CEO and Director Compensation, Firm Performance and Institutional Investors: Cronyism in the UK?

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Abstract

This paper presents more evidence that the overpayment of CEOs and directors is symptomatic of agency problems associated with cronyism. Like Brick et al. (2006), I find a positive relation between director and CEO compensation and a negative relation between excess compensation and subsequent firm performance using a UK sample from 1998 to 2009. This paper adds to their work by showing that director excess compensation is negatively related to CEO turnover, *ceteris paribus*. In other words, well-compensated directors are less likely to replace CEOs. However, this negative relation is mitigated by total institutional ownership. In addition, as institutional ownership increases, the positive effect of director compensation on CEO cash compensation is also significantly reduced. Further, in firms with high levels of institutional ownership the negative impact of excess compensation on subsequent firm performance is weakened most likely due to reinforced monitoring. The fact that external monitoring by institutional investors mitigates the effects of excess compensation means excess compensation of directors and CEOs is at least partly due to agency problems related to cronyism.

1. Introduction

Enron is a wake-up call that the independent director doesn't serve for the monitor of management…It is obvious that rules on directors' financial ties to the company he or she oversees need tightening.

−Dick Grasso, NYSE Chief Executive, April 2002

In most of corporate scandals in history, such as Enron, WorldCom, Global Crossing and Amgen[1], there has always been some underlying accusation of top executives making off with millions even as the employees and shareholders suffer from the particular fallout of such events. Critics argue that high levels of compensation and reciprocal relationships with the CEO might have compromised directors' ability to monitor managers in the interest of shareholders. The phenomenon in which CEO-director reciprocity results in excessive compensation, weak monitoring and eventually poor firm performance can be viewed as evidence of 'cronyism' (Bebchuk and Fried, 2005; Brick et al., 2006).

The issue concerns a wide range of stakeholders, from employees to shareholders, who could be harmed by a collusive board and top executive's abuse of the firm's assets. Existing theories offer some insights on the governance issues related to the board. Jensen (1993) points out that the board may not effectively monitor executive performance due to the board culture problem in which directors emphasize on politeness and courtesy at the expense of truth and frankness results. Bebchuk and Fried (2005) and Bebchuk et al. (2002) argue that CEOs may have power to influence their own compensation via their control over the board. Directors have various incentives to support arrangements that favour top executives, such as director's incentive to be re-elected. In addition, the CEO can encourage higher director compensation in exchange for generous treatment of directors in terms of approving higher CEO compensation and exerting weak monitoring.

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[1] See Abelson, The New York times, December 16, 2001; Mark Tran, the guardian, August 9, 2002; Douglas et al., Los Angeles Times, February 24, 2002 and Peter Whoriskey, The Washington Post, October 4, 2011 for more details.

To date, little empirical work has been done on agency problems associated with cronyism in the corporate context. An exception is Brick et al. (2006) who find director compensation to be positively related to CEO compensation using a sample of US firms from 1992 to 2001. They point out that this positive relation could be either due to unobserved firm complexity, with predicted weakly positive effects on firm performance, or the board culture problems, with predicted negative effects on firm performance. The results are consistent with the latter cronyism hypothesis as they find a negative relation between director excess compensation and firm performance. As such, they describe cronyism as a phenomenon of 'mutual back scratching' associated with excess compensation and weak monitoring.

Like Brick et al. (2006), I also find a positive relation between director and CEO compensation after controlling for firm characteristics, executive characteristics and other governance factors. A 10% increase in director total compensation is associated with an increase of 1.06% in CEO cash compensation and 3.09% in CEO total compensation. Consistent with the cronyism hypothesis, there is a negative relation between excess compensation and both subsequent stock and accounting performance. The sample consists of all non-financial listed firms in the UK from 1998 to 2009.

To further test the cronyism hypothesis and gain insights into the impact of excess compensation, I investigate whether well-compensated directors are less likely to replace the CEO. Given that firms with excess compensation tend to perform poorly, it is expected that CEOs of such firms are more likely to be replaced, *ceteris paribus*, suggesting a positive relation between excess compensation and CEO turnover. However, the fact that director excess compensation is found to be negatively related to CEO turnover means the overpayment is at least partly due to agency problems associated with cronyism. CEOs offer directors higher compensation in exchange for their loyalty to avoid being replaced despite of their weak performance.

This finding makes two contributions. First, it adds to the CEO turnover literature (Inders and Mueller, 2005; Fisman et al., 2005; Weisbach, 1988; Hermalin and Weisbach, 1998) by showing that after controlling for other factors director excess compensation has a negative first-order effect on CEO turnover. Second, it provides more evidence for the cronyism hypothesis and supplements the work of Brick et al. (2006) by presenting a means through which excess compensation could hurt firm performance. If incompetent CEOs avoid being replaced by simply offering directors higher compensation, firms will perform poorly under their continuing leadership. Previous studies find that boards improve firm value by replacing incompetent CEOs. CEO resignation preceded by poor performance is associated with an increase in firm value surrounding the event day (Weisbach, 1988). In contrast, not firing a CEO whom the board views as incompetent hurts subsequent performance (Cornelli et al., 2013).

Next, I further explore whether the above effects of excess compensation vary in firms with different levels of institutional holdings. If the excess compensation of directors and CEOs is due to agency problems, we should expect external monitoring by institutional investors to mitigate the effects of excess compensation on CEO turnover and firm performance. It has been well-documented that intuitional investors are effective monitors associated with higher firm value (McConnell and Servaes, 1990), more active voting actions (Brickley et al., 1988) and higher probability of top executive turnover (Denis et al., 1997).

Consistent with the conjecture that institutional investors put pressure on directors and mitigate agency problems related to cronyism, I find total institutional ownership to mitigate the positive relation between director excess compensation and CEO cash compensation and the negative relation between director excess compensation and CEO turnover. In addition, the negative effects of excess compensation on firm performance are weakened in firms with high levels of institutional ownership. Taken together, firm performance is less lowered as

institutional investors reinforce monitoring on executive compensation and re-enhance the threat of replacement. Overall, these results are in line with the cronyism hypothesis, in firms with more external monitoring (i.e., less agency problems) the effects of excess compensation is mitigated, suggesting that the overpayment and the resulting underperformance is at least partly due to agency problems.

The remainder of the paper is organised as follows. In section 2, I review the prior literature. Sample is described and variables and methodology are discussed in section 3. Section 4 estimates CEO and director compensation as well as examines the impact of director compensation on CEO compensation. Then I examine the effects of excess compensation on firm performance in Section 5 and its effects on CEO turnover in Section 6. Section 7 explores the role played by institutional investors in mitigating agency problems associated with cronyism. Section 8 presents robustness tests results and Section 9 concludes.

2. Prior Literature

Given the diffuse ownership in the modern corporation and the resulting free-rider problem, it is difficult for shareholders to oversee the management effectively. Hence, shareholders elect board members and delegate this task to them. Ideally, the board plays both supervisory and managerial roles, providing an important internal control mechanism to protect the interests of shareholders. But recently this view has been challenged by a growing literature suggesting that the board is ineffective and that board member's behaviour may deviate from the interest of shareholders (Jensen, 1993; Core et al., 1999; Brick et al. 2006; Bebchuk and Fried, 2005; Bebchuk, Fried and Walker, 2002).

The concern over board problems is nothing new. In a widely cited paper, Fama (1980) points out the likelihood that top management decide to collude with the board and expropriate shareholders rather than competing among themselves. Jensen (1993) argues that

poor board culture, where directors emphasize on politeness and courtesy at the expense of truth and frankness, results in the failure of the internal control system.

Bebchuk and Fried (2005) indicate that CEOs can benefit the board or individual directors through their influence over director compensation. For example, the CEO can encourage higher director compensation in exchange for generous treatment of directors, which might include the support to higher CEO compensation and/or looser monitoring. Further, CEOs use their power over corporate resources to reward cooperative directors. Such reward generally outweighs the direct personal cost to most directors for not serving shareholder interests.[2] It also increases director's cost to challenge the CEO making them more reluctant to do so. Eventually, as noted by Jensen (1993, P.863), the reciprocal relation between the management and directors makes a continuing cycle of ineffectiveness: "by rewarding consent and discouraging conflicts, CEOs have the power to control the board, which in turn ultimately reduces the CEO's and the company's performance."

Brick et al. (2006) look into the problem of cronyism by examining the empirical relation between CEO and director compensation and test whether excess compensation for both CEOs and directors is associated with weak firm performance. First, they find a significant positive relation between excess director compensation and CEO compensation. They then regress the future firm performance on CEO/director excess compensation and find a negative association between future firm performance and excess compensation. The results suggest that excess compensation may be a symptom of agency problems related to cronyism.

Other empirical researches examine whether board composition and/or CEO power affect executive compensation arrangements and firm performance and the extent to which they are related to internal governance problems. Using survey CEO compensation data of 495 observations from 205 publicly traded US firms in the period 1982-1984, Core et al.

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[2] This is because directors typically own only a small fraction of the firm's share and thus the potential direct cost to directors when the firm performs poorly, the reduction in the value of their shareholdings, is small. See Bebchuk and Fried (2005) for more details.

(1999) find that CEOs earn higher levels of compensation when governance structures are less effective. For example, CEO compensation is higher when the CEO is also the board chair, when the board is larger and when outside directors are old or busy (i.e. serve on more than three other boards). They also find that the predicted component of compensation explained by board composition and ownership structure is negatively related to subsequent firm operating and stock performance. Taken together, higher compensation reflects inefficient internal control mechanism which in turn causes poor firm performance.

Ryan and Wiggins (2004) provide empirical evidence that CEO's managerial power over the board distorts optimal compensation contracts. The sample consists of board compensation data for 1995 and 1997 from the ExecuComp database. They find that both board size and CEO tenure[3] are negatively associated with CEO's residual equity-based compensation. The intuition is that entrenched CEOs using managerial power to influence their own compensation to be relatively less sensitive to stock price performance. Large boards, on the other hand, are considered to be subject to coordination problems creating barriers to monitoring on compensation matters.

In addition to influencing their own compensation, entrenched CEOs may also lower the probability of being replaced in various ways. Weisbach (1988) indicates that the decision to replace the CEO is of utmost importance to management of the firm and should be based on information about the CEO's true ability. However, CEO's control over the information in the boardroom and their attempts to hide information limit board's ability to conduct effectively monitoring and make it more costly for the board to fire them. By influencing the board's information, entrenched CEOs can increase the cost of firing and lower the probability of being fired (Inders and Mueller, 2005; Fisman et al., 2005). Alternatively, the CEO can avoid being fired by influencing the director selection process. CEOs, who command much loyalty

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[3] CEO tenure is used as a proxy for entrenchment. Higher tenure implies higher probability of entrenchment. See Ryan and Wiggins (2004) for more details.

or control over their shareholders, would have more insiders (or trusted cronies) on their boards (Weisbach, 1988; Hermalin and Weisbach, 1998) such that they are less likely to be challenged.

Institutional investors are effective monitors of management (Shleifer and Vishny, 1986). They can reduce the degrees of entrenchment by putting pressure on directors to take disciplinary action against a poorly performing manager. Prior empirical researches show that the presence of block-holders or institutional investors is associated with improved sensitivity of top executive turnover to firm performance (Denis et al., 1997); improved corporate monitoring and greater firm performance (McConnell and Servaes, 1990); and higher fraction of votes cast against management-sponsored antitakeover amendments (Brickley et al., 1988).

3. Model specification and methodology

3.1. Determinants of executive compensation

First, firm size is one of the most important determinants of executive compensation (Baker and Hall, 2004; Murphy 1999). A positive relation is expected between compensation level and firm size because larger firms with more complex operations require higher-quality managers whose managerial decision has a higher potential value added in larger firms than in smaller firms (Rosen, 1982; Smith and Watts, 1992). In addition, Gabaix and Landier (2008) show theoretically that as the average firm size increases in the relevant market, competition for scarce managerial talents will also bid up the level of compensation. I measure size as firm's sales adjusted by inflation with a base year of 2005.

I also expect a positive relation between compensation level and firm's growth opportunities. Smith and Watts (1992) argue that the larger the proportion of firm value represented by growth opportunities, the more closely manager's compensation is tied to firm value and the greater the variance of their compensation. To compensate for the additional

risk, higher compensation is demanded. I measure growth opportunity as total assets plus market value of equity minus book value of equity divided by total assets. Likewise, both leverage and stock return volatility increases the riskiness of equity-based compensation and thus are expected to be associated with higher compensation (Fama, 1980; Fernandes et al., 2013).

Linking executive compensation positively to performance is a central prediction of agent theory (Holmstrom, I979; Tirole, 1988; Jensen and Murphy, 1990). I include both market (i.e. stock return) and accounting measures (i.e. return on assets) as indicators of executive's prior performance. Further, the more tangible assets a firm has, the easier it is to monitor and the less severe the agency problems are (Himmelberg, et al., 1999). Hence, I expect a negative relation between firm tangibility, measured as PPE_{t-1}/TA_{t-1}, and total compensation. Firms with higher fractions of tangible assets are easier to monitor (for directors) and need less incentive alignments (for the CEO). The firm characteristics included in the regressions are lagged one year so as to reduce potential endogeneity. The detailed definitions are given in Appendix A. To mitigate the influence of outliers, I winsorize all firm characteristics at the 1% (99%) level.

Moreover, I include both *Insider ownership* and *Total institutional ownership* to account for the impact of ownership structure on executive compensation. First, higher insider ownership, either because of CEO ownership or other block-holders, is associated with lower compensation (Fernandes, et al., 2013). If the CEO ownership is high, they are primarily motivated by their ownership not compensation. Likewise, if there are large block-holders, enhanced monitoring and the less need for incentive compensation pull total compensation down (Fernandes, et al., 2013).

The impact of institutional investors on executive compensation has been well documented in previous studies (Hartzell and Starks 2003; Khan et al., 2005). Effective

monitoring by institutions exerts pressure on executives. To the extent greater pressure reduces utility, executives need to be compensated by higher pay (Hermalin, 2005). I measure institution's influence as total institutional ownership. Institutions herein include hedge funds, insurance companies, pension funds, mutual funds, investment advisors and banks/trusts, etc.

Many previous literatures have shown the important role of board characteristics in determining executive compensation both theoretically and empirically (Singh, 2006; Fernandes et al., 2013; Laux, 2008). I include four measures of board characteristics. First, both large board (Yermark, 1996) and busy board (Fich and Shivdasani, 2006) are associated with lower monitoring efficiency resulting in higher compensation. I measure board busyness as the ratio of the number of current board positions held by all directors on board to board size (*Current board positions*).

Previous studies have a mixed view on the impact of independent directors on executive compensation. On the one hand, the more independent the board the higher the pressure on executives due to reinforced monitoring and the higher the compensation for disutility (Hermalin, 2005). On the other hand, Bebchuck et al. (2002) suggest that managers at firms with more independent boards are less able to extract rent from the firm, leading to a negative relation between board independence and total compensation. To the extant the compensation-for-disutility effect dominates the other, I predict a positive relation between board independence and total compensation and vice versa. I measure board independence as the ratio of the number of independent directors to board size. Finally, CEO Chairman is a dummy equals one if CEO is also the chairman and zero otherwise. Such CEO is expected to have more power in influencing their compensation, leading to higher levels of compensation.

It is also important to control for individual-specific variables when studying executive compensation, otherwise the results would be biased and misleading (Murphy, 1985). For instance, age is a key determinant of executive's human capital risk. Chang et al. (2009)

indicate that younger executives bear more human capital risk than older executives and therefore demand higher premium as the firm becomes distressed. Ryan and Wiggins (2001) argue that both younger and older CEOs are subject to the 'horizon problem'[4] and that the use of equity-based compensation is suggested to mitigate myopic behaviour.

Second, *Tenure* is executives' time in position in years. The relation between tenure and executive compensation is expected to be ambiguous (Ryan and Wiggins, 2001; Ozkan, 2011b) Executives with longer tenures are more likely to be entrenched and have more managerial power to affect their own compensation packages, while they might also have larger ownership alignment from previous equity grants owing to their longer tenure. Third, *External* is a dummy equals one if the executive is hired from outside the firm and zero otherwise. Gilson and Vetsuypens (1993), Murphy (2002) and Murphy and Zabojnik (2006) all show that executives hired from the outside earn significantly more than those promoted internally. Murphy and Zabojnik (2006) interpret the result by arguing that the relative importance of general over firm-specific managerial ability[5] leads to higher compensation for external hires than internal hires.

3.2. Estimation method

Although I control for many firm characteristics, it is inevitable that other unobserved firm characteristics, such as corporate culture, investment strategies and the demand for unique management skills etc., can also exert an impact on compensation. Hence, I adopt

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[4] Ryan and Wiggins (2001) argue that older CEOs have the incentives to choose projects that pay off before retirement and younger CEOs have the incentives to focus on short-term goals to build their reputation. I however do not attempt to test this hypothesis in the paper.

[5] Murphy and Zabojnik (2006) define general managerial ability as managerial skills valuable to all companies, such as financial and accounting expertise as well as management skills. Firm-specific managerial capital in contrast refers to those skills, experience and knowledge valuable only to the specific organization, such as connection with colleagues and clients and familiarity with the culture and regulations of a specific company. It is important to distinguish between internal and external executives because of the remarkably different managerial ability they acquire. While internal executives feature a considerable amount of firm-specific managerial capital at stake, external executives are hired solely for their general (transferable) managerial ability.

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fixed effects regressions to account for firm's latent traits.[6] Robust standard errors clustered at the firm level are used to calculate t-statistics.

Fixed effects method produces parameters on observed firm characteristics that are less likely to be contaminated by omitted-variable bias, to the extent that the omitted variables are time invariant (Graham, et al., 2012). For example, Graham, et al. (2012) show that the effect of firm size on executive compensation level declines significantly after using fixed effects model, suggesting that the size effect is likely overstated if the omitted-variable bias is not properly addressed. In addition, fixed effects method helps to alleviate the endogeneity concern. Ackerberg and Botticini (2002) use the fixed effects approach to address endogenous matching in the labour market. They argue that to the extent unobserved characteristics are constant across contracts, panel techniques can eliminate the endogeneity problem. In the fixed effects model, firm-level unobservables (i.e., firm effects) are permitted to be correlated with the regressors (i.e. the observed characteristics). This allows a limited form of endogeneity (Cameron and Trivedi, 2009).

3.3. Data sources and description

The dataset merges three different sources. Executive compensation data is obtained from BoardEx, a UK-based provider of detailed corporate governance information, in particular, executive compensation. Cash compensation is the sum of salary and cash bonuses, while equity-based compensation includes mainly performance shares, LTIPs and options. Value of LTIPs is set to be the value obtainable on the grant date. Value of stock options is calculated by using the Black-Sholes model during the vesting period and therefore is the estimated value of options awarded instead of their intrinsic value. Total compensation is the sum of cash and equity compensation. I use real compensation in that I adjust the level of

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[6] Hausman test results reject the use of random effects model.

executive compensation by inflation with a base year of 2005. Second, institutional ownership variables are obtained from Thomson One Banker. Firm-specific financial and accounting variables are obtained from DataStream.

One issue with the compensation data arises from the fact that new executives assume office at different times during their first fiscal years. Thus, the reported compensation is expected to be affected by their different terms in position. What's more, the extent of this timing problem varies in different types of new executives. For instance, the reported salary/bonuses for internal-promoted executives are the amounts earned over the entire fiscal year. Although the figures represent not just the part after the change of position, the magnitude of timing issues for internal replacements should be much less than external replacements (Chang et al., 2009). To eliminate the timing problem and ensure the robustness of the test results, I exclude new executives, those with tenure less than one year.

As a result, the final sample consists of 19,291 executive-year observations from 1,294 UK-listed non-financial firms over the period 1998 to 2009. I exclude financial companies for, first, they tend to have special asset composition and are subject to relatively stricter government regulation as compared to non-financial companies, and second, Tobin's Q cannot be compared between companies in financial and non-financial sectors (Ozkan, 2011a).

Table I reports the summary statistics for the level of executive compensation as well as main explanatory variables in the regressions. Compare to the US sample employed by Brick et al. (2006), my sample firms are of similar size (average sales £1,650,191 compared with a $2,883,943 reported by Brick et al.) with similar levels of growth opportunities (average Tobin's q 1.980 compared with a 1.848 reported by Brick et al.) and stock return volatility (0.403 compare with 0.386). However, the reported profitability is lower relative to previous literature due to partially the downward pressure of the latest recession. For instance, the average return on assets is 7.6%, lower than a 14.8% documented by Brick et al. (2006).

Insert Table I about here

For ownership structure and board composition variables, I note first that the sample firms have an average insider ownership of 27.1%, a bit lower than a 32.0% in Fernandes et al. (2013) for a sample of non-US firms. The average institutional ownership in this paper is 50.1%, higher than a 22.8% in Fernandes et al. (2013) for non-US firms but much lower than an 80.1% for US firms. In addition, the boards have on average 8 members compared with 9 reported by Ozkan (2007) for UK firms. The mean fraction of independent directors is 38.2%, compared with a 55.1% reported by Fernandes et al. (2013) for non-US firms.

I also note that 11.3% of the CEOs in this sample are also the chairman in their firms. This is comparable with a 16.0% reported by Fernandes et al. (2013) for the sample of non-US firms but much less than a 53.6% for the sample of US firms. Brick et al. (2006) also report that 73.8% of CEOs in their sample of US firms are also the chairman. These results suggest that UK firms are much less likely to appoint CEOs who also assume the title of chairman compared to US firms.

4. Director and CEO compensation

4.1 Estimating cash and total compensation

$$Ln(Total\ compensation) = f(Firm\ controls, Individual\ controls, Year\ effects)\ (1)$$

$$Ln(Cash\ compensation) = f(Firm\ controls, Individual\ controls, Year\ effects)\ (2)$$

I start with modelling cash and total compensation for both directors and the CEO via equation 1 and 2 above. The regression results are reported in Table II. First, I expect that executive compensation should be positively related to firm size and firm performance. Consistent with this prediction, I find that the coefficients on *LnSale $_{t-1}$* are positive and statistically significant at least at 1% level across all regressions. The coefficients on *Stock return* are in general positive although less significant. Similar results have been reported in

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prior research (Brick et al., 2006; Fernandes et al., 2013; Core et al., 1999). Moreover, I find *PPE $_{t-1}$/TA $_{t-1}$* negatively related to director and CEO compensation. The results are statistically significant at least at 5% level across all regressions. This is consistent with the prediction that firms with more tangible assets are easier to monitor and thus require lower compensation.

Insert Table II about here

In terms of ownership structure, I find that both cash and total compensation is negatively associated with *Insider ownership*, and positively associated with *Total institutional ownership*, consistent with Fernandes et al. (2013). These results are in line with the view that insider holdings substitute for incentive alignments while institutional investors impose intense monitoring on the management.

Generally, the results suggest board composition variables are significant determinants of executive compensation. Consistent with Fernandes et al. (2013) and Core et al. (1999), CEO compensation is higher in firms with larger boards and higher fraction of independent directors. The board is less effective in monitoring compensation decisions when it is oversized. In firms with more independent directors, executives may under greater pressure which leads to higher compensation (Hermalin, 2005). However, Core et al. (1999) argue that higher compensation associated with independent directors put the consensus into question that independent directors are better monitors of management.

Opposite to the prediction, I find some evidence that the CEO who also assumes the position of chairman is associated with lower (cash) compensation in the UK. The coefficients are negative although not consistently significant. Using US data, Core et al. find a significant positive relation between compensation level and CEO Chairman dummy. Fernandes et al. (2013) also document a significant positive relation between compensation level and CEO Chairman dummy for a sample of US firms while a significant negative relation for non-US

firms. The noticeable differences in the impact of CEO duality on compensation level across countries may reflect their different regulatory environment on top of the fact that CEO duality is rarer in some countries (e.g. the UK) than others (e.g. the US). Further, the UK has the highest protection of creditor rights [7] and shareholder rights among the developed economies. Thus, Chairman CEO is less likely to be entrenched in the UK.

4.2. The impact of director compensation on CEO compensation

Next I examine the impact of director compensation on CEO cash and total compensation by estimating Eq. (3) and (4). Excess director compensation (or residual director compensation) is the residual from the director total compensation regression, i.e., model 2 of Table II.

Ln (Total CEO Compensation) =

$\qquad$ *f(Excess director compensation, Firm controls, Individual controls, Year effects)* (3)

Ln (Cash CEO Compensation) =

$\qquad$ *f(Excess director compensation, Firm controls, Individual controls, Year effects)* (4)

The results are presented in Table III. *Excess director total compensation* is defined as the

Insert Table III about here

sum of residual compensations of all board members in the firm. Other control variables include the same firm, CEO and governance characteristic variables as in Table II. The estimated coefficients for *Excess director total compensation* are positive and statistically significant at 1% level indicating a positive relation between CEO compensation and director

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[7] In the seminal paper of La Porta et al. (1998), UK has the highest creditor rights score of 4 and US has the score of 1. Others, for instance, France scores 0 and Germany scores 3.

compensation after controlling for other factors. The coefficients on *Excess director total compensation* are 0.106 in cash compensation regression and 0.309 in total compensation regression. As both compensation variables are in logarithms, these coefficients can be interpreted as elasticity. Thus, the regression results indicate that a 10% increase in director total compensation is associated with an increase of 1.06% in CEO cash compensation and 3.09% in CEO total compensation, which are comparable with an increase of 0.71% and 2.16% correspondingly reported by Brick et al. (2006).

5. Compensation and subsequent firm performance

As demonstrated by the above results, director compensation is positively related to CEO compensation controlling for other factors. While it's tempting at this point to draw the conclusion that the positive relation infers the presence of cronyism, one cannot do so without thinking about alternative explanations. Brick et al. (2006) point out that an alternative explanation for the positive relation is that both CEO and director compensation are positively related to firm complexity and the talent and effort needed to manage such firms. It is well likely that such firm complexity is not fully captured in the model. To rule out this alternative explanation, Brick et al. (2006) examine the relation between excess compensation and firm performance. In the first case, they posit a negative relation and, in the second case, the relation should be weakly positive. The fact that they find a negative relation between excess compensation and firm performance means the positive relation between director and CEO compensation is more likely due to agency problems related to cronyism.

Following Brick et al. (2006)'s approach, I test the cronyism hypothesis by examining the relation between excess compensation and subsequent firm performance. The estimated coefficients from the CEO total compensation regressions with the director compensation variable (i.e. Table III column 3) allows the author to estimate the predicted component of

excess compensation for each CEO that is due to director compensation, denoted as *CEO_DUE_TO_DIR1*. Following the methodological approach of Core et al. (1999) (Journal of Financial Economics, p390-391), I calculate the following for each CEO:

$$CEO\_DUE\_TO\_DIR1 = Z\hat{\delta}$$

where $\hat{\delta}$ is the estimated coefficient on the director compensation variable which, as shown in Table III column 3, equals to 0.309. More details of the calculation are given in Appendix C. It is a part of CEO excess compensation because it measures the predicted component of CEO compensation arising from director compensation in excess of the controls for the standard determinants of compensation. Likewise, *DIR_DUE_TO_CEO1* is calculated in the same way and it is the predicted component of excess compensation for each director that is due to CEO compensation (from an unreported regression).

Insert Table IV about here

The results are shown in Table IV. In panel A, the dependent variables are the average stock returns for the subsequent two, three and four years. Following Core et al. (1999; Table 4, p.395, Journal of Financial Economics), I control for three potential determinants of stock return including: *Stock return volatility* is the standard deviation based on daily stock return over the prior year; *Market to book ratio* is the ratio of market value to book value of the firm's equity at the end of year prior to which compensation is awarded; *Ln(MVE)* is the log of market value of the firm's equity at the end of prior year. Focusing on the main variables, all six coefficients on either *CEO_DUE_TO_DIR1* or *DIR_DUE_TO_CEO1* are negative. Four of them are statistically different from zero at least at the 5% level. Moreover, the results suggest that the negative impact of compensation variables on stock performance seems to be more pronounced over the three and four year period.

In Panel B, I employ accounting return as an alternative measure of firm performance. The dependent variables are the average return on assets for the subsequent two, three and

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four years. Following Core et al. (1999; Table 3, p.394, Journal of Financial Economics), I control for the potential determinants of accounting performance including: *Sales* are for the year prior to which compensation is awarded; *Standard deviation of ROA* is calculated as the standard deviation of annual return on assets for the four years ending with the year prior to which compensation is awarded. Again, the coefficients on the main variables are in general negative and three of them are statistically significant. The results with three and four year average returns are more pronounced.

Overall, consistent with Brick et al. (2006), I also find negative and generally significant coefficients for our excess compensation variables controlling for other factors of firm performance. The results suggest that excess compensation is less likely due to firm complexity or additional effort. Instead, it is consistent with the conjecture that overpayment of CEOs and directors is symptomatic of the agency problems associated with cronyism and the resulting subsequent underperformance.

The findings can be related to previous studies on the relation between firm performance and various internal governance indexes. To the extent excess compensation reflects internal governance issues, weak subsequent performance is expected. Using a governance index based on 24 unique provisions about shareholder rights, Gompers et al. (2003) find that firms with strong shareholder rights (low index value) significantly outperform firms with weak shareholder rights (high index value) during the 1990s. With the same governance index data, Bhaget and Bolton (2008) also find that good governance has a positive impact on contemporaneous and subsequent operating performance. Nevertheless, the results on the relation between governance quality and future stock performance could be subject to endogeneity issues[8]. Moreover, Callahan et al. (2003) construct an index of

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[8] For instance, both governance and firm performance can be related to managerial power and thus might be endogenous. Bhaget and Bolton (2008) find a significantly negative relation between the governance index and next year's Tobin's Q using OLS estimation while a positive insignificant relation after taking into account the potential endogeneity issue.

management participation in director selection and find that such management participation is positively associated with shareholder wealth. The results seem to suggest that management's expertise is valuable to shareholders in selecting board members.

Other studies look at how board composition or/and ownership structure are related to future firm performance. Hermalin and Weisbach (1991) find no relation between board composition and firm performance, which they consider as expected if the board is optimally weighted between insiders and outsiders based on firm characteristics[9]. Core et al. (1999) first examine the relation between board/ownership structure and CEO compensation and find that CEOs earn higher compensation when governance structures are less effective.[10] They then find that the part of compensation explained by board and ownership structure is significantly negatively related to subsequent firm operating and stock return performance. The negative relation suggests that firms with weaker governance structures have greater agency problems resulting in poor subsequent performance.

6. Compensation and CEO turnover

To provide more evidence for the cronyism hypothesis and gain insights into the impact of excess compensation, I ask whether excess compensation makes CEO replacement more unlikely. If incompetent CEO avoids being replaced by offering higher director compensation, firms will continue to perform poorly. Cornelli et al. (2013) empirically evaluate the performance consequences of CEO turnover. Using law changes as an instrument for CEO turnover, they find a significant positive relation between CEO turnover and firm subsequent performance. In contrast, not firing a CEO whom the board views as incompetent hurts

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[9] Hermalin and Weisbach (1991) argue that having inside directors on the board facilitates the succession process and helps CEOs maximize shareholder wealth by providing experienced advice about the daily operations of the firm. Hence, they expect that if the firm optimally chooses between insiders and outsiders based on the firm characteristics, there would be no cross-sectional relation between board composition and firm performance in equilibrium.

[10] For instance, their results indicate that CEO compensation is higher when the CEO chairs the board, the board is larger or lack of independence, and when outside directors are older and serve on more than three other boards.

subsequent performance. Likewise, Weisbach (1988) shows empirically that boards improve firm value by replacing bad CEOs. He finds that CEO resignation preceded by poor performance is associated with an increase in firm value surrounding the event day and such relation is stronger for the companies with more independent directors on the board.

Given that firms with excess compensation display underperformance, it should thus be expected that CEOs of such firms are more likely to be replaced unless the overpayment is at least partly due to agency problems associated with cronyism. Higher compensation of directors strengthens their loyalty to the CEO making CEO's position more secure regardless of their ability. The subordination of competency to loyalty ultimately leads to weak performance (Khatri and Tsang, 2003). Thus, I examine the impact of excess compensation on CEO turnover.

Insert Table V about here

Table V displays the test results. The dependent variable is set to one if the CEO title has changed from one person to another in a given year and zero otherwise.[11] There are 816 CEO turnovers in the sample period. The variables of interest are the two compensation variables, *CEO_DUE_TO_DIR1* and *DIR_DUE_TO_CEO1*. Following Bebchuk et al. (2011; Table 9, p.218, Journal of Financial Economics), I control for potential determinants of CEO turnover including firm and market performance, CEO pay slice (CPS), CEO tenure dummies, age and the CEO Chairman dummy. In particular, CPS is defined as the percentage of the total compensation to the top five executives that goes to the CEO. It is a measure of CEO dominance within the top executive team and has been proved significant in determining firm outcomes including accounting profitability, acquisition decisions, compensation policies and CEO turnover etc. (Bebchuk et al., 2011).

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[11] Herein, I use logit regressions to estimate the likelihood of CEO turnover.

The results are consistent with the conjecture. The coefficients on *DIR_DUE_TO_CEO1* are negative and statistically significant even after controlling for the level of CEO dominance (CPS). The coefficient on *CEO_DUE_TO_DIR1* is not significant at any sensible level. The more director compensation due to CEO compensation the less likely they are to replace the CEO. But how much a CEO gets because of directors seems to be irrelevant.

In addition, the coefficient on CPS is -1.519, higher than a -2.346 reported by Bebchuk et al. (2011). The relation between firm stock return and CEO turnover is negative (albeit not significantly so) as expected. Unlike Bebchuk et al. (2011) (based on US data), the results show an insignificant but positive coefficient on the CEO Chairman dummy. As indicated earlier, this might reflect the differences in the regulatory environment between the UK and the US.

7. Institutional investors, Executive Compensation, CEO turnover and Firm Performance

At this point, we've seen a negative relation between excess compensation and firm performance and a negative relation between director excess compensation and CEO turnover. All the results appear to be consistent with the cronyism hypothesis. But it's not the whole picture yet. Even if cronyism is there to break down the internal monitoring mechanism, the firm may still be able to rely on the external monitoring of institutional investors.

Previous studies stress the role of institutional investors in monitoring the firm and determining firm performance (Shleifer and Vishny, 1986; Denis et al., 1997; McConnell and Servaes, 1990). McConnell and Servaes (1990) document a positive association between institutional ownership and Tobin's q. They interpret this finding as a result of improved corporate monitoring in firms with high levels of institutional ownership. Brickley et al. (1988)

show empirical evidence of institutions being active in monitoring manager's actions. Specifically, they find a positive relation between institutional ownership and the percentage of votes cast against management-sponsored antitakeover amendments. Denis et al. (1997) find that the probability of top executive turnover is positively related to the presence of an outside blockholder (typically institutional investors). In addition, the probability of top executive turnover is more sensitive to stock price performance in firms with outside blockholders.

In this section I further test the cronyism hypothesis by examine how institutional investor's influence, as proxied by total institutional ownership, affects the effects of excess compensation shown in previous tables. If excess compensation is due to agency problems, we would expect institutional ownership to mitigate the corresponding effects of excess compensation.

First, I expect total institutional ownership to weaken the relation between director excess compensation and CEO compensation. Table VI presents the results from estimating regressions that include an interaction term between *Total institutional ownership* and *Excess director total compensation*. The results show that, consistent with the cronyism hypothesis,

Insert Table VI about here

the positive relation between director excess compensation and CEO cash compensation is mitigated by institutional ownership. The coefficient on the interaction term in column 1 is statistically significant and has the opposite sign of the coefficient on *Excess director total compensation*. The coefficient on the interaction term is insignificant in column 2 where the dependent variable is the log of CEO total compensation. Institutional investors appear to reduce only the impact of director compensation on CEO cash compensation, which is not surprising given the performance-based nature of equity compensation. Institutional investors

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would like the CEO to take more equity-based compensation that aligns the interest of the CEO more closely with theirs, especially when cronyism becomes a concern.

Second, I explore whether institutional ownership changes the relation between director excess compensation and CEO turnover. In firms with high institutional ownership, it is more difficult and less likely for the CEO to avoid being replaced by offering directors higher compensation. The pressure exerted by institutional investors reduces director's incentive to pursue private benefits. I thus expect intuitional ownership to weaken the relation between director excess compensation and CEO turnover.

Insert Table VII about here

To test this conjecture, I enhance model 3 Table V by including *Total institutional ownership* and its interaction with *DIR_DUE_TO_CEO1* as additional explanatory variables. The results are shown in Table VII. Consistent with the prediction, the effects of *DIR_DUE_TO_CEO1* on CEO turnover are mitigated by *Total institutional ownership*. The coefficient on the only interaction term is statistically significant and has the opposite sign of the coefficient on *DIR_DUE_TO_CEO1*.

Third, I further explore whether institutional ownership changes the relation between excess compensation and firm performance. As indicated previously, failing to replace incompetent CEOs hurts subsequent firm performance (Cornelli et al., 2013). Given that institutional investors exert effective monitoring, it should be expected the negative relation between excess compensation and firm performance is mitigated in firms with high levels of institutional ownership.

Insert Table VIII about here

To test this, I re-estimate all regressions in Table IV in subsamples of different levels of institutional ownership. Firms are included in the high institutional ownership group if its

total institutional ownership is above the sample median and low institutional ownership group otherwise (shown in the row title). Again, the dependent variables are the average stock returns and average ROA for the subsequent two, three and four years (shown in the column title). The variables of interest are *CEO_DUE_TO_DIR1* for Panel A and *DIR_DUE_TO_CEO1* for Panel B. For simplicity, only the coefficients on the main variables are reported, while other factors including volatility, market to book, firm size and year effects are controlled in each regression. Each coefficient estimate in Table VI represents one regression.

Table VIII presents the test results. Consistent with the prediction, the results suggest that institutional investors weaken the effects of excess compensation on subsequent firm performance. Focusing on column 1 to 3 where the dependent variables are stock returns, all coefficient estimates are negative. The ones estimated using firms in the low institutional ownership group are much greater in magnitude than those in the high institutional ownership group. Often, the coefficients on the low institutional ownership side are more than three times as large as those on the high side. The results in column 4 to 6 are qualitatively similar.

Overall, the fact that external monitoring by institutional investors mitigates the effects of excess compensation on both CEO turnover and subsequent firm performance means that the excess compensation of directors and CEOs is at least partly due to agency problems related to cronyism.

8. Robustness Tests

In this section, I undertake several tests to ensure that the results are robust to alternative measures of excess compensation. The alternative measures include: i) residual compensation of CEOs and directors. They are calculated as the residuals from total compensation regressions for the CEO (i.e., model 4 Table II) and directors (i.e., model 2

Table II); ii) *CEO_DUE_TO_DIR2* and *DIR_DUE_TO_CEO2*. The former is measured as the difference between fitted CEO compensation regressions with (from Table III, column 3) and without (from Table II, column 4) director compensation. The latter is measured as the difference between fitted director compensation with (from an unreported regression) and without (from Table II, column 2) CEO compensation. Readers are referred to Appendix B for more details about the calculation. The results from all of the above tests are both quantitatively and qualitatively similar to the ones reported.

9. Conclusion

This paper presents more evidence that the excess compensation of directors and CEOs are due to agency problems related to cronyism. I start the analysis by finding the same results of Brick et al. (2006) using a sample consists of all non-financial listed UK firms from 1998 to 2009. There is a positive relation between director compensation and CEO compensation controlling for other determinants. This positive relation is found to be negatively associated with firm performance. In addition, I show that the probability of CEO turnover is negatively related to director excess compensation. That is, well-compensated directors are less likely to replace CEOs.

If the above findings are due to agency problems related to cronyism, we should expect effective monitoring by institutional investors to mitigate the effects of excess compensation. Consistent with the conjecture, the results suggest that the positive relation between director excess compensation and CEO cash compensation and the negative relation between director excess compensation and CEO turnover is weakened by total institutional ownership. In addition, in firms with high levels of institutional ownership the negative impact of excess compensation on subsequent firm performance is significantly reduced. Overall, these

findings suggest excess compensation of directors and CEOs is at least partly due to agency problems.

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Table I
Summary Statistics

In this table, I present summary statistics of main input variables in the paper. *Director (CEO) Cash Compensation* is the sum of inflation-adjusted salary and bonus for directors (CEO). *Director (CEO) Total Compensation* is the sum of inflation-adjusted cash and equity compensation for directors (CEO). I report summary statistics for compensation variables both in thousand pounds. *Sale $_{t-1}$* is inflation-adjusted sales at the previous financial year end. I use its logarithmic transformation, *LnSale $_{t-1}$*, in regressions. *Leverage $_{t-1}$* is total debt divided by total assets at the previous financial year end. *Tobin's q $_{t-1}$* is total assets plus market value of equity minus book value of equity divided by total assets, at the previous financial year end. *Stock return* is the holding period stock return over the past year. *Stock-return volatility* is annualized standard deviation of daily stock returns for the past year. *ROA $_{t-1}$* is earnings before interest, taxes, depreciation, and amortization (EBITA) divided by total assets, at the previous financial year end. *PPE $_{t-1}$/TA $_{t-1}$* is the ratio of tangible assets (i.e. plant, property, and equipment) to total assets, at the previous financial year end. *Insider ownership* is the number of closely held shares by insiders as a percentage of the number of shares outstanding, where insiders are defined as shareholders who hold at least 5% of the outstanding shares. *Total institutional ownership* is intitutional ownership by all institutions as a percentage of market capitalization. *Board size* is the number of executive and non-executive directors. *Fraction of independent directors* is the ratio of the number of independent directors to board size. *CEO Chairman* is a dummy that equals one if CEO is also the chairman. *Current board positions* is the ratio of the number of current board positions held by all directors on board to board size. *Age* is age of executives in years. *Tenure* is the number of years in position in the firm. *External* is a dummy equals one if the executive is hired from outside the firm and zero otherwise. The sample consists of 19291 observations (including 5769 CEO-year observations and 13522 director-year observations) from 1294 UK listed nonfinancial companies.

Variables	N	Mean	Median	Standard deviation
A. Executive compensation				
Director Cash Compensation (£000)	13522	275.747	195.676	267.309
Director Total Compensation (£000)	13522	495.359	252.301	980.998
CEO Cash Compensation (£000)	5769	440.835	290.100	465.354
CEO Total Compensation (£000)	5769	876.856	384.648	2216.208
B. Determinants of executive compensation				
Sale $_{t-1}$ (£000)	19291	1650.191	145.179	9004.436
Leverage $_{t-1}$	19291	0.189	0.163	0.174
Tobin's q $_{t-1}$	19291	1.980	1.473	1.607
Stock return	19291	0.141	0.077	0.530
Stock-return volatility	19291	0.403	0.342	0.234
ROA $_{t-1}$	19291	0.076	0.119	0.216
PPE $_{t-1}$/TA $_{t-1}$	19291	0.285	0.211	0.252
Insider ownership	19291	0.271	0.238	0.218
Total institutional ownership	19291	0.501	0.525	0.274
Board size	19291	8.062	8.000	2.816
Fraction of independent directors	19291	0.382	0.400	0.181
Current board positions	19291	1.719	1.625	0.563
CEO Chairman	19291	0.113	0.000	0.314
Age	19291	49.995	50.000	7.588
Tenure	19291	5.692	3.900	5.026
External	19291	0.551	1.000	0.497

Table II
CEO and Director Compensation

This table provides regression results on CEO and director compensation. The dependent variables are the logarithm of cash compensation and the logarithm of total compensation respectively. The independent variables include: *LnSale $_{t-1}$* is the logarithm of inflation-adjusted sales at the previous financial year end. *Leverage $_{t-1}$* is total debt divided by total assets at the previous financial year end. *Tobin's q $_{t-1}$* is total assets plus market value of equity minus book value of equity divided by total assets, at the previous financial year end. *Stock return* is the holding period stock return over the past year. *Stock-return volatility* is annualized standard deviation of daily stock returns for the past year. *ROA $_{t-1}$* is earnings before interest, taxes, depreciation, and amortization (EBITA) divided by total assets, at the previous financial year end. *PPE $_{t-1}$/TA $_{t-1}$* is the ratio of tangible assets (i.e. plant, property, and equipment) to total assets, at the previous financial year end. *Insider ownership* is the number of closely held shares by insiders as a percentage of the number of shares outstanding, where insiders are defined as shareholders who hold at least 5% of the outstanding shares. *Total institutional ownership* is institutional ownership by all institutions as a percentage of market capitalization. *Board size* is the number of executive and non-executive directors. *Fraction of independent directors* is the ratio of the number of independent directors to board size. *CEO chairman* is a dummy that equals one if CEO is also the chairman. *Current board positions* is the ratio of the number of current board positions held by all directors on board to board size. *Age* is age of executives in years. *Tenure* is the number of years in position in the firm. *External* is a dummy equals one if the executive is hired from outside the firm and zero otherwise. The sample consists of 19291 observations (including 5769 CEO-year observations and 13522 director-year observations) from 1294 UK listed nonfinancial companies. t-statistics are based on robust standard error clustered at firm level. '*', '**' and '***' denote significance at 10%, 5% and 1% level respectively. Year dummies results are suppressed.

Variables	Fixed Effect Regressions			
	Director Compensation		CEO Compensation	
	(1)	(2)	(3)	(4)
	LnCash	Lntotal	LnCash	Lntotal
Intercept	11.148***	11.554***	11.563***	11.825***
	(59.62)	(53.54)	(54.45)	(42.96)
LnSale $_{t-1}$	0.034***	0.031***	0.023***	0.028***
	(3.78)	(3.15)	(3.07)	(2.97)
Leverage $_{t-1}$	0.080	0.059	-0.103	-0.024
	(1.27)	(0.69)	(-1.14)	(-0.23)
Tobin's q $_{t-1}$	0.003	0.011	0.003	0.012
	(0.52)	(1.17)	(0.48)	(1.26)
Stock return	0.010	0.028*	0.015	0.016
	(0.93)	(1.66)	(1.21)	(0.81)
Stock return volatility	-0.163***	-0.199***	-0.138***	-0.170***
	(-4.75)	(-4.14)	(-3.72)	(-3.16)
ROA $_{t-1}$	0.010	-0.074	0.062	0.001
	(0.22)	(-1.09)	(1.25)	(0.02)
PPE $_{t-1}$/TA $_{t-1}$	-0.194**	-0.288**	-0.254**	-0.323**
	(-1.99)	(-2.01)	(-2.36)	(-2.19)
Insider ownership	-0.146***	-0.214***	-0.095	-0.151*
	(-2.96)	(-3.07)	(-1.56)	(-1.89)
Total institutional ownership	0.076**	0.115*	0.174***	0.208***
	(2.09)	(1.94)	(4.29)	(3.40)
Board size	-0.001	0.001	0.022***	0.027***
	(-0.12)	(0.19)	(3.29)	(3.05)
Fraction of independent directors	0.193**	0.400***	0.107	0.331***
	(2.51)	(3.88)	(1.44)	(3.27)
Current board positions	0.040*	0.053*	0.026	0.028
	(1.87)	(1.75)	(1.03)	(0.83)
CEO Chairman	-0.038	-0.043	-0.091*	-0.063
	(-1.39)	(-1.19)	(-1.66)	(-1.12)
Age	-0.003**	-0.007***	-0.004	-0.011***
	(-2.09)	(-4.91)	(-1.42)	(-3.58)
Tenure	0.006***	0.004**	0.005*	0.003
	(3.07)	(2.00)	(1.68)	(0.86)
External	-0.021	-0.035**	-0.022	-0.014
	(-1.41)	(-2.02)	(-0.76)	(-0.39)
Year Dummies	+	+	+	+
N	13522	13522	5769	5769
Adjusted R-sq	0.316	0.280	0.447	0.339

Table III
The Impact of Director Compensation on CEO Compensation

In this table I examine the impact of director compensation on CEO compensation. The dependent variables are CEO cash and total compensation respectively. The variables of interest are: *Execess director total compensation* is the sum of residuals from director total compensation in Table II of all board members in the firm. Other control variables include the same firm, CEO and governance characteristic variables as in model (3) and (4) of Table II. The sample consists of 5769 CEO-year observations. t-statistics are based on robust standard error clustered at firm level. '*', '**' and '***' denote significance at 10%, 5% and 1% level respectively. Year dummies results are suppressed.

Variables	Fixed Effect Regressions CEO Compensation	
	(1) LnCash	(3) Lntotal
Intercept	11.521***	11.701***
	(56.93)	(50.88)
Excess director total compensation	0.106***	0.309***
	(9.53)	(23.71)
LnSale $_{t-1}$	0.024***	0.029***
	(3.33)	(3.90)
Leverage $_{t-1}$	-0.096	-0.006
	(-1.10)	(-0.06)
Tobin's q $_{t-1}$	0.004	0.013*
	(0.54)	(1.67)
Stock return	0.018	0.023
	(1.43)	(1.40)
Stock return volatility	-0.140***	-0.177***
	(-3.94)	(-4.07)
ROA $_{t-1}$	0.064	0.007
	(1.32)	(0.13)
PPE $_{t-1}$/TA $_{t-1}$	-0.244**	-0.295**
	(-2.37)	(-2.40)
Insider ownership	-0.101*	-0.169**
	(-1.73)	(-2.49)
Total institutional ownership	0.178***	0.221***
	(4.67)	(4.24)
Board size	0.021***	0.024***
	(3.26)	(3.16)
Fraction of independent directors	0.118*	0.361***
	(1.69)	(4.49)
Current board positions	0.023	0.018
	(0.97)	(0.68)
CEO Chairman	-0.104*	-0.101*
	(-1.92)	(-1.91)
Age	-0.003	-0.007***
	(-0.94)	(-2.59)
Tenure	0.003	-0.001
	(1.22)	(-0.34)
External	-0.024	-0.021
	(-0.88)	(-0.65)
Year Dummies	+	+
N	5769	5769
Adjusted R-sq	0.497	0.563

Table IV
Compensation and Subsequent Firm Performance

This table provides estimated coefficients from regressions on firm performance. In Panel A, the dependent variable is the average stock return for the subsequent two, three and four fiscal years after compensation is awarded. In Panel B, it is the average accounting return (ROA) for the subsequent two, three and four fiscal years. The variables of interest include: *CEO_DUE_TO_DIR1* is the portion of CEO compensation explained by director compensation, while *DIR_DUE_TO_CEO1* is the portion of director compensation explained by CEO compensation. Other control variables include: *Sales* is for the year prior to which compensation is awarded. *Standard deviation of ROA* is calculated as the standard deviation of annual return on assets for the four years ending with the year prior to which compensation is awarded. *Stock return volatility* is the standard deviation based on daily stock return over the prior year. *Market to book ratio* is the ratio of market value to book value of the firm's equity at the end of the year prior to which compensation is awarded. *Ln(MVE)* is the log of market value of the firm's equity at the end of prior year. t-statistics are based on robust standard errors clustered at the firm level. '*', '**' and '***' denote significance at 10%, 5% and 1% level respectively. Year dummies results are suppressed.

Panel A: Stock performance						
	Fixed Effects Regressions					
Variables	Average Stock return for period					
	(1)	(2)	(3)	(4)	(5)	(6)
	Two years	Three years	Four years	Two years	Three years	Four years
Intercept	2.526***	2.158***	1.915***	2.531***	2.170***	1.936***
	(14.12)	(9.50)	(11.13)	(14.11)	(9.53)	(11.29)
CEO_DUE_TO_DIR1	-0.021	-0.075***	-0.081***	—	—	—
	(-0.73)	(-2.63)	(-2.68)			
DIR_DUE_TO_CEO1	—	—	—	-0.006	-0.025**	-0.020**
				(-0.54)	(-2.58)	(-2.09)
Stock return volatility	0.113	0.165	0.200	0.113	0.164	0.199
	(1.20)	(0.99)	(0.84)	(1.20)	(0.98)	(0.83)
Market to book ratio	-0.004	0.000	-0.001	-0.004	0.000	-0.001
	(-0.92)	(0.04)	(-0.39)	(-0.91)	(0.07)	(-0.32)
Ln(MVE)	-0.210***	-0.182***	-0.166***	-0.211***	-0.183***	-0.168***
	(-12.85)	(-8.32)	(-10.44)	(-12.82)	(-8.30)	(-10.40)
Year Dummy	+	+	+	+	+	+
N	5769	5769	5769	5769	5769	5769
Adjusted R-sq	0.221	0.159	0.132	0.221	0.159	0.131
Panel B: Operating performance						
	Fixed Effects Regressions					
Variables	Average ROA for period					
	(1)	(2)	(3)	(4)	(5)	(6)
	Two years	Three years	Four years	Two years	Three years	Four years
Intercept	0.078***	0.069***	0.061***	0.078***	0.069***	0.061***
	(5.05)	(5.84)	(4.75)	(5.05)	(5.94)	(4.84)
CEO_DUE_TO_DIR1	-0.003	-0.012*	-0.015**	—	—	—
	(-0.49)	(-1.65)	(-2.44)			
DIR_DUE_TO_CEO1	—	—	—	0.001	-0.001	-0.004**
				(0.33)	(-0.69)	(-2.25)
Sales	-0.000*	-0.000*	-0.000	-0.000*	-0.000*	-0.000
	(-1.84)	(-1.89)	(-1.51)	(-1.81)	(-1.80)	(-1.30)
Standard deviation of ROA	0.095	0.102*	0.130**	0.094	0.102*	0.130**
	(1.35)	(1.74)	(2.07)	(1.35)	(1.74)	(2.07)
Year Dummy	+	+	+	+	+	+
N	4706	4289	3567	4706	4289	3567
Adjusted R-sq	0.038	0.059	0.036	0.038	0.059	0.036

Table V
Compensation and CEO Turnover

Table V displays the results of logit regressions on CEO turnover. The sample consists of 5769 observations with available data on CEO turnover in year t and independent variables in the year prior to the turnover. The dependent variable is a dummy equal to one if the CEO for firm *i* in year *t-1* is not the same as in year *t* (there are 816 turnovers in the sample period). The variables of interest include: *CEO_DUE_TO_DIR1* is the portion of CEO compensation explained by director compensation, while *DIR_DUE_TO_CEO1* is the portion of director compensation explained by CEO compensation. Other control variables include: *CEO Pay Slice (CPS)* is the fraction of the aggregate compensation of the firm's top five executive team captured by the CEO. *Stock return* is the return over the year prior to the CEO turnover. Tenure dummy equals to one if CEO's tenure falls into the corresponding range. For example, *CEO Tenure=2* equals to one if CEO's tenure is between two and three. *CEO Tenure=1* is the hold-out group. *CEO Age>60 Dummy* is a dummy equals to one if the CEO's age is above 60. *CEO Chairman* is a dummy equals to one if the CEO is also the chairman and zero otherwise. t-statistics are based on robust standard errors clustered at the firm level. '*', '**' and '***' denote significance at 10%, 5% and 1% level respectively. Year and industry-level dummies results are suppressed. Industry dummy variables are based on 12 Fama-French industries.

	CEO turnover dummy		
	(1)	(2)	(3)
Intercept	-3.662***	-3.679***	-3.037***
	(-18.59)	(-18.69)	(-12.02)
CEO_DUE_TO_DIR1 $_{t-1}$	-0.095	—	—
	(-0.61)		
DIR_DUE_TO_CEO1 $_{t-1}$	—	-0.244***	-0.160**
		(-3.30)	(-2.22)
CPS $_{t-1}$	—	—	-1.519***
			(-4.66)
Stock Return $_{t-1}$	-0.135	-0.118	-0.124
	(-1.62)	(-1.46)	(-1.56)
CEO Tenure=2 $_{t-1}$	0.092	0.089	0.093
	(0.71)	(0.68)	(0.71)
CEO Tenure=3 $_{t-1}$	-0.182	-0.179	-0.181
	(-1.16)	(-1.14)	(-1.15)
CEO Tenure=4 $_{t-1}$	-0.062	-0.044	-0.039
	(-0.39)	(-0.28)	(-0.25)
CEO Tenure=5 $_{t-1}$	0.118	0.119	0.119
	(0.71)	(0.71)	(0.71)
CEO Tenure=6 $_{t-1}$	0.083	0.083	0.077
	(0.47)	(0.47)	(0.43)
CEO Tenure>6 $_{t-1}$	0.037	0.036	0.030
	(0.29)	(0.28)	(0.24)
CEO Age>60 Dummy $_{t-1}$	0.473***	0.475***	0.435***
	(3.70)	(3.72)	(3.34)
CEO Chairman $_{t-1}$	0.237*	0.242*	0.217*
	(1.84)	(1.87)	(1.67)
Industry dummy	+	+	+
Year dummy	+	+	+
N	5769	5769	5769
pseudo R-sq	0.071	0.074	0.079

Table VI
Institutional Investors and the Impact of Director Compensation on CEO Compensation

In this table I examine how institutional investors change the impact of director compensation on CEO compensation. The dependent variables are CEO cash and total compensation respectively. The variables of interest are: *Excess director total compensation* is the sum of residuals from director total compensation in Table II of all board members in the firm, and its interaction term with *Total institutional ownership*. Other control variables include the same firm, CEO and governance characteristic variables as in model (3) and (4) of Table II. The sample consists of 5769 CEO-year observations. t-statistics are based on robust standard error clustered at firm level. '*', '**' and '***' denote significance at 10%, 5% and 1% level respectively. Year dummies results are suppressed.

Variables	Fixed Effect Regressions CEO Compensation	
	(1) LnCash	(3) Lntotal
Intercept	11.518***	11.701***
	(56.63)	(50.98)
Excess director total compensation	0.158***	0.305***
	(7.13)	(10.09)
Excess director total compensation*Total institutional ownership	-0.093**	0.008
	(-2.41)	(0.15)
LnSale $_{t-1}$	0.025***	0.029***
	(3.49)	(3.87)
Leverage $_{t-1}$	-0.096	-0.006
	(-1.11)	(-0.06)
Tobin's q $_{t-1}$	0.004	0.013*
	(0.57)	(1.66)
Stock return	0.018	0.023
	(1.46)	(1.40)
Stock return volatility	-0.143***	-0.176***
	(-4.05)	(-4.06)
ROA $_{t-1}$	0.062	0.007
	(1.29)	(0.14)
PPE $_{t-1}$/TA $_{t-1}$	-0.252**	-0.295**
	(-2.47)	(-2.40)
Insider ownership	-0.106*	-0.169**
	(-1.80)	(-2.49)
Total institutional ownership	0.172***	0.222***
	(4.43)	(4.21)
Board size	0.020***	0.024***
	(3.17)	(3.15)
Fraction of independent directors	0.111	0.362***
	(1.58)	(4.47)
Current board positions	0.024	0.018
	(1.03)	(0.68)
CEO Chairman	-0.105*	-0.101*
	(-1.94)	(-1.90)
Age	-0.003	-0.007***
	(-0.95)	(-2.59)
Tenure	0.003	-0.001
	(1.21)	(-0.34)
External	-0.024	-0.021
	(-0.88)	(-0.65)
Year Dummies	+	+
N	5769	5769
Adjusted R-sq	0.499	0.563

Table VII
Institutional Investors, Compensation and CEO Turnover

Table V displays the results of logit regressions on CEO turnover. The sample consists of 5769 observations with available data on CEO turnover in year t and independent variables in the year prior to the turnover. The dependent variable is a dummy equal to one if the CEO for firm *i* in year *t-1* is not the same as in year *t* (there are 816 turnovers in the sample period). The variables of interest include: *DIR_DUE_TO_CEO1* is the portion of director compensation explained by CEO compensation. Other control variables include: *Total institutional ownership* is institutional ownership by all institutions as a percentage of market capitalization. *CEO Pay Slice (CPS)* is the fraction of the aggregate compensation of the firm's top five executive team captured by the CEO. *Stock return* is the return over the year prior to the CEO turnover. Tenure dummy equals to one if CEO's tenure falls into the corresponding range. For example, *CEO Tenure=2* equals to one if CEO's tenure is between two and three. *CEO Tenure=1* is the hold-out group. *CEO Age>60 Dummy* is a dummy equals to one if the CEO's age is above 60. *CEO Chairman* is a dummy equals to one if the CEO is also the chairman and zero otherwise. t-statistics are based on robust standard errors clustered at the firm level. '*', '**' and '***' denote significance at 10%, 5% and 1% level respectively. Year and industry-level dummies results are suppressed. Industry dummy variables are based on 12 Fama-French industries.

	CEO turnover dummy
Intercept	-3.053***
	(-11.47)
DIR_DUE_TO_CEO1 $_{t-1}$	-0.395***
	(-2.65)
DIR_DUE_TO_CEO1 $_{t-1}$× Total institutional ownership	0.492*
	(1.90)
Total institutional ownership	-0.024
	(-0.16)
CPS $_{t-1}$	-1.501***
	(-4.61)
Stock Return $_{t-1}$	-0.128
	(-1.63)
CEO Tenure=2 $_{t-1}$	0.088
	(0.68)
CEO Tenure=3 $_{t-1}$	-0.179
	(-1.14)
CEO Tenure=4 $_{t-1}$	-0.035
	(-0.22)
CEO Tenure=5 $_{t-1}$	0.127
	(0.76)
CEO Tenure=6 $_{t-1}$	0.083
	(0.47)
CEO Tenure>6 $_{t-1}$	0.025
	(0.20)
CEO Age>60 Dummy $_{t-1}$	0.437***
	(3.35)
CEO Chairman $_{t-1}$	0.213
	(1.61)
Industry dummy	+
Year dummy	+
N	5769
pseudo R-sq	0.080

Table VIII
Institutional Investors, Compensation and Subsequent Firm Performance

In this table we re-estimate models in Table IV in subsamples of different levels of institutional ownership. I classify a firm into the high (low) institutional ownership group if the *Total institutional ownership* is above (below) the sample median. The dependent variable is the average stock return for the subsequent two, three and four fiscal years after compensation is awarded (in column 1 to 3) and average accounting return (ROA) for the subsequent two, three and four fiscal years (in column 4 to 6). The variable of interest is *CEO_DUE_TO_DIR1* for Panel A and *DIR_DUE_TO_CEO1* for Panel B. For simplicity, only the coefficient estimates on the variable of interest are presented. *CEO_DUE_TO_DIR1* is the portion of CEO compensation explained by director compensation, while *DIR_DUE_TO_CEO1* is the portion of director compensation explained by CEO compensation. In each regression in column 1 to 3 I also control for: *Stock return volatility* is the standard deviation based on daily stock return over the prior year. *Market to book ratio* is the ratio of market value to book value of the firm's equity at the end of the year prior to which compensation is awarded. *Ln(MVE)* is the log of market value of the firm's equity at the end of prior year. For column 4 to 6 I control for: *Sales* is for the year prior to which compensation is awarded. *Standard deviation of ROA* is calculated as the standard deviation of annual return on assets for the four years ending with the year prior to which compensation is awarded. Year dummies are included. t-statistics are based on robust standard errors clustered at the firm level. '*', '**' and '***' denote significance at 10%, 5% and 1% level respectively.

	Fixed Effects Regressions					
	Average Stock return for period			Average ROA for period		
	(1)	(2)	(3)	(4)	(5)	(6)
	Two years	Three years	Four years	Two years	Three years	Four years
Panel A. Coefficients on *CEO_DUE_TO_DIR1*						
High Institutional ownership	-0.021	-0.046*	-0.042*	-0.003	-0.005	-0.006
	(-0.71)	(-1.90)	(-1.94)	(-0.47)	(-0.87)	(-1.36)
	2884	2884	2884	2478	2293	1936
Low Institutional ownership	-0.071	-0.135*	-0.169*	0.004	-0.021	-0.029*
	(-1.11)	(-1.77)	(-1.87)	(0.20)	(-1.11)	(-1.73)
	2885	2885	2885	2228	1996	1631
Panel B. Coefficients on *DIR_DUE_TO_CEO1*						
High Institutional ownership	-0.001	-0.014	-0.009	0.002	-0.000	-0.002
	(-0.10)	(-1.51)	(-1.01)	(0.71)	(-0.06)	(-1.12)
	2884	2884	2884	2478	2293	1936
Low Institutional ownership	-0.026	-0.042*	-0.036	0.001	0.000	-0.005
	(-1.42)	(-1.83)	(-1.49)	(0.25)	(0.01)	(-1.48)
	2885	2885	2885	2228	1996	1631

Appendix A
Compensation Variables and the Determinants of Compensation

Variable	Definition
A. Compensation Variables	
Cash compensation	Inflation-adjusted salary plus bonus with base year of 2005.
Equity compensation	Inflation-adjusted stock and options awards in pounds with base year of 2005. It is calculated as market value of shares plus long-term incentive plans plus Black-Scholes option value.
Total compensation	The sum of cash and equity compensation, adjusted by inflation with base year of 2005.
Excess director total compensation	The sum of residual compensations of all board members in the firm, where residual compensation is the residual from the director total compensation regression.
B. Firm Characteristics	
LnSale $_{t-1}$	The logarithm of inflation-adjusted sales at the previous financial year end. The base year for inflation is 2005.
Leverage $_{t-1}$	Total debt divided by total assets at the previous financial year end.
Tobin's q $_{t-1}$	Total assets plus market value of equity minus book value of equity divided by total assets, at the previous financial year end.
Stock return	Holding period stock return over the past year.
Stock-return volatility	Annualized standard deviation of daily stock returns for the past year.
ROA $_{t-1}$	Earnings before interest, taxes, depreciation, and amortization (EBITA) divided by total assets, at the previous financial year end.
PPE $_{t-1}$/TA $_{t-1}$	The ratio of tangible assets (i.e. plant, property, and equipment) to total assets, at the previous financial year end.
C. Ownership Structure	
Insider ownership	Number of closely held shares by insiders as a percentage of the number of shares outstanding, where insiders are defined as shareholders who hold at least 5% of the outstanding shares such as officers and directors and immediate families, other corporations, or individuals.
Total institutional ownership	Institutional ownership by all institutions as a percentage of market capitalization.
D. Board Characteristics	
Board size	Number of executive and non-executive directors.
Fraction of independent directors	Ratio of the number of independent directors to board size.
CEO Chairman	Dummy that equals one if CEO is also the chairman.
Current board positions	The ratio of the number of current board positions held by all directors on board to board size.
E. Executive Characteristics	
Age	Age of executives in years.
Tenure	Number of years in position in the firm.
External	Dummy equals one if the executive is hired from outside the firm and zero otherwise.
CEO_DUE_TO_DIR	The portion of CEO compensation explained by director compensation.
DIR_DUE_TO_CEO	The portion of director compensation explained by CEO compensation.

Appendix B: The Measures of CEO Excess Compensation due to Directors

$Fitted\ CEO\ Compensation = X\hat{\beta}_1$

$Fitted\ CEO\ Compensation\ with\ Dir\ Compensation = X\hat{\beta}_2 + Z\hat{\delta}$

$CEO\_DUE\_TO\_DIR1 = Z\hat{\delta}$

$CEO\_DUE\_TO\_DIR2 = Fitted\ CEO\ Compensation\ with\ Dir\ Compensation -$
$$Fitted\ CEO\ Compensation$$

X is the matrix of data used in the first CEO total compensation regression. $\hat{\beta}_1$ is the estimated coefficients of model 4 of Table II, which does not include director compensation as one of the explanatory variables. $\hat{\beta}_2$ is the estimated coefficients of model 3 of Table III, which include director compensation. Z is the matrix of director compensation and $\hat{\delta}$ denote its estimated coefficients.

CEO_DUE_TO_DIR2 is the portion of CEO compensation explained by director compensation. It is calculated as the difference between fitted CEO compensation regressions with (from Table III, column 3) and without (from Table II, column 4) director compensation. Likewise, *DIR_DUE_TO_CEO2* is the portion of director compensation explained by CEO compensation. It is calculated as the difference between fitted director compensation with (from an unreported regression) and without (from Table II, column 2) CEO compensation. *CEO_DUE_TO_DIR1* is rather straightforward given the estimated coefficient on the director compensation variable $\hat{\delta}$.