Insider and Outsider Careers in Executive Management.*

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Abstract

This paper asked the question of whether the behavior and compensation of interlocked executives and non-independent board of directors are consistent with the hypothesis of governance problem or whether this problem is mitigated by implicit and market incentives. It then analyzes the role of independent board of directors. Empirically, we cannot reject the hypothesis that executives in companies with a large number of non-independent directors on the board receive the same expected compensation as other executives. In our model, every executive has an incentive to work. Placing more of non-independent directors on the board mitigates gross losses to the firm should any one of them shirk because they monitor each other. It also reduces the net benefits from shirking and increases the gross value of the firm from greater coordination (reflected in the firm's equity value and thus impounded into its financial returns). Therefore having a greater non-independent director representation on the board create a more challenging signaling problem to solve thereby raising the risk premium. However, giving more votes on the board to non-independent executives fosters better executive working conditions, which in turn offsets the higher risk premium in pay by a lower certainty-equivalent wage in equilibrium. Thus, our estimates undergird a plausible explanation of how large shareholders determine the number of insiders on the board to maximize the expected value of their equity. We then conduct counterfactual policy experiment imposing 50% upper bound on the fraction of insiders on the board and another counterfactual imposing 40% quotas for women on the boards.

*The views expressed are those of the individual authors and do not necessarily reflect official positions of the Federal Reserve Bank of St. Louis, the Federal Reserve System, or the Board of Governors.

1 Introduction

This paper develops and estimates a structural econometric model of agency to quantitatively predict how changes proposed in the regulation of corporate governance affect executive compensation and the internal organization of executive management in publicly traded corporations. To frame the analysis, we cast the agency problem as an infinitely lived value maximizing principal choosing an insider and outsider mix, through nurturing, cultivating and rotating overlapping generations of executives who compatible with the firm's corporate culture. To estimate the model, we use panel data on the composition of the C suite, which includes histories of their executives and directors detailing compensation, promotions, turnover and exit, along with background characteristics such as age and education. To predict the effects of recent policy suggestions on the structure of executive management within incorporated firms, we solve the estimated model to obtain the distribution of equilibrium outcomes in counterfactual regimes.

In the next section we describe the data, concentrating on indicators of governance. More specifically we focus on three flash points raised in the media and acknowledged to some extent within the economics literature that addresses governance issues. First, is the executive a board director? We say the company has large/small insider board if number of insiders on the board is greater/less than the median for firms in that sector and size. Second, is the executive interlocked? This occurs when the executive is on compensation committee, or on another firm's board with director serving on compensation committee of employer firm, or vice versa. Third, what gender is the executive? Many commentators argue that women are treated as outsiders in the executive management.

More generally, the notion of corporate governance is a broad concept that could be defined in many different ways. In Section 3 we justify our three measures of governance by drawing upon an additive decomposition developed in Gayle Golan and Miller (2015), hereafter GGM, that partitions individual executive compensation into a risk premium (signifying agency concerns), nonpecuniary characteristics of the position (such as perks from the job), its investment value (through skills acquired from working on the job and as a career stepping stone) and idiosyncratic demand features (that equilibrate supply with demand for that type of position). GGM show that the size of the risk premium, an agency cost, is decreasing in the career concerns of the executive (his willingness to undertake hidden actions that increase firm value because it adds to his own unobserved human capital). We find the estimated components vary by our measures of governance, and offer intuitive interpretation of these results.

The point of departure for our overlapping generations model is that corporate governance does not intrinsically apply to individuals, but rather to the whole of the C-suite. As such results obtained for each individual executive within the company's leadership circle ignore two related features that are critical for understanding firm governance strategy as a whole. First, in the steady state an infinitely lived firm is managed by overlapping generations of executives, so agency costs are spread over demographic composition of the C-suite value in two ways. Thus paying the CEO a high risk premium and other high rank officials in the autumn of their careers not only satisfies his incentive compatibility constraints, but also acts as a career incentive to lower ranked executives reducing shareholder reliance on costly incentive contracting and simultaneously preventing the unravelling of incentives to accumulate human capital. Second, almost by definition, different mixes of insiders and outsiders (as defined the variables on governance in our data set) affect the functions of the other executives in the C-suite. For example, an interlocked executive may not simply affect his own compensation with his counterpart in another firm, but also those of his colleagues; similarly executives on the board may influence their colleagues indirectly through the directives of the board.

The model is developed in Section 5. Firm governance is modeled as a multilateral contract between a value maximizing principal, the board of directors representing shareholders and risk averse agents, executives in different positions that determine their span of control over the firm's outcomes, who maximize lifetime expected utility best responding to incentives and market opportunities and nonpecuniary factors. Hidden actions affect both the current performance of the firm and also the executive's human capital, the latter factor ameliorating the moral hazard problem. The model is closed with a sequential equilibrium, analyzed in Section 6, and its data generating process (DGP) is the probability distribution of observed equilibrium outcomes; the structural parameters are estimated from panel taken off the DGP, and the effects of policy innovations are found by perturbing the structural parameters and resolving the model in counterfactual regimes.

Our measures of governance and policy evaluation focus on four issues that have received considerable attention in the last decade: caps on total compensation, restricting the number of insiders on boards, restricting interlock agreements, and increasing the number of women executives. All four issues have been raised in the context of a larger debate about corporate governance and the agency problem between managers and shareholders. In Section 7 we solve the model in counterfactual regimes that implement these proposals. To derive the resulting equilibrium distribution we must account not only for the individual dynamic effects that change incentives directly but also the indirect consequences driven by general equilibrium concerns. For example a mandate to increase the number of female executives reduces the demand for males and hence has opposite effects on promotion prospects and compensation because they are close substitutes in production.

Section 8 concludes.

2 Relating this Paper to the Literature

Whether promotional structure and compensation practice make for good governance or not, is the subject of empirical research (Rose and Shephard, 1997; Hallock, 1997; Bebchuk and Fried, 2003, 2005; Kuhnen and Zwiebel, 2009; Acharya and Volpin, 2010; Dicks, 2012). The empirical studies use measures of executive's bargaining power, tenure, and the executive's share holdings and correlated them with measures of board independence. Executive compensation is generally positively correlated with measures of their network and negatively with the independence of their board of directors (Hallock, 1997; Bebchuk and Fried, 2003, 2005). These correlations are often interpreted as evidence of entrenchment of management within publicly traded companies. But not all empirical studies find support for the entrenchment hypothesis (Rose and Shephard, 1997). Also poorly performing CEOs are less likely than well-performing CEOs to gain board seats on other companies (Gilson, 1990;

Kaplan and Reishus, 1990).

In the next section we empirically document that the interlocked executives are more entrenchment, i.e. the have longer tenure in the firms, turnover less, are less likely to retire and more likely to eventually becomes a member the board of directors. We also documents that unconditionally the interlocked executives are paid more however, the structure of their incentive pay is also substantially different from non-interlocked executives. Moreover, once we control for the rank and firm characteristics they are paid less on average. We document that being an interlocked executive or on the board of directors also reduces the probability of exit by 55 and 65 percent respectively. Also being a board member increases the probability of being/becoming CEO. As we found in the probability of exit, being a board member, and being interlocked reduces turnover. Also, executives in firms that have a large insider board are less likely to change firms. Furthermore executives on the board are paid a premium of about $845,000, but are also more affected by firm abnormal returns. Finally, compensation is more closely tied to firm's performance in firms with more insider board members, and for interlocked executives.

None of the papers cited above has estimated a theoretical model that embodies explicit, career, reputation, and market incentives and empirically quantify the relative importance of these different elements across board and executive network structure. Also the empirical evidence on whether these measures of board independence and executives are consistent with the "capture" or implicit incentives hypothesis are mixed. Empirical study of boards suffers from a number of difficulties. First, one must deal with broader than ideal classifications of directors. Second, nearly all variables of interest are, as discussed, jointly endogenous. Ultimately, much of what one learns about boards is about equilibrium associations; the structural differences across boards and type of executives' network have difference implications for executives' behaviors and compensation structure. These differences in behaviors and compensation structure can be used to separate the influence of explicit incentives, career and reputation concerns, and market forces across difference board and executive's network structures.

The potential for governance problems arises when contracts are incomplete such as moral hazard arising from noncontractable hidden actions, moral hazard arising from noncontractable hidden actions and hidden information about firm, and adverse selection arising from hidden information about a manager (Holmstrom, 1999). There is a theoretical literature on structuring the boards of directors (Hermalin and Weisbach, 1998; Yermack, 1996; Dominquez-Martinez et. al, 2008; See Adams, Hermalin, and Weisbach (2010) for a survey). However incompleteness is not synonymous with a governance problem because implicit incentives and market forces, producing career concerns and regard for reputation concerns, might counteract short term misalignment of goals between managers and owners (Fama, 1980). For example well networked executives and large insider boards might be a form of implicit incentives (Lee and Persson, 2011). Gibbons and Murphy (1992) have integrated that these competing perspectives by showing they are different sides of the same coin: Early in their career, the prospect of continuation with the firm leads them to accumulate human capital that is not observed and directly benefits the firm, so an implicit contract between worker and firm keeps actions aligned with costly incentives executives are easy to motivate because their promotional prospects are aligned with their privately observed actions; typically Chief Executive Officers (CEOs) and Company Presidents were groomed for many years in executive management before taking a position at the helm of their company. Moreover many other firm employees with aspirations to those positions also acquired considerable executive experience without ever reaching the top. Towards the end of their professional careers there is less alignment and greater use of financial incentives because the value of acquiring further capital is diminished. Thus the composition of the C suite, and the agency costs associated with executive management, cannot be adequately explained without accounting for the dynamic considerations that arise from the human capital accumulation encthat precedes ascendency as well as the. in the The behavior and compensation of interlocked executives and non-independent board of directors is both symptomatic of an internal governance problem, and also a response to implicit contracting coupled to external market forces. Early in the career versus later.

We model firms as multilateral contracts between independent agents – executives at in different positions– and the principals with different span of control over the firm's outcomes. This view of the internal organizations of a firm was put forward by Alchian and Demsetz (1972) and Mirrless (1976) and was shown in Gayle, Golan, and Miller (2015) to empirically match the organization of publicly traded companies in the USA. Therefore the directors sign contract with the shareholders as just the other executives. The directors' job could include monitoring the CEO and the CEO could monitor the lower level executives in the C-suite but it is not a chain of command model like in Williamson (1967) and Calvo and Wellisz (1980) in which the directors have a contract with the shareholders and the CEO have a contract with the board of directors. There exist the standard moral hazard problem with call for a second best incentive contract. However, this is supplemented with career and reputation concerns as suggested by Fama (1980). This is modeled as human capital accumulation problem which is priced in a market equilibrium, however, if the executive or directors shirks – not act in the shareholders interest- no human capital is accumulation. However, as the effort the hidden action of the executives and directors this gives rise to also private information. Therefore in equilibrium the market beliefs of about the executives and directors human capital becomes important. We close the model using a sequential equilibrium concept, which requires that these beliefs be consistent in equilibrium. As entrenchment is normally measured by tenure in the firm and experience in similar firm these are endogenous to model through promotion and turnover.

GGM develop and estimate a general equilibrium model of agency with both career and reputation concerns, a dynamic Roy model of human capital accumulation and optimal contracting, in which career concerns and entrenchment arise endogenously, to empirically quantify the relative importance of these different elements. They derive an additive decomposition associated with each position of the optimal compensation function that shows the risk premium or agency costs, the nonpecuniary benefits of the job, the value of human capital, and the idiosyncratic demand factors. In Section 3 we report the results from undertaking this decomposition. The decomposition show that once we adjust for the risk, the certainty equivalent pay in these firm is substantially lower than firms with independent boards ($380k versus $740k). This result is consistent with better work conditions and good governance of firms with boards that are less independent. The risk premium, however, is larger by $280k on average in firms with large number of insiders on the board. Analyzing the risk premium, which is the cost of agency in our model, shows that the net benefit of shirking is lower when there are large number of insiders on the board. This can indicate that monitoring is more efficient in firms with less independent boards and therefore the goals of the executives are more aligned with the goals of the shareholders. The reason that we find that the risk premium is higher in these firms is because the quality of signals of productivity when an executive shirks while the rest of the executives are working diligently is lower. Put it another way, shirking of one executive causes less destruction in these firms which may imply better governance but also implies that the risk premium is higher for executives to work diligently. At the higher ranks, executives give up compensation to be board members; a Rank-5 executive receives an additional $333,000 compensation for being on the board, but the top three ranked executives with at least a year's experience with their firm are willing to forego more than $200,000 to become a board member. Similarly, interlocked executives generally receive a lower compensating differential compared to those who are not; only the lowest ranked executives in medium or large firms demand a (small) positive premium to be interlocked. These measures of networking opportunities reduce the nonpecuniary costs of a job match, and hence its equilibrium compensation.

Comparing the certainty equivalent pay confirms that the gap between their compensation and the compensation of other executives would be a lot smaller if it was not for the risk component. An executive who is interlocked receives a certainty-equivalent wage of $560,000, less than those who are not, $710,000. Again, in both cases, the negative effect of nonpecuniary losses from working versus retiring outweighs the positive effect of net demand. An interlocked executive, however, receives a lower risk premium, $1.9 million, but a higher percentage of expected compensation, 77 percent, than an executive who is not interlocked. This is because interlocked executives receive a lower certainty-equivalent wage, $560,000, than a non-interlocked executive, $710,000. Executive directors and interlocked executives would be less destructive if they were not motivated (perhaps because these extra duties are associated with greater monitoring), and the losses are smaller if there are many insiders on the board, possibly for similar reasons. For interlocked executives, it falls by $930,000 in small firms in the consumer sector, a further $616,000 in the service sector, although these differences are less pronounced in other firm types. Likewise when insiders dominate the board, it falls by $2.2 million. Interlocked executives places lower value on career concerns, executive directors higher. However, overall the role of implicit incentives are small even for executive directors. We therefore conclude that the main difference in the pay structure for these executives is the higher costs of agency due to the relative difficulty in assessing their performance relative to other executives, therefore, explicit incentive provided by compensation contract is the most important tool for shareholders to align incentives of board members and interlocked executives with their own goals.

Empirically, we cannot reject the hypothesis that executives in companies with a large number of insiders on the board receive the same expected compensation as other executives. In our model, every executive has an incentive to work. Placing more of them on the board to monitor each other mitigates gross losses to the firm should any one of them shirk, reduces the net benefits from shirking, and increases the gross value of the firm from greater coordination (reflected in the firm's equity value and thus impounded into its financial returns). But greater executive representation on the board does more than create a more challenging signaling problem to solve, thereby raising the risk premium; giving more votes to executives fosters better executive working conditions, which in turn is offset by a lower certainty-equivalent wage in equilibrium. Thus, our estimates undergird a plausible explanation of how large shareholders determine the number of insiders on the board to maximize the expected value of their equity.

We find that female executives are less likely to be board members and interlocked executives (with the exception of females in rank 3 which are more likely to be interlocked). We find that women are more likely to quit because of greater opportunities from exiting relative to the nonpecuniary characteristics of work. They value investment in human capital less than men, there is lower net demand for their services, they receive higher certainty-equivalent compensation, and would reap smaller net benefits from shirking.

3 Sample

The data for our empirical study are from three sources. The main data source is Standard & Poor's ExecuComp database, which contains annual records on 30,614 individual executives, itemizing their compensation and describing their titles. Each executive worked for one of the 2,818 firms comprising the (composite) S&P 500, MidCap, and SmallCap indices for at least one year spanning the period 1992 to 2006, which covers about 85 percent of the U.S. equities market. In the years for which we have observations, the executive was one of the eight top-paid employees in the firm whose compensation was reported to the Securities and Exchange Commission (SEC). Data on the 2,818 firms for the ExecuComp database were supplemented by the COMPUSTAT North America database and monthly stock price data from the Center for Research in Security Prices database. We also gathered background history for a subsample of 16,300 executives, recovered by matching the 30,614 executives from our COMPUSTAT database using their full name, year of birth and gender with the records in Marquis Who's Who, which contains biographies of about 350,000 executives.

Following Gayle, Golan and Miller (2012) we constructed a hierarchy consisting of five ranks using a rational ordering over a set of job titles based on transition independent of compensation.[1] Rank 1 includes chairman of the board of the company or chairman of a subsidiary who does not have any other executive positions in the firm. Rank 2 is the CEO of the company. Rank 3 includes the COO, the CFO, and the chairman of the board of the company if that person holds an executive position in the company other than CEO. Other high-level corporate executives and heads of subsidiaries or regional chiefs comprise Rank 4, while Rank 5 is reserved for lower-level executives. Thus, CEOs are not in Rank 1. Since this hierarchy is based on transitions, the ranking reflects lifecycle considerations, not power or control. The ranking corroborates the institutional use of the term, which emphasizes the supervisory roles of managers over their subordinates. For example, the chairman of the board of directors monitors the CEO of the firm.

[1] The method for constructing the hierarchy, and a detailed description of the titles in each rank, is in Gayle, Golan, and Miller (2012).

Following the literature on corporate governance we construct two measures of governance and executives power. The first measure is at the executive level and is called interlock. A executive is classified as being interlocked if at least one of the following is true:

a) The executive serves on the board committee that makes his compensation decisions.

b) The executive serves on the board (and possibly compensation committee) of another company that has an executive officer serving on the compensation committee of the indicated executive's company.

c) The executive serves on the compensation committee of another company that has an executive officer serving on the board (and possibly compensation committee) of the indicated executive's company.

The second is at the company level and is the number of its own executives that serves on its board of director. This measure is constructed the variable reported in the Standard & Poor's ExecuComp database indicating whether or not a given is a member of the board of director. From this variable create a variable for the number of insiders on the board of director and we classified a company as has having a large insider board if the number of insiders on its board above the median for its sector and firm size over the sample.

We classify firms into three industrial sectors: primary, consumer, and service. Firms are also partitioned by size – large, medium, and small – based on the value of their assets and number of employees over the sample period. A firm is defined as large if both its value of assets and its number of employees are above the median for its sector over the sample period, and as small if both its value of assets and number employees are below the median for its sector over the sample. All other firms are medium sized. We further classify firms by the number of "insiders" on their board relative to the industrial norm. A company is defined as having a large insider board if the number of insiders on its board is above the median for its sector and firm size. Finally, reflecting our focus on executive compensation, firms are classified from the perspective of their executives: New if this is the first year the executive is working in the firm and old if the executive has worked in the firm for more than one year. This variable allows us to capture the effects of executive turnover. Summarizing, there are 36 firm types, differentiated by size, industrial sector, importance of insiders on the board, and whether the executive in question has just joined the firm. Total compensation is the sum of salary and bonus, the value of restricted stocks and options granted, the value of retirement and long-term compensation schemes, plus changes in wealth from executives holding firm options and changes in wealth from holding firm stock relative to a well-diversified market portfolio.[2] Hence, the change in wealth from holding their firms' stock is the value of the stock at the beginning of the period

[2] Changes in wealth from holding firm stock and options reflect the cost a manager incurs from not being able to fully diversify her wealth portfolio because of restrictions on stock and option sales. When forming their portfolio of real and financial assets, managers recognize that part of the return from their firm-denominated securities should be attributed to aggregate factors, so they reduce their holdings of other stocks to neutralize those factors. See Antle and Smith (1985, 1986), Hall and Liebman (1998), Margiotta and Miller (2000), and Gayle and Miller (2009a,b) for other papers using this measure of total executive compensation.

multiplied by the abnormal return, defined as the residual component of returns that cannot be priced by aggregate factors the manager does not control.

Individual characteristics consist of several dimensions of labor market experience, some demographic background variables, and whether the executive is interlocked.[3] Variables we construct on labor market experience include years of tenure with the firm, years worked as top executive, number of firms in which an executive worked before becoming an executive, and the number of firms in which an executive worked after becoming an executive. We also observe educational qualifications (including MBA, MSc, PhD), gender, and age. Finally, since the price of console bonds plays a role in consumption smoothing in our model, we construct a bond price series from the Federal Reserve Economic Database (FRED). Online Appendix B contains a full description of the construction and a data summary.

Table 1A and 1B document basic facts on the pay by ranks of executive directors, interlocked executives and firm with large fraction of insiders on the board compared to other executives and firms with small fraction of insiders on the board. The salary component is larger for executive directors than salaries of other executives in all ranks. The salaries of interlocked executives are smaller with the exception of interlocked executives in ranks 4 and 5; however, the majority of interlocked executives are in rank 2. Salaries in all ranks are higher in firms with large insider board. However, unlike the previous literature on interlocked executives we find that unconditionally interlocked executives are paid \$ 3.7 million while non-interlocked executives are paid \$ 2.5 million. This highlights the need to control for rank and the structure of firm. The table presents the different components of compensation. Total compensation of executive directors is larger in general (with the exception of rank 1) than the compensation of other executives. With the exception of ranks 4 and 5 the total compensation of interlocked executives is smaller than that of other executives. With the exception of rank 3 total compensation in firms with large insider board is lower than that of the average pay of executives in firms with smaller insider fraction on the board.

To further analyze the pay differentials, Tables 2A and 2B document the personal attributes of executives by rank. Interlocked executives and executives directors are older than other executives and there are no age differences by board structure. Interlocked executives and executives directors have more tenure, experience as executives relative to other executives. Retirement probabilities of board members and interlocked executives are lower and they are more likely to transition to other firms (Table 2B). This facts are consistent with these executives being more entrenched. With the exception of level 5, executives in firms with larger fraction of insiders on the board are also more experienced and have more tenure in the firms, they are less likely to quit the executive occupation or move to another firm. These facts can be related to governance quality and our model rationalizes it in the context of an equilibrium model. Table 3 presents the governance structure by sector, firm

[3] An executive is classified as interlocked if at least one of the following is true: (i) The executive serves on the board committee that makes her compensation decisions. (ii) The executive serves on the board of another company that has an executive officer serving on the compensation committee of the indicated executive's company. (iii) The executive serves on the compensation committee of another company that has an executive officer serving on the board of the indicated executive's company.

size and ranks. Board members are drawn mainly from the top 3 ranks. In all firms the likelihood of becoming executive director is highest for executives at ranks 1 and 2. Executives are more likely to become board members in smaller firms and in the primary sector. The likelihood of becoming interlocked executive is small in all ranks and in all types of firms. It is also larger for executives in the consumer sector (10.5 percent for R1 in this sector) and in small firms (15 percent for R1). The likelihood of being: an executive director is highest for top executives (and 91 percent in R2 versus 5 percent in R5), slightly higher in smaller firms and in the primary sector, an interlocked executive is low (less than 5 percent), larger in the consumer sector (10.5 percent for R1) and in small firms (15 percent for R1).

4 Decomposition of Executive Compensation by Insider Status

Denote by W the expected compensation of an executive with a given set of characteristics for working a given type of firm in a designated position, integrated over the effects of abnormal firm returns. Following GGM we interpret W as the value of the executive's marginal product and decompose it into four additive components:

$$W \equiv \Delta^{\alpha} + \Delta^{p} + \Delta^{q} + \Delta^{r}$$

where Δ^{α} is the systematic component of non-pecuniary utility of the job, Δ^{p} is its investment value, Δ^{q} is the marginal value of the idiosyncratic preference shock that equates demand with supply for that type of executive-position-firm combination, and Δ^{r} is a nonnegative risk premium. GGM use this decomposition to explain why executives in big firms are paid more generously than those in small firms, but it is also a useful tool for probing how measures of governance affect compensation packages.

Insiders and entrenchment (Figure 1) When there are large numbers of insiders on the board expected pay is \$60K lower on average (\$2.96M - \$2.9M); in other words they are less productive. Furthermore certainty equivalent pay is \$340K lower on average (\$60K + \$2.51M - \$2.23M). The difference in certainty equivalent pay is mainly explained by more agreeable work routines (\$250K = \$1.52M - \$1.27M) and human capital considerations (\$110K = \$640K - \$530K). Presumably job descriptions and challenges are easier to meet when executives have a greater hand though their participation on the board, a finding which confirms presvous results by Bertrand and Mularathan (2000). Since the value of human capital is closely related to how long they anticipate remaining with the firm, and executives employed by firms with insider boards

The risk premium is \$280K higher for executives on insider boards (\$2.51M - \$2.23M due to a poorer signal (associated with lower losses from shirking), although career concerns are the same, and there are less benefits to shirking in firms where there are more insiders. The last factor could be due to mutual monitoring or more agreeable work routines in the implicit contract they strike with the board.

Interlocked executives (Figure 2) Compared to non-interlocked executives, the interlocked receive less expected pay, reflected by a lower marginal product ($2.43M versus $2.86M). However they receive a higher a certainty equivalent pay ($710K compared to $560K). The difference is explained by poorer working conditions; the systematic ($110K = M$1.51M - $1.4M) and the idiosyncratic ($40K = $590K - $550K) components are paid as compensating differentials. Perhaps the most obvious explanation is that interlocked executives indirectly affect not only their own pay through their connections to the financial committee, but also those of their colleagues in teh C-suite, putting them in a uncomfortaqble position. We find that human capital considerations do not play a role. Indeed, career concerns are less important for interlocked executives (by $200K). The profitability of the firm provides a less informative signal about the effort of an interlocked executive. Both factors raise the risk premium. However interlocked executives are paid a lower risk premium (by $280K) because the compensating differential for the value of shirking relative to working is lower (by $910K); being interlocked is balanced with having less discretion, which in turn ameliorates goal misalignment between management and shareholders.

Executive directors (Figure 3) Executive directors have a lower value of marginal product, that is paid lower expected compensation, than other executives. Their certainty equivalent equivalent pay is lower ($635K versus $710K) as is their risk premium (by $203K). The reduced certainty equivalent pay to executive directors is more than compensated by benefits stemming from bettter working conditions, stemming from both the systematic and idiosyncratic components(by $40K and $391K respectively). Controlling for their demographics, executive directors place slightly less value on human capital (by $4K) than other executives, reflecting that fact that from a career perspective, they are closer to retirement. Executive directors would benefit more than other executives from tending to their own interests at the expese of shareholders ($130K), not surprising given their elevated position, but for the same reason are more visible than those who are not on the board, and consequently cause less destruction of firm value if they are not provided with incentives than other executives (17.5 percent versus 24.6 percent). This explains why they have greater career concerns ($2.01M versus S1.88M) and hence a lower risk premium.

Female executives (Figure 4) Expected pay, or the value of marginal product, does not differ across genders. However female executives receive higher certainty equivalent pay (by $100K) than males. The primary reason is that females value human capital lower than males (by $100K), and hence require larger compensating differentials, reflecting their higher exit rate, a finding of GGM2012. The nonpecuniary benefits are comparable across gender, differences in systematic and idiosyncratic factors roughly cancelling each other. Thus outside options, such as retirement, are apparently more attractive to females than males; one possible explanation is that female spouses are younger on average than their male counterparts, and marital pairs benefit from coordinating their retirement plans.

Females are paid a lower risk premium than males. With some notable exceptions (in R2 and those joining new firms) female executives place a lower value than males on career concerns, which is consistent with their higher exit rates. This factor increases the risk premium, as does the fact that the gross loss from shirking, an indicator of the signal for striving for the objectives of the firm) is slightly smaller for females. Therefore the lower risk premium to females is primarily because they derive less benefit from shirking than males; intuitively as a highly visible minority their actions are more likely to attract attention, and hence could be subject ot greater informal monitoring.

5 The Model

As mentioned in the introduction, to analyze governance in public corporations, we cannot view the agency problem as a bilateral relationship at a given point of time, but must deal with the whole executive management group at once. we pose the research question by extending the model of Gayle, Golan and Miller (2015). At the beginning of each period executives with their respective endowments of human capital choose their consumption for the period, and then obtain more information about their work prospects for the period. With this information in hand each chooses a firm and position within the firm, or retires. When considering a position in management, they anticipate a multilateral negotiation process between shareholders and the other executives on the firm's management team will follow, but are not fully informed about exactly who will comprise the management team when they make their own individual simultaneous choices about firm and rank. Once a firm's management team has been decided in this way, other tasks are assigned, including executive directorships and hence the composition of the board, plus the degree of interlocking between executives and financial compensation committees. Then the management team makes an ultimatum demand to the board, which is accepted in equilibrium. Finally executives individually choose their effort levels that collectively determine the probability distribution for the firm's abnormal returns and also their human capital investment. We now formally describe the model.

Executives and firms There are a finite number of firm types in the executive labor market, defined by there size and industrial sector, indexed by $j \in \{1, \ldots, J\}$, where $j = 0$ represents retirement. There are K ranks within each firm j, indexed by $k \in \{1, \ldots, K\}$. The composition of the firm and tasks attached to certain position are indicated by $i \in \{0, 1 \ldots, I\}$. Let $t \in \{0, 1, \ldots\}$ denote each executive's age, with retirement upon reaching or before age $T < \infty$. To simplify the notation, we assume that executives are infinitely lived. Each manager's background is defined by age t and a vector of human capital h_t, which includes fixed demographic characteristics and indexes work experience.

Employment and effort choices At the beginning of period t, executives choose consumption, $c_t \in \mathcal{R}$, and, for any $t \leq T$, they make employment choices. Let $d_{0t} \in \{0, 1\}$ denote an indicator variable for retirement, let $d_{J+1,kt} \in \{0, 1\}$ denote an indicator function for continuing with the current employer and choosing rank k, and let $d_{jkt} \in \{0, 1\}$ indicate the executive's choice of rank k in another firm of type $j \in \{1, 2..., J\}$, at age t. The $(J + 1) K + 1$ choices are mutually exclusive, implying:

$$1 = d_{0t} + \sum\nolimits_{j=1}^{J+1} \sum\nolimits_{k=1}^{K} d_{jkt}. \tag{1}$$

Summarizing, $d_t \equiv (d_{0t}, d_{11t}, \ldots, d_{J+1,Kt})$ denotes the vector of job matches from which an executive chooses at any age t preceding retirement. There are two effort levels, working and shirking, denoted by $l_t \in \{0, 1\}$, where $l_t = 0$ means the executive shirks at age t and $l_t = 1$ means the executive works.

Human Capital Accumulation The human capital of an executive is defined by a vector $h_t \equiv (t, d_{t-1}, h_0, h_{1t}, h_{2t}, h_{3t}, h_{4t})$ where h_0 is a fixed set of individual characteristics (such as gender and education), h_{1t} is internal capital at age t, measured by total number of years working for firm as an executive, h_{2t} is general capital at age t, measured by total number of years working as an executive, and h_{3t} is external capital, which we define as the number of past firms worked in as an executive.

The updating rule for $(h_{1t}, h_{2t}, h_{3t}, h_{4t})$ is governed by three assumptions. First the executive loses all his/her internal capital unless s/he remains with the firm and works:

$$h_{1,t+1} \equiv l_t (1 + h_{1t}) \sum\nolimits_{k=1}^{K} d_{J+1,kt}$$

Second, the executive adds to his/her general capital by working:

$$h_{2,t+1} \equiv h_{2t} + l_t$$

Third, the executive adds to his/her external capital only by working and switching firms:

$$h_{3,t+1} \equiv h_{3t} + l_t \sum\nolimits_{j=1}^{J+1} \sum\nolimits_{k=1}^{K} d_{jkt}$$

Fourth, the characteristics of the executive's current firm only change with a new employer; the variable $h_{4t} \in \{1, \ldots, J\}$ tracks those changes:

$$h_{4,t+1} = h_{4t} + \sum\nolimits_{j=1}^{J+1} \sum\nolimits_{k=1}^{K} (j - h_{4t}) d_{jkt}$$

Let $\underline{H}(h_t, d_t)$ denote human capital in period $t+1$ if the executive chooses d_t with human capital h_t in period t and shirks by setting $l_t = 0$; similarly let $\overline{H}(h_t, d_t)$ denote human capital in period $t+1$ if the executive chooses d_t with human cappital h_t in period t and works by setting $l_t = 1$.The assumptions about the laws of motion for human capital for shirking and working imply:

$$\underline{H}(h_t, d_t) \equiv \left(t+1, h_0, 0, h_{2t}, h_{3t}, h_{4t} + \sum\nolimits_{j=1}^{J+1} \sum\nolimits_{k=1}^{K} (j - h_{4t}) d_{jkt}\right)$$

$$\begin{aligned} \overline{H}(h_t, d_t) \quad \equiv \quad & \Big(t+1, h_0, (1 + h_{1t}) \sum\nolimits_{k=1}^{K} d_{J+1,kt}, h_{2t} + 1, \\ & h_{3t} + \sum\nolimits_{j=1,k=1}^{J+1,K} d_{jkt}, h_{4t} + \sum\nolimits_{j=1}^{J+1} \sum\nolimits_{k=1}^{K} (j - h_{4t}) d_{jkt}\Big) \end{aligned}$$

Preferences A manager's preferences depend on his consumption and nonpecuniary utility derived from his working environment. Preferences are characterized by a time-separable discounted sum of utility functions, where the subjective discount factor is δ, and utility per period exhibits constant absolute risk-aversion (CARA) with risk aversion parameter ρ. The utility function decomposes into utility from consumption and nonpecuniary features of employment that depend on the employer's firm, the composition of the management team, the executive's position, his assigned tasks and chosen effort level. The nonpecuniary costs of working and shirking differ by rank and firm type, and are further decomposed into systematic and nonsystematic components.

The nonsystematic components comprise idiosyncratic shocks relating to the executive's firm and rank choices, the composition of the management team, and the task assignment. A $(J+1)K+1$ dimensional taste shock vector denoted by $\varepsilon_t \equiv (\varepsilon_{0t}, \varepsilon_{11t}, \ldots, \varepsilon_{J+1,Kt})$ is determined by the executive's choice of position: the retired manager's taste shock is given by ε_{0t}, the shock from continuing to work for the same employer in rank k is $\varepsilon_{J+1,kt}$, and the taste shock from working for a new firm $j \in (1, \ldots, J)$ at rank k in period is ε_{jkt}. We assume ε_t is independent and identically distributed, taking the nested logit form. One nest is defined by the K dimensional random vector $(\varepsilon_{J+1,1t}, \ldots, \varepsilon_{J+1,Kt})$, for continuing with the current firm. A second nest encompasses for all JK positions at new firms $(\varepsilon_{11t}, \varepsilon_{12t}, \ldots, \varepsilon_{JKt})$. Given firm and rank choices d_t, a second random variable simultaneously determines the composition of the management team to which the executive belongs, and their task assignments, in other words its corporate culture.

In contrast to nonsystematic components, the systematic components of utility depend on the manager's effort, the tasks to which he is assigned, and the firm's cultural mix. The latter also depends on the characteristics and experience h, as well as firm and rank (j,k). If $l_t = 1$, the nonpecuniary cost of working in t is $\alpha_{ijkt}(h)$; if $l_t = 0$, work cost is $\beta_{ijkt}(h)$. The nonpecuniary benefits from retirement are normalized to be equal to one and we assume there is more disutility from working than from shirking, so $\alpha_{ijkt}(h) > \beta_{ijkt}(h) > 0$. Thus the manager's lifetime utility can be summarized as:

$$-\sum_{t=1}^{\infty} \delta^t \exp(-\rho c_t) \left[d_{0t} \exp(-\varepsilon_{0t}) + \sum_{i=1}^{I} \sum_{j=1}^{J+1} \sum_{k=1}^{K} d_{jkt} [\alpha_{ijkt}(h_t) l_t + \beta_{ijkt}(h_t)(1-l_t)] \exp(-\varepsilon_{jkt}) \right]. \quad (2)$$

Firm technology Let τ denote calendar time, $\mathcal{E}_{j\tau}$ denote the equity value of the j^{th} firm at the beginning of period τ, and $\mathcal{D}_{j\tau}$ dividends paid at the begining of the period. Let $\pi_{\tau+1}$ an aggregate return on corporate capital realized at the end of period τ, and denote by $\pi_{j,\tau+1}$ the individual return to the firm net of $\pi_{\tau+1}$ but before payements to the management team. Suppose the management team is composed of $N_{j\tau}$ executives in τ, the set whom we denote by $\mathcal{N}_{j\tau}$. Also let $t(n,\tau)$ denote the age of executive n at calendar time τ, and $w_{ijkt(n,\tau)+1}$ compensation to the n^{th} executive for employment in (i,j,k) in period τ at age t, measured in units of current consumption at $\tau+1$. Then by definition the equity value of firm j at the beginning of period τ is:

$$\mathcal{E}_{j,\tau+1} = \mathcal{E}_{j\tau}(\pi_{\tau+1} + \pi_{j,\tau+1}) - \textstyle\sum_{n \in \mathcal{N}_{j\tau}}^{N} \sum_{k=1}^{K} d_{jkt(\tau,n)} w_{ijkt(n,\tau)+1} - \mathcal{D}_{j,\tau+1}$$

Executive effort only affects firm production through the probability distribution determining $\pi_{j,\tau+1}$. We assume that the probability density function for $\pi_{j,\tau+1}$ is $f_{ij}(\pi_{j,\tau+1})$ when all the executives employed in firm type j with culture is i work at τ, that is when $l_{t(n,\tau)} = 1$ for all $n \in \mathcal{N}_{j\tau}$. If one executive at rank k shirks and every other executive works the probability density for $\pi_{j,\tau+1}$ is $f_{ij}(\pi_{j,\tau+1})g_{ijk}(\pi_{j,\tau+1} | h_t)$ when all executives but k work. We denote the probability density function for abnormal if at least two executives shirk by $f_{0j}(\pi)$, the abnormal returns from a corrupted firm, and assume the gross expected return to a firms increase with the number of people who work:[4]

$$\int \pi f_{ij}(\pi)d\pi > \max\left\{\int \pi f_{ij}(\pi)g_{ijk}(\pi | h_t)d\pi > \int \pi f_{0j}(\pi)d\pi\right\} \tag{3}$$

The potential for conflict between executive and shareholder goals arises in this model from the preferences of executives to shirk rather than work, that is $\alpha_{ijkt}(h_t) > \beta_{ijkt}(h_t)$, whereas the inequalities in (3) show production is greater when all executives work. The likelihood ratio $g_{ijk}(\pi|h_t)$ measures the degree to which executive effort can affect a firm's returns, and can be interpreted as a measure of the span of control for that position. For example if $g_{ijk}(\pi|h) \equiv 1$ for all π, then the effort level of an executive with background h and rank k has no effect in a type j firm, whereas if $g_{ijk}(\pi|h)$ is steeply decreasing over the support of π then the same executive greatly reduces the value of the firm by shirking. Effort is unobserved in our model but $\pi_{j,\tau+1}$ is a signal of effort. In this respect $g_{jk}(\pi|h_t)$ measure the quality of the signal. For example if $g_{ijk}(\pi', h) = 1$ for some π' then the signal is uninformative about effort. If there exists some π'' in the support of $f_{ij}(\pi)$ such that $g_{ijk}(\pi'', h)$ was arbitrarily large, then the signal would so informative that a first best allocation could be achieved, by heavily penalizing all executives if π'' occurs, and paying a constant wage otherwise. Since executives are not paid constant wages, we assume $g_{ijk}(\pi|h_t)$ is bounded. We also impose the regularity condition:

$$\lim_{\pi\to\infty} g_{ijk}(\pi|h_t) = 0. \tag{4}$$

Intuitively this condition states that if firm performance at the end of the period is truly outstanding, then shareholders are almost certain that all the executives have worked during the period. Our assumptions ensure the existence of an optimal contract with bounded compensation (Mirrlees, 1975), and are clearly weaker than the common monotonicity assumption requiring $g_{ijk}(\pi|h_t)$ to decline in π.

Information, capital markets and timing To summarize the information structure, taste shocks, consumption, asset and effort level choices are assumed to be private information to the executive. Shareholders observe rank and firm choices by executives, as well as the realization of aggregate and firm specific returns, but can infer their human capital, because they do not observe past effort levels.

We assume there exists a complete contingent-claims market for consumption, including all publicly disclosed events. This implies an executive can save for his/her retirement, and insure him/herself

[4] In the equilibrium contracts of this model, all executives are induced to work, so the precise functional form of $f_{0j}(\pi)$ is immaterial, since only unilateral deviations to shirk, not bilateral deviations, are considered in any such equilibrium contract.

against future idiosyncratic and aggregate shocks, the former for free, the latter at a price. However the executive's wealth at age t, denoted by ξ_t, is endogenously determined by her compensation and cannot be fully insured when compensation depends on the firm's returns $\pi_{j,\tau+1}$. In this way we separate the agency problem of noncontractible payoff relevant information, from the problem of smoothing consumption when income is volatile; both are important factors in managerial compensation.[5]

At the beginning of each period each executive knows his/her h_t and privately chooses consumption c_t. Then s/he privately observes ε_t and selects a firm and position (j, k). Their choices generate $a_{j\tau}$, the composition of the management team and with the assignments of tasks to each executive in firm j. In the ensuing negotiation stage between the management team and shareholders, the former make an ultimatum offer to the latter. If no agreement is reached, the executives are not employed during that period, there is no additional hiring by the firm, and the breakdown in negotiations is observed by everyone.[6] If approved, each executive privately chooses l_{nt}.Then h_t is updated with $\underline{H}(h_t, d_{nt})$ or $\overline{H}(h_t, d_t)$. Finally, at the end of the τ^{th} calendar period, $\pi_{\tau+1}$, the aggregate effect on returns, and $\pi_{j,\tau+1}$, the abnormal return to each firm j, is revealed, and managerial compensations $w_{jkt(\tau)+1}$ are paid to all the executives.

6 Equilibrium

There are three main aspects to the equilibrium, consumption and labor supply choices, the effort choice and the solution to the optimal contract.[7] Separable preferences, absolute risk aversion and the complete capital markets simplify the solution to executives' consumption and labor supply problems; their indirect utility function, a mapping from their wealth, history maps their expected utility as a function of the relevant security prices, the portion of their wealth that can be fully diversified, the distribution of any unanticipated changes in their wealth induced by the undiversifiable component of their contingent compensation and the option value of their stock of human capital. However the game exhibits incomplete information because shareholders never have the opportunity to verify the history of the executives they employ, and this complicates the equilibrium derivation. We denote by h'_t denote shareholders' belief about an executive's human capital, to be distinguished from h_t, his/her actual human capital. Consequently there is only one subgame, the whole game. We show that a perfect equilibrium exists where all executives work on the equilibrium path, and it is not optimal for executives to declare any past shirking. In this equilibrium shareholders believe that if executives make demands that are off the equilibrium path, the whole management team has become tainted, lowering their productivity to levels that are unacceptable to shareholders.

Intertemporal consumption, employment choices and equilibrium sorting We analyze a perfect equilibrium in which executives are incentivized to work every period. Let $p_{jkt}(h, h')$ denote

[5] In these resepcts framework folllows Margiotta and Miller (2000).

[6] That is, to simplify the analysis of outcomes that can occur off the equilibrium path, we assume that all accepted and rejected contracts and employment histories are observed by all firms.

[7] The model specification implies the composition of the management team and task assignment is an exogenous process, estimated as part of the transition process in our empirical specification.

the probability of choosing (j,k) at age t conditional on (h,h'). Similarly, denote the retirement probability by $p_{0t}(h,h')$. Denote the utility of the present value of compensation by

$$\upsilon'_{ijk,t(\tau)+1} \equiv \exp\left(-\rho w_{ijk,t(\tau)+1}(h'_t,\pi_t)/b_{\tau+1}\right). \tag{5}$$

where b_τ denote the price of a bond that, contingent on the history through date τ, pays a unit of consumption from period τ in perpetuity in period-τ prices. Also denote by q_{ij} the probability that a type j firm has corporate culture b$i \in (1,\ldots,I)$.

Theorem 6.1 *Abbreviating $\tau = \tau(t)$, job matches d_t and effort levels l_t are picked to sequentially maximize:*

$$\varepsilon_{0t}d_{0t} + \sum_{j=1}^{J}\sum_{k=1}^{K} d_{jkt}\left\{\varepsilon_{jkt} - \ln\left[\sum_{k=1}^{K} q_{ik}V_{ijkt}(h,h',b_\tau)\right]\right\} \tag{6}$$

where

$$\begin{aligned} V_{ijkt}(h,h',b_\tau) \quad \equiv \quad & \min\left\{\alpha_{ijkt}(h)^{\frac{1}{b_\tau}}\left\{p_{0,t+1}\left[\overline{H}(h,d_t),\overline{H}(h',d_t)\right]^{\frac{1}{b_{\tau+1}}}E_t\left[\upsilon'_{ijk,t+1}\right]\right\}^{1-\frac{1}{b_\tau}},\right. \\ & \left.\beta_{ijkt}(h)^{\frac{1}{b_\tau}}\left\{p_{0,t+1}\left[\underline{H}(h,d_t),\overline{H}(h',d_t)\right]^{\frac{1}{b_{\tau+1}}}E_t\left[\upsilon'_{ijk,t+1}g_{jkt}(\pi\,|h)\right]\right\}^{1-\frac{1}{b_t}}\right\} \end{aligned} \tag{7}$$

The first element of the minimization operator in Equation (7) is proportional to the manager's conditional valuation function, net of lifetime utility conferred by endowment wealth, at age t in position (j,k) with human capital h and reputation h' from choosing to work. The second element is proportional to a conditional-valuation function for a similarly placed manager from choosing to shirk: She reaps the immediate benefit from shirking since $\beta_{ijkt}(h) < \alpha_{ijkt}(h)$, but firm returns are drawn from $g_{ijkt(\tau)}(\pi\,|h)f(\pi)$ rather than $f_j(\pi)$, affecting the probability distribution of her compensation; her reputation subsequently diverges further from her true human capital. Formally the result follows from four features of the model: absolute risk aversion assumption plus markets for nonlabor income implies separation between consumption smoothing from labor income process and financial wealth (Margiotta and Miller, 2000); the model satisfies the inversion theorem so we can write differences in conditional valuation function in terms of choice probabilities (Hotz and Miller, 1993 , Proposition 1); the retirement option leads to a terminal state (Hotz and Miller, 1993), so other choices can be valued easily with respect to this exit option.

Supposing all executives work in all periods, then $h' = h$ and $V_{ijkt}(h,h,b_\tau)$ is attained by the left element in the brackets of (**??**) on the right side. If in addition ε_{jkt} is distributed according to the nested logit specification described in the previous section, then from the top line of (6), the equilibrium sorting of job/firm combinations is given by the relation:

$$\begin{aligned} & \ln\left[p_{0t}(h,h)\right]-\sigma_{\widetilde{J}}\ln\left[p_{jkt}(h,h)\right]-\left(1-\sigma_{\widetilde{J}}\right)\ln\left\{\sum_{j'=1}^{J}\sum_{k=1}^{K}p_{j'kt}(h,h)\right\} \\ = \; & \ln\sum_{i=1}^{I}q_{ik}\left\{\alpha_{ijkt}(h)^{\frac{1}{b_\tau}}E_t[\upsilon_{ijk,t(\tau)+1}]^{1-\frac{1}{b_\tau}}\right\}+\frac{b_\tau-1}{b_\tau b_{\tau+1}}\ln p_{0,t+1}\left[\overline{H}\left(h',d_t\right),\overline{H}\left(h',d_t\right)\right] \end{aligned}$$

for jobs in other firms and, within the same firm:

$$\begin{aligned} & \ln\left[p_{0t}(h,h)\right]-\sigma_{J+1}\ln\left[p_{J+1,kt}(h,h)\right]-\left(1-\sigma_{J+1}\right)\ln\left\{\sum_{k=1}^{K}p_{J+1,kt}(h,h)\right\} \\ = \; & \sum_{i=1}^{I}q_{ik}\left\{\ln\alpha_{i,J+1,kt}(h)+\ln(b_\tau-1)E_t[\upsilon_{i,J+1,k,t(\tau)+1}]\right\}+\frac{b_\tau-1}{b_{\tau+1}}\ln p_{0,t+1}\left[\overline{H}\left(h',d_t\right),\overline{H}\left(h',d_t\right)\right]. \end{aligned} \tag{8}$$

Optimal compensation The executives in each firm write contracts ensuring that condtional on working up until now, each of them prefers to work at least one morer period rather than shirk in the current period, taking into account how this will affect future payoffs. From Equation (7) the incentive compatibility constraint is:

$$\left[\frac{\alpha_{ijkt}(h)}{\beta_{ijkt}(h)}\right]^{\frac{1}{b_\tau-1}}\leq\left\{\frac{p_{0,t+1}\left[\underline{H}(h),\overline{H}(h',d_t)\right]}{p_{0,t+1}\left[\overline{H}(h,d_t),\overline{H}(h',d_t)\right]}\right\}^{\frac{1}{b_{\tau+1}}}\frac{E_t\left[\upsilon'_{ijk,t+1}g_{jkt}(\pi\,|h)\right]}{E_t\left[\upsilon'_{ijk,t+1}\right]}$$

Whenever $p_{0,t+1}\left[\underline{H}(h),\overline{H}(h',d_t)\right]<p_{0,t+1}\left[\overline{H}(h,d_t),\overline{H}(h',d_t)\right]$, career concerns ameliorate the agency problem. For example, the future benefits of human capital fully offset the current gains from shirking, implying the executive would work for a fixed wage satisfying the participation constraint if:

$$\frac{\alpha_{ijkt}(h)}{\beta_{ijkt}(h)}\leq\left\{\frac{p_{0,t+1}\left[\underline{H}(h),\overline{H}(h',d_t)\right]}{p_{0,t+1}\left[\overline{H}(h,d_t),\overline{H}(h',d_t)\right]}\right\}^{\frac{b_\tau-1}{b_{\tau+1}}}$$

The optimal contract for each executive can be found by solving the dual cost minimization problem of minimizing costs subject to the incentive compatibility and sorting probabilities. Define:

$$r_{ijk,t+1}(h,\pi)\equiv\begin{cases}0 & \text{if (??) holds}\\ \frac{b_{\tau+1}}{\rho}\ln\left\{1-\eta g_{ijkt}(\pi\,|h)+\eta\left[\frac{p_{0,t+1}\left[\overline{H}(h,d_t),\overline{H}(h,d_t)\right]}{p_{0,t+1}\left[\underline{H}(h,d_t),\overline{H}(h,d_t)\right]}\right]^{\frac{1}{b_\tau}}\left[\frac{\alpha_{ijkt}(h)}{\beta_{ijkt}(h)}\right]^{\frac{1}{b_\tau-1}}\right\} & \text{otherwise}\end{cases}$$

where η the unique positive root to:

$$\int \frac{f_j(\pi)}{\eta^{-1} + \left[\frac{p_{0,t+1}\left[\overline{H}(h,d_t),\overline{H}(h,d_t)\right]}{p_{0,t+1}\left[\underline{H}(h,d_t),\overline{H}(h,d_t)\right]}\right]^{\frac{1}{b_\tau}} \left[\frac{\alpha_{jkt}(h)}{\beta_{jkt}(h)}\right]^{\frac{1}{b_\tau - 1}} - g_{jkt}(\pi \left| h \right.)} d\pi = 1$$

Also let:

$$\begin{aligned}
\Delta^{\alpha}_{ijkt}(h) &\equiv \rho^{-1}(b_\tau - 1)^{-1} b_{\tau+1} \ln \alpha_{ijkt}(h) \\
\Delta^{p}_{jkt}(h) &\equiv \rho^{-1} \ln p_{0,t+1}\left[\overline{H}(h,d_t), \overline{H}(h,d_t)\right] + \rho^{-1} b_{\tau+1} \ln \Gamma\left(\frac{b_{\tau+1}+1}{b_{\tau+1}}\right) \\
\Delta^{q}_{jkt}(h) &\equiv \rho^{-1}(b_\tau - 1)^{-1} b_{\tau+1} \ln \left[\frac{p_{jkt}(h)}{p_{0t}(h)}\right]
\end{aligned}$$

The next theorem extends Theorem 5.2 of GGM on compensation to workplace situations in which employees enjoy some but not complete latitute over their choice of job assignments within their firm. In words expected compensation decomposes into four pieces, the first three of which comprise the certainty-equivalent wage: $\Delta^{\alpha}_{ijkt}(h)$ is the systematic component of non-pecuniary utility; $\Delta^{p}_{jkt}(h)$ is the investment of the job; $\Delta^{q}_{jkt}(h)$ are the idiosyncratic values making executive in fractal $p_{jkt}(h,h)$ indifferent between (j,k) and retirement; $r_{jk,t+1}(h,\pi)$ is the variable component of compensation with expectation $\Delta^{r}_{ijkt}(h) \equiv E\left[r_{ijk,t+1}(h,\pi)\right]$, the risk premium.

Theorem 6.2 *In equilibrium:*

$$w_{ijk,t+1}(h,\pi) \equiv \Delta^{\alpha}_{ijkt}(h) + \Delta^{p}_{jkt}(h) + \Delta^{q}_{jkt}(h) + r_{ijk,t+1}(h,\pi) \tag{9}$$

7 Empirical Strategy

Turning now to the empirical strategy, we isolate the effects of the various driving forces behind the empirical regularities observed in our data through the lens of our theoretical model. Our data consist of matched panel data on firms and their executives in different time periods, consisting of job-match choices d_{jkt} over firm types j, culture i, and ranks k, their compensation w_{jkt} indexed by age t, executive demographic information and employment histories h_t, excess firm returns $\pi_{j\tau}$ indexed by calendar time τ, and bond prices b_τ, again indexed by calendar time. The model is characterized by its preference and technology parameters. The preference parameters include the coefficient of risk aversion ρ, the disutility from working $\alpha_{ijkt}(h_t)$, the disutility from shirking $\beta_{ijkt}(h_t)$, and an idiosyncratic taste shock associated with each job match $G(\varepsilon_t)$. The technology parameters are the marginal product of work $F_{jk}(h)$, the probability density function of excess returns when every executive works, $f_{ij}(\pi)$, and the likelihood ratio $g_{ijk}(\pi \left| h_t \right.)$ that essentially defines the density $f_{ij}(\pi) g_{ijk}(\pi \left| h_t \right.)$ when everybody except from one executive in rank k at firm j with culture i works.

Our approach to identification and estimation follows GGM, dealing first with compensating differentials and risk aversion with a CCP estimator, and then exploiting the recursive structure of the dynamic framework to recover the remaining parameters associated with the agency problem. In this section we first outline the steps in identification and then describe the estimator.

Compensating differentials and risk aversion Noting that from the perspective of an executive (6) is a nonstationary dynamic discrete choice problem, we can appeal to Arcidiacono and Miller (2015) to show that $\alpha_{ijkt}(h)$ and ρ are identified up the distribution of ε_t. Intuitively jobs are like lottery tickets. Distinct jobs differ in their probability distributions over their pecuniary payoffs, and the shadow values of their nonpecuniary features. Hence the different characteristics of their job choices induce executives to reveal their attitude towards risk, the value they place on nonpecuniary features of the job, and their investment value. Sample analogs were constructed for the CCPs, compensation schedule, and conditional and unconditional densities of the abnormal return. We constructed a GMM estimator can be constructed from moment conditions using (**??**).

The CCP vector is identified by the conditional expectation of $d_{ijk\tau}$, on $(h_{i\tau}, t_{i\tau}, b_\tau)$. Exponentiating equation (8) (**??**) and then raising it to the power of $1/b_\tau$ yields:[8]

$$
\begin{aligned}
& \ln\left[\frac{p_{0t}(h,h)}{p_{jkt}(h,h)}\left[\frac{p_{jkt}(h,h)}{\sum_{j'=1}^{J}\sum_{k=1}^{K}p_{j'kt}(h,h)}\right]^{(1-\sigma_{\tilde{J}})} p_{0,t+1}\left[\overline{H}\left(h',d_t\right),\overline{H}\left(h',d_t\right)\right]^{\frac{b_\tau b_{\tau+1}}{b_\tau-1}}\right] \\
= & \ln\sum_{i=1}^{I}q_{ik}\left\{\alpha_{ijkt}(h)^{\frac{1}{b_\tau}}E_t[\upsilon_{ijk,t(\tau)+1}]^{1-\frac{1}{b_\tau}}\right\}+\ln
\end{aligned}
$$

$$
\begin{aligned}
& \frac{p_{0t}(h,h)}{p_{jkt}(h,h)}p_{0,t+1}\left[\overline{H}\left(h',d_t\right),\overline{H}\left(h',d_t\right)\right]^{\frac{b_\tau b_{\tau+1}}{b_\tau-1}} \\
= & \sum_{i=1}^{I}q_{ik}\left\{\left[p_{jkt}(h,h)\Big/\sum_{j'=1}^{J}\sum_{k=1}^{K}p_{j'kt}(h,h)\right]^{(\sigma_{\tilde{J}}-1)}\alpha_{ijkt}(h)^{\frac{1}{b_\tau}}E_t[\upsilon_{ijk,t(\tau)+1}]^{1-\frac{1}{b_\tau}}\right\}
\end{aligned}
$$

and for jobs in other firms and, within the same firm:

$$
\begin{aligned}
& \ln\left[p_{0t}(h,h)\right]-\sigma_{J+1}\ln\left[p_{J+1,kt}(h,h)\right]-(1-\sigma_{J+1})\ln\left\{\sum_{k=1}^{K}p_{J+1,kt}(h,h)\right\} \\
= & \sum_{k=1}^{K}q_{ik}\left\{\ln\alpha_{i,J+1,kt}(h)+\ln(b_\tau-1)E_t[\upsilon_{i,J+1,k,t(\tau)+1}]\right\}+\frac{b_\tau-1}{b_{\tau+1}}\ln p_{0,t+1}\left[\overline{H}\left(h',d_t\right),\overline{H}\left(h',d_t\right)\right].
\end{aligned}
$$

$$
\alpha_{jkt}(h)^{\frac{1}{b_\tau}}\left\{E_t[\upsilon_{jk,t+1}]p_{0,t+1}(h+\Delta_{jkt},h+\Delta_{jkt})^{\frac{1}{b_{t=1}}}\Gamma\left[\left(b_{t+1}+1\right)/b_{t+1}\right]\right\}^{1-\frac{1}{b_\tau}}=\left(\frac{p_{jkt}(h,h)}{p_{0t}(h,h)}\right)^{\frac{1}{b_\tau}}. \quad (10)
$$

[8] Henceforth, the dependence of $A_t(h)$ and $B_t(h,h')$ on b_τ is made explicit. In identification and estimation, b_τ plays a critical role; for example, in Gayle and Miller (2009b) the exclusion restriction on b_τ is one of the main sources of identification.

Rearranging (10) we obtain

$$\alpha_{jkt}(h_t) = \left(\frac{p_{jkt}(h,h)}{p_{0t}(h,h)}\right)\frac{1}{p_{0,t+1}(h+\Delta_{jkt},h+\Delta_{jkt})^{b_\tau-1}\Gamma\left[\frac{b_{t+1}+1}{b_{t+1}}\right]^{b_\tau-1}}E\left[e^{-\rho w_{jk,t+1}(h,\pi)/b_{\tau+1}}|h_t,j\right]^{1-b_\tau}. \quad (11)$$

Equation (11) is an equilibrium sorting condition characterized by $E_t[v_{jk,t+1}]$ that accounts for certainty equivalent pay, the value of human capital $p_{0,t+1}(h+\Delta_{jkt},h+\Delta_{jkt})\Gamma\left[\frac{b_{t+1}+1}{b_{t+1}}\right]$, a shrinkage factor that raises the value of job matches, and a market-clearing condition captured by $\left(\frac{p_{jkt}(h,h)}{p_{0t}(h,h)}\right)$ that equilibrates the idiosyncratic individual taste disturbances.

The compensation schedules offered by different ranks, firms, board and executives's network structures can be interpreted as choices over lotteries with different nonpecuniary characteristics. Thus, (11) can be used to identify both $\alpha_{jkt}(h_t)$ and ρ when exclusion restrictions exist that limit the dependence of the taste parameters on variables the help determine the contract. Define $z_{jkt}(h,b_\tau,b_{\tau+1})$ as

$$z_{jkt}(h,b_\tau,b_{\tau+1}) \equiv \Gamma\left(\frac{b_{\tau+1}+1}{b_{\tau+1}}\right)^{-1} p_{0,t+1}(h+\Delta_{jkt},h+\Delta_{jkt})^{\frac{-1}{b_{\tau+1}}}\left[\frac{p_{0t}(h,h)}{p_{jkt}(h,h)}\right]^{\frac{1}{(b_\tau-1)}} \quad (12)$$

since $p_{jkt}(h,h)$, $p_{0t}(h,h)$, and ${}^{-1}p_{0,t+1}(h+\Delta_{jkt},h+\Delta_{jkt})$ are identified from the conditional expectation of $d_{ijk\tau}$, on $(h_{i\tau},t_{i\tau},b_\tau)$, so is $z_{jkt}(h,b_\tau,b_{\tau+1})$. Identification of ρ and $\alpha_{jkt}(h)$ then follow from assumptions that some components of (j,k,t,h,b_τ) affect $z_{jkt}(h,b_\tau,b_{\tau+1})$ but neither ρ nor $\alpha_{jkt}(h)$. Note that all the elements in (j,k,t,h,b_τ) belong to the information set of the executive at the beginning of each age period t that affects her choices. This can be ascertained by checking for variation in the CCP vector. Hence, they qualify as valid instruments if they do not affect preferences as well. In this paper, we assume that (i) ρ is independent of an executive's human capital and (ii) that the nonpecuniary cost of switching firms or ranks does not depend on some dimension of human-capital accumulation. In estimation, we use previous ranks as an instrument. Similarly, b_τ is a valid instrument if, as we later assume, ρ and $\alpha_{jkt}(h)$ are independent of the aggregate state of the economy.

Let x denote a vector of instruments constructed from (h,j,k,b_τ) for each observation, and define the unconditional density of π as $f(\pi)$. Substituting $z_{jkt}(h,b_\tau,b_{\tau+1})$ into (11), rearranging to make $z_{jkt}(h,b_\tau,b_{\tau+1})$ the subject of the equation, and taking expectations conditional on x yields

$$E[z_{jkt}(h,b_\tau,b_{\tau+1})|x] = E\left[\alpha_{jkt}(h)^{\frac{1}{b_\tau-1}}\exp\left(\frac{-\rho w_{jk,t+1}(\pi,h)}{b_{\tau+1}}\right)\frac{f_j(\pi)}{f(\pi)}|x\right]. \quad (13)$$

Thus, ρ and $\alpha_{jkt}(h)$ are identified from the conditional expectations function (13).

The likielihood ratio This only leaves $\beta_{jkt}(h)$ and $g_{jkt}(\pi|h)$ to identify and estimate. Note that we can only identify these two parameters career concerns do not fully offset the agency problem, that is when $r_{jk,t+1}(h,\pi)\neq 0$ implying (from thei incentive compatibility condition) that

$$r_{jk,t+1}(h,\pi) = \frac{b_{\tau+1}}{\rho}\ln\left\{1-\eta g_{jkt}(\pi|h)+\eta\left[\frac{p_{0,t+1}\left[\overline{H}(h,d_t),\overline{H}(h,d_t)\right]}{p_{0,t+1}\left[\underline{H}(h,d_t),\overline{H}(h,d_t)\right]}\right]^{\frac{1}{b_\tau}}\left[\frac{\alpha_{jkt}(h)}{\beta_{jkt}(h)}\right]^{\frac{1}{b_\tau-1}}\right\}$$

With regards the likelihood ratio $g_{jkt}(\pi\,|h)$ we follow Gayle and Miller (2015) by exploiting the curvature of the compensation equation. From the optimal compensation equation (9):

$$\frac{\partial w_{jk,t+1}(h,\pi)}{\partial \pi} = \frac{\partial r_{jk,t+1}(h,\pi)}{\partial \pi}$$

Note the preferences for shirking $\beta_{jkt}(h)$ we note that this term also only enters through $r_{jk,t+1}(h,\pi)$. We obtain this parameter by successively solving for $p_{0,t+1}\left[\underline{H}(h,d_t), \overline{H}(h,d_t)\right]$ using backwards induction and in the process identifying $\beta_{jkT}(h)$, $\beta_{jk,T-1}(h)$,.... with the compensation equation.

From the data the equilibrium compensation schedule, $w_{jk,t+1}(h_t,\pi)$, is identified by the conditional expectation of individual observations of compensation on $(d_{jkt},\pi_{j\tau},h_t,t,b_\tau)$.[9] The finite-upper-bound property of $r_{jk,t+1}(h,\pi)$ and the optimal compensation schedule in equation (**??**) imply that compensation is bounded and the executive's maximum compensation is

$$\lim_{\pi\to\infty} w_{jk,t+1}(h,\pi) = w^*_{jk,t+1}(h) + \overline{r}_{jk,t+1}(h) \equiv \overline{w}_{jk,t+1}(h). \quad (14)$$

Thus, $\overline{w}_{jk,t+1}(h_t)$ is identified by the maximum of $w_{jk,t+1}$ conditional on (d_{jkt},h_t,t,b_τ).

GGM demonstrates that, in equilibrium, $g_{jk}(\pi\,|h_t)$ is a mapping of the identified functions $p_t(h)$, $w_{jk,t+1}(h_t,\pi)$, $\overline{w}_{jk,t+1}(h_t)$, and ρ. Intuitively, (15) shows $g_{jk}(\pi\,|h_t)$ is identified from the curvature of $w_{jkt+1}(h_t,\pi)$. Therefore in equilibrium

$$g_{jk}(\pi|h_t) = \frac{e^{\rho\overline{w}_{jk,t+1}(h_t)/b_{\tau+1}} - e^{\rho w_{jk,t+1}(h_t,\pi)/b_{\tau+1}}}{e^{\rho\overline{w}_{jk,t+1}(h_t)/b_{\tau+1}} - E[e^{\rho w_{jk,t+1}(h,\pi)/b_{\tau+1}}|h_t,j]}. \quad (15)$$

Shadow benefit of shirking So identification purposes is instructive to a virtual shirking parameter as

$$\beta^*_{jkt}(h) \equiv \beta_{jkt}(h)\left\{\frac{p_{0,t+1}\left[h+\Delta_{jkt},h+\Delta_{jkt},b_\tau\right]}{p_{0,t+1}\left[h+\underline{\Delta}_{jkt},h+\Delta_{jkt},b_\tau\right]}\right\}^{(b_\tau-1)}. \quad (16)$$

Having identified the working preference parameter $\alpha_{jkt}(h_t)$ from (11) and the likelihood ratio $g_{jk}(\pi|h_t)$ from (15), the shirking preference parameter $\beta^*_{jkt}(h_t)$ is now identified from the incentive-compatibility constraint (**??**), which holds with equality when compensation varies with π:

$$\beta^*_{jkt}(h) = \left(\frac{p_{jkt}(h,h)}{p_{0t}(h,h)}\right)\frac{1}{p_{0,t+1}(h+\Delta_{jkt},h+\Delta_{jkt})^{b_\tau-1}\Gamma\left[\frac{b_{t+1}+1}{b_{t+1}}\right]^{b_\tau-1}}E\left[e^{\rho w_{jk,t\ +1}(h,\pi)/b_{\tau+1}}g_{jk}(\pi|h_t)|h,j\right]^{1-b_\tau}. \quad (17)$$

Note that the virtual shrinking parameter is a combination of the explicit incentives $(\beta_{jkt}(h))$ and the implicitly incentives $\left\{p_{0,t+1}\left[h+\Delta_{jkt},h+\Delta_{jkt},b_\tau\right]/p_{0,t+1}\left[h+\underline{\Delta}_{jkt},h+\Delta_{jkt},b_\tau\right]\right\}^{(b_\tau-1)}$. While $p_{0,t+1}\left[h+\Delta_{jkt},h+\right.$ is identified on the equilibrium paths $p_{0,t+1}\left[h+\underline{\Delta}_{jkt},h+\Delta_{jkt},b_\tau\right]$ is counterfactual is not. So in order to identify the explicit from the implicit incentives we need to identify $p_{0,t+1}\left[h+\underline{\Delta}_{jkt},h+\Delta_{jkt},b_\tau\right]$. Imposing exclusion restrictions on preferences or the technology of human capital accumulation does, however, distinguish the explicit incentives from the implicit incentives component.

[9] In this way, we allow for observations on compensation to be measured with independent error.

7.1 Estimation

We use a four step procedure, which directly follows the approach of our identification strategy, to estimate and test our models:

1. Flexibly estimate $w_{jkt}(\pi, h)$, $\overline{w}_{jkt}(h)$, $f_j(\pi)$, $f(\pi)$, and $p_{jkt}(h)$.
2. Estimate ρ and $\alpha_{jkt}(h)$ from sample moments formed from population moments implied by (13), replacing $w_{jkt}(\pi, h)$, $\overline{w}_{jkt}(h)$, $f_j(\pi)$, $f(\pi)$, and $p_{jkt}(h)$ with their estimates obtained from Step 1.
3. Use the formulas from equations (15) and (17) to estimate $g_{jk}(\pi \,|h)$ and $\beta^*_{jkt}(h)$ by replacing ρ with its estimate from Step 2 and $w_{jkt}(\pi, h)$, $\overline{w}_{jkt}(h)$, $f_j(\pi)$, and $p_{jkt}(h)$ with their estimates from Step 1.
4. Numerically calculate $p_{0,t+1}\left[h + \underline{\Delta}_{jkt}, h + \Delta_{jkt}, b_{\tau(t+1)}\right]$ recursively, assuming that $\beta_{jkt}(h)$ is independent of b_τ and that $\underline{\Delta}_{jkt}$ is known, and test the implied overidentifying restrictions.

Step 1. The state space for the dynamic system is the Cartesian product of the executive's age, t, and personal background, $h_t \in \{1, \ldots, H\}$, at the beginning of each period, as well as a vector that includes her employer firm during the last period, $j_{t-1} \in \{1, \ldots, 36\}$, management rank last period, $k_{t-1} \in \{0, 1, \ldots, 5\}$, fixed components (such as cohort, gender, and education), and other variable components (such as measures of executive experience). Job matches in our model follow a stochastic law of motion, $p_{jkt}(h_t)$ and $p_{0t}(h_t)$. We estimate a multinomial logit model of firm type and position transitions with some (but not all) interactions for exit, promotions, and turnover. In estimation, we exploit Bayes' rule: Given background h, the (joint) probability, $p_{jkt}(h_t)$, is the product of the probability of choosing the jth firm conditional on choosing the kth rank, and the (marginal) probability of choosing Rank k. The compensation schedule, $w_{jkt(\tau)}(\pi, h)$, is estimated using a polynomial, and the boundary condition, $\overline{w}_{jkt(\tau)}(h)$, is estimated using the maximum of $w_{jkt(\tau)}(\pi, h)$ over π. Finally, $f_j(\pi)$ and $f(\pi)$ are estimated using kernel density estimators with normal kernel and the Silverman rule of thumb for the bandwidth.

Step 2. To estimate ρ and $\alpha_{jkt}(h)$, we exploit the exclusion restrictions discussed in the identification section by forming population moments from the conditional expectation function (13). We approximate $z_{jkt}(h)$ by substituting the Step 1 estimates of the conditional-choice probabilities, $p_{0t}(h)$, $p_{jkt}(h)$ and $p_{0,t+1}\left(\overline{H}_{jk}(h)\right)$ into (12). Sample analogs for the CCP vector, the compensation schedule, and conditional and unconditional densities of the abnormal return from Step 1 are substituted into Equation (13). Consistent estimates of ρ and $\alpha_{jkt}(h)$ are then obtained from the approximate sample moments along with (consistent estimates of their) standard errors adjusted for the pre-estimation.

We specify $\alpha_{jkt}(h)$ as a log-linear function of age, age squared, tenure, tenure squared, executive experience, executive experience squared, number of employers before becoming an executive, number of employers after becoming an executive, and indicators for board membership, interlocked, no college degree, MBA, MS/MA, PhD, and gender. We estimate an unrestricted version of the model that allows

$\alpha_{jkt}(h)$ and ρ to be fully interacted with rank and firm type. This allows us to test whether ρ is a function of firm size, a possibility that might arise if our assumption of absolute risk aversion is violated (Baker and Hall, 2004). We interact these 16 variables with rank and firm type to form $\alpha_{jkt}(h)$. We also permit the risk-aversion parameter to vary by the 36 firm types, but not by rank. In total, there are $(16 \times 5 + 1) \times 36 = 2{,}916$ parameters to be estimated. Equation (13) yields an orthogonal condition for each rank and firm combination, giving $5 \times 36 = 180$ moment conditions. In addition to the variables affecting $\alpha_{jkt}(h)$, we use bond prices and the lag of Ranks 1 through 4 as instruments, adding another $5 \times 20 \times 36 = 3{,}600$ moment conditions. After rejecting the null hypothesis that ρ varies with firm size, we impose these and other nonrejected restrictions on the results and reestimate the model. These restrictions are a common ρ for all firm types and that the effect of rank and firm type in $\alpha_{jkt}(h)$ is additive. This reduces the number of parameters to $(16 \times 36 + 5 \times 16 + 1) = 657$. We obtain similar results from both the restricted and unrestricted versions; hence, only the restricted version is reported.

Step 3. We form $\widehat{w}(h_t, \pi)$, the nonparametric estimates of the compensation schedule, as a polynomial expansion from Step 1, using them in conjunction with our estimate of the risk-aversion parameter obtained from Step 2. We approximate the conditional expectation, $E_t[\exp(-\widehat{\rho}\widehat{w}\,(h_t, \pi)\,/b_{\tau+1}]$, by integration using the nonparametrically estimated density of π for a given j, from Step 1, and compute $\overline{w}_{jk,t+1}(h)$ using the maximum $\widehat{w}\,(h_t, \pi)$ for each value of (j, k, t, h). Finally, our estimate of $g_{jk}(\pi|h)$ is obtained by substituting our estimates of $\overline{w}_{jk,t+1}(h)$, ρ and $E_t[v_{jk,t+1}(\rho, \pi)]$ into equation (15). The sample analog of the CCP vector, $\widehat{w}(h_t, \pi)$,and the estimates of $g_{jk}(\pi|h)$ are now substituted into a sample average of equation (17) to obtain an estimate for $\beta^*_{jkt}(h)$.

Step 4. Estimates of $\beta_{jkt}(h)$ and $p_{0,t+1}\left[h + \underline{\Delta}_{jkt}, h + \Delta_{jkt}, b_{\tau(t+1)}\right]$ are obtained recursively. Noting that $p_{0,T+1}\left[h + \underline{\Delta}_{jkT}, h + \Delta_{jkT}, b_{\tau(t+1)}\right] \equiv 1$ and substituting our estimated risk-aversion parameter and conditional choice probabilities into equation (**??**) yields $\beta_{jkT}(h)$. Substituting $\beta_{jkT}(h)$ into equation (**??**) yields $V_{jkT}(h, h', b_\tau)$ and hence $p_{0,T}\,(h, h', b_\tau)$, using equation (20). More generally, given $p_{0,t+1}\left[h + \underline{\Delta}_{jkt}, h + \Delta_{jkt}, b_{\tau(t+1)}\right]$, $\beta_{jkt}(h)$ is obtained from equation (**??**); hence, estimates of $V_{jkt}(h, h', b_\tau)$ and $p_{0,t+1}\left[h + \underline{\Delta}_{jkt}, h + \Delta_{jkt}, b_{\tau(t+1)}\right]$ are produced from equations (**??**) and (20), respectively.

8 Governance, Interlocked Executives, and Board Members

This section presents our estimates of different components comprising the sources of pay differentials between executives and executives who are also board members or interlocked executives. We also present the components of the pay and how they differ by the composition of the board. These estimates shed light on governance practices and the role of market and agency in explaining the pay of interlocked executives and board members. Furthermore, it relates the fraction of insider on the board, the agency problem and the market pay differential between firms with different board structure. The structural parameters of the utility function are presented in the Appendix.

8.1 Governance and Board Structure

Figure 1 presents the differences in compensation components of firms with large and small fraction of insiders on the board. Panel A presents the expected pay and the risk premium for firms with large and small fraction of insiders on the board; Panel B presents the certainty equivalent pay and its components: compensation for non-pecuniary costs of diligent work, compensating differentials pay to meet demand and compensating differentials for human capital and reputation. The expected compensation is the sum of certainty-equivalent pay and a risk premium. The estimation results demonstrate that while the differences in expected pay between firms with large fraction and small fraction of insiders on the board is small (60K more in firms with small fraction of insiders on the board), firms with a large fraction of insiders on the board pay substantially lower certainty equivalent wage for firms with large insider boards: \$380K versus \$740K in firms with small fraction of insiders on the board.

What drives the differences in the certainty equivalent pay? The certainty equivalent pay can be decomposed into three additive components:

$$w^*_{jkt(\tau)+1}(h) = \Delta^{\alpha}_{jkt}(h) + \Delta^{A}_{jkt}(h) - \Delta^{q}_{jkt}(h), \tag{18}$$

where $\Delta^{\alpha}_{jkt}(h)$ is a compensating differential due to the nonpecuniary utility gain or loss incurred by working in (j,k) relative to the outside option, $\Delta^{A}_{jkt}(h)$ is the investment value of (j,k) from accumulating human capital, and $\Delta^{q}_{jkt}(h)$ is a compensating differential that induces selection on the unobserved idiosyncratic preference shocks:

$$\begin{aligned}
\Delta^{\alpha}_{jkt}(h) &\equiv [\rho(b_\tau - 1)]^{-1} b_{\tau+1} \ln \alpha_{jkt}(h) \\
\Delta^{A}_{jkt}(h) &\equiv \rho^{-1} b_{\tau+1} \ln A_{t+1} \left[\overline{H}_{jk}(h), b_{\tau+1}\right] \\
\Delta^{q}_{jkt}(h) &\equiv [\rho(b_\tau - 1)]^{-1} b_{\tau+1} q_{jk}[p_t(h,h)]
\end{aligned}$$

Note that $q_{jk}[p_t(h,h)]$ is the value of the disturbance $\varepsilon_{jkt} - \varepsilon_{0t}$ that makes the marginal executive in (j,k) indifferent between that position and her outside option at market-clearing pay. Following the literature, we call $q_{jk}[p_t(h,b_\tau)]$ the demand effect.

The main difference between the types of firms driving the difference in certainty equivalent pay is the smaller compensation for diligent work ($\Delta^{\alpha}_{jkt}(h)$) in firms with large fraction of insiders on the board. (1.27 million versus 1.52 Million). Moreover, firms with large fraction of insiders on the board pay less compensating differentials in order to meet market demand (that is, the marginal manager recruited to work has lower disutility from working in the firm and needs \$110K less in compensation for the disutility from the job). This can be indicative of better governance practices improving working conditions in firms with large fraction of insiders on the board. However, the risk premium is larger in those firms (2.51 Million versus 2.23 Million), bringing the expected pay to similar levels.

We then compare the differences in the components of the risk premium: The risk premium is a compensating differential to risk-averse executives for bearing risk in the form of firm-denominated securities. It measures the costs of agency. In our model, it is measured by the difference between expected compensation and certainty equivalent pay defined in equation (**??**). From (**??**) expected compensation is the expected value of the executive's marginal product:

$$\Delta^r_{jkt}(h) \equiv E_t\left[r_{jk,t+1}(h,\pi)\right] = F_{jk}(h) - w^*_{jk,t+1}(h). \tag{19}$$

Further look into the compensation for agency risk premium indicates that the net benefit of shirking in firms with larger fraction of insiders on boards is smaller by $2.2M on average. The gross loss to shareholders from shirking in firms with large fraction of insiders on the boards is on average $3M smaller. The latter finding also explain the larger risk premium paid by firms with large fractions of insiders on the board. The fact that the gross loss from shirking is smaller for these firms implies that the likelihood ratio is flatter, that is the signals are less informative of shirking. Therefore, conditional on providing incentives for diligent work, when signals are less informative the pay has to be more strongly tied to firm performance and the risk premium is larger. Both evidence are consistent with the role of board in monitoring showing that large fraction of insider boards improve monitoring in firms.

8.2 Compensation, Markets and Incentives

Interlocked Executives Figure 2 documents the decomposition of the pay for interlocked executives using the estimation results. In our model executives are paid their marginal product, since the expected pay of interlocked executives is lower ($2.43M versus $2.86M for non-interlocked executives), their marginal productivity is lower in the firm. However, since the pay is composed of variable pay and fixed salary we compute the risk premium and the certainty equivalent. Our estimation results show that the certainty equivalent pay of interlocked executives is on average $710K relative to $570K which is the certainty equivalent pay of non-interlocked executives. The main cause for the lower certainty equivalent is the cost of diligent work; it is lower by $110K for interlocked relative to non-interlocked executives. We did not find significant differences in the value of human capital. We find that the risk-agency premium is lower by $280K for interlocked executives.

A further look at the component of the agency-risk premium reveals that compensating differential for the value of shirking relative to working diligently is lower by $910K for interlocked executive. That is, interlocked executives goals are more closely aligned with those of shareholders than goals of other executives reducing the agency-risk premium. This is perhaps an indication of better monitoring for interlocked executives. On the other-hand, the degree to which career concerns ameliorate the moral hazard problem is lower for interlocked executives by $200K. The loss to shareholders from not providing incentives to work is smaller for interlock executive (loss of 22% versus 25%). The latter implies that providing incentives for interlocked executives is more costly as the signals are less informative, mitigating the large effect of the more aligned preferences of interlocked executives.

Board members Executive directors have a lower expected pay than other executives. Our estimates show that their certainty equivalent pay is also lower on average. Figure 3 shows that on average the certainty equivalent of executive directors is $635k versus $710k for non board members executives. The reason for the lower certainty equivalent paid to executive directors is lower non-pecuniary costs, both the systematic part of the non-pecuniary costs of diligent work which requires lower compensating differentials (by 40k) and lower compensation for the idiosyncratic taste for the position which is implied by lower compensating differentials firms pay to meet demand for board members. Board members, however, value human capital slightly less than other executives requiring an extra 4k of compensating differentials. Tables 5-7 show the components of the certainty equivalent pay vary by ranks. Table 5 shows that only at the higher ranks, executives give up compensation to be board members; a Rank-5 executive receives an additional $333,000 compensation for being on the board, but the top three ranked executives with at least a year's experience with their firm are willing to forego more than $200,000 to become a board member. There is greater net demand (Table 6) for high-ranked executives to be on the board of directors. Low-ranked executives sacrifice $320,000 to be on the board (even more if they have just joined the firm), but higher ranked executive board members command a premium of over $100,000.

The agency risk premium for board members is lower by $203k. Looking further into the agency risk premium reveals a greater divergence of the shareholders and board members: the compensating differentials for working diligently versus shirking is $130k higher for executive directors than for the rest of the executives, career concerns ameliorate the problem of moral hazard for executive directors more than it does for other executive (2.01M versus 1.88M). Like interlocked executives, board members also cause less destruction of firm value if they are not provided with incentives than other executives (17.5% gross loss of value versus 24.6). Again this might be because board members are more closely monitored than other executives. The latter two findings explain the lower agency-risk premium of board member.

Entrenchment While the pay for interlocked executives and executive directors is lower than the pay for non-interlocked or non-board members executives, they are more entrenched in two ways; they have a lower probability of turnover and the probability of exit is 55% smaller. Thus, they are also older on average. Our estimates show that the main reason for the observed lower exit probability is the lower non-pecuniary costs (both the cost of the diligent work and the fact that the idiosyncratic disutility from working is lower for interlocked executives). What explains the lower probability of turnover for these executives? First, the non-pecuniary costs are higher; it requires 26k increase in premium for switching for interlocked executives and 111K for executive directors. Second, the net demand for new interlocked executives is lower than the demand for new hires among other executives. Lastly, note that if a new hire is an interlocked executive or executive director the divergence between the goals of the executive and shareholders grows by 318k for interlocked executives and by 34K for executive directors relative to executives in these positions that are not new hires.

Females Our counterfactuals consider quotas for females on boards hence we explore the gender differences revealed in the estimates. Figure 4 panels A-C present the pay decomposition for females. We find that female executives receive higher certainty equivalent pay than male executives. Female executives receive a lower risk premium, \$2.1 million, than men, \$2.2 million, equalizing expected compensation, \$2.9 million across gender. In our framework, expected compensation is the executive's marginal product: Thus, we find female and male executives are equally productive. Looking at the different components of the certainty equivalent pay reveals that there is lower net demand (thus, the compensating differentials for females for unobserved factor is lower than that of male executives) for females. The exception is demand for low ranks in the consumer and service sectors.

However, female executives receive a higher differential than men to accept Rank-1 and -2 jobs in the consumer sector, \$176,000 and \$304,000 respectively, plus an additional \$100,000 for primary- and service-sector jobs (see Table 5). At the average age, tenure, and executive experience, female executives receive \$1.6 million overall, as compared to \$1.5 million for men, to offset nonpecuniary utility losses from continuing to work one more year. This pattern may reflect superior outside options, in other labor markets and retirement, for female executives (see discussion in Gayle, Golan and Miller 2012). Lastly, the value of human capital is lower for female executive, requiring larger compensating differentials. Reflecting their higher exit rate, female executives place a lower value on human capital investment. A female executive is willing to give up \$200,000 because of the human capital investment, whereas men are willing to forego \$300,000.

What explains the lower risk premium for females? Looking at Figure 4 panel C, we find significant that there the differences the gross loss from shirking is slightly smaller for females, which if anything should increase the risk premium. Moreover, we find that generally female executives place lower value on career concerns, which is consistent with higher exit rates. An exception is female executives in rank 2 and female executives who join new firms where they place higher value of career concerns than men. Thus, this also increases the risk premium . However, the reason for the lower risk premium is that the net benefit from shirking is lower overall for females, implying that their goals are more aligned with the goals of shareholders.

9 The Role of Insiders on the Board and Female Representation

In this section we consider alternative board structures. We first consider a requirement of having 50% outsiders on the board. The counterfactual will allow us to assess to role and impact of having boards with large fraction of insiders. The second counterfactual requires quotas of females in boards (for example, Norway's 40% female representation on boards). As we documented females behavior and compensation differs, most notably, they are more likely to exit the executive occupation than males. However, their representation on boards is low, and policies mandating females quotas may change exit behavior as well as career paths. Similarly, requiring 50% of outsiders on the board, may change the composition of boards, compensation and career choices. *The work on this section is still oncoming.*

10 Conclusion

This paper estimates a model of executive compensation assessing the role of insiders on the board in governance and analyzing the compensation of board members and interlocked executives. We then perform counterfactual policy analysis first imposing a rule that at least 50% of the board member have to be outsiders, and second imposing quotas for females on boards.

We first document that controlling for ranks and other executive and firm characteristics, interlocked and board members executives are not paid more than other executives. Empirically, we cannot reject the hypothesis that executives in companies with a large number of insiders on the board receive the same expected compensation as other executives. In our model, every executive has an incentive to work. Placing more of them on the board to monitor each other mitigates gross losses to the firm should any one of them shirk, reduces the net benefits from shirking, and increases the gross value of the firm from greater coordination (reflected in the firm's equity value and thus impounded into its financial returns). But greater executive representation on the board does more than create a more challenging signalling problem to solve, thereby raising the risk premium; giving more votes to executives fosters better executive working conditions, which in turn is offset by a lower certainty-equivalent wage in equilibrium. Thus, our estimates undergird a plausible explanation of how large shareholders determine the number of insiders on the board to maximize the expected value of their equity.

Despite the fact that their pay is not larger than that of other executives, board members and interlocked executives are more entrenched than other executives. We also document that their compensation structure is different. Our models allows us to uncover the reasons for these differences. Our estimation results reveal that the certainty equivalent pay is substantially smaller than that of other executives. The main reason for the lower pay is the lower non-pecuniary costs of working diligently in these positions. The lower non-pecuniary costs of working also rationalizes why these executives are less likely to exit the executive profession and therefore are more entrenched. While this findings provide further support to the argument that these executives are not extracting higher pay by exploiting existing rules, we cannot rule out the case that there are other unobserved payments not included in compensation packages. The risk premium for executive directors is lower despite the fact that there is a greater divergence between their goals and the shareholders goals. However, the greater career concerns ameliorate the agency problem. Thus our findings support the view that implicit incentives play important role in aligning shareholders and board members goals. Interlocked executives and shareholders, however, have more closely aligned goals, but their career concerns are smaller. Thus, explicit incentive provided by formal compensation contracts are more important than the implicit incentives relative to non-interlocked executives.

To further analyze the role of imposing quotas of females on board, we first find that behavior and compensation of female executives differ from that of male executives. Our empirical results show that, after controlling for other observed characteristics including rank, women are paid the same expected compensation as their male counterparts. We find that women are more likely to quit because of greater opportunities from exiting relative to the nonpecuniary characteristics of work. They value investment in human capital less than men, there is lower net demand for their services, they receive higher certainty-equivalent compensation, and would reap smaller net benefits from shirking implying their goals are more closely aligned to the goals of the shareholders. These results confirm and expand upon findings in Bertrand and Hallock (2001), Bell (2005), Albanesi and Olivetti (2008), Selody (2010), and Gayle, Golan, and Miller (2012). The higher estimates of certainty equivalent is consistent with females having higher outside options relative to the value of working diligently. Our framework shows that the gender differential in the nonpecuniary benefit ratio of executive work to exit creates its own dynamic, reflected in human capital accumulation and career movement within the executive sector: The small minority of women in executive management are behaving like discouraged workers, even though we cannot reject the joint hypothesis that there is no gender discrimination within this employment sector and women have better outside options than men. Nevertheless, imposing quotas for females on board may change exit behavior and choices of females.

11 Appendix: The Extreme-Value Distribution

In our structural estimation, we assume throughout that ε_t is distributed as a type 1 extreme value. The computational advantages of parameterizing $G(\varepsilon)$ this way are most evident from Lemma .1 below, where we provide formulas for $B_t(h, h')$, the value of human capital on and off the equilibrium path, and also an expression for marginal disturbances, $q_{jk}[p_t(h)]$.

Lemma .1 *If ε_{jkt} is independently and identically distributed as a Type I extreme value with location and scale parameters $(0, 1)$, then:*

$$B_t\left(h, h'\right) = p_{0t}\left(h, h'\right)^{\frac{1}{b_t}} \Gamma\left[\left(b_t + 1\right)/b_t\right]. \tag{20}$$

where $p_{0t}(h, h')$ is the probability that the optimal choice is retirement.

The IIA property of type 1 extreme values implies that the marginal idiosyncratic shock for a manager who is indifferent between the best job match (j, k) and retiring is the log odds ratio of the probability that a manager with characteristics (t, h) who accepts employment in (j, k) versus retiring. This ratio does not depend on the other components of the conditional-choice probability vector. The greater the probability of retirement observed in equilibrium, the less important is the human-capital component, and the higher is the unobserved shock for the marginal person.

Proof. Denoting the probability density function of $\varepsilon^*_{jkt} \equiv d_{jk}\varepsilon_{jkt}$ by $d\overline{G}(\varepsilon^*_{jkt})$, we first derive an expression for $E[\exp(-\varepsilon^*_{jkt}/b_t)]$ and then use it in our derivation of the formula for $A_t(h_t)$:

1. For each (j, k, t), denote the deterministic part of utility by

$$W_{jkt} \equiv \ln \alpha_{jkt} + (b_t - 1) \ln A_{t+1}\left[\overline{H}_{jk}(h)\right] + (b_t - 1) \log\left\{E_t\left[\upsilon_{jk,t+1}\right]\right\}. \tag{21}$$

Then (j, k) is chosen at t if $\varepsilon_{jkt} + W_{jkt}$ is maximal for all (j', k'). Let $G(\varepsilon_{11t}, \ldots, \varepsilon_{JKt})$ denote the probability distribution function for $(\varepsilon_{11t}, \ldots, \varepsilon_{JKt})$ and $G_{jk}(\varepsilon_{11t}, \ldots, \varepsilon_{JKt})$ its derivative with respect to ε_{jkt}. Since $G(\varepsilon_{11t}, \ldots, \varepsilon_{JKt})$ is the product of independently distributed standard Type 1 extreme-value probability distributions in our model,

$$G_{jk}(\varepsilon_{11t}, \ldots, \varepsilon_{JKt}) = \exp\left(-\varepsilon_{jkt}\right) \prod\nolimits_{(j',k')} \exp\left[-\exp\left(-\varepsilon_{j'k't}\right)\right]. \tag{22}$$

Using the well-known fact that

$$W_{jkt} - W_{j'k't} = \log p_{jkt} - \log p_{j'k't}, \tag{23}$$

it now follows from (22) and (23) that

$$G_{jk}(\varepsilon_{jkt} + W_{jkt} - W_{11t}, \ldots, \varepsilon_{jkt} + W_{jkt} + W_{JKt}) = \exp[-\varepsilon_{jkt} - \exp(-\varepsilon_{jkt} - \log p_{jkt})]. \tag{24}$$

From Equation (21) and Theorem 4.2 in the main text, the conditional-choice probability for (j, k) can be expressed as

$$p_{jkt} = \int_{-\infty}^{\infty} G_{jk}\left(\varepsilon_{jkt} + W_{jkt} - W_{11t}, \ldots, \varepsilon_{jkt} + W_{jkt} + W_{JKt}\right) \mathrm{d}\varepsilon_{jkt}. \tag{25}$$

Hence, the probability density function of $\varepsilon^*_{jkt} \equiv d_{jk}\varepsilon_{jkt}$ is a type 1 extreme value with location parameter $-\log p_{jkt}$ and unit scale parameter since

$$\begin{aligned} d\overline{G}\left(\varepsilon^*_{jkt}\right) &= p^{-1}_{jkt} \frac{\partial \int_{-\infty}^{\varepsilon^*_{jkt}} G_{jk}\left(\varepsilon_{jkt} + W_{jkt} - W_{11t}, \ldots, \varepsilon_{jkt} + W_{jkt} + W_{JKt}\right) \mathrm{d}\varepsilon_{jkt}}{\partial \varepsilon^*_{jkt}} \\ &= \exp\left[-\varepsilon^*_{jkt} - \log p_{jkt} - \exp\left(-\varepsilon^*_{jkt} - \log p_{jkt}\right)\right]. \end{aligned}$$

To derive $E[\exp(-\varepsilon^*_{jkt}/b_t)]$, we draw from Equations (15) and (17) of Chapter 21 of Johnston and Kotz (1970, 277–278), who prove that the moment-generating function for ε^*_{jkt} is

$$E\left[\exp\left(t\varepsilon^*_{jkt}\right)\right] = \exp\left(-t \log p_{jkt}(h)^{1/b_t}\right) \Gamma(1 - t).$$

Setting $t = -b_t^{-1}$, this simplifies to

$$E_t\left[\exp\left(\varepsilon^*_{jkt}/b_t\right)\right] = \exp\left(\log p_{jkt}(h, h')^{1/b_t}\right) \Gamma\left[\left(b_t + 1\right)/b_t\right] = p_{jkt}(h, h')^{1/b_t} \Gamma\left[\left(b_t + 1\right)/b_t\right]. \tag{26}$$

2. To prove (20), we first note that if ε_{jkt} is independently and identically distributed as a Type I Extreme Value with location and scale parameters $(0, 1)$, then from (**??**) and (5.6) in the main text,

$$V'_{jkt}(h, h') = \left[\frac{p_{0t}(h, h')}{p_{jkt}(h, h')}\right]^{1/b_t}. \tag{27}$$

Summing over (j, k) and rearranging, we obtain

$$p_{0t}(h, h') = \left\{1 + \sum_{j=1}^{J} \sum_{k=1}^{K} \left[V'_{jkt}(h, h')\right]^{-1}\right\}^{-1}. \tag{28}$$

Substituting (26) along with the conditional-choice probability ratios (27) and the retirement probability (28) into (5.4) yields

$$B_t(h,h') = p_{0t}(h,h')^{1+\frac{1}{b_t}}\,\Gamma\left(\frac{b_t+1}{b_t}\right) + \sum_{j=1}^{J}\sum_{k=1}^{K}\left[p_{jkt}(h,h')^{1+\frac{1}{b_t}}\,\Gamma\left(\frac{b_t+1}{b_t}\right)\left[\frac{p_{0t}(h,h')}{p_{jkt}(h,h')}\right]^{1/b_t}\right]$$
$$= p_{0t}(h,h')^{\frac{1}{b_t}}\,\Gamma\left[\frac{b_t+1}{b_t}\right],$$

which simplifies to (20).

■

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Table 1 A:. Pay and Compensation Structure Comparison by Rank

VARIABLES	RANK	ALL EXECUTIVES	EXECUTIVE DIRECTORS	INTERLOCKED EXECUIVES	BOARD WITH A LARGE NUMBER OF INSIDERS
Salary	1	594	608	504	616
		(351)	(358)	(362)	(369)
	2	678	695	623	699
		(412)	(403)	(415)	(465)
	3	519	565	511	542
		(314)	(332)	(331)	(358)
	4	368	450	396	388
		(179)	(241)	(256)	(201)
	5	285	365	286	291
		(150)	(221)	(197)	(173)
Bonus	1	705	674	313	777
		(1500)	(1524)	(619)	(1676)
	2	725	748	565	840
		(1782)	(1826)	(1519)	(2286)
	3	608	688	434	698
		(1695)	(1955)	(666)	(1710)
	4	292	409	235	343
		(866)	(1030)	(440)	(836)
	5	178	304	207	192
		(426)	(743)	(408)	(550)
Number of shares owned	1	2021	2592	2877	2187
		(8819)	(10341)	(7903)	(8557)
	2	1812	1923	2484	2095
		(11071)	(11514)	(5880)	(10198)
	3	527	637	1801	651
		(2197)	(2508)	(6024)	(2514)
	4	288	418	548	337
		(1713)	(1721)	(1029)	(1448)
	5	174	338	153	204
		(1012)	(1098)	(506)	(1144)
Value of restricted shares granted	1	359	305	103	369
		(1439)	(1284)	(541)	(1358)
	2	456	480	252	468
		(2155)	(2229)	(1657)	(2174)
	3	413	450	132	465
		(4708)	(5913)	(966)	(5857)
	4	157	211	135	178
		(896)	(1901)	(595)	(1131)
	5	83	106	60	88
		(441)	(587)	(246)	(512)
Number of observations	1	6581	4535	516	4740
	2	28526	26188	1933	14186
	3	8858	5344	222	5522
	4	61131	7961	442	29742
	5	37594	1899	114	15934

Note: Standard deviations are enclosed in parenthesis.

Table 1 B:. Pay and Compensation Structure Comparison by Rank

VARIABLES	RANK	ALL EXECUTIVES	EXECUTIVE DIRECTORS	INTERLOCKED EXECUIVES	BOARD WITH A LARGE NUMBER OF INSIDERS
Values of options held	1	6632	7443	3636	6330
		(19552)	(21922)	(15324)	(17187)
	2	10137	10708	5168	9575
		(28211)	(28780)	(19640)	(26693)
	3	6312	6691	2629	6190
		(21514)	(22501)	(6356)	(20468)
	4	2487	3227	1437	2352
		(9376)	(11364)	(4301)	(6610)
	5	1617	2522	929	1393
		(8596)	(8334)	(2448)	(6569)
Change in wealth from options held	1	71	-177	-199	31
		(14612)	(16383)	(17946)	(14567)
	2	548	654.1	886	521
		(19344)	(19233)	(15766)	(17284)
	3	757	925	457	821
		(17156)	(17308)	(3592)	(15987)
	4	324	387	387	326
		(6927)	(8905)	(2493)	(5071)
	5	262	385	185	212.7
		(6661)	(6246)	(1998)	(6294)
Change in wealth from restricted shares held	1	7327	11214	3721	8765
		(376316)	(454053)	(84732)	(434834)
	2	9888	10584	2220	4523
		(940336)	(973186)	(677919)	(304058)
	3	830	1759	-4611	1604
		(75660)	(94848)	(44960)	(94115)
	4	1469	4156	794	1889
		(123066)	(243655)	(18033)	(139730)
	5	811	404	566	331.6
		(76359)	(17996)	(4200)	(52716)
Total compensation	1	2693	2632	2106	2596
		(25325)	(28312)	(31256)	(26622)
	2	4294	4586	3517	4191
		(25520)	(26159)	(29869)	(27043)
	3	3247	3744	618	3296
		(17708)	(19350)	(23587)	(18785)
	4	1662	2392	1962	1660
		(10979)	(13203)	(12218)	(11511)
	5	1153	2155	1469	1027
		(9091)	(12153)	(4793)	(9157)
Number of observations	1	6581	4535	516	4740
	2	28526	26188	1933	14186
	3	8858	5344	222	5522
	4	61131	7961	442	29742
	5	37594	1899	114	15934

Note: Standard deviations are enclosed in parenthesis.

Table 2A. Education and Personal Attributes Comparison by Rank

VARIABLE	RANK	ALL EXECUTIVES	EXECUTIVE DIRECTORS	INTERLOCKED EXECUTIVES	BOARD WITH A LARGE NUMBER OF INSIDERS
Age	1	59.2	60.82	64.05	59.73
		(9.86)	(9.85)	(10.40)	(10.24)
	2	55.28	55.47	57.27	55.96
		(7.85)	(7.72)	(9.23)	(8.41)
	3	52.11	52.59	54.19	52.48
		(8.05)	(7.38)	(9.77)	(7.88)
	4	51.94	52.25	53.34	51.95
		(9.47)	(7.57)	(8.55)	(9.06)
	5	51.88	52.46	57.2	51.58
		(10.62)	(8.01)	(12.33)	(9.84)
		(0.40)	(0.38)	(0.36)	(0.40)
Years of tenure in the firm	1	16.44	17.74	18.2	17.22
		(12.63)	(12.84)	(13.49)	(12.95)
	2	14.23	14.42	16.49	15.39
		(10.90)	(10.87)	(11.19)	(11.07)
	3	13.23	13.79	12.24	13.79
		(10.47)	(10.48)	(9.23)	(10.47)
	4	13.19	14.99	16.35	13.7
		(10.40)	(10.55)	(12.43)	(10.66)
	5	13.23	13.98	14.72	13.03
		(10.32)	(9.51)	(10.54)	(9.81)
Years of executive experience	1	21.32	22.9	24.51	21.9
		(12.24)	(12.51)	(12.24)	(12.73)
	2	18.86	19.03	21.78	19.65
		(9.91)	(9.86)	(10.20)	(10.07)
	3	15.69	16.45	19	16.2
		(9.91)	(9.44)	(11.53)	(9.81)
	4	15.56	15.79	17.48	15.76
		(10.65)	(9.66)	(11.16)	(10.53)
	5	15.95	16.26	19.59	15.62
		(11.11)	(9.88)	(12.41)	(10.43)
Number of firms worked for before becoming an executive	1	0.683	0.678	0.824	0.694
		(1.17)	(1.16)	(1.69)	(1.20)
	2	0.686	0.679	0.673	0.697
		(1.12)	(1.11)	(1.14)	(1.17)
	3	0.686	0.675	0.684	0.672
		(1.18)	(1.13)	(0.98)	(1.12)
	4	0.89	0.79	0.7	0.859
		(1.32)	(1.17)	(1.13)	(1.29)
	5	1.077	0.951	1.136	0.992
		(1.42)	(1.29)	(1.18)	(1.34)
Number of firms worked for after becoming an executive	1	0.899	0.896	0.971	0.886
		(1.38)	(1.38)	(1.51)	(1.39)
	2	0.912	0.912	0.917	0.865
		(1.38)	(1.38)	(1.43)	(1.32)
	3	0.734	0.745	0.954	0.721
		(1.29)	(1.31)	(1.57)	(1.31)
	4	0.761	0.608	0.568	0.739
		(1.31)	(1.15)	(1.16)	(1.32)
	5	0.797	0.716	1.288	0.766
		(1.34)	(1.25)	(2.13)	(1.30)
Number of observations	1	4,812	3,430	375	3,489
	2	21,283	19,725	1,498	10,561
	3	5,953	3,822	152	3,709
	4	32,550	5,028	273	16,275
	5	18,508	1,105	59	7,844

Note: Standard deviations are enclosed in parenthesis.

Table 2 B. Education and Personal Attributes Comparison by Rank

VARIABLE	RANK	ALL EXECUTIVES	EXECUTIVE DIRECTORS	INTERLOCKED EXECUTIVES	BOARD WITH A LARGE NUMBER OF INSIDERS
Retirement from Executive occupation	1	0.246	0.249	0.171	0.218
	2	0.096	0.094	0.061	0.097
	3	0.137	0.105	0.037	0.125
	4	0.168	0.126	0.102	0.162
	5	0.168	0.135	0.139	0.164
Firm-to-firm transition	1	0.024	0.018	0.006	0.018
	2	0.031	0.030	0.009	0.022
	3	0.027	0.020	0.014	0.020
	4	0.017	0.008	0.007	0.014
	5	0.012	0.004	0.001	0.011
College graduate	1	0.755	0.745	0.752	0.745
	2	0.786	0.787	0.778	0.772
	3	0.752	0.751	0.697	0.75
	4	0.789	0.796	0.832	0.786
	5	0.823	0.753	0.966	0.813
Masters of business administration	1	0.238	0.223	0.224	0.238
	2	0.254	0.256	0.241	0.225
	3	0.230	0.225	0.204	0.223
	4	0.226	0.222	0.198	0.225
	5	0.191	0.226	0.237	0.189
Masters of science	1	0.158	0.154	0.141	0.149
	2	0.172	0.17	0.168	0.163
	3	0.168	0.179	0.211	0.159
	4	0.202	0.199	0.227	0.202
	5	0.205	0.175	0.153	0.197
Phd	1	0.148	0.157	0.221	0.148
	2	0.149	0.149	0.156	0.145
	3	0.132	0.142	0.204	0.139
	4	0.170	0.169	0.139	0.172
	5	0.248	0.156	0.271	0.243
Professional certification	1	0.152	0.143	0.123	0.155
	2	0.141	0.138	0.095	0.142
	3	0.152	0.155	0.178	0.157
	4	0.234	0.226	0.165	0.239
	5	0.333	0.227	0.407	0.324
Female	1	0.018	0.009	0.016	0.018
	2	0.015	0.014	0.011	0.011
	3	0.027	0.022	0.050	0.026
	4	0.058	0.029	0.025	0.046
	5	0.068	0.042	0.123	0.062
Number of observations	1	4812	3430	375	3489
	2	21283	19725	1498	10561
	3	5953	3822	152	3709
	4	32550	5028	273	16275
	5	18508	1105	59	7844

Note: Standard deviations are enclosed in parenthesis.

Table 3. Governance Structure by Firm Type and Rank

VARIABLES	RANK	ALL FIRMS	LARGE FIRMS	MEDIUM SIZE FIRMS	SMALL FIRMS	PRIMARY SECTOR FIRMS	CONSUMER SSECTOR FIRMS
	1	0.689	0.588	0.757	0.885	0.807	0.795
Executive directors	2	0.918	0.930	0.921	0.906	0.981	0.972
	3	0.603	0.597	0.604	0.612	0.693	0.689
	4	0.130	0.122	0.133	0.138	0.136	0.171
	5	0.051	0.051	0.060	0.046	0.050	0.084
	1	0.078	0.047	0.091	0.149	0.084	0.105
Interlocked executives	2	0.068	0.057	0.071	0.074	0.058	0.073
	3	0.025	0.016	0.032	0.033	0.022	0.030
	4	0.007	0.004	0.010	0.009	0.005	0.009
	5	0.003	0.002	0.005	0.003	0.003	0.003
Firms with large numbers of insiders on board	1	0.720	0.696	0.739	0.774	0.637	0.773
	2	0.497	0.495	0.502	0.502	0.432	0.557
	3	0.623	0.604	0.631	0.653	0.582	0.680
	4	0.487	0.479	0.488	0.501	0.419	0.546
	5	0.424	0.395	0.412	0.447	0.389	0.476
	1	6581	3671	1554	1338	1516	1646
Number of observations	2	28526	9685	7391	11333	7996	6113
	3	8858	3899	2276	2648	2102	2298
	4	61131	24660	16885	19323	15820	12905
	5	37594	10202	8759	18574	11338	6347

Table 4: Compensation and transitions

	Compensation			Within firm transition					Firm-to-firm transition	Retirement
Variable	Fixed pay	excess return	excess return sq.	R1	R2	R3	R4	R5		
					Ranks					
constant	-4359	21601	-9114							
	(2716)	(3859)	(1,914)							
R4	103	1529	-242	-20.3	-76	-67.80	63.40	-536		
	(463)	(926)	(444)	(21)	(9.80)	(10)	(4)	(7)		
R3	1267	2627	-164	-88.1	-72	114	-404	-754	94.70	
	(662)	(1407)	(605)	(24)	(12.80)	(4)	(15)	(20)	(18)	
R2	3456	6007	-789	-118	68	-393	-551	-901	213	-8.90
	(683)	(1,394)	(699)	(25)	(3.90)	(20)	(18)	(22)	(13)	(4)
R1	1055	9839	-454	111	123	-345	-585	-939	86.1	55.26
	(797)	(1690)	(987)	(10)	(4)	(34)	(34)	(39)	(23)	(3)
			Governance variables							
Executive directors	845	7,695	-848	-22.8	123	15.6	-70.4	-105	-102	-64.72
	(251)	(570)	(304)	(13.2)	(4.03)	(5.32)	(3.39)	(6.50)	(9)	(4)
Board with a large number of insiders	280	2,683	-1203						-25.7	
	(163)	(570)	(176)						(6)	
Interlocked executives	-299	6403	-1496						-93	-55
	(464)	(995)	(471)						(29)	(8)
			Human Capital and Demographic							
Years of executive Experience	2	191	-42	-9.66	-32.8	1.01	14.04	34.76	82.8	24.44
	(25)	(26)	(14)	(15)	(9)	(12)	(7)	(11)	(13)	(6)
Years of executive Experience Squared				6.09	8.22	-3.08	-3.79	-10.1	-20.6	-11.38
				(6)	(4)	(6)	(3)	(5)	(7)	(3)
Years of tenue with firm	-40	-23	22	-10.43	-23.03	-10.56	10.7	25.8	-302	24.66
	(20)	(25)	(14)	(9)	(6)	(8)	(5)	(8)	(9)	(4)
Years of tenue with firm squared				4.8	7.28	4.19	-2.79	-11.85	88.1	-7.26
				(4)	(3)	(4)	(2)	(4)	(4)	(2)
Number of firms worked for before becoming an executive				-8.99	-0.91	-6.86	3.11	8.11	-11.1	5.54
				(2)	(2)	(2)	(1)	(1)	(2)	(1)
Number of firms worked for after becoming an executive	215	-484	-58	-1.23	1.35	-2.43	-0.34	-0.25	-13.7	4.49
	(80)	(174)	(93)	(2)	(1)	(2)	(1)	(2)	(2)	1
Age	281	17	15	-9.01	1024	174	-459	-847	1948	-528
	(85)	(23)	(10)	(188)	(124)	(158)	(86)	(128)	(239)	(59)
Age Squared	-3.05			136.00	5.20	-111.00	236.00	434.00	-992	313
	(0.80)			(88.70)	(60.30)	(80.30)	(44.40)	(65.80)	(122)	(28.81)
Female Dummy Dummy										17.42
										(4)
Female Dummy X R 2	2668								-0.51	
	(1,295)								(0.24)	

Table 5: Compensating Differential for Nonpecuniary Cost of Diligence versus Exit

Variable	Constant	Age-50	Tenure	Eex. Exp	NBE	NAE	Female	Interlock	Execidir
Constant	1.628	0.007	0.016	-0.004	-0.006	0.025	-0.043	-0.074	0.333
	(0.071)	(0.001)	(0.002)	(0.000)	(0.004)	(0.001)	(0.024)	(0.011)	(0.049)
Rank 1	0.205						0.219	-0.125	-0.564
	(0.063)						(0.020)	(0.010)	(0.042)
Rank 2	0.263						0.347	-0.070	-0.545
	(0.063)						(0.020)	(0.008)	(0.034)
Rank 3	0.111						-0.072	-0.070	-0.545
	(0.063)						(0.020)	(0.008)	(0.034)
Rank 4	-0.181								
	(0.063)								
Industrial Sector									
Primary	-0.241	-0.006	-0.008	0.003	0.000	-0.009	0.106	0.034	0.005
	(0.048)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)	(0.018)	(0.009)	(0.037)
Service	0.400	0.009	0.008	0.002	-0.012	0.003	0.091	-0.038	0.017
	(0.050)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)	(0.019)	(0.009)	(0.038)
Firm Size									
Medium	-0.373	-0.009	-0.010	0.001	0.021	-0.002	-0.080	0.042	-0.045
	(0.050)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)	(0.019)	(0.009)	(0.038)
Large	-0.553	-0.016	-0.012	0.004	0.033	-0.006	-0.063	0.068	-0.067
	(0.049)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)	(0.019)	(0.009)	(0.038)
Board with a large number of insiders									
Large	-0.238	0.000	0.005	-0.003	0.004	0.008	-0.023	-0.036	-0.095
	(0.040)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)	(0.015)	(0.007)	(0.031)
Firm-to-firm transition									
New Employer	-0.380	0.001	0.008	-0.002	-0.004	0.004	-0.020	0.026	0.111
	(0.040)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)	(0.015)	(0.007)	(0.031)

Table 6: Compensation for Market Demand Versus Exit

Variable	Constant	Age-50	Tenure	Eex. Exp	NBE	NAE	Female	Interlock	Execidir
Constant	-0.569	-0.003	-0.007	0.002	-0.003	-0.010	0.069	-0.034	-0.320
	(0.013)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)	(0.014)	(0.008)	(0.029)
Rank 1	-0.151						-0.219	0.094	0.458
	(0.013)						(0.013)	(0.007)	(0.027)
Rank 2	0.022						-0.181	0.050	0.486
	(0.013)						(0.013)	(0.006)	(0.022)
Rank 3	0.019						-0.050	0.050	0.486
	(0.013)						(0.013)	(0.006)	(0.022)
Rank 4	0.182								
	(0.013)								
Industrial Sector									
Primary	0.048	0.002	0.004	-0.003	0.001	0.006	-0.124	-0.009	0.017
	(0.010)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.012)	(0.007)	(0.024)
Service	-0.006	-0.002	0.001	-0.001	0.004	-0.001	-0.045	0.011	0.006
	(0.010)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.012)	(0.007)	(0.024)
Firm Size									
Medium	0.032	0.001	0.002	-0.002	-0.010	0.000	0.029	0.009	0.010
	(0.010)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.012)	(0.007)	(0.024)
Large	0.170	0.005	0.000	-0.004	-0.020	0.003	-0.003	-0.044	-0.010
	(0.010)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.012)	(0.007)	(0.024)
Board with a large number of insiders									
Large	-0.117	0.000	-0.008	0.002	-0.007	-0.009	0.000	0.002	0.052
	(0.008)	(0.000)	(0.001)	(0.000)	(0.002)	(0.001)	(0.010)	(0.005)	(0.020)
Firm-to-firm transition									
New Employer	-0.085	0.000	-0.013	0.003	-0.007	-0.010	-0.006	-0.060	-0.111
	(0.008)	(0.000)	(0.001)	(0.000)	(0.002)	(0.001)	(0.010)	(0.005)	(0.020)

Table 7: Value of Human Capital Investment

Variable	Constant	Age-50	Eex. Exp	NBE	NAE	Female	Interlock	Execidir
Constant	-0.2278	0.0013	0.0014	0.0058	0.0050	0.0182	-0.0015	0.0004
	(0.0002)	(0.0005)	(0.0006)	(0.0001)	(0.0001)	(0.0003)	(0.0003)	(0.0001)
Rank 1	0.0237			0.0001	0.0003	0.0033	0.0001	0.0000
	(0.0005)			(0.0001)	(0.0001)	(0.0006)	(0.0006)	(0.0002)
Rank 2	-0.0632			0.0006	0.0007	0.0017	-0.0003	0.0000
	(0.0005)			(0.0001)	(0.0001)	(0.0006)	(0.0007)	(0.0002)
Rank 3	-0.0372			0.0012	0.0012	0.0070	-0.0002	-0.0001
	(0.0005)			(0.0001)	(0.0001)	(0.0006)	(0.0007)	(0.0002)
Rank 4	-0.0062			0.0005	0.0005	0.0026	0.0000	-0.0001
	(0.0005)			(0.0001)	(0.0001)	(0.0006)	(0.0007)	(0.0002)
Firm-to-firm transition								
New Employer	-0.0132			0.0006	0.0006	0.0036	-0.0001	-0.0001
	(0.0005)			(0.0001)	(0.0001)	(0.0006)	(0.0007)	(0.0002)

Table 8: Risk Premium From Agency

Variable	Constant	Age-50	Tenure	Eex. Exp	NBE	NAE	Female	Interlock	Execidir
Constant	0.499	-0.046	-0.019	-0.012	0.032	0.190	-0.268	-0.333	-0.507
	(0.736)	(0.005)	(0.004)	(0.002)	(0.011)	(0.005)	(0.195)	(0.049)	(0.224)
Rank 1	0.569					0.000	-0.660	0.140	0.177
	(0.125)					(0.000)	(0.069)	(0.045)	(0.112)
Rank 2	2.836					-0.001	2.338	0.058	0.081
	(0.125)					(0.000)	(0.069)	(0.037)	(0.092)
Rank 3	1.032					-0.002	-1.120	0.058	0.081
	(0.125)					(0.000)	(0.069)	(0.037)	(0.092)
Rank 4	-0.016					0.000	-0.003	0.000	0.000
	(0.125)					(0.000)	(0.001)	(0.001)	(0.000)
Industrial Sector									
Primary	-0.037	-0.001	-0.001	0.000	0.012	0.011	0.142	-0.013	0.083
	(0.096)	(0.004)	(0.003)	(0.002)	(0.010)	(0.004)	(0.061)	(0.039)	(0.100)
Service	0.379	-0.049	-0.003	0.010	0.035	-0.061	-0.595	0.749	0.639
	(0.098)	(0.004)	(0.003)	(0.002)	(0.010)	(0.004)	(0.062)	(0.040)	(0.101)
Firm Size									
Medium	1.032	0.016	0.003	0.004	-0.033	0.007	0.513	-0.240	0.375
	(0.098)	(0.004)	(0.003)	(0.002)	(0.010)	(0.004)	(0.062)	(0.040)	(0.101)
Large	3.350	0.030	0.004	0.001	-0.064	0.002	0.495	-0.312	0.531
	(0.097)	(0.004)	(0.003)	(0.002)	(0.010)	(0.004)	(0.061)	(0.040)	(0.101)
Board with a large number of insiders									
Large	0.270	0.006	0.006	0.003	-0.022	-0.004	0.049	-0.085	0.088
	(0.079)	(0.003)	(0.003)	(0.001)	(0.008)	(0.004)	(0.050)	(0.032)	(0.082)
Firm-to-firm transition									
New Employer	0.362	0.008	-0.003	-0.003	0.012	0.025	0.258	-0.053	-0.062
	(0.080)	(0.003)	(0.003)	(0.001)	(0.008)	(0.004)	(0.051)	(0.033)	(0.083)

Table 9: Gross Loss to Shareholders from not Providing Executive Incentives

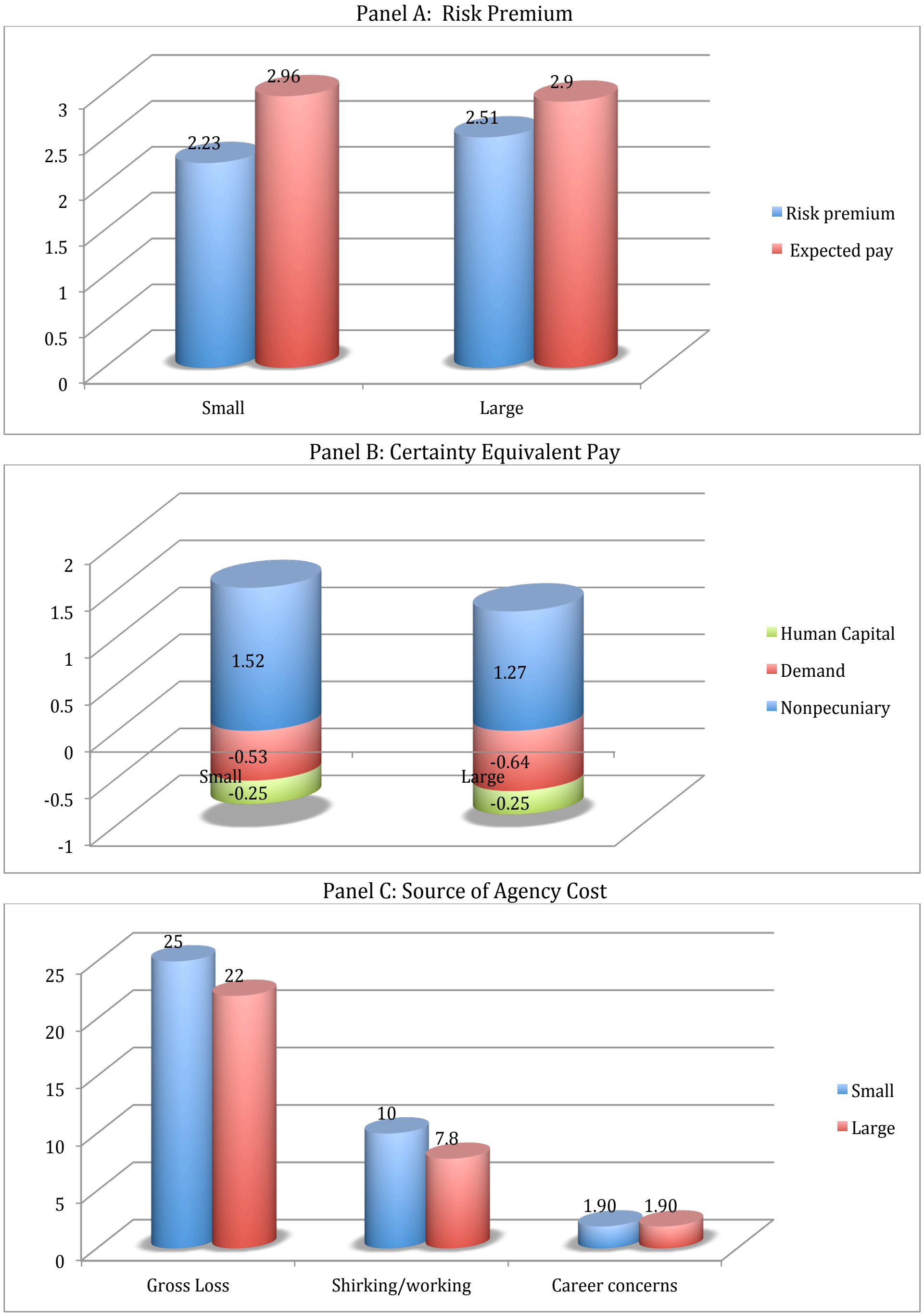
	$E(x(1-g(x)))$	New Employer	Female	Individual	Characteristics
Constant	33.5963	6.8678	1.7380	Interlocked	-3.0951
	(0.0367)	(0.0036)	(0.0263)		(0.0100)
Rank 1	-8.0575	1.0166	-1.5638	Execdir	-7.0620
	(0.0056)	(0.0395)	(0.0358)		(0.0051)
Rank 2	-4.2791	2.8547	-1.7018	Exec.Exp.	-0.1339
	(0.0057)	(0.0412)	(0.0359)		(0.0006)
Rank 3	-1.9994	3.3221	-1.5730	Exec.Exp. Sq	0.0001
	(0.0057)	(0.0440)	(0.0361)		(0.0001)
Rank 4	-0.9403	2.8096	-1.3255	Tenure	0.0012
	(0.0058)	(0.0455)	(0.0362)		(0.0005)
Rank 1 Lagged	-6.6667			Tenure Sq.	-0.0001
	(0.0096)				(0.0001)
Rank 2 Lagged	-8.1900			NAE	0.4477
	(0.0067)				(0.0018)
Rank 3 Lagged	-3.5289			NBE	0.5651
	(0.0080)				(0.0015)
Rank 4 Lagged	-0.4527			Age-50	-0.0411
	(0.0049)				(0.0005)
Industrial Sector				Age-50 Sq	0.0005
Primary	-3.7273				(0.0001)
	(0.0042)				
Service	9.3501				
	(0.0043)				
Firm Size					
Medium	-12.9481		0.0093		
	(0.0044)		(0.0244)		
Large	-25.4104		0.0139		
	(0.0044)		(0.0221)		
Board with a large number of insiders					
Large	-3.0350				
	(0.0035)				

Table 10: The Net Compensating Differentials to Executives from Working Versus Shirking

Variable	Constant	Age-50	Age-50 Sq	Tenure	Eex. Exp	NBE	NAE	Female	Interlock	Execidir
Constant	9.952	0.053	-0.001	0.110	0.015	-0.067	0.141	1.437	-0.930	-0.151
	(0.888)	(0.019)	(0.001)	(0.027)	(0.000)	(0.066)	(0.031)	(0.530)	(0.190)	(0.002)
Rank 1	1.029					-0.004	-0.004	-0.378	-0.070	0.018
	(0.798)					(0.002)	(0.002)	(0.480)	(0.173)	(0.003)
Rank 2	0.759					0.000	0.000	-1.082	-0.058	0.015
	(0.798)					(0.002)	(0.002)	(0.481)	(0.144)	(0.003)
Rank 3	0.307					0.006	0.005	-1.716	-0.063	0.018
	(0.798)					(0.002)	(0.002)	(0.481)	(0.144)	(0.003)
Rank 4	0.039					-0.001	-0.003	-0.120	0.010	0.017
	(0.798)					(0.002)	(0.002)	(0.008)	(0.010)	(0.003)
Industrial Sector										
Primary	-2.599	-0.032	0.001	-0.040		-0.005	-0.080	-0.612	0.427	
	(0.605)	(0.016)	(0.001)	(0.023)		(0.055)	(0.026)	(0.419)	(0.145)	
Service	3.799	0.060	-0.001	0.080		-0.050	0.074	0.788	-0.616	
	(0.628)	(0.017)	(0.001)	(0.024)		(0.057)	(0.027)	(0.427)	(0.149)	
Firm Size										
Medium	-3.105	-0.073	0.002	-0.079		0.125	-0.061	-1.041	0.769	
	(0.628)	(0.017)	(0.001)	(0.024)		(0.057)	(0.027)	(0.427)	(0.149)	
Large	-4.500	-0.096	0.002	-0.111		0.153	-0.105	-1.207	0.766	
	(0.621)	(0.016)	(0.001)	(0.024)		(0.056)	(0.027)	(0.425)	(0.148)	
Number of Insde Executves on the board ofdirectors										
Large	-2.182	0.015	-0.001	-0.027		-0.056	-0.077	-0.415	0.149	
	(0.508)	(0.013)	(0.001)	(0.019)		(0.046)	(0.022)	(0.347)	(0.121)	
Firm-to-firm transition										
New firm	-4.755	0.051	-0.001	-0.052		-0.187	-0.189	-2.485	0.318	0.034
	(0.514)	(0.013)	(0.001)	(0.019)		(0.048)	(0.023)	(0.355)	(0.130)	(0.003)

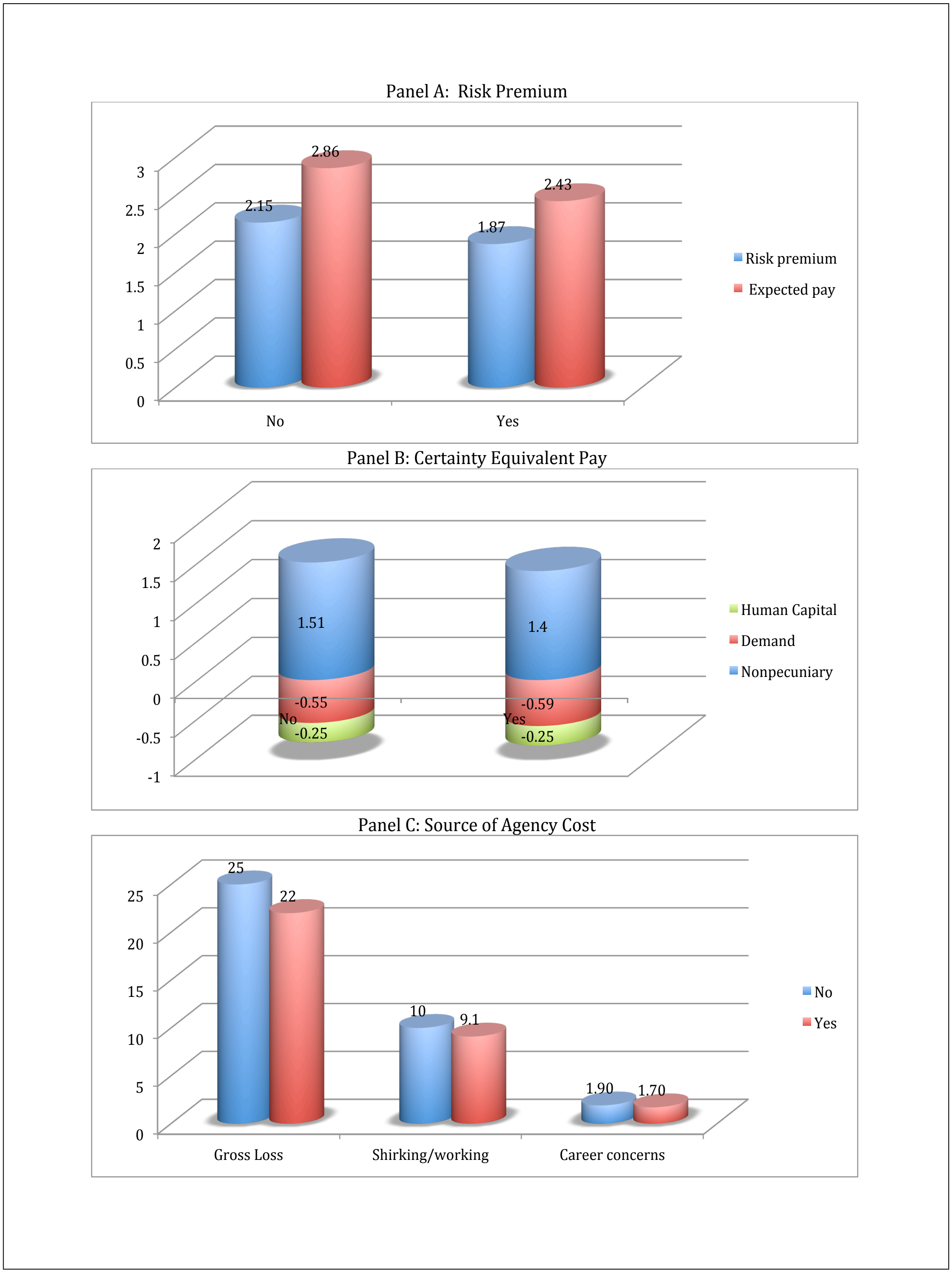
Table 11: Career Concern Amelioration of Agency Problem

Variable	Constant	Age-50	Age-50 Sq	Tenure	Eex. Exp	NBE	NAE	Female	Interlock	Execidir
Constant	-1.547	0.006	0.001	0.009	0.015	0.059	0.050	0.154	0.170	-0.151
	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.005)	(0.002)
Rank 1	0.013					-0.004	-0.004	0.061	0.010	0.018
	(0.006)					(0.002)	(0.002)	(0.008)	(0.009)	(0.003)
Rank 2	-0.490					0.000	0.000	-0.198	0.011	0.015
	(0.006)					(0.002)	(0.002)	(0.009)	(0.010)	(0.003)
Rank 3	-0.671					0.006	0.005	0.182	0.007	0.018
	(0.006)					(0.002)	(0.002)	(0.009)	(0.010)	(0.003)
Rank 4	-0.242					-0.001	-0.003	-0.120	0.010	0.017
	(0.006)					(0.002)	(0.002)	(0.008)	(0.010)	(0.003)
Firm-to-firm transition										
New firm	-0.101					-0.017	-0.019	-0.150	0.023	0.034
	(0.006)					(0.002)	(0.002)	(0.008)	(0.009)	(0.003)



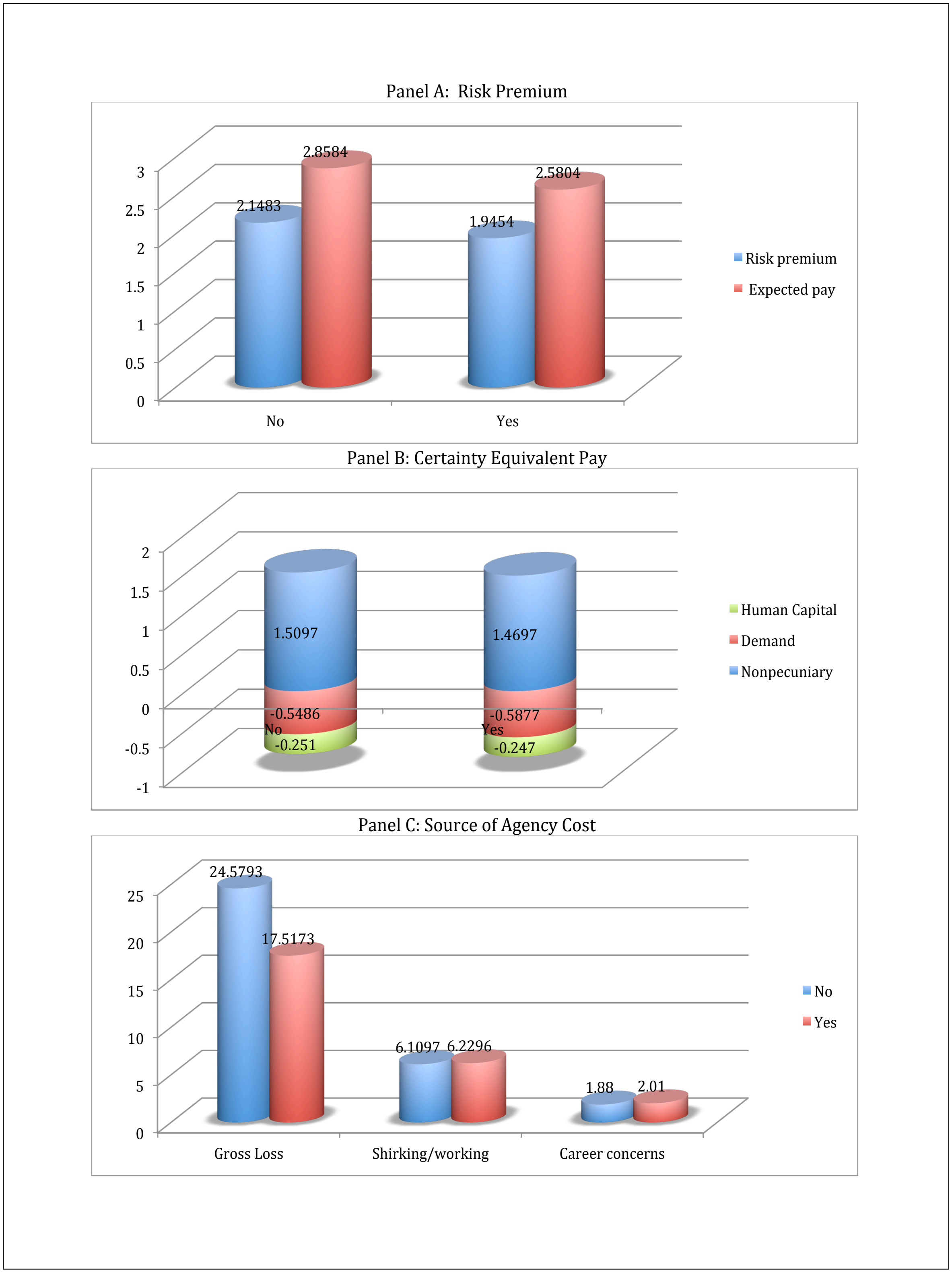
Note: Gross loss is the percentage of the firm value lost if an executive shirks instead of working. Loss of equity is the firm value lost if an executive shirks instead of working. Nonpecuniary benefit is the value to an executive of shirking relative to working. Career concerns measures the extent to which career concerns ameliorate the agency problem.

Figure 1: Governance Pay Decomposition: No. of Insider on the board.



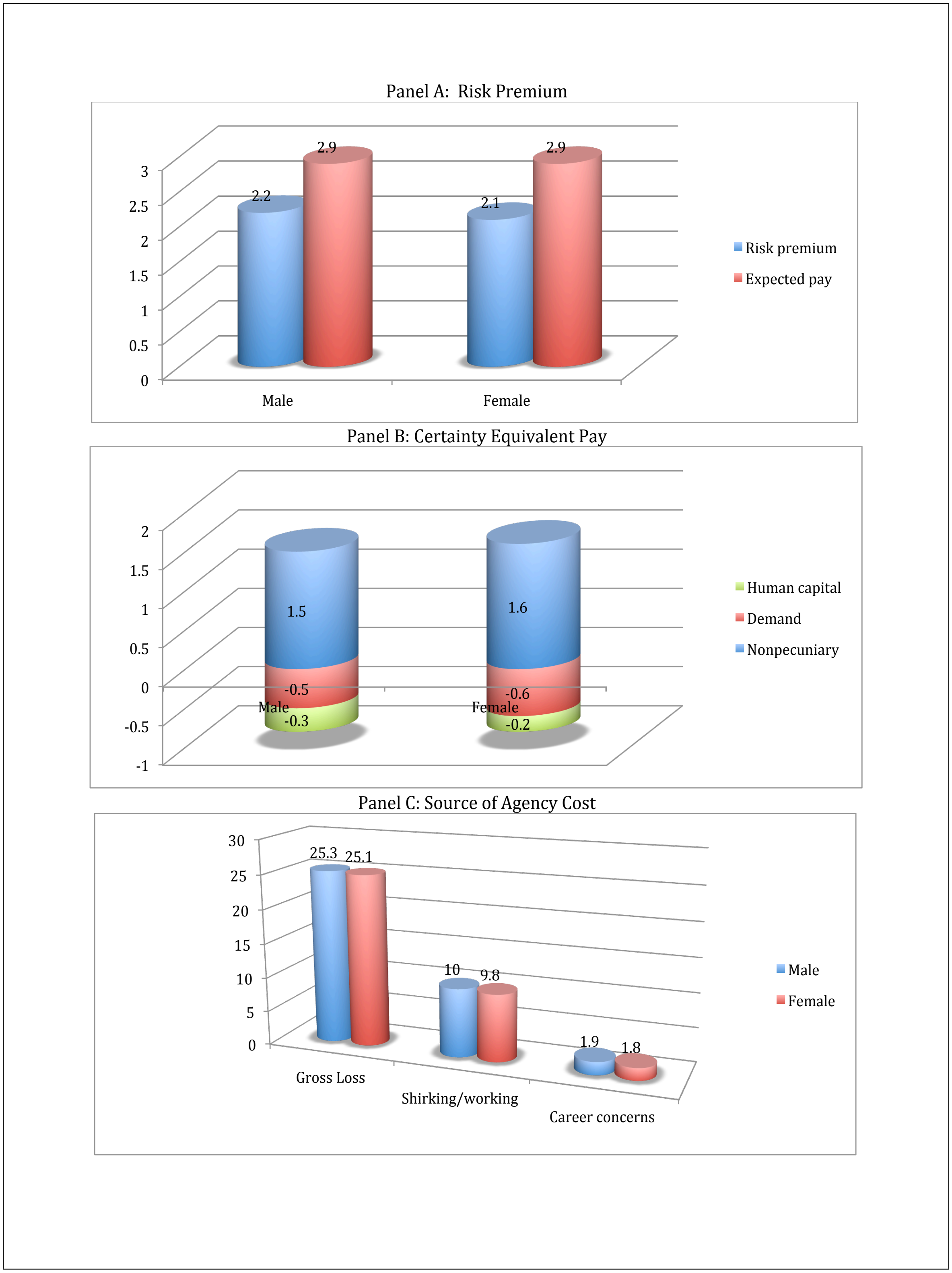
Note: Gross loss is the percentage of the firm value lost if an executive shirks instead of working. Loss of equity is the firm value lost if an executive shirks instead of working. Nonpecuniary benefit is the value to an executive of shirking relative to working. Career concerns measures the extent to which career concerns ameliorate the agency problem.

Figure 2: Governance Pay Decomposition: Interlocked Executives



Note: Gross loss is the percentage of the firm value lost if an executive shirks instead of working. Loss of equity is the firm value lost if an executive shirks instead of working. Nonpecuniary benefit is the value to an executive of shirking relative to working. Career concerns measures the extent to which career concerns ameliorate the agency problem.

Figure 3: Governance Pay Decomposition: Executive Director



Note: Gross loss is the percentage of the firm value lost if an executive shirks instead of working. Loss of equity is the firm value lost if an executive shirks instead of working. Nonpecuniary benefit is the value to an executive of shirking relative to working. Career concerns measures the extent to which career concerns ameliorate the agency problem.

Figure 4: Governance Pay Decomposition: Gender