

Competition for Managers, Corporate Governance and Incentive Compensation

Viral Acharya (NYU, CEPR, NBER)

Marc Gabarro (Erasmus University)

Paolo Volpin (LBS, CEPR)

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Abstract

Stronger corporate governance incentivizes managers to perform better and thus saves on the cost of providing pay for performance. However, when managerial talent is scarce, firms' competition to attract better managers reduces an individual firm's incentives to invest in corporate governance. In equilibrium, better managers end up at firms with weaker governance, and conversely, better-governed firms have lower-quality managers. Consistent with these implications, in a sample of US firms, we show that (i) better CEOs are matched to firms with weaker corporate governance and more so in industries with stronger competition for managers, and, (ii) corporate governance is more likely to change when there is CEO turnover, with governance weakening when the incoming CEO is better than the departing one.

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Authors' e-mail addresses: vacharya@stern.nyu.edu; gabarro@ese.eur.nl; pvolpin@london.edu.

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1 Introduction

The public outcry against the pay of investment bankers following the crisis of 2007-08 is just the latest manifestation of the ongoing debate on executive pay that has kept academics busy for the last twenty years. Executives receive large pay for performance when their firm does well and they are also paid well when their firm does poorly (for instance, in the form of severance payments and golden parachutes). Why are executives (and other professionals) paid so much and, apparently, independently of performance?

The literature has evolved into two conflicting camps. The first one, starting with Jensen and Murphy (1990), argues that entrenchment, or poor corporate governance, allows managers to skim profits away from the firm in the form of high pay (see also Bertrand and Mullainathan, 2001, Bebchuk and Fried, 2004, among others). The second camp suggests an efficient explanation: better managers can generate greater value at larger firms and competition for scarce managerial talent forces large firms to pay managers a lot (see Rosen, 1981, and Gabaix and Landier, 2008). In this paper, we show that these views are not in conflict and there is in fact a natural link between them.

We develop a model of the managerial labor market in which poor corporate governance and entrenchment arise *because* of competition in the market for managerial talent. Some firms on purpose choose lower governance and higher pay to attract and retain better managers. The key insight is that corporate governance affects the matching between managers and firms. Better governance may incentivize managers

to perform better for a lower pay. However, it also reduces firms' ability to attract the best managers.

In our model, firms can incentivize managers to choose the right action via (i) *pay for performance*, that is, by rewarding them when things go well, and (ii) *corporate governance*, that is, by punishing them when things go badly. When firms do not have to compete with each other to attract top quality managers, they choose an efficient combination of pay for performance and corporate governance that just meets the manager's incentive compatibility condition.

However, when managerial talent is scarce and firms have to compete to attract the few top quality managers, firms depart from the optimal level of corporate governance. This result follows from the inability of a firm to affect the rents of the top quality managers as these managers can always find another firm to employ them. In other words, the individual rationality constraint is binding and thus the overall compensation of top-quality managers is exogenous for a given firm. Therefore, it becomes inefficient for a firm that wants to employ a top quality manager to set high levels of corporate governance as it would in any case have to match the manager's individual rationality constraint by setting a high pay for performance. Thus, shareholders would end up bearing the full costs of better corporate governance in the form of set up costs for a monitoring and screening technology, while they would share with other firms the benefits of corporate governance (in the form of lower incentive pay).

With ex-ante identical firms and observable managerial talent, in equilibrium

firms are indifferent between hiring a better- and a worse-quality manager. Then, the better-quality managers extract all the rents, which are exactly equal to the difference in profitability between better and worse managers. The firms that hire worse-quality managers feature the optimal combination of corporate governance and managerial pay. Those that hire better-quality managers rationally choose to under-invest in corporate governance and pay managers more. These associations are ex-ante rational as firms offered these compensation and governance packages to attract scarce managerial talent.

If we could measure managerial talent, our main empirical prediction would be that better quality managers are matched to firms that have weaker governance and receive higher pay. Moreover, since governance is part of optimal compensation package, changes in corporate governance should primarily arise when a new CEO is hired and should depend on the quality of the new CEO: governance standards should improve when the new CEO is of worse quality than the old one and should worsen when on the contrary the new CEO is of better quality than the old one.

We test these predictions using a dataset that combines balance-sheet data from Compustat on unregulated firms in the United States over the period 1993 to 2007, data from ExecuComp on the compensation they award their CEOs and on their turnover, and firm-level corporate governance data from Riskmetrics. We focus on the *G-Index* developed by Gompers et al. (2003) and its individual components as our measures of outside corporate governance and find evidence in favor of our predictions.

We propose two measures of CEO quality. The first is the pay of the future CEO in the firm where he or she worked before becoming CEO, relative to the CEO pay in that firm. The argument is that a higher paid executive is likely to be a more talented manager. The second is the age of the new CEO. The argument is that executives that become CEOs at a *younger* age are likely to be stars.

Armed with these proxies for talent, we show that the changes in governance primarily happen around CEO turnovers. Specifically, the frequency of changes in corporate governance raises by 10 percent in case of an external appointment. This result is robust to controlling for past performance of the firm and concerns of endogeneity of the decision to choose an external replacement for the CEO.

Further, as predicted by the model, the quality of corporate governance is more likely to decrease when the quality of the new CEO is higher. This effect is larger in the case of external successions. When we examine which components of the G-Index are more correlated with changes in CEO talent we find that the most important provisions are the ones restricting shareholder voting rights.

As a validation for our proxies for talent, we also find that better quality CEO tend to come from firms that performed better in the past, and tend to be paid more.

The evidence from these tests provides support for our theoretical starting point that competition amongst firms for scarce managerial talent is an important determinant of observed executive compensation *and* governance practices. Indeed, firms seem to use corporate governance as a compensation component to attract better managers.

The rest of the paper is structured as follows. Section 2 discusses related literature. Section 3 presents the model. Section 4 presents the empirical evidence for our testable hypotheses. Section 5 concludes.

2 Related Literature

This paper is related to a large literature on executive compensation and corporate governance.

The neoclassical view is that executive compensation is the solution of the principal-agent problem between a set of risk-neutral investors and a risk-averse manager (Holmström, 1979). In this setting, pay for performance solves the trade-off between the need to incentivize the manager and the desire to insure him against idiosyncratic risk. According to this view, a firm chooses low- or high-powered compensation packages depending on the relative importance of managerial risk-aversion and incentives. Starting with Jensen and Murphy (1990), skepticism grew among academics on whether this view provides a satisfactory explanation for the recent trends in executive compensation. Two alternative economic views have been suggested to explain executive compensation trends: one, managerial rent extraction, and second, efficient matching between managerial skills and firm characteristics.

The first explanation links executive compensation to managers' ability to extract rents (see Bertrand and Mullainathan, 2001, Bebchuk and Fried, 2004, Kuhnen and Zwiebel, 2009). According to this view, weaker corporate governance allows managers to skim profits from the firm, thereby leading to higher executive compensation.

Even though this is currently the most popular explanation for the high executive pay, it begs several questions: If better corporate governance is the solution to excessive executive compensation, why don't all shareholders demand better corporate governance? Moreover, why are CEOs of well-governed firms also paid a lot? In our model, we treat corporate governance as a choice of the firm. We show that better corporate governance could indeed reduce managerial pay. However, when there is an active market for scarce managerial talent, firms are forced to choose weaker corporate governance and to leave rents for managers. In this respect, our contribution is to clarify the link between corporate governance, pay for performance and scarcity of managerial talent.

The second explanation relates the level of executive pay to exogenous heterogeneity in firm size. Gabaix and Landier (2008), Terviö (2008), and Edmans, Gabaix and Landier (2009) present matching models à la Rosen (1981) in which the differences in size across firms predict some of the well-documented empirical facts on executive compensation. Gabaix and Landier (2008) and Terviö (2008) show that the empirically documented positive cross-sectional correlation between firm size and compensation may optimally arise in a setup where managerial talent has a multiplicative effect on firm performance and managers are compensated according to their increase in productivity as better managers will be matched to larger firms. Similarly, Edmans, Gabaix and Landier (2009) present a model in which both low ownership concentration and its negative correlation with firm size arise as part of an optimal contract.¹ In a similar setup, Edmans and Gabaix (2011) show that inefficient in-

¹Within this framework, the recent rise in compensation can be related to changes in the types

centive contracts and CEO allocation across firms arise when firms differ in terms of risks or disutilities for managers.

Our model departs from this part of the literature because managers in our model can be incentivized by shareholders through a combination of incentive contracts and corporate governance, where governance acts as a substitute for compensation, as shown by Core et al. (1999) and Fahlenbrach (2009). Fahlenbrach (2009), in particular, finds that there is more pay for performance in firms with weaker corporate governance, as measured by less board independence, more CEO-Chairman duality, longer CEO tenure, and less ownership by institutions. Similarly, Chung (2008) studies the adoption of the Sarbanes-Oxley Act of 2002 and shows that firms required to have more than 50% of outside directors (interpreted as an improvement in shareholder governance) decreased significantly their CEO pay-performance sensitivity relative to the control group.

Finally, this paper is also related to a growing literature on spillover and externality effects in corporate governance initiated by Hermalin and Weisbach (2006), who provide a framework for assessing corporate governance reforms from a contracting standpoint and justify the need for regulation in the presence of negative externalities arising from governance failures. Acharya and Volpin (2010) and Dicks (2010) formalize this argument in a model where the choice of corporate governance

of managerial skills required by firms. Murphy and Zábajník (2007) argue that CEO pay has risen because of the increasing importance of general managerial skills relative to firm-specific abilities. Supportive evidence is provided by Frydman and Saks (2010). Cremers and Grinstein (2010) study CEOs movements for the period between 1993 and 2005 and find that the characteristics of the market for CEOs differs across industries. Specifically, the proportion of CEOs coming from firms in other sectors significantly varies across industries, indicating that there is not a unique pool of managers that all firms compete for, but instead many pools specific to individual industries.

in one firm is a strategic substitute for corporate governance in another firm. As in this paper, the externality therein is due to competition for managerial talent among firms. In a somewhat different context, Nielsen (2006) and Cheng (2011) model the negative externalities caused by earnings manipulation across firms. Nielsen (2006) considers a setting where governance improves publicly disclosed information about a firm and facilitate managerial assessment in competing firms. Cheng (2011) shows that earnings management in one firm may induce earnings management in other firms in the presence of relative performance compensation.

The paper is in the tradition of Milbourn (2003), Murphy and Zaboknik (2007) and Falato, Milbourn, and Li (2012), using an empirical proxy for CEO talent based on observable characteristics. These papers show that boards reward several reputational, career, and educational credentials of the CEOs (which can be viewed as measure for talent) when setting CEO compensation. We add to this literature by showing that indicators of talent are correlated with corporate governance.

3 Theoretical Analysis

To motivate our empirical analysis we develop a simple model built on Acharya and Volpin (2010). The basic idea of our model is that firms compete for managers by choosing governance as part of an optimal incentive contract. We show in this section that in the presence of competition for scarce managerial talent, in equilibrium, ex-ante identical firms are indifferent between hiring a better manager and choosing weaker governance regime, and hiring a worse manager and setting a stronger governance regime.

3.1 Setup of the Model

Consider an economy with n firms and m managers. There are two types of managers, m_H are high-quality, well-established managers with a strong track-record (H -type), and m_L are low-quality, or less-experienced, managers (L -type). Types are observable. We assume that the number of L -type managers is greater than the number of firms, $m_L > n$, while the H -type managers are not numerous enough to be hired by all firms, $m_H < n$. Firms can hire at most one manager. Managers and shareholders are risk neutral. All firms are ex-ante identical.

The assumption that good managers are in short supply is the critical ingredients of our model. Without this assumption, there is no effective competition in the CEO market; and therefore there is no interesting interaction between the choice of corporate governance and the competition for managers across firms.

The timeline is as described in Figure 1: At $t = 1$, each firm hires a CEO from a pool of candidates of observable quality $q \in \{L, H\}$. Given that abilities are observable, each firm sets a compensation contract which is a function of the manager's quality q . Managers apply for one of the jobs. If a manager is not employed at the end of this stage, he receives a reservation utility equal to 0. Similarly, a firm that does not employ any managers receives an output equal to 0. Compensation contracts are represented by a performance-related bonus $w \geq 0$, which is contingent on the verifiable output X produced at $t = 4$.² Moreover, as part of the incentive

²This assumption is without loss of generality because allowing for a further payment that is independent of performance would be inefficient: it would simply increase the amount of compensation needed in the case of good performance.

package, at $t = 1$ the firm also chooses the level of corporate governance $g \in [0, 1]$ at a linear cost cg . This cost may for instance reflect the cost of setting up an auditing and information technology for shareholders to monitor the CEO. As we explain below, the benefit of corporate governance is that it increases the probability of learning the productivity of current managers to replace them effectively.

At $t = 2$, managers choose action $Z \in \{M, S\}$, where action S generates at $t = 4$ output $X = Y_q$ with probability p and $X = 0$ otherwise, and no private benefit for the manager ($b = 0$); while action M generates a private benefit $b = B$ for the manager and no output ($X = 0$) for the firm. We assume $Y \equiv Y_H > Y_L \equiv y$ (i.e. the productivity of better quality managers is higher). The choice of action is not observable by shareholders and the manager must stay employed until $t = 4$ for the firm to produce output X and private benefits b .³

At $t = 3$, with probability g shareholders observe a signal $\tilde{x} \in \{Y_q, 0\}$ on the expected output X . After observing this signal, shareholders can fire the existing CEO and hire a new one. The replacement CEO produces a return R .

At $t = 4$, output X is realized and distributed, the performance-related bonus w is paid, and, if still in control, the initial manager receives the private benefit b .

We make the following technical assumptions, which simplify our analysis but are not critical for our results:

- (1) $c \in ((1 - p)R, (1 - p)R + B)$: this assumption ensures that the choice of

³This requirement ensures that firms do not behave strategically and fire a manager that will produce higher output purely to save on pay for performance.

corporate governance is not trivial. If $c < (1 - p)R$, the optimal choice is always to invest in corporate governance; if instead $c > (1 - p)R + B$, it is optimal never to invest in corporate governance.

(2) $py > \max\{B, R\}$: the first inequality ($py > B$) ensures that incentivizing the L -type manager to put effort is efficient (and thus as a consequence incentivizing the H -type is efficient); the second inequality makes sure that shareholders have no incentives to fire the L -type manager (and thus also the H -type one) when they have no information of his performance.

(3) The signal \tilde{x} is perfectly informative. This assumption can be relaxed without substantially changing the model.

(4) When indifferent, firms prefer to hire a H -type manager rather than a L -type one: this tie-breaking assumption simplifies the analysis.

3.2 Competition for Managers

To derive the equilibrium, we proceed by backwards induction, starting from the turnover decision at $t = 3$.

3.2.1 Turnover

If $\tilde{x} = Y_q$, there is no turnover as no replacement CEO can produce an output greater than Y_q . Similarly, if there is no informative signal, there is no turnover as no replacement CEO can produce an output greater than py . If instead $\tilde{x} = 0$, then there is a turnover as the new CEO can always increase productivity.

3.2.2 Moral Hazard Problem

Now consider the incentive compatibility and participation constraint at $t = 2$ of a manager of type q . Starting with the incentive compatibility condition, if the manager chooses the private-benefit action $Z = M$, output always equals 0 and manager's utility equals:

$$U(M) = (1 - g) B \quad (1)$$

The CEO will receive the private benefit B from choosing action M only if he is not replaced at $t = 3$, which happens with probability $1 - g$. If he chooses the firm-value maximizing action $Z = S$, then his utility equals

$$U(S) = pw \quad (2)$$

He is a compensation w only when output $X > 0$.

Hence, we can derive the incentive compatibility (IC) condition $U(S) \geq U(M)$ as

$$w \geq (1 - g) \frac{B}{p}. \quad (3)$$

Conveniently, under our assumptions, the IC constraint is identical for the two types.

Provided that the IC constraint is satisfied, the corresponding individual rationality (IR) constraint becomes

$$w \geq \frac{\bar{u}_q}{p} \quad (4)$$

where \bar{u}_q is type q 's reservation utility and will be endogenously determined so as to clear the market for managers.

These constraints highlight the role of corporate governance from the manager

perspective. Increasing corporate governance implies that the incentive compatibility condition is achievable with lower compensation.

3.2.3 Incentive Contract

Proceeding backwards to $t = 1$, shareholders' expected profits equal $Y_q - w$ if the project is successful (which happens with probability p) and gR , if the project fails (which happens with probability $1 - p$). Shareholders' problem is then:

$$\max_{(w,g)} p(Y_q - w) + (1 - p)gR - cg \quad (5)$$

subject to the IC and IR conditions (3) and (4), respectively. Analyzing the optimal incentive contracts conditional on the manager's type, we derive the following result:

Lemma 1: *The optimal contract for a manager of type q depends on \bar{u}_q :*

(i) *if $\bar{u}_q < B$, the optimal incentive contract is independent of q : $(w_q, g_q) = (0, 1)$, with associated profit equal to $pY_q + (1 - p)R - c$;*

(ii) *if $\bar{u}_q > B$, the optimal incentive contract is $(w_q, g_q) = \left(\frac{\bar{u}_q}{p}, 0\right)$, with associated profit equal to $pY_q - \bar{u}_q$.*

Intuitively, the optimal incentive contract for a type- q manager depends on his reservation utility. If the manager reservation utility is low ($\bar{u}_q < B$), the individual rationality constraint is redundant and governance is set equal to the highest level ($g = 1$) and incentive pay is at the lowest level ($w = 0$). In this case the incentive contract is independent of the manager's quality.

If instead the manager's reservation utility is large ($\bar{u}_q > B$), governance is an

ineffective substitute for pay. Hence, governance is set at its lowest level ($g = 0$) and the incentive pay is at the highest level $w = \bar{u}_q/p$.

As proved in Appendix A, the equilibrium in the managerial market is as follows:

Proposition 1 (Competition for managerial talent) *A mass m_H of firms hire a H manager. The compensation contract for an H -type manager is*

$$(w_H, g_H) = \left((Y - y) + \frac{c - (1 - p)R}{p}, 0 \right)$$

The remaining $n - m_H$ firms hire L -type managers and offer the contract

$$(w_L, g_L) = (0, 1).$$

This is the key result of the model. Because there is a scarcity of H -type managers, in equilibrium, competition among firms will be so that the rent awarded to H -type managers (\bar{u}_H) makes firms indifferent between hiring a H -type or a L -type manager. If hiring a H -type manager leads to higher profits than hiring a L -type manager, then a firm can marginally increase the compensation to H -type types, attracting one of them for sure, increasing profit. If instead hiring a L -type manager leads to a higher profit, all firms would hire a L -type manager and thus H -type managers would be willing to work for less. Given that corporate governance is used by firms to reduce managerial rent, firms hiring H -type managers find high level of corporate governance suboptimal. Conversely, firms hiring L -type managers face no competition for them and can, therefore, keep managerial compensation down to the incentive compatibility constraint. Thus, these firms choose the profit-maximizing level of corporate governance.

The solution also highlights a potential reason for the non-perfect substitutability of corporate governance and executive compensation. Proposition 1 shows that firms choose a suboptimal level of corporate governance instead of implementing the optimal level of corporate governance. The reason is because shareholders do not internalize the externality their choices of corporate governance impose on other firms. Specifically, in our model, when firms increase corporate governance, they reduce the reservation utility of managers working in other firms. Hence, they bear all the cost of higher governance but only enjoys part of the benefits.

4 Empirical Analysis

We now turn to the empirical analysis. First, we develop the three main testable implications of the model. Then, we describe our data and discuss our results.

4.1 Empirical Predictions

The model starts with the assumption that corporate governance is part of incentive contract for managers. Hence, our first prediction is:

Prediction 1 (Governance as Part of Incentive Contract for CEO): *Changes in corporate governance should be more common in years when a new CEO is hired.*

The main result of the model is that in equilibrium some firms will attract better managers by paying them more and choosing weaker governance standards; while others will attract worse managers by paying them less and choosing stricter corporate standards. Thus, provided that we can find an appropriate measure of managerial

talent, our main empirical prediction is:

Prediction 2 (Matching Equilibrium): *Better quality managers receive higher pay and are matched to firms that have weaker governance standards.*

Competition for managers plays a critical role in the model. If the number of H -type managers were to exceed the number of firms ($m_H > n$), in equilibrium all firms would hire an H -type manager, invest in corporate governance ($g = 1$) and pay low compensation ($w = 0$). More precisely, our model predicts that better managers are matched to firms that have lower corporate governance only when the competition among firms to attract them is high. Therefore, conditionally on us finding a relevant measure of the effective competition for managers, our model predicts:

Prediction 3 (Competition for Managers): *The relationship between high quality managers and weaker governance standards should be stronger in sectors with stronger competition for managers.*

4.2 Data description

We use firm-level financial variables from Compustat: *TobinQ* as the ratio of firm's total market value (item `prcc_f` times the absolute value of item `csho` plus items `at` and `ceq` minus item `txdb`) over total assets (item `at`). *Size* is the firm's total market value (item `prcc_f` times the absolute value of item `csho` plus items `at` and `ceq` minus item `txdb`). *Pre Firm Perf* is the previous three years average of the industry adjusted *TobinQ*. All variables are winsorized at the 1 percent level.

As commonly done, we exclude financial, utilities and governmental and quasi governmental firms (SIC codes from 6000 to 6999, from 4900 to 4999 and bigger than 9000; respectively) because their competition for managerial talent may be distorted. We use the 49 Fama-French Industry classification: our final sample includes 36 different industries.

Our principal measure of firm corporate governance is the Gompers et al. (2003) governance index, which we obtain from RiskMetrics. The *G-Index* ranges from 1 to 24 and one point is added for each governance provision restricting shareholders right with respect to managers (for further details see Gompers et al. 2003).⁴ A higher *G-Index* indicates more restrictions on shareholder rights or a greater number of anti-takeover measures. Therefore, a higher value of the *G-Index* corresponds to a lower g in our theoretical representations. Hence, all coefficient signs on the empirical predictions using the *G-Index* switch sign with respect to the ones using our theoretical g governance measure. The index is reported at interval of 2 or 3 years and we do not fill the gaps between reported values.

We obtain our measures of executive compensation from ExecuComp. We measure *Total Compensation* as natural logarithm of item `tdc1`. We define *Pay for Performance* as the ratio of bonuses and stock options (the latter is the natural loga-

⁴The list of provisions included in the *G-Index* are as follows: Antigreenmail, Blank Check, Business Combination laws, Bylaw and Charter amendment limitations, Control-share Cash-out laws, Classified Board (or Staggered Board), Compensation Plans, Director indemnification Contracts, Control-share Acquisition laws, Cumulative Voting, Directors Duties provisions, Fair-Price provisions, Golden Parachutes, Director Indemnification, Limitations on director Liability, Pension Parachutes, Poison Pills, Secret Ballot, Executive Severance agreements, Silver Parachutes, Special Meeting limitations, Supermajority requirements, Unequal Voting rights, and Limitations on action by Written Consent.

rithm of the Black Scholes value of options granted: item `option_awards_blk_value`) and total compensation, measured in percentage terms. We also use ExecuComp to define *External* as a dummy variable that takes value one if the CEO was not an executive in the firm the year before being appointed as CEO, and zero otherwise; and *Dummy65*, a dummy variable that takes value 1 if the executive is at least 65 years old, 0 otherwise. Finally, we use ExecuComp and Compustat to calculate *Own Past Perf*, the previous three years average of the industry adjusted *TobinQ* of the firm a given manager worked for.

We follow the approach to proxy CEO talent with observable characteristics, like press coverage (as in Milbourn, 2003) or MBA education (Murphy and Zaboknik, 2007). We use two measures of talent, both defined at the point in time when the manager takes a given CEO position. The first measure of talent is based on the manager compensation. We calculate the ratio between the manager total compensation and the CEO total compensation; where total compensation is measured by *tdc1*. Then, we define *Quality: Compensation* as the last three years average of the above pay ratio, calculated for the firm the executive worked before becoming CEO. A higher value of *Quality: Compensation* implies a more talented manager. We also measure talent using age. The second measure of talent, *Quality: Age*, is the logarithm of the age of the first CEO appointment within a S&P 1500 firm. A lower value of *Quality: Age* implies a more talented manager.

Summary statistics for all the variables are reported in Table 1. Our dataset spans the period from 1993 to 2006 as this corresponds to the RiskMetrics data availability.

We report the summary statistics on changes in corporate governance (in Table 2) only for the set of the observations in which a new CEO is hired, because our analysis will only use these observations.

4.3 Results

We start our analysis by looking at whether changes in corporate governance are associated with CEO turnover. Then, we study what is the correlation between changes in corporate governance and our proxies for quality of the new CEO. Furthermore, we look for validation of our proxies by analyzing compensation and performance. Finally, we decompose the governance indicator to study what are the components of the G-Index that are more likely to change with CEO quality.

4.3.1 Governance as Part of the CEO Incentive Contract

In Table 3, we study whether corporate governance is used as part of the incentive contract for new CEO. As suggested by Prediction 1 of the model, we should expect a higher frequency of changes of corporate governance when there is a CEO turnover than otherwise.

In Panel A we find that the changes in corporate governance are 4 percent more common in years when there is a change in CEO. In case of external succession in particular the frequency of changes in G-Index increase to 41.55 percent. The difference between external and internal succession may be due to the fact that in case of external succession there is a much greater change in the managerial team and thus greater need to alter corporate governance.

In Panel B, we test whether the distribution of the changes in G-Index differ systematically depending on whether there is a CEO turnover or not, and whether the new CEO is external or internal. We find that only in the case of external successions the distribution of the changes in G-Index is significantly different from the others.

In Table 4, we focus on CEO turnovers and test the probability of changes in G-Index in case of external succession controlling for size and year trends. In column 1, we confirm the univariate results that external successions are associated with 10-percent higher frequency of changes in G-Index. The results are confirmed when we estimate a probit model (in column 2) and when we control for past performance (as in column 3).

One concern with the results so far is that the decision to hire an external CEO is endogenous. In column 4, we use a dummy variable that takes value 1 when the incumbent CEO is 65 or older, and 0 otherwise. The idea is that in case the CEO is 65 or older, the succession is likely to be planned and the future CEO is likely to be already on the board. The first stage regression (unreported) indicates that *Dummy65* is strongly negatively correlated with external successions. At the same time, there is no reason to expect that this dummy affect the decision to change the G-Index. The results are confirm and the magnitude of the effect seems to be even greater.

The results thus confirm Prediction 1 of the model. Corporate governance seems to be used as part of the incentive package for new CEO. These results also suggest

that most of the changes in corporate governance arise because of an optimal decision by the firm rather than as a result of managerial entrenchment. Managerial entrenchment is likely to increase with tenure and would therefore suggest that changes in corporate governance should occur towards the later CEO employment years rather than the early ones.

4.3.2 Changes in Governance and CEO Quality

In Table 5, we start the analysis of the relation between changes in governance the quality of the new CEO. In this table, we use the entire sample of turnover cases, independently of whether the new CEO is internal or external.

From Prediction 2, we expect a positive correlation between changes in the G-Index and the new CEO quality. In Panel A, we measure quality as the age of the new CEO: younger CEOs are likely to be better CEOs. In Panel B, we measure quality as the relative compensation of the incoming CEO in the firm in which he or she was previously employed, scaled by the pay of the CEO in that firm.

We find a significant positive correlation between CEO quality and reduction in the governance standards in Panel B and no significant relationships in Panel A. The results are robust across specifications. In column 1, we estimate a standard OLS model. There is no change in the result when we control for sample selection (since we have only selected cases of CEO turnover) using the Heckman model. We estimate the selection model using `Dummy65` as a predictor of turnover, which is unlikely to be correlated with future changes of corporate governance.

Since the dependent variable is an indicator that takes value 1 if G-Index increases,

-1 if it decreases and 0 if it does not change, a linear model is not appropriate. Hence, in column 3, we estimate an ordered logit model. The results are unchanged. Finally, the positive correlation between CEO quality and governance may be either due to the fact that governance improves when the new CEO is less talented, or because the governance weakens when the new CEO is very talented. To distinguish between the two cases, in column 4, we estimate a multinomial logit model. We find that the significant effect is the second: G-Index is increased when the new CEO is of better quality. This result is consistent with our model, according to which weaker governance is adopted in order to attract talented CEOs.

The latter result is confirmed in Table 6 where we only consider the sample of external successions. Across both measures of quality, in the multinomial logit model presented in column 4, we find that G-Index is increased when the new CEO is of better quality. However, because of the small number of observations, results are not robust across specifications.

Our results rely on the assumption that our proxies indeed measure CEO talent. To validate this assumption, in Table 7, we study the correlation between our measures of CEO quality and CEO compensation following the appointment of the CEO and his/her performance both in the firms where he/she was employed before and in the new firm.

In Panel A, we find that CEO age is negatively correlated with past performance (which is measured as the average industry-adjusted Tobin Q for the firm where the CEO was employed in the 3 years prior to the succession), future performance (as

measured as the industry-adjusted Tobin Q in the year following the succession), total compensation and incentive pay (measured in the year of the succession).

The results are weaker in Panel B: the signs of the correlation coefficients are positive but only the coefficient on total compensation is statistically significant. Overall, these results seem to validate our measures of CEO talent.

4.3.3 Components of G-index

Table 8 provides a detailed analysis of the evidence that better managers are employed in firms with weaker corporate governance by examining individual components of the *G-Index*. In Panels A-E, we report the correlation between our proxies for CEO quality and the changes at the time of a CEO turnover in the E-Index and each of the 5 sub-indexes of the *G-index*: Delay (measuring the ability to delay an hostile takeover), Protection (which considers the six provisions protecting directors and officers from legal liability or job termination), Voting (which measures shareholder voting rights), Other (which includes miscellaneous indicators, like limits on director duties and pension parachutes) and State Law (focusing on the six state takeover laws: antigreenmail, business combination freeze, control share acquisition, fair price, director duties laws and redemption rights statutes). The indicator that is more strongly positively correlated with CEO quality is Voting. Protection is (if anything) negatively correlated with CEO quality; while the others are not significantly correlated with CEO quality.

These results suggest that the important provisions are the ones restricting shareholder voting rights. These provisions increase when the new CEOs are better than

the old ones. The effect of the other component is not statistically significant, reducing the concern that our results are driven by state level regulations. The robustness of this result is also supported by Table 2, which shows a very small amount of changes in state law provisions around turnover.

4.3.4 Cross-industry test

We now turn to study how the role of corporate governance as part of an optimal compensation contract depends on the competition for managers, in order to test Prediction 3. Figure 2 plots the relationship between corporate governance and CEO ability measured by age and relative compensation, in Panel A and B respectively. Specifically, the graph axes are as follows: the vertical axis is the coefficient of the regression of corporate governance (*G-Index Up*) on CEO ability for a given industry; that is, β_{γ}^{ind} as per equations in columns (1) in table (5). The horizontal axis is the percentage of internally promoted CEOs in that industry, as reported by Cremers and Grinstein (2010).

Each point in the figure corresponds to a different industry. The number reported next to each point is the number of the industry that generated that data point, coded following the 49 Fama French industries. To ensure robust results, we only include industries that have at least 50 observations.

As evidence supporting Prediction 3, we also plot the linear fit of all the different data points. The figure shows that higher competition for managers implies a steeper relationship between corporate governance and managerial ability. This implies a more important role of corporate governance as part of an optimal compensation

contract. In numbers, the correlation between the different β_γ^{ind} and the percentage of internal promotions is 0.393 and -0.1236 in Panel A and B, respectively. Both correlations are statistically different from zero.

In short, this picture provides evidence that the competition for managers plays a crucial role in the choices of corporate governance of firms that want to attract highly talented managers, the key insight of our model. Indeed, firms seem to use corporate governance as part of an optimal compensation contract more aggressively in those industries where the competition for talent is more severe.

5 Conclusion

In this paper, we explore the joint role played by corporate governance and competition in the market for CEOs. In our principal agent problem, there are two ways to induce a CEO to make the right decision: paying compensation in case of better performance and investing in corporate governance to replace CEOs if things go badly. We showed that when managerial ability is observable and managerial skills are scarce, competition among firms to hire better CEOs implies that in equilibrium firms will choose lower levels of corporate governance. Intuitively, the result follows from the fact that managerial rents cannot be influenced by an individual firm but instead are determined by the value of managers when employed somewhere else. Hence, if a firm chooses a high level of corporate governance, the remuneration package will have to increase accordingly to meet the participation constraint of the manager. It is therefore firms (and not managers) that end up bearing the costs of higher corporate governance while the benefit of corporate governance (in terms of

lower incentive pay) are shares with other firms.

We provided novel empirical evidence supporting our model. The observed allocation of CEOs and firms is consistent with the model: we provided empirical measures of managerial talent and found it is negatively correlated with indicators of corporate governance. Moreover, we find a stronger negative relationship between corporate governance and CEO quality in industries with greater competition for managers, where the latter is measured as the frequency of external hires. Finally, in support of the assumption that compensation and governance are chosen as part of an optimal incentive package, corporate governance changes significantly when a new CEO is hired with better CEOs being offered weaker governance.

Our finding that corporate governance affects the matching between managers and firms has important implications for the debate on executive pay and governance. Specifically, while better governance may incentivize managers to perform better, it also reduces firms' ability to attract the best managers. These two effects offset each other and may explain why it has proven so hard so far to find direct evidence that corporate governance increases firm performance. A notable exception is the link between governance and performance found in firms owned by private equity: Private equity ownership features strong corporate governance, high pay-for-performance but also significant CEO co-investment, and superior operating performance.⁵ Since private equity funds hold concentrated stakes in firms they own

⁵See, for example, Jensen (1989) for theoretical argument, Kaplan (1989) for evidence on operational improvements due private equity ownership in early wave of leveraged buyouts (LBOs), and Acharya, Gottschalg, Hahn and Kehoe (2013) on the LBOs during 1995 to 2005 (in the U.K. and the Western Europe).

and manage, they internalize better (compared, for example, to dispersed shareholders) the benefits of investing in costly governance. Our model and empirical results can be viewed as providing an explanation for why there exist governance inefficiencies in firms with dispersed shareholders that concentrated private equity investors can “arbitrage” through their investments in active governance.

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Table 1: **Summary Statistics**

This table presents the summary statistics for the variables used in the empirical section. *G Index Changes Dummy* is a dummy variable that takes value 1 if *G-Index* changes from the previous period, 0 otherwise. *External* is a dummy variable that takes value 1 if the CEO is an external hire, 0 otherwise. *Quality: Compensation* is a measure of manager quality based on her compensation. This measure is the previous three years average of the ratio between the manager total compensation and the CEO total compensation in that firm; where total compensation is measured by *tdc1*. *Quality: Age* is a measure of manager quality based on her age. This measure is the logarithm of the age of the first CEO appointment. *Dummy65* is a dummy variable that takes value 1 if the CEO is at least 65 years old, 0 otherwise. *Own Past Perf* is a measure of the manager past performance. This measure is the previous three years average of the industry adjusted *TobinQ* of the firm the manager worked for. *Pre Firm Perf* is a measure of the firm past performance. This measure is the previous three years average of the firm industry adjusted *TobinQ*. *Total Compensation* is the logarithm of total compensation, measured by *tdc1*. *Incentive Pay* is the proportion of variable pay (bonuses and stock options) over total pay; in percentage. *TobinQ* is the ratio of firm's total market value over total assets. *Size* is the firm market capitalization. The sample includes only years with available *G-Index*. It includes 6797 observations and ranges from 1995 to 2006.

Variable	Mean	Std. Dev.	Min	Max
G Index Changes Dummy	0.362	0.481	0	1
External	0.347	0.476	0	1
Quality: Compensation	1.136	1.355	0.054	8.360
Quality: Age	3.958	0.127	3.664	4.331
Dummy65	0.559	0.497	0	1
Own Past Perf	0.261	1.125	-3.866	7.191
Pre Firm Perf	0.289	1.151	-3.379	7.191
Total Compensation	7.856	1.065	4.766	9.839
Incentive Pay	72.248	22.901	0	100
TobinQ	1.854	1.337	0.507	13.024
Size	8.043	1.629	3.141	11.477

Table 2: **Changes in Corporate Governance**

This table presents the summary statistics for the changes in corporate governance at the time when a new CEO is hired. *G Index Up* is a variable that takes value -1 if *G-Index* decreases, 0 if it does not change, and 1 if it increases. *E-Index Up* is a variable that takes value -1 if *E-Index* decreases, 0 if it does not change, and 1 if it increases. *Delay Up* is a variable that takes value -1 if the *Delay* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases. *Protection Up* is a variable that takes value -1 if the *Protection* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases. *Voting Up* is a variable that takes value -1 if the *Voting* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases. *Other Up* is a variable that takes value -1 if the *Other* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases. *State Law Up* is a variable that takes value -1 if the *State Law* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases.

Variable	-1	0	1
G Index Up	150	877	316
E Index Up	39	961	68
Delay Up	19	1,004	45
Protection Up	20	984	64
Voting Up	19	1,040	9
Other Up	28	1,004	36
State Law Up	8	1,055	5

Table 3: **Corporate Governance Changes and CEO Turnover**

This table analyzes the changes in corporate governance and their relationship to turnover. Panel A shows the frequency of *G-Index* changes. In the first column, it shows the frequency of *G-Index* changes during no CEO turnover periods and around CEO turnover. It also shows the t-test for the differences in the frequency. In the second column, it shows the frequency of *G-Index* changes around internal promotions and around external CEO hires. It also shows the t-test for the differences in the frequency. Panel B analyzes the distribution of the *G-Index* changes. In the first column, it analyzes the proportion of *G-Index* increases, no changes and decreases during no CEO turnover periods and around CEO turnover. It also shows the t-test for the Wilcoxon test of equality of distribution. In the second column, it analyzes the proportion of *G-Index* increases, no changes and decreases around internal promotions and around external CEO hires. It also shows the t-test for the Wilcoxon test of equality of distribution.

Panel A. Frequency of Changes in G-Index

No CEO Turnover	32.93%	5123	Internal Succession	33.27%	1094
CEO Turnover	36.35%	1674	External Succession	41.55%	580
T-test	2.584***		T-test	3.365***	
Sample	Entire sample			CEO Turnover	

Panel B. Changes in G-Index

	No CEO Turnover	CEO Turnover	Internal	External
Decreases in G-Index	9.76%	11.22%	10.79%	12.59%
No change in G-Index	67.07%	63.65%	68.10%	58.45%
Increase in G-Index	23.17%	25.13%	23.77%	28.97%
Obs	5123	1703	1094	580
Wilcoxon Test of Equality of Distribution:		-0.41		-1.68*

Table 4: **Corporate Governance Changes and External CEO Turnover**

This table shows the changes in *G-Index* around turnover. The dependent variable is *G Index Changes Dummy*, a dummy variable that takes value 1 if *G-Index* changes from the previous period, 0 otherwise. The independent variables are: *External*, a dummy variable that takes value 1 if the CEO is an external hire, 0 otherwise; *Pre Firm Perf*, the previous three years average of the firm industry adjusted *TobinQ*; *Dummy65*, a dummy variable that takes value 1 if the CEO is at least 65 years old, 0 otherwise. Column (1) presents a linear probability model, columns (2) and (3) present a Probit model. Column (4) presents an instrumental variable Probit model with *Dummy65* as an instrument for *External*. All columns include one observation per turnover. All regressions include size and year controls. Standard errors are reported in parenthesis below the coefficient and clustered at the industry-year level. *, **, or *** indicates that the coefficient is statistically significantly different from zero at the 10%, 5%, or 1% level, respectively.

	(1)	(2)	(3)	(4)
Model	OLS	Probit	Probit	IV
External	0.101 (0.030)***	0.269 (0.080)***	0.276 (0.081)***	1.475 (0.676)**
Pre Firm Performance			0.005 (0.030)	0.027 (0.033)
Observations	1,434	1,434	1,418	1,418

Table 5: Corporate Governance Changes and New CEO Quality

This table shows the changes in *G-Index* and their relationship to new CEO quality. The dependent variable is *G Index Up*, a variable that takes value -1 if *G-Index* decreases, 0 if it does not change, and 1 if it increases. The independent variables are: *Quality*, a measure of CEO quality. In Panel A, *Quality* is a measure of manager quality based on her compensation. This measure is the previous three years average of the ratio between the manager total compensation and the CEO total compensation in that firm; where total compensation is measured by *tdc1*. In Panel B, *Quality* is a measure of manager quality based on her age. This measure is the logarithm of the age of the first CEO appointment. *Dummy65* is a dummy variable that takes value 1 if the CEO is at least 65 years old, 0 otherwise. Columns (1) present a linear probability model, columns (2) presents a Heckman selection model with *Dummy65* as the selection instrument, columns (3) present an Ordered Logit model, and columns (4) present a Multinomial Logit model. All columns include one observation per turnover. All regressions include previous firm performance, size and year controls. Standard errors are reported in parenthesis below the coefficient and clustered at the industry-year level. *, **, or *** indicates that the coefficient is statistically significantly different from zero at the 10%, 5%, or 1% level, respectively.

Panel A: Age of first CEO appointment as a measure of quality

	(1)	(2)	(3)	(4)	
Model	OLS	Heckman	Ordered logit	Decrease	Increase
Quality	0.076 (0.094)	0.076 (0.105)	0.274 (0.369)	-0.327 (0.626)	0.179 (0.457)
Observations	1,349	1,349	1,349	1,349	1,349

Panel B: Compensation as a measure of quality

	(1)	(2)	(3)	(4)	
Model	OLS	Heckman	Ordered logit	Decrease	Increase
Quality	0.027 (0.015)*	0.027 (0.015)*	0.102 (0.052)*	0.071 (0.065)	0.157 (0.054)***
Observations	1,202	1,202	1,202	1,202	1,202

Table 6: **Corporate Governance Changes and New External CEO Quality**

This table shows the changes in *G-Index* and their relationship to new external CEO quality. The dependent variable is *G Index Up*, a variable that takes value -1 if *G-Index* decreases, 0 if it does not change, and 1 if it increases. The independent variables are: *Quality*, a measure of CEO quality. In Panel A, *Quality* is a measure of manager quality based on her compensation. This measure is the previous three years average of the ratio between the manager total compensation and the CEO total compensation in that firm; where total compensation is measured by *tdc1*. In Panel B, *Quality* is a measure of manager quality based on her age. This measure is the logarithm of the age of the first CEO appointment. *Dummy65* is a dummy variable that takes value 1 if the CEO is at least 65 years old, 0 otherwise. Columns (1) present a linear probability model, columns (2) presents a Heckman selection model with *Dummy65* as the selection instrument, columns (3) present an Ordered Logit model, and columns (4) present a Multinomial Logit model. All columns include one observation per external hire. All regressions include previous firm performance, size and year controls. Standard errors are reported in parenthesis below the coefficient and clustered at the industry-year level. *, **, or *** indicates that the coefficient is statistically significantly different from zero at the 10%, 5%, or 1% level, respectively.

Panel A: Age of first CEO appointment as a measure of quality

	(1)	(2)	(3)	(4)	
Model	OLS	Heckman	Ordered logit	Decrease	Increase
Quality	-0.203 (0.219)	-0.210 (0.200)	-0.697 (0.668)	-1.375 (1.190)	-1.665 (0.879)*
Observations	462	462	462	462	462

Panel B: Compensation as a measure of quality

	(1)	(2)	(3)	(4)	
Model	OLS	Heckman	Ordered logit	Decrease	Increase
Quality	0.028 (0.021)	0.028 (0.021)	0.094 (0.070)	0.021 (0.088)	0.127 (0.073)*
Observations	289	289	289	289	289

Table 7: **Impact of CEO Quality**

This table analyzes the impact of CEO quality. The dependent variables are: *Own Past Perf*, the previous three years average of the industry adjusted *TobinQ* of the firm the manager worked for; *Total Compensation*, the logarithm of total compensation *tdc1*; *TobinQ*, the ratio of firm's total market value over total assets; *Incentive Pay*, the proportion of variable pay (bonuses and stock options) over total pay, in percentage. The independent variables are: *Quality*, a measure of CEO quality. In Panel A, *Quality* is a measure of manager quality based on her compensation. This measure is the previous three years average of the ratio between the manager total compensation and the CEO total compensation in that firm; where total compensation is measured by *tdc1*. In Panel B, *Quality* is a measure of manager quality based on her age. This measure is the logarithm of the age of the first CEO appointment. All columns are OLS and include one observation per turnover. All regressions include size, year and industry dummies. Standard errors are reported in parenthesis below the coefficient and clustered at the industry-year level. *, **, or *** indicates that the coefficient is statistically significantly different from zero at the 10%, 5%, or 1% level, respectively.

Panel A: Age of first CEO appointment as a measure of quality

	(1)	(2)	(3)	(4)
Dep Variable	Own Past Perf	Total Comp	TobinQ	Incentive Comp
Quality	-0.621 (0.298)**	-0.435 (0.202)**	-0.336 (0.311)	-11.260 (5.330)**
Observations	1,278	901	852	900
R-squared	0.088	0.549	0.232	0.298

Panel B: Compensation as a measure of quality

	(1)	(2)	(3)	(4)
Dep Variable	Own Past Perf	Total Comp	TobinQ	Incentive Comp
Quality	0.036 (0.033)	0.034 (0.020)*	0.001 (0.028)	0.726 (0.485)
Observations	1,307	800	755	799
R-squared	0.086	0.542	0.225	0.305

Table 8: Corporate Governance Components

This table shows the changes in *G-Index* components and their relationship to new CEO quality. The dependent variables are: in Panel A, *E-Index Up*, a variable that takes value -1 if *E-Index* decreases, 0 if it does not change, and 1 if it increases; in Panel B, *Delay Up*, a variable that takes value -1 if the *Delay* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases; in Panel C, *Protection Up*, a variable that takes value -1 if the *Protection* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases; in Panel D, *Voting Up*, a variable that takes value -1 if the *Voting* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases; in Panel E, *Other Up*, a variable that takes value -1 if the *Other* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases; in Panel F, *State Law Up*, a variable that takes value -1 if the *State Law* sub-index of the *G-Index* decreases, 0 if it does not change, and 1 if it increases. The independent variables are: *Quality*, a measure of CEO quality. In columns (1) and (3), *Quality* is a measure of manager quality based on her compensation. This measure is the previous three years average of the ratio between the manager total compensation and the CEO total compensation in that firm; where total compensation is measured by *tdc1*. In columns (2) and (4), *Quality* is a measure of manager quality based on her age. This measure is the logarithm of the age of the first CEO appointment. Columns (1) and (2) include one observation per turnover event, while columns (3) and (4) include one observation per external hire. All regressions include previous firm performance, size and year controls. Standard errors are reported in parenthesis below the coefficient and clustered at the industry-year level. *, **, or *** indicates that the coefficient is statistically significantly different from zero at the 10%, 5%, or 1% level, respectively.

Panel A: E-Index

	(1)	(2)	(3)	(4)
Sample	All	All	Externals	Externals
Quality	Age	Comp	Age	Comp
Quality	0.017 (0.080)	-0.001 (0.008)	-0.099 (0.153)	-0.004 (0.011)
Observations	1,085	966	384	243

Panel B: Delay

	(1)	(2)	(3)	(4)
Sample	All	All	Externals	Externals
Quality	Age	Comp	Age	Comp
Quality	-0.006 (0.058)	0.001 (0.007)	0.020 (0.094)	0.033 (0.125)
Observations	1,085	966	384	243

Panel C: Protection

	(1)	(2)	(3)	(4)
Sample	All	All	Externals	Externals
Quality	Age	Comp	Age	Comp
Quality	0.159 (0.075)**	-0.010 (0.007)	0.181 (0.132)	-0.010 (0.010)
Observations	1,085	966	384	243

Panel D: Voting

	(1)	(2)	(3)	(4)
Sample	All	All	Externals	Externals
Quality	Age	Comp	Age	Comp
Quality	-0.041 (0.036)	0.004 (0.005)	-0.026 (0.081)	0.014 (0.006)**
Observations	1,085	966	384	243

Panel E: Other

	(1)	(2)	(3)	(4)
Sample	All	All	Externals	Externals
Quality	Age	Comp	Age	Comp
Quality	-0.005 (0.056)	-0.001 (0.008)	-0.064 (0.104)	-0.000 (0.011)
Observations	1,085	966	384	243

Panel F: State Law

	(1)	(2)	(3)	(4)
Sample	All	All	Externals	Externals
Quality	Age	Comp	Age	Comp
Quality	0.037 (0.028)	-0.003 (0.003)	0.036 (0.044)	-0.002 (0.002)
Observations	1,085	966	384	243

Appendix: Proof of Proposition 1

By assumption, there is an excess of L managers. Hence, $\bar{u}_L = 0$. It follows from Lemma 1 that firms hiring a L manager set $g_L = 1$ and $w_L = 0$ with associated profits

$$\pi_L = py - c + (1 - p)R$$

Any firm can achieve this level of profit, and they may be able to do better by hiring the more productive H -type manager. Given Lemma 1, the expected profits from hiring a H managers are:

$$\pi_H = \begin{cases} pY - c + (1 - p)R & \text{if } \bar{u}_H < B \\ pY - \bar{u}_H & \text{if } \bar{u}_H > B \end{cases}$$

To find the optimal contract for the H -type managers, we need to solve for the endogenously determined \bar{u}_H . First, we can establish the following result: in equilibrium, firms must obtain the same profits hiring the H -type or the L -type manager. The reasoning is as follows. Given $m_H < n$, $m_L > n$ and Assumption 1, in any equilibrium, some firms employ L -type managers. Suppose there is an equilibrium in which firm j employs an H -type with contract (w_H^j, g_H^j) and obtains higher profits than firms employing an L -type. This cannot be an equilibrium because a firm employing an L -type would profitably deviate to $(w_H^j + \varepsilon, g_H^j)$, with ε close enough to zero, would hire the H -type manager previously employed by firm j for sure and would increase profits. On the contrary, suppose there is an equilibrium in which firm k employs an H -type with contract (w_H^k, g_H^k) and obtains lower profits than firms employing an L -type. Then, this firm would always find it profitable to employ and L -type manager and offer the contract (w_L, g_L) .

Therefore, it must be that employing an H -type manager leads to the same profits than employing an L -type manager ($\pi_H = \pi_L$). Under these conditions, Assumption 4 implies that all H -type managers and only $n - m_H$ of the L -type managers will be employed. The condition that employing an H -type manager leads to the same profit as hiring a L -type can be solved for \bar{u}_H . From equation (8), it is clear that $\bar{u}_H > B$. Otherwise, π_H is not a function of \bar{u}_H . If $\bar{u}_H > B$, then $\bar{u}_H = p(Y - y) + c - (1 - p)R$, which is indeed greater than B by Assumption 2. ■

Figure 1: Timeline

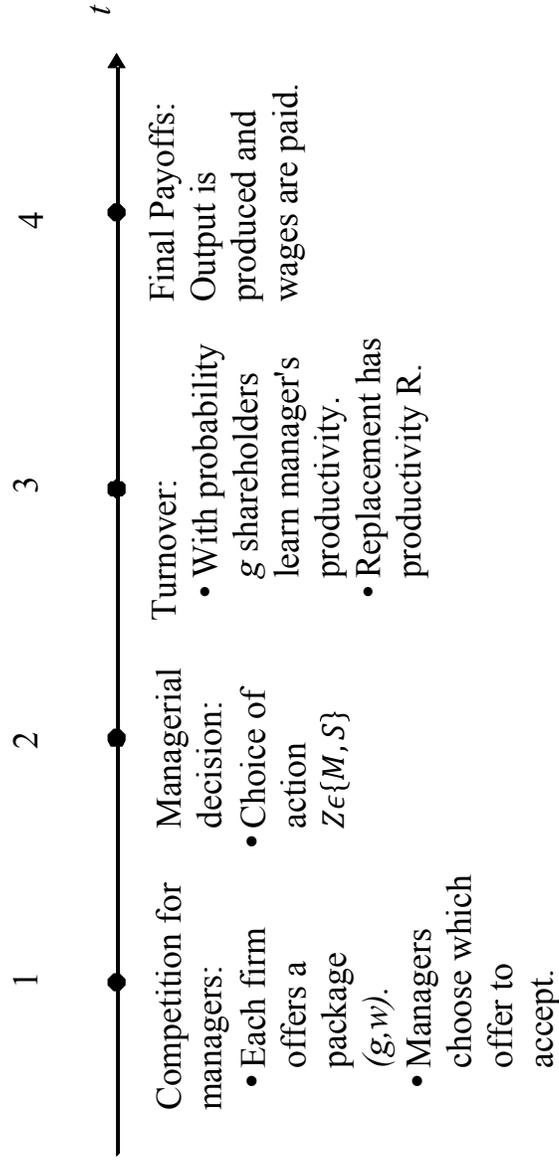
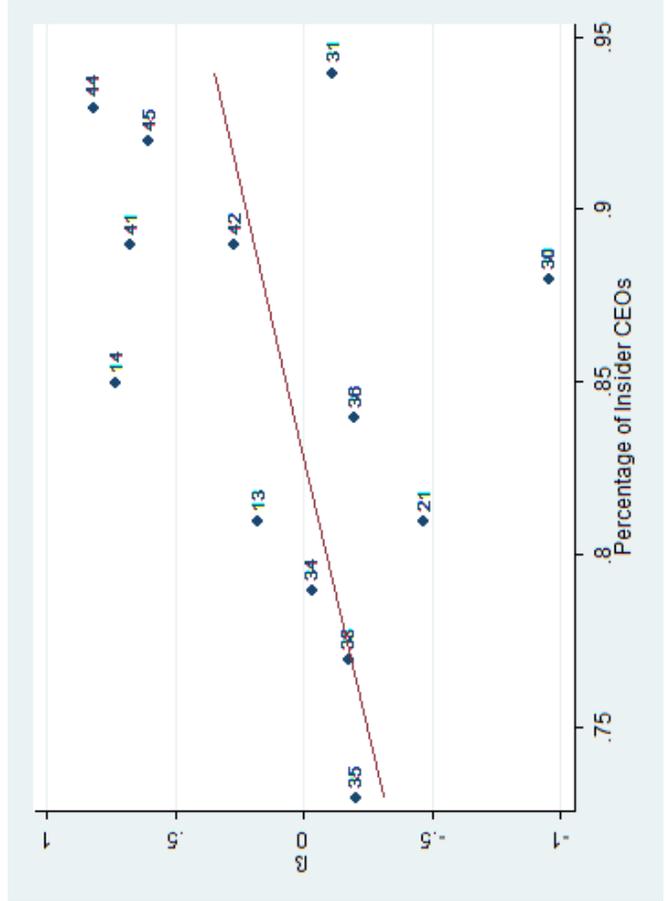


Figure 2: Competition for Managers

In this figure, we show the cross-industry differences in the correlation between corporate governance and managerial ability. We estimate regression $Up = \alpha + \beta_{\gamma}^{ind} \times CEOAbility + Year + Size + PreFirmPerf + \xi_{it}$, using OLS separately for each industry. The figure below plots the value of the estimated coefficient on $CEO Ability (\beta_{\gamma}^{ind})$ with respect to our measure of the degree of competition for managers in that industry (the *Percentage of Insider Promotions* as per Cremers and Grinstein, 2010). In Panel A, *Quality* is the previous three years average of the ratio between the manager total compensation and the CEO total compensation in that firm; where total compensation is measured by *tdc1*. In Panel B, *Quality* is the logarithm of the age of the first CEO appointment. The number next to each data point indicates the industry code: 1 = Agriculture, 2 = Food Products, 3 = Candy & Soda, 4 = Beer & Liquor, 5 = Tobacco Products, 6 = Recreation, 7 = Entertainment, 8 = Printing and Publishing, 9 = Consumer Goods, 10 = Apparel, 11 = Healthcare, 12 = Medical Equipment, 13 = Pharmaceutical Products, 14 = Chemicals, 15 = Rubber and Plastic Products, 16 = Textiles, 17 = Construction Materials, 18 = Construction, 19 = Steel Works Etc, 20 = Fabricated Products, 21 = Machinery, 22 = Electrical Equipment, 23 = Automobiles and Trucks, 24 = Aircraft, 25 = Shipbuilding, Railroad Equipment, 26 = Defense, 27 = Precious Metals, 28 = Non-Metallic and Industrial Metal Mining, 29 = Coal, 30 = Petroleum and Natural Gas, 31 = Utilities, 32 = Communication, 33 = Personal Services, 34 = Business Services, 35 = Computers, 36 = Computer Software, 37 = Electronic Equipment, 38 = Measuring and Control Equipment, 39 = Business Supplies, 40 = Shipping Containers, 41 = Transportation, 42 = Wholesale, 43 = Retail, 44 = Restaurants, Hotels, Motels, 45 = Banking, 46 = Insurance, 47 = Real Estate, 48 = Trading. We include only industries with more than 50 observations.

Panel A: Age of first CEO appointment as a measure of quality



Panel B: Compensation as a measure of quality

