO turnover using the log–logistic distribution. Model 1 includes only the control variables. Model 2 examines the impact of the level of CEO cash compensation. The results shows that the coefficient for CEO cash compensation level is negative and significant ($b = -.20, p < .001$).

Model 3 examines the impact of CEO cash compensation relative to the average cash compensation of the TMT. The coefficient for CEO cash compensation ratio is negative and significant ($b = -.09, p < .01$). Model 4 includes both CEO cash compensation level and ratio. The results show that the coefficient for CEO cash compensation level is negative and significant ($b = -.16, p < .01$), and the coefficient for CEO cash compensation ratio is negative and marginally significant ($b = -.06, p < .10$).

Table 3 reports results from our event history analysis of the likelihood of CEO dismissal using the log–logistic distribution. Model 1 includes only the control variables. Model 2 and Model 3 examine the impact of CEO cash compensation level and ratio on CEO dismissal separately. The coefficient for CEO cash compensation level is negative

Table 2
Maximum likelihood estimates of the likelihood of CEO turnover.

| Variables | Model 1 | Model 2 | Model 3 | Model 4 |
|--------------------------------|-----------------|------------------|-----------------|-----------------|
| CEO cash compensation level | | -0.20*** (0.06) | | -0.16** (0.07) |
| CEO cash compensation ratio | | | -0.09** (0.03) | -0.06† (0.04) |
| Industry adjusted ROA | -0.01** (0.01) | -0.01** (0.01) | -0.01** (0.01) | -0.01** (0.01) |
| CEO ownership | -1.78*** (0.48) | -1.77*** (0.47) | -1.82*** (0.48) | -1.80*** (0.47) |
| CEO duality | -0.14* (0.07) | -0.12† (0.06) | -0.12* (0.06) | -0.11† (0.06) |
| New CEO | 0.33*** (0.06) | 0.32*** (0.06) | 0.32*** (0.06) | 0.31*** (0.06) |
| Outside CEO | 0.41*** (0.10) | 0.42*** (0.10) | 0.40*** (0.10) | 0.41*** (0.10) |
| CEO year of hire | 0.05*** (0.01) | 0.06*** (0.01) | 0.06*** (0.01) | 0.06*** (0.01) |
| CEO age 60–62 | 0.30*** (0.06) | 0.29*** (0.05) | 0.29*** (0.06) | 0.28*** (0.05) |
| CEO age 63–64 | 0.61*** (0.07) | 0.60*** (0.07) | 0.59*** (0.07) | 0.59*** (0.07) |
| CEO age 65 and over | 0.53*** (0.07) | 0.53*** (0.07) | 0.53*** (0.07) | 0.53*** (0.07) |
| Proportion of inside directors | -0.07 (0.14) | -0.11 (0.13) | -0.10 (0.13) | -0.12 (0.13) |
| Outside director ownership | -0.03 (0.41) | 0.04 (0.40) | 0.04 (0.39) | 0.07 (0.39) |
| Outside 5% ownership | -0.04 (0.05) | -0.04 (0.04) | -0.03 (0.05) | -0.03 (0.04) |
| Institutional ownership | 0.16 (0.14) | 0.18 (0.14) | 0.18 (0.14) | 0.18 (0.14) |
| Non-CEO executive ownership | 0.34 (0.33) | 0.30 (0.33) | 0.24 (0.32) | 0.25 (0.32) |
| Industry instability | -1.12 (1.79) | -1.20 (1.72) | -1.15 (1.73) | -1.21 (1.70) |
| Firm size | 0.01 (0.02) | 0.05* (0.02) | 0.01 (0.02) | 0.04† (0.02) |
| Constant | -7.25*** (0.32) | -7.578*** (0.33) | -7.14*** (0.31) | -7.44*** (0.33) |
| Log-likelihood | -210.88 | -205.55 | -207.21 | -204.28 |
| Model χ^2 | 448.85*** | 459.51*** | 456.20*** | 462.04*** |

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. Standard errors are in parentheses.

Table 3
Maximum likelihood estimates of the likelihood of CEO dismissal.

| Variables | Model 1 | Model 2 | Model 3 | Model 4 |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|
| CEO pay level | | -0.58** (0.24) | | -0.52* (0.25) |
| CEO pay ratio | | | -0.17† (0.12) | -0.09 (0.12) |
| Industry adjusted ROA | -0.02† (0.01) | -0.01 (0.01) | -0.02† (0.01) | -0.01† (0.01) |
| CEO ownership | -5.66† (3.27) | -5.69† (3.10) | -5.65† (3.20) | -5.68† (3.07) |
| CEO duality | -0.48** (0.16) | -0.42** (0.15) | -0.43** (0.15) | -0.41** (0.14) |
| New CEO | 0.52** (0.17) | 0.47** (0.17) | 0.50** (0.17) | 0.47** (0.16) |
| Outside CEO | 0.06 (0.24) | 0.14 (0.23) | 0.07 (0.23) | 0.14 (0.22) |
| CEO year of hire | 0.05*** (0.01) | 0.06*** (0.01) | 0.06*** (0.01) | 0.06*** (0.01) |
| CEO age 60–62 | 0.14 (0.15) | 0.12 (0.14) | 0.13 (0.14) | 0.12 (0.14) |
| CEO age 63–64 | -0.28 (0.30) | -0.32 (0.29) | -0.29 (0.29) | -0.32 (0.28) |
| CEO age 65 and over | -0.53 (0.42) | -0.54 (0.39) | -0.52 (0.40) | -0.54 (0.39) |
| Proportion of inside directors | -0.20 (0.39) | -0.24 (0.36) | -0.25 (0.38) | -0.26 (0.36) |
| Outside director ownership | 0.85 (1.12) | 0.80 (1.06) | 0.95 (1.10) | 0.83 (1.06) |
| Outside 5% ownership | -0.01 (0.14) | -0.00 (0.13) | 0.01 (0.13) | 0.01 (0.13) |
| Institutional ownership | -0.21 (0.44) | -0.17 (0.41) | -0.22 (0.42) | -0.17 (0.40) |
| Non-CEO executive ownership | -0.05 (0.95) | -0.05 (0.89) | -0.10 (0.93) | 0.02 (0.88) |
| Industry instability | -2.39 (6.05) | -3.05 (5.68) | -2.89 (5.83) | -3.24 (5.60) |
| Firm size | -0.03 (0.06) | 0.10 (0.07) | -0.02 (0.05) | 0.09 (0.07) |
| Constant | -7.23*** (1.19) | -7.94*** (1.17) | -7.07*** (1.17) | -7.79*** (1.17) |
| Log-likelihood | -137.52 | -133.76 | -136.39 | -133.50 |
| Model χ^2 | 120.59*** | 128.11*** | 122.86*** | 128.64*** |

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. Standard errors are in parentheses.

and significant ($b = -.58, p < .01$), the coefficient for CEO cash compensation ratio is also negative but only marginally significant ($b = -.17, p < .10$). Model 4 includes both CEO cash compensation level and ratio in the analysis. The coefficient for CEO cash compensation level is negative and significant ($b = -.52, p < .05$), and the coefficient for CEO cash compensation ratio is negative and but not significant ($b = -.09, n.s.$).

Overall, our results show that CEO cash compensation, particularly its absolute level, has a strong negative impact on CEO turnover. When we limit CEO turnover to dismissal only, CEO cash compensation level still has a negative impact on it. CEO cash compensation ratio also shows a negative impact, though relatively weaker, on CEO dismissal when CEO cash compensation level is not included in the analysis. These results support H1a that predicts a negative impact of CEO pay on CEO turnover from the managerial power perspective, and contradicts H1b that predicts a positive impact from the tournament theory perspective.

5. Robustness tests

To ensure the robustness of the above findings, we conduct two sets of analysis. In the first set we replace cash compensation with total pay. Executives tend to receive more pay from long-term incentives than from salary and bonuses. Some authors (e.g., Wright et al., 2005) suggest that cash compensation and long-term incentives may induce different managerial behaviors because long-term incentives are linked to long-term performance while cash compensation is not. To examine this possibility, we collect total compensation data and redo the analysis. Our sample drops to 855 CEO-year observations, with 71 turnovers and 13 dismissals from 1992 to 1997. The results show that both CEO total pay level and CEO total pay ratio are negatively related to CEO turnover, and that CEO total pay ratio is negatively related to CEO dismissal. We also run analysis with long-term incentives only, and obtain similar results.

In the second set of analysis, we examine whether performance and CEO tenure moderate the impact of CEO pay on CEO turnover. Although we do not find a positive effect of CEO pay on CEO turnover, one may argue that it exists only when performance is poor or when

the CEO is new in office (Ocasio, 1994; Shen and Cannella, 2002). We thus include the interactions of CEO cash compensation with performance and new CEO in the analysis. The results show that the interactions of CEO pay level and pay ratio with performance have no impact on either CEO turnover or CEO dismissal. The interactions of CEO pay level and pay ratio with new CEO have no impact on CEO dismissal, either.

The only significant interaction effects are CEO pay with new CEO on CEO turnover. We find a positive interaction effect of CEO cash compensation ratio with new CEO, suggesting that CEO cash compensation ratio increases the likelihood of turnover for new CEOs. This finding gives some support to tournament theory. However, we also find a negative interaction effect of CEO cash compensation level with new CEO, suggesting that CEO cash compensation level decreases the likelihood of turnover for new CEOs. This finding is consistent with managerial power perspective. Moreover, we find that CEO cash compensation, particularly its level, continues to show a negative main effect on CEO turnover and dismissal.

6. Discussion and conclusions

Our study makes important contributions. First, it contributes to research on CEO power and the power distribution at the top of the firm. Although the managerial power perspective has long recognized that executive pay is a function of power, little research uses pay as a measure of executive power. Our finding of the negative effect of CEO pay on CEO turnover suggests that CEO pay, including both cash compensation and total pay, can be considered as another valid measure of CEO power. Because we control for many commonly used measures of CEO power in the analysis, our finding suggests that CEO pay captures CEO power beyond the traditional measures we use as controls. Because we find that both the level of CEO pay and its ratio to the pay of the other executives have a negative impact on CEO turnover, we recommend researchers to consider them both as measures of CEO power.

Second, our study has implications for research and practice following the tournament theory of CEO pay. Although our study does not directly examine the incentive effect of CEO pay on the other executives, our finding of the negative impact of CEO pay on CEO turnover suggests that the other executives are unlikely to believe that there is a fair tournament at the top and that CEO pay is a top prize for them to compete for. Instead of initiating a power contest against a highly paid CEO, competent executives may elect to seek CEO opportunities in the external managerial labor market because of the fear of being forced out by the entrenched CEO (Cannella and Shen, 2001). Therefore, our study joins Bloom and Michel (2002) to challenge the incentive effect of CEO pay proposed by tournament theory. It is interesting and important for future research to examine how CEO pay influences the turnover of senior executives.

The only situation in which we find a positive impact of CEO pay on CEO turnover is when the ratio of CEO cash compensation over the average cash compensation of the next four highest-paid executives is high and the CEO is new in office. Although this finding suggests that a large pay gap between a new CEO and the rest of the TMT provides incentive for executives to challenge the CEO, it may not be in the best interest of the firm. Because new CEOs need time to develop and implement their strategies (Hambrick and Fukutomi, 1991), frequent CEO turnover can have a negative impact on leadership stability and firm strategy. Shen (2003) indeed argues that boards of directors should stand behind new CEOs, rather than create incentives for other executives to challenge them. Therefore, if the boards are in control and intend to set up CEO pay as a top tournament prize following the suggestion of tournament theory, they should avoid doing it during the early years of CEO tenure. Moreover, if the boards decide to do it after their CEOs have become established in the office, they need to communicate their intention clearly to the other executives. Other-

wise, the other executives may interpret the large pay CEOs receive as an indicator of the CEOs' dominance over the boards.

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