Executive pay in Japan: the role of bank-appointed monitors and the Main Bank relationship

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Abstract

A feature of tournament models is that executive compensation is not independent of the wages paid at lower levels of the corporate hierarchy. Agency models show that compensation based on firm performance is a means by which incentives can be provided to executives once a promotion tournament has been resolved. In this paper, we combine elements of both models and show that the existence of an outsider who monitors the firm’s activities will lower the sensitivity of pay to firm performance for top executives and reduce the importance of tournament-based incentives. Using panel data for 55 Japanese electronics firms, we find support for the notion that bank-appointed Board members help monitor top executives and that tournament considerations are a particularly important feature of executive compensation in Japan.

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1. Introduction

Rewards for executives often include performance-linked remuneration. In large firms with internal labor markets, the relative rewards across levels of the corporate hierarchy also provide incentives to workers and managers. In other words, executive compensation schemes have elements that reflect rewards for having won promotion ‘tournaments’ as well as incentives to address classic agency concerns. In this paper, we develop a model that combines important elements of both the standard tournament and agency models to study the compensation of Japanese top executives.

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Tournament or rank-order models are often considered appropriate for studying compensation schemes within firms with internal hierarchies or job ladders. Such models seem particularly suitable for studying executive compensation at Japanese firms, with their lifetime employment systems and well-developed corporate hierarchies. In the presence of moral hazard and costly monitoring, compensation schemes that depend on relative rather than absolute performance may provide appropriate incentives for workers. It is well known that incentives, in the sense of inducing agents to take actions in the best interests of the firm’s shareholders, are increasing in the spread between first prize (e.g., direct salary plus share options and performance-related bonuses) and second prize. Further, this spread exceeds the difference in productivity between ‘winners’ and ‘losers’.

In contrast, agency models show that compensation based on firm performance is a means by which incentives can be provided to executives, once a promotion tournament has been resolved. It is standard practice in economics to assume that agents pursue their own goals, such as the enjoyment of perquisites (e.g., taking leisure time on the job) as well as the maximization of their own income (Jensen and Meckling, 1976). This explains the considerable attention paid to honing compensation or incentive schemes, which may include profit-sharing arrangements, granting share options, or bonus payments tied to performance as mechanisms that help to align top management interests with shareholder interests.

In the empirical part of the paper, we examine the importance of agency and tournament considerations for top executive compensation in Japan. In particular, we focus on the impact of the Main Bank relationship and the role of bank-appointed members to the Board of Directors on both the level and the sensitivity of executive compensation to firm performance as well as the importance placed on tournament-based incentives. It has been argued that the Main Bank has played a major role in monitoring companies (e.g., Sheard, 1989; Aoki, 1994). Our focus is related, because if the Main Bank does perform this monitoring role, then this should affect executive compensation as well as corporate performance. In addition, we examine whether there is a significant difference in the level and composition of executive compensation in firms with bank-appointed directors on their Boards. Specifically, we investigate the hypothesis that the pay–performance sensitivity of executive pay is smaller in firms that have bank-appointed directors. The implicit

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1 A major benefit of tournaments is that they preserve the ordinal rank of “contestants” for highly correlated productivity shocks (Holmström, 1979; Laezer and Rosen, 1981; Green and Stokey, 1983). Dye (1984) lists some potential drawbacks associated with tournament structures. For example, they may have side effects such as increased mobility of losing contestants who still possess valuable specific human capital as well as incentives to sabotage opponents (see also Laezer, 1989). However, Holmström and Tirole (1989) note that tournaments are quite commonplace within firms. Vancil (1987) describes many CEO succession rites as a “horse race”.

2 Masson (1971) was one of the first studies to investigate the joint hypothesis of executive shareholding and improved corporate performance. The importance of effectively tying executive ‘fortunes’ to their companies’ ‘fortunes’ is documented by Benston (1985), Coughlan and Schmidt (1985), Murphy (1985, 1999), as well as Morck et al. (1988). Shleifer and Vishny (1988), however, counsel caution when interpreting larger shareholdings as properly motivating managers to maximize value. For instance, they cite examples where managers may push for short-term contracts when they possess inside information that earnings will improve.

3 On the other hand, recent studies suggest that the monitoring by banks has been largely ineffective (e.g., Hanazaki and Horiuchi, 2000).
assumption is that banks can better observe the behavior of executives when they have a member on the Board. In turn, this information is used to determine the nature of the tournament, the structure of compensation and incentive contracts for executives.

Existing research on executive pay in Japan (e.g., Kaplan, 1994; Kato, 1997; Xu, 1997; Kubo, 2001) suggests that there is a positive and significant relationship between directors’ bonuses and firm profits, although the relationship between directors’ pay and performance is far weaker. In addition, Kato (1997) shows that the compensation paid to directors is significantly smaller in the companies of keiretsu. However, no previous studies have investigated the effect of the Main Bank relationship on executive compensation, i.e., the differences in the level as well as the performance sensitivity of executive pay across firms with or without relationships with Main Banks.4

Section 2 introduces a standard tournament model and discusses the issues involved once the tournament is resolved. In Section 3, our focus is redirected to the incentives that would increase CEO effort. Specifically, we incorporate performance-based incentives into a ‘hybrid’ tournament and agency model. Conditions of observability, or the existence of an independent monitor, dictate the extent to which these incentives take the form of increased performance pay. Section 4 empirically examines the relationship between the pay hierarchy and the incentive pay for a sample of top executives in the Japanese electronics industry. Section 5 provides some concluding comments.

2. A two-period model: ‘pure’ tournament

In this section, we modify Lazear and Rosen’s (1981) two-player, one-period tournament model by adding a second period. This enables us to focus on the issues involved once a promotion tournament has been decided. The basic structure of the game is illustrated in Fig. 1.

In period 1, there are two contestants or mid-level managers, indexed by $i$ and $j$, who compete for promotion to CEO. The incumbent CEO retires at the end of period 1. In period 2, one of the contestants is declared the winner and promoted. The loser could choose to leave the firm or to stay with the firm in a non-aspirant, non-executive capacity. In the former case, the game structure would typify what is termed an ‘up-or-out’ employment contract. In what follows, however, we assume that the loser chooses to stay with the firm and to not compete to become the next CEO.5

We denote $W$ and $W + \delta$ are the fixed salaries attaching to the job positions of mid-level manager and CEO, respectively. Hence, first period contestants and the loser of the

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4 The study that comes closest to doing so is Ke et al. (1999) which compares the CEO pay–performance sensitivity in publicly- and privately-owned insurance companies. They find that pay–performance sensitivity is significantly smaller in privately-owned insurance firms, suggesting that the CEOs of such firms may be monitored not only by the firms’ financial performance, but also through the direct monitoring by large shareholders.

5 That is, the value of staying with the same company exceeds a reservation alternative, possibly due to specific human capital considerations. We leave aside the implications that this assumption may have for firm growth (see O’Flaherty and Siow, 1992, 1995).
promotion tournament receive \( W \). The winner of the tournament receives an additional salary or ‘prize’, \( \delta \). The latter amount also indexes the degree of pay inequality within a hierarchically organized enterprise.

To illustrate how the optimal compensation structure is determined, we follow Lazear and Rosen (1981) by assuming that the output of agent \( i \) conditional upon his effort is described by

\[
q_{it} = x_{it} + \epsilon_{it},
\]

where \( x_{it} \) denotes \( i \)'s intensity of effort in period \( t = 1, 2 \). \( \epsilon_{it} \) is a random measurement or monitoring error.

Define \( P_i = P_i(x_{i1}, x_{j1}) \) as the probability that player \( i \) succeeds over player \( j \). Given that the agent with greater period 1 output is promoted, the probability that agent \( i \) wins is

\[
P_i = \text{Prob}(x_{i1} > x_{j1}) = \text{Prob}(x_{i1} - x_{j1} > \bar{\epsilon}) = G(x_{i1} - x_{j1}),
\]

where \( \bar{\epsilon} = (\epsilon_{j1} - \epsilon_{i1}) \), the difference in observational errors, has density \( g(\cdot) \) and c.d.f. \( G(\cdot) \), with \( E\bar{\epsilon} = 0 \), \( E\bar{\epsilon}^2 = 2\sigma^2 \) and \( G(0) = 1/2 \).

Each contestant is assumed to choose \( x_1 \) and \( x_2 \) to maximize expected utility (wealth) which, for agent \( i \) playing against an opponent \( j \), is given by

\[
V_{ij} = P_i[W - c(x_{i1}) + \beta(W + \delta - c(x_{j2}))] + (1 - P_i)
\times [W - c(x_{i1}) + \beta(W - c(x_{j2}))]
= (1 + \beta)W - c(x_{i1}) - \beta c(x_{j2}) + P_i\beta \delta,
\]

where \( \beta \in (0, 1] \) is the rate of time preference and \( c(\cdot) \) is the cost of effort function, which is assumed to be strictly convex and increasing in \( x \).

First, consider the second stage of the game, where there is an already determined winner and loser. We assume that workers are constrained to work at least \( x_L \) in the second period as a condition of payment. (The latter assumption is important and is discussed at greater length further below.) It follows that both workers will choose the minimum effort level in period 2, i.e., \( x_3 = x_L \). In the simple game described thus far, there exists no mechanism by which to increase effort above minimum (mutually verifiable) levels.

Assuming an interior solution, the first-order condition for first period effort is

\[
-c'(x_{i1}) + \beta \delta \frac{\partial P_i}{\partial x_{i1}} = 0.
\]

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6 By focusing on risk neutral workers we eschew the issues dealing with the insurance aspects of different compensation schemes. For the impact of this assumption in the context of tournament schemes, see Lazear and Rosen (1981); for a more general discussion, see Gibbons and Waldman (1999).
The optimal compensation contract can be shown to be (see Appendix A)

\[ \{W^*, \delta^*\} = \left\{ \frac{M}{1 + \beta} \left( x^*_1 + \beta x_L \right) - \frac{1}{2g(0)}, \frac{M}{\beta g(0)} \right\}, \tag{5} \]

where \( M \) is the output price. Clearly, both \( \delta^* \) and \( W^* \) are ‘cyclical’, i.e., they are increasing in \( M \). Also, \( \delta^* \) decreases in \( \beta \). Hence, the tournament is ‘diluted’, if agents discount the future less heavily. Alternatively, if the future becomes less certain, the tournament has to be given greater weight to bolster worker incentives in the first period of the game. Finally, the tournament reflects the importance of monitoring worker effort levels in period 1. Since \( g(0) \) is non-increasing in the variance of \( \xi \), then greater uncertainty over first period effort levels increases the importance of the tournament compensation structure. Finally, the larger is the prize, the smaller is the first period wage. The tournament pay scheme essentially acts like a bonding scheme by shifting total expected lifetime pay to the second period.

3. The two-period tournament model with performance bonuses

Due to the lack of contractual enforceability, an undesirable feature of the ‘pure’ tournament model is that the period 2 effort levels of the winner and the loser never exceed the minimum verifiable level. Fortunately, various mechanisms exist to address this deficiency. For example, increased period 2 effort levels may be motivated by increased shareholding or profit-sharing, or a pension or bonus payable in a third period, or any form of deferred compensation that can be effectively tied to period 2 performance. (Per se, a second period tournament will not provide a solution to the “the end-period problem”, unless there is some form of ex post settling up.)

Agency considerations play a central role in the compensation of top executives (see Garen, 1994). Accordingly, we now introduce performance-based compensation into the second period of model of the last section. We show that after the workers’ output capabilities have been revealed in a tournament, an efficient (although not necessarily unique) solution involves the use of performance-based incentives for the CEO.

Define \( x_W(z) \) as the winner’s effort level over and above \( x_L \) in period 2, i.e., \( x_2 = x_L + x_W(z) \). We assume that \( x_W \) is increasing and concave in the share of residual income, \( z \), with \( x_W(0) = 0 \). Hence, if \( z = 0 \), agents will always provide the minimum verifiable level of effort in period 2. Further, it is assumed that the ‘marginal effort’ function is both non-stochastic and common knowledge to both the agent and the principal.

To the extent that \( x_W(z) \) is known, alteration of the composition of first prize to part relative performance and part profit-contingent may deter potential malfeasance in period 2. In fact, the type of mechanism used to spur CEO effort depends critically upon observability and monitoring conditions. For example, if it is impossible for employees to verify an employer’s observation of their output, then a third period bonus or lump sum payment may be preferable to residual income sharing (see Malcomson, 1984). This would be

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7 We do not explicitly model the payment of a performance bonus to the loser as well. On the one hand, our focus is top executive compensation and, on the other hand, \( z \) may be interpreted in relative terms as the proportionally higher bonus paid to the winner.
tantamount to adding another period to the model. In addition, profit-sharing is a rather blunt instrument to handle the problem at hand, in that it may not stimulate individual effort when profits result from the joint nature of production. Alternatively, if explicit knowledge of \( x_W(z) \) is formed, then it makes sense to base compensation on \( z \) in some way. We note two rationales for knowledge of \( x_W(z) \) to be acquired. First, there is a tournament that reveals contestants’ capabilities, and secondly, if an incumbent CEO has a ‘significant’ shareholding or continued financial interest in the firm, he takes a more active interest in his successor.

To illustrate how effort may be increased in period 2, we rewrite the expected utility for agent \( i \) as

\[
V_{ij} = P_i[W - c(x_{i1}) + \beta(W + \delta + \alpha EI_{i2} - c(x_{i2}))] + (1 - P_i)
\times [W - c(x_{i1}) + \beta(W - c(x_{i2}))]
\]
\[
= (1 + \beta)W - c(x_{i1}) - \beta c(x_{i1}) + \beta P_i(\delta + \alpha EI_{i2} - R(z)),
\]
where we have assumed that \( c(x_2) = c(x_1 + x_W(z)) = c(x_1) + R(z). \)

That is, \( R(z) \) denotes the cost of the effort induced by the share of residual income; it is assumed increasing and strictly convex in \( z \), with \( R(0) = 0 \).

Second period expected profits are

\[
EI_{i2} = M(2x_L + x_W) - 2W - \delta - A(z),
\]
where \( A(z) \) represents the alignment costs to the extant owners of the firm of excessive profit-dependent compensation for the manager. To ensure interior solutions we assume that \( A(\cdot) \) is increasing in \( z \) with \( A(0) = 0 \). The alignment costs may be manifested by an under-investment in risky assets and excessive managerial firm-specific risk aversion (from the outside shareholders’ point of view), for instance. In addition, ‘excessively’ tying the interests of managers and shareholders may increase costs of maintaining the implicit value of stakeholder contracts.

We examine second period strategies by first considering the ‘loser’. Clearly, the loser of the contest obtains utility \( W - c(x_{i1}) \), some fixed value with certainty. In period 2, the loser provides the minimum verifiable amount of effort, since effort provides disutility. (The following results would not be tangibly affected by having the loser leave the firm in period 2.)

Next, consider the strategy of the ‘winner’ of the first period tournament. The winner’s utility is given by

\[
V_W = W + \delta + \alpha EI_{i2} - c(x_2),
\]

\(^8\)To ensure that the cost of second period effort is increasing and strictly convex, \( x_W(z) \) cannot be ‘too’ concave. More formally, suppressing dependence of \( x_W \) on \( z \), we require that

\[
x_W'' > \frac{-c''(x_W)(x_W')^2}{c'(x_W)}.
\]

\(^9\)Marcus (1982) discussed a number of instances where conflicts of interests between managers and owners raise alignment or agency costs when managers are compensated with shares in the firm that they cannot, or are not allowed to, diversify. However, there exists a critical level of \( z \) beyond which \( A' < 0 \), since, by definition, the alignment costs associated with share ownership disappear when \( z = 1 \). On the other hand, the delegation literature takes seriously the possibility that it may pay the firm to select a compensation package for its top executives that effectively severs ownership and control (e.g., Fershtman and Judd, 1987; Brander and Poitevin, 1992; Garvey and Gaston, 1997; Gaston, 1997).
where $E\Pi_2$ and $c(x_2)$ are functions of $x$. The winner will choose second period effort such that $zM = c'(x_2^*)$, i.e., the marginal private return equals the marginal private cost. Clearly, second period effort increases in $x$. Also, note that $c'(x_2) (\partial x_2 / \partial x) = c'(x_2)x_w'(x) = R'(x)$, which implies that $zMx_w'(x) = R'(x)$.

From Eq. (6), assuming interior solutions and a symmetric equilibrium, so that $x_1 = x_j = x_1$ and $P_i = 1/2$, the first-order condition with respect to first period effort can be written as

$$\beta A g(0) = c'(x_1^*),$$

where $A = \delta + zE\Pi_2 - R$. First period effort, $x_1$, is increasing in $A$. If $x = 0$, the solution reverts to the pure tournament case considered in the last section. Alternatively, if $x = 0$ the prize takes the form of incentive pay only. (In fact, there is nothing to restrict $x$ to be strictly positive.) Since $x^*$ is set by the principal to resolve the second-period incentive problem, then $\delta^* = A^* - x^*E\Pi_2 + R(x^*)$, with $A^*$ given by Eq. (9).

Competition ensures that an efficient two period contract equates total expected compensation and total expected output, i.e.,

$$E(\Pi_1 + \beta (1 - x)\Pi_2) = 0.$$

The principal’s problem involves choosing a contract, $\{W, \delta, x\}$, which maximizes a worker’s expected utility evaluated at its equilibrium values. In order to characterize this contract we substitute Eq. (10) into Eq. (6). That is, evaluating $V_j$ at optimum values, and given that symmetry implies that the outcome of the first period tournament is purely random in equilibrium, we have

$$V = Mx_1^* + \beta M(x_1 + \frac{1}{2}x_w(x)) - c(x_1^*) - \beta c(x_1) - \frac{1}{2} \beta (A(x) + R(x)).$$

Assuming interior solutions, we obtain

$$\frac{\partial V}{\partial W} = (M - c'(x_1^*)) \frac{\partial x_1^*}{\partial W} = 0,$$

$$\frac{\partial V}{\partial \delta} = (M - c'(x_1^*)) \frac{\partial x_1^*}{\partial \delta} = 0,$$

$$\frac{\partial V}{\partial x} = (M - c'(x_1^*)) \frac{\partial x_1^*}{\partial x} + \frac{\beta}{2} (Mx_w' - A' - R') = 0.$$

The first two conditions imply that $M = c'(x_1^*)$, so that the first period tournament is socially efficient. The third condition implies that

$$Mx_w'(x^*) = A'(x^*) + R'(x^*).$$

Hence, $x$ is set so that the marginal social benefit equals its marginal social cost, i.e., the game is socially efficient in both of its stages. Recall that the winner determines his effort according to $zMx_w' = R'$, hence, Eq. (13) can be rewritten as

$$(1 - x^*)Mx_w'(x^*) = A'(x^*).$$

In determining the share of profits to award the winner, the firm takes into account the increased alignment costs of performance-related compensation for the new CEO. If these added costs are negligible, then efficiency dictates that $x^*$ is closer to 1. In fact, as is well
known, the absence of alignment costs associated with managerial shareholding implies that an optimal response is to sell the firm (or to rent the productive non-labor assets) to a risk neutral agent. Of course, observed practice certainly suggests otherwise, hence, either executives are extremely risk averse or the alignment and agency costs of managerial ownership are non-trivial.

Finally, we summarize the key results and comparative statics of the optimal compensation contract. Proposition 1 deals with provision of first-period incentives and Proposition 2 deals with provision of second-period incentives, i.e., given the need to provide first-period incentives. (Proofs are given in Appendix A.)

**Proposition 1 (First-period incentives).** The optimum prize differential, $\Delta^*$, rises in the output price and the rate at which workers discount the future, and falls with improved monitoring of first period workers.

**Proposition 2 (Second-period incentives).** (i) Given the optimum prize differential, executive bonus pay and direct salary are inversely related; (ii) any factor which reduces the second-period incentive problem, such as improved monitoring, will leave unchanged the size of the prize, but will be associated with lower performance-related pay and a higher direct salary for the winner.

The main finding of Proposition 1 suggests that that improved monitoring of workers at levels of the corporate hierarchy below the very top level reduces the importance placed on tournament-based incentives. Proposition 2 states how the monitoring of the eventual winner of a promotion tournament affects the performance-related compensation and the degree of pay inequality within the organization.

From the viewpoint of mid-level managers, increased shareholding or incentive pay and direct salary or cash compensation are substitutes. The optimum prize differential is set by the firm to provide optimal effort incentives for first period workers. Ex ante, the composition of the prize is irrelevant given the risk neutrality assumption. However, from the firm’s point of view, profit-sharing and the tournament are complementary incentive devices that address quite different problems. The size of the pay increase upon promotion reflects the provision of tournament or first-period incentives only. The performance-related component of pay, however, reflects the need to provide second-period incentives. However, note that the use of performance pay, in lieu of direct salary, is not costless and exists only when the alignment costs of profit-dependent compensation are low, or alternatively, the costs of monitoring executive effort are high.

4. Confronting empirical realities: the determinants of executive pay in Japan

4.1. Executive bonuses in Japan

In order to provide evidence that sheds light on the tournament and agency implications for compensation of upper-level management, we focus on top executive compensation in Japan. Japanese executive pay characteristically takes two forms—direct salary and
performance-related bonuses. In addition, international comparisons of executive pay reveal that the compensation of Japanese executives is disproportionately weighted towards direct salary suggesting the importance of tournament structures within large firms with internal hierarchies (see Murphy, 1999, p. 2495, Fig. 4).

One of the most important characteristics of Japan’s wage system is the role played by bonuses. Many employees, both white collar and blue collar, receive about 20 percent of their total compensation in the form of bonuses (see Hart and Kawasaki, 1999). There have been several hypotheses to explain the Japanese bonus system.

Hashimoto (1979) develops a model in which increased on-the-job training leads to a higher bonus-to-wage ratio. Using data from the Basic Wage Census and Monthly Survey he finds that tenure and firm size are positive and significant determinants of the bonus-to-wage ratio. In Hashimoto’s model tenure proxies for specific human capital accumulation. Similarly, employees in large firms tend to have more firm-specific human capital.

Some scholars argue that the Japanese wage system is a form of “profit-sharing” which serves to maintain employment levels (Weizman, 1984; Freeman and Weitzman, 1987). In other words, rather than laying off workers when economic conditions deteriorate, employers can reduce labor costs by lowering bonuses. Using industry level data for 1958–1983, Freeman and Weitzman (1987) find that bonuses were far more sensitive to profitability than were regular wages.

In addition, it is important to note that the bonuses paid to directors are more flexible than the bonuses paid to employees. Using grouped data for 1955–1986, Ono (1989) finds that directors’ bonuses are more than twice as responsive to changes in corporate profitability than are employees’ bonuses. Moreover, while the ratio of total compensation paid as bonuses to employees showed a slight downward trend for the period 1988–1995 (see Hart and Kawasaki, 1999); for the same time period, the Bonus ratio declined sharply for the directors in the sample used for our empirical analysis below.

Nakamura and Nakamura (1991) construct a multi-stage model in which the ratio of bonus to total salary paid rises for workers with more qualifications. Using grouped wage data for 1974 and 1984, they find that tenure and qualifications are more important for bonuses than for regular wages. Similar results are found by Nakamura and Hübl er (1998), who estimate the determinants of regular pay and the bonus-to-total salary ratio for Japan, Germany, and the US. They argue that their results are consistent with agency theory. Specifically, in a manner similar to that explicated in our paper, performance-sensitive pay is used when it is more difficult to monitor employees. Managers in higher ranks are considered to conduct more complex tasks than employees in lower ranks; consequently, the proportion of performance pay rises with rank and qualifications.

4.2. The empirical model

The main implication of the model developed in the previous two sections is that executive compensation is likely to reflect the need to resolve two distinct incentive problems. The difficulty in directly monitoring or verifying the efforts of first period workers suggests that a significant part of top executive pay comprises a prize component. Further, classic agency considerations suggest the need to shift the composition of executive pay towards performance-related or bonus pay rather than direct salary.
We test two predictions of our model below. First, the argument that the Main Bank helps monitor the firm’s activities suggests that the need for a tournament to resolve worker incentive problems is attenuated. Secondly, not only does the need to provide incentives to top executives increase the sensitivity of pay to performance but also, as a corollary, the importance of total performance-related pay for executives will increase relative to the direct salary component of compensation. Improved monitoring of top executives will therefore reduce the sensitivity of pay to firm performance as well as the pay gap between total compensation paid and the wages paid at lower levels of the firm’s internal hierarchy.

These considerations suggest estimation of the following model

$$\text{Paygap} = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \varepsilon. \quad (15)$$

$$\text{Bonus ratio} = \beta_0 + \beta_1 X_1 + \beta_2 X_3 + \upsilon. \quad (16)$$

$Paygap$ is the ratio of the directors’ average total compensation and average employee wages. It is our proxy for the winner’s prize, $A$, and reflects the need to resolve the first period moral hazard problem. For each director, $\text{Bonus ratio}$ is measured as the ratio of bonus pay to total compensation. In terms of the theoretical model, this variable reflects the need to address the second period moral hazard problem.

$X_1$ denotes the vector of variables that affect both the first period and second-period incentive problems. One of the variables is the Main Bank relationship, MB. It has been previously argued that the Main Bank has played a major role in monitoring companies. By extension, if this is the case, then Main Bank monitoring should help resolve the first period and second period agency problems. In other words, firms without Main Bank relationship may require other incentive mechanisms, such as tournaments and agency contracts, to motivate employees and executives.10 The other variable in $X_1$ is firm size. Firm size is invariably one of the most important determinants of all the various components of executive pay (see Murphy, 1999; Oi and Idson, 1999). We use the natural logarithm of sales as well as total assets as alternative measures of firm size. Lastly, we include firm performance. The impact on $\text{Bonus ratio}$ is direct, and from Eqs. (7) and (9), expected profits are positively related to $\text{Paygap}$, for a given $\alpha$. Our preferred measure of performance is the rate of stock return. However, we also report estimates using profits before tax in the sensitivity analysis.

$X_2$ denotes the vector of variables that mainly affect the tournament. Most notable is the probability of promotion or structure of the firm’s hierarchy. In order to provide first-period incentives, a low probability of promotion must be ‘compensated’ with an even larger prize (see Rosen, 1986). The result that the prize increases in the number of equally able contestants can be readily seen from inspecting either Eq. (3) or Eq. (6). As the probability

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10 The Main Bank dummy is from Hanazaki and Hachisuka (1997). In their study, a Main Bank relationship exists if all of the following conditions are satisfied:

(a) The same bank provides the largest single proportion of the firm’s borrowing from private financial institutions in 1981, 1985, and 1990.

(b) The coefficient of variation of the proportion of the largest lending bank in firm’s borrowing is less than 20 during the period 1981–1990.

(c) The shareholding of the largest lending bank, together with its affiliated banks, exceeds 5 percent.
of winning falls, to ensure an optimal effort level by all contestants, regardless of the eventual outcome, the prize for winning must rise. We use two proxies. One proxy measures whether either the president (shacho) or the chairman (kaicho) have been internally promoted or not. The idea is that if a firm hires its chief executives from outside, then this effectively lowers the probability of an internal promotion, hence the pay gap must rise to maintain first-period incentives. We also use the ratio of executives to total employees, as suggested by Xu (1997), a more direct measure of the promotion probability. By construction, this variable is closely related to firm size. Of course, larger firms have larger and more developed internal hierarchies (see Ariga et al., 1992).

$X_3$ denotes the vector of variables that affect second-period incentives. One included variable is the director’s holdings of the company’s shares, $S$. If a top executive’s interests are already closely aligned with those of the firm’s shareholders, then this will also reduce the sensitivity of pay to firm performance. Thus, in terms of the provision of second-period incentives, our theory suggests that directors’ compensation is more closely linked to a firm’s performance when it is difficult to observe the behavior of top executives or when a director’s interests are not aligned with those of the firm’s shareholders.

Until recently, it was difficult for Japanese firms to grant stock options as a part of executives’ compensation packages because it was illegal for firms to purchase their own stock. This law was amended in 1997, after which it became possible to grant stock options. Therefore, it is highly unlikely that the directors received shares as a part of their total compensation package. However, some companies have encouraged directors to own their stock. In addition, it may be the case that directors establish their own stock ownership schemes to purchase the firms’ shares. Coupled with this is the fact that it is difficult for directors to trade actively in their own companies’ shares due to insider trading regulations. Notwithstanding, it is unclear whether a high $S$ signals the presence or absence of an agency problem, i.e., whether it is a complement or substitute for improved monitoring.

Finally, we include a variable which indicates the presence of at least one bank appointee on the Board of Directors, $B$. This variable is hypothesized to primarily capture the monitoring of top executives. That is, $B$ affects second-period incentives because bank directors can directly monitor the behavior of top executives. While there has been considerable debate on the effectiveness of bank monitoring on corporate performance, there have been far fewer empirical studies about how these monitors affect the incentives of the firm’s top executives.

One of the main differences between $B$ and MB is that bank directors attend Board meetings and so have access to information on decision-making. In contrast, MB monitors overall firm performance (by observing the settlement of accounts, for instance). Therefore, we postulate that $B$ mainly affects the second-period incentive problem while MB mainly affects the first-period incentive problem.

4.3. The data

The data cover 55 listed companies in the electronics industry for the time period from 1989 to 1999. Employing data on publicly-listed companies in the electronics industry
alone has several advantages. First, focusing on one industry enables us to control for any time-varying industry effects on pay–performance sensitivity. In theory, at least, all firms within the given industry have been subject to the same demand-side and supply-side shocks. Secondly, compared to other industries, the Japanese electronics industry has been relatively free from regulation.

Most of the data, including that for directors’ base pay and bonuses, are from the Nikkei database. (In turn, these data are from companies’ annual reports.) The data on each company’s board structure are from Toyo Keizai Yakuin Shikihou (The Directory of Directors). Amongst other things, this directory indicates the organization from which each director comes, i.e., whether they have been internally promoted. Data on other variables, such as the rate of return on stock, are taken from the Worldscope database. The latter variable captures the changes in both stock prices and dividends.

One of the difficulties in analyzing executive compensation in Japan is that companies do not disclose the exact amount of each director’s remuneration. Neither company law nor stock market listing rules require companies to disclose such information. However, firms do disclose the total amount of directors’ base pay and bonuses as well as the number of directors, accordingly, the directors’ average base pay and average bonus are available for each company.

Table 1 contains the basic descriptive statistics of the variables used for our empirical analysis. Bonus ratio ranges from zero to approximately one half of total compensation for each director. The number of companies with at least one director from a bank comprises about one half of the sample and about one-third of the firms have a Main Bank relationship. Interestingly, the correlations in Table 1 reveal that, while positive, the correlation between the presence of a bank appointee on the Board, B, and whether there is a Main Bank relationship, MB, is just 0.29.

An informative breakdown of our data, where the descriptive statistics are classified by B and MB, is given in Table 2. One of the more striking features is the apparent difference in the structure of directors’ compensation between companies with and without bank directors. Paygap and the Bonus ratio are larger for the companies without bank directors and the Paygap is bigger in companies without Main Bank relationships. Superficially, at least, this lends support to important features of the model developed above. However, as we show below, the same pattern of results continues to hold in a multivariate regression setting.

4.4. The findings

Random effects estimates for Eqs. (15) and (16) are displayed in Table 3.11 We also report the estimates from the regressions of Paygap and Bonus ratio on all regressors. We do so for two reasons. First, both Paygap and Bonus ratio are endogenous variables and

An advantage of random effects estimation is that it helps to preserve degrees of freedom. More substantively, the Main Bank relationship does not vary much over time. Therefore, our results show that the Main Bank effect is consistent with the monitoring role posited by our theory or that those firms that happen to have Main Bank relationships have lower tournament pay.
### Table 1: Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paygap: directors’ average total compensation/employees’ average wages</td>
<td>2.27</td>
<td>0.74</td>
<td>1.02</td>
<td>7.01</td>
<td>a, b</td>
</tr>
<tr>
<td>Bonus ratio: directors’ average annual bonus/average total compensation (percent)</td>
<td>0.13</td>
<td>0.10</td>
<td>0.00</td>
<td>0.51</td>
<td>a, b</td>
</tr>
<tr>
<td>Rate of return (percent)</td>
<td>0.72</td>
<td>0.58</td>
<td>-0.65</td>
<td>2.90</td>
<td>c</td>
</tr>
<tr>
<td>Firm size: log sales (millions of ¥)</td>
<td>11.45</td>
<td>1.36</td>
<td>8.15</td>
<td>15.26</td>
<td>a</td>
</tr>
<tr>
<td>Promotion probability: number of directors number of employees (percent)</td>
<td>1.22</td>
<td>1.04</td>
<td>0.03</td>
<td>7.14</td>
<td>a, b</td>
</tr>
<tr>
<td>External promotion</td>
<td>0.28</td>
<td>0.45</td>
<td>0.00</td>
<td>1.00</td>
<td>b, d</td>
</tr>
<tr>
<td>S: total director shareholdings (percent of total shares)</td>
<td>1.76</td>
<td>3.13</td>
<td>0.01</td>
<td>18.72</td>
<td>a</td>
</tr>
<tr>
<td>MB: Main Bank relationship</td>
<td>0.31</td>
<td>0.46</td>
<td>0.00</td>
<td>1.00</td>
<td>e</td>
</tr>
<tr>
<td>B: bank appointee on Board of Directors</td>
<td>0.51</td>
<td>0.50</td>
<td>0.00</td>
<td>1.00</td>
<td>b</td>
</tr>
</tbody>
</table>

### Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>Paygap</th>
<th>Bonus ratio</th>
<th>Rate of return</th>
<th>Firm size</th>
<th>Promotion probability</th>
<th>External promotion</th>
<th>S</th>
<th>MB</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paygap</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonus ratio</td>
<td>0.35</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of return</td>
<td>0.17</td>
<td>0.24</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>0.35</td>
<td>0.40</td>
<td>0.09</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion probability</td>
<td>-0.33</td>
<td>-0.30</td>
<td>-0.01</td>
<td>-0.69</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External promotion</td>
<td>-0.17</td>
<td>0.03</td>
<td>-0.02</td>
<td>-0.17</td>
<td>0.08</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>0.03</td>
<td>0.03</td>
<td>-0.01</td>
<td>-0.27</td>
<td>0.13</td>
<td>-0.16</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB</td>
<td>-0.08</td>
<td>0.03</td>
<td>-0.04</td>
<td>0.15</td>
<td>-0.15</td>
<td>0.03</td>
<td>-0.12</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>-0.10</td>
<td>-0.11</td>
<td>-0.04</td>
<td>0.06</td>
<td>0.04</td>
<td>-0.01</td>
<td>-0.02</td>
<td>0.29</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Notes:** (a) Nikkei Needs Database; (b) Toyo Keizai Yakuin Shikihou (The Directory of Directors); (c) Worldscope database; (d) Toyo Keizai Keiretsu Soran (The Directory of Company Keiretsu); (e) Hanazaki and Hachisuka (1997). Total observations = 605; 11 years (1989–1999) and 55 firms.
Table 2
Descriptive statistics classified by bank appointee on Board of Directors and Main Bank relationship

| Variable                | $B = 0$ | $B = 1$ | $|t|$ | $MB = 0$ | $MB = 1$ | $|t|$ |
|------------------------|---------|---------|------|----------|----------|------|
| Paygap                 | 2.34    | 2.19    | 2.51** | 2.31    | 2.17    | 2.08** |
| Bonus ratio            | 0.14    | 0.12    | 2.82** | 0.13    | 0.14    | 0.71  |
| Rate of return         | 0.74    | 0.70    | 0.87  | 0.74    | 0.69    | 1.03  |
| Firm size              | 11.37   | 11.53   | 1.53* | 11.32   | 11.76   | 3.73***|
| Promotion probability  | 1.18    | 1.27    | 1.07  | 1.32    | 1.00    | 3.63***|
| External promotion     | 0.29    | 0.28    | 0.16  | 0.28    | 0.30    | 0.61  |
| Executive shareholding | 0.02    | 0.02    | 0.42  | 0.02    | 0.01    | 3.07***|
| Main Bank (MB)         | 0.17    | 0.44    | 7.51*** | 0.42    | 0.73    | 7.51***|
| Bank-appointed director ($B$) | 294 | 311 | 418 | 187 |

Notes: Data sources described in Table 1. Total observations = 605; 11 years (1989–1999) and 55 firms. $|t|$ is the absolute value of the $t$-statistic for test of the difference in means.

* Significant 10 percent level.
** Significant 5 percent level.
*** Significant 1 percent level.

jointly determined. Accordingly, variable $B$ may affect the first period and the second period incentive problems. Secondly, both dependent variables have a common factor (bonus) in their numerators.

Overall, despite the obvious level of abstraction, we consider that our theory of executive compensation fares reasonably, at least as judged by the coherence of the signs of the coefficient estimates to the hypothesized sign patterns. Better financial performance of the enterprise leads to higher bonus pay. This was expected, since bonuses are generally paid only when the profits are positive.\(^{12}\) The structure of the firm’s hierarchy, and the proxy for the unconditional probability of promotion, is strongly negatively related to Paygap. On the other hand, whether top executive appointments are made externally or not seems to be unimportant. Interestingly, the effect of firm size has no effect on Paygap.\(^{13}\) However, as predicted the coefficient estimates for the promotion probability and firm size are completely the opposite for Bonus ratio, i.e., the promotion probability has no effect, but firm size is very important.

\(^{12}\) Performance is also positive and significant in the Paygap regression. Although more difficult to interpret, our main results hold even when we drop the performance variable from Eq. (15) (see Table A.1 in Appendix A).

\(^{13}\) On the other hand, the measure of promotion probability is highly negatively correlated with various firm size measures. Hence, given the importance of size for various compensation measures, it could be argued that our finding simply confirms the well-known size–compensation correlation. However, Ariga et al. (1992) document the fact that across many Japanese industries there is a stable positive correlation between ‘span of control’, their measure of a firm’s internal hierarchy, and relative wages. In addition, they note the high positive correlation between span of control and firm size. Note that the signs of all estimated coefficients are robust to using a different measure of firm size and to dropping log sales from the main regression specification (see Table A.1 in Appendix A). In the latter case, note that the promotion probability increases in its economic significance.
Table 3
The determinants of executive compensation

<table>
<thead>
<tr>
<th></th>
<th>Paygap&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
<th>Bonus ratio&lt;sup&gt;b&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypothesized</td>
<td>Eq. (15)</td>
<td>No exclusions</td>
<td>Hypothesized</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Eq. (16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No exclusions</td>
</tr>
<tr>
<td>Rate of return (P)</td>
<td>+</td>
<td>0.127*** (0.045)</td>
<td>0.135*** (0.045)</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.064*** (0.008)</td>
</tr>
<tr>
<td>Firm size (In sales)</td>
<td>?</td>
<td>0.076 (0.054)</td>
<td>0.057 (0.057)</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.043*** (0.009)</td>
</tr>
<tr>
<td>Promotion probability (× 10⁻²)</td>
<td>–</td>
<td>−0.281*** (0.062)</td>
<td>−0.303*** (0.066)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.267 (1.043)</td>
</tr>
<tr>
<td>External promotion</td>
<td>+</td>
<td>−0.080 (0.079)</td>
<td>−0.082 (0.080)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.012 (0.015)</td>
</tr>
<tr>
<td>Main Bank (MB)</td>
<td>–</td>
<td>−0.253⁺ (0.142)</td>
<td>−0.260⁺ (0.149)</td>
<td>−?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.004 (0.021)</td>
</tr>
<tr>
<td>Bank director (B)</td>
<td>0</td>
<td>−0.023 (0.076)</td>
<td>−</td>
<td>−0.023⁺ (0.013)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.025⁺ (0.014)</td>
</tr>
<tr>
<td>Executive shareholding (S)</td>
<td>0</td>
<td>−1.951 (1.443)</td>
<td>−</td>
<td>−0.055 (0.24)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.006 (0.242)</td>
</tr>
<tr>
<td>Intercept</td>
<td>.</td>
<td>1.786*** (0.664)</td>
<td>2.093*** (0.712)</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.336*** (0.103)</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>–489.27</td>
<td>–488.27</td>
<td>298.76</td>
<td>299.14</td>
</tr>
<tr>
<td>LR χ²</td>
<td>78.70</td>
<td>80.69</td>
<td>275.83</td>
<td>233.49</td>
</tr>
<tr>
<td>Observations</td>
<td>605</td>
<td>605</td>
<td>605</td>
<td>605</td>
</tr>
</tbody>
</table>

Note: All regressions include year dummies. Asymptotic standard errors in parentheses.

<sup>a</sup> Maximum likelihood estimates.
<sup>b</sup> Tobit random effects estimates.
⁺ Significant 10 percent level.
⁺⁺ Significant 5 percent level.
⁺⁺⁺ Significant 1 percent level.
The estimates for the promotion probability are indicative of the importance of tournaments and internal hierarchies within Japanese firms. The findings generally support Xu’s (1997) findings. Our estimated pay gap elasticities are smaller, which is not terribly surprisingly given the dissimilarity of our samples (Xu’s sample covers an earlier time period than ours and includes firms in the general machinery industries). For example, a ten percent increase in the promotion probability lowers Paygap by 1.5 percent (i.e., \(-2.81 \times (1.22/2.27)\)). Based on far more parsimonious model specifications, and using outside reservation wages in lieu of firm wages to calculate the pay gap, Xu’s estimates are between 4.3 and 5.3 percent. Notwithstanding, both sets of findings support the view that the magnitude of executive pay in Japan is strongly linked to the provision of tournament incentives.14 That is, a large part of executive rewards represent a ‘prize’ for having won a succession of promotion tournaments and a long tenure with the firm, i.e., a reward for ‘past deeds’.

The findings for the existence of a Main Bank relationship and of a bank-appointed director on the Board are of particular interest. Supportive of our theory’s predictions, the presence of a bank appointee on the Board of Directors tends to reduce pay–performance sensitivity for executives (by about 2.5 percentage points).15 The findings for the Main Bank variable indicate that the effect of the relationship on executive compensation primarily operates on reducing the importance of the tournament, as was hypothesized above. Per se, the Main Bank does not affect second-period incentives.

The findings for the effects of executives already owning the company’s shares on executive compensation are insignificant. It was hypothesized above that such shareholdings could reduce the second-period incentive problem in that potential agency conflicts should be ameliorated. If such is the case, greater executive shareholdings should reduce the importance of incentive pay. On the other hand, greater shareholdings could reflect the existence of potential agency problems that are being inefficiently addressed by shareholding. In fact, there is no real support for either view. This is not surprising for at least two reasons. First, share ownership by top executives in their own firms has not been a prominent feature of either executive compensation schemes or traditional corporate governance mechanisms. Secondly, and as a corollary, share ownership by executives is minuscule in our sample (1.8 percent on average). Accordingly, share ownership of such proportions is unlikely to be able to adequately address potential agency conflicts.

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14 Two potential caveats on this interpretation are noted by Kato (1997). First, Japanese publicly-held corporations tend to under-report the salary of directors in corporate proxy statements. Further, this under-reporting may be greater for firms with a larger number of directors. Further, the existence of part-time directors will lower our measures of directors’ compensation. To the extent that the number of full-time and part-time directors is positively correlated with the promotion probability, then the observed negative relationship between the promotion probability and the Paygap could be the result of the under-reporting and part-time biases.

15 An alternative, although qualitatively similar, interpretation of this finding is that bank-appointed Board members maximize a weighted sum of the firm’s profit and the Main Bank’s desire to have its loans repaid. See Weinstein and Yafeh (1995, 1998). Hence, the pay–performance relationship may be weaker in firms with a Main Bank relationship due to bank appointees having primarily the interests of the Main Bank at heart.
4.5. More on the role of bank appointees

An increasingly common view is that bank monitoring in Japan was poor or that poorly performing firms sought the intervention of their Main Bank. Kaplan and Minton (1994) and Morck and Nakamura (1999) find that banks are more likely to have one of their employees serve as a director when a company is in financial distress. Accordingly, it could be argued that the bank director variable captures the effects of negative financial performance and therefore, like lower profits, should be associated with lower executive compensation. However, recall that the unconditional correlations between either MB or B and measures of profitability and performance are insignificantly different from zero. Hence, the negative coefficients on both variables are not simply picking up a poor financial performance effect. Moreover, we controlled for firm performance in the regression specification.

Moreover, in our sample of firms, companies without bank directors do not outperform companies with bank directors. As noted, average profits and performance are marginally higher in the latter. Thus, for firms in the Japanese electronics industry at least, it is not a simple matter of firms with bank-appointed directors performing poorly and hence, paying less. The descriptive statistics in Table 2 and the regression results in Table 3 are therefore consistent with the significant positive relationship found between bank control rights and German firm performance (see Gorton and Schmid, 2000).

Notwithstanding, it is still possible that poorly-performing firms with low directors’ pay have a bank-appointed director on their Boards. Furthermore, if firm performance does improve it may be that executive pay only increases after some sustained period of improved firm performance. To investigate the potential for this “timing issue” to bias our results we estimated panel probit regressions for the presence of a bank appointee on the Board, B, on contemporaneous and lagged measures of corporate financial distress. LR tests determined that none of the lags were statistically significant. Regressing B on contemporaneous financial distress yielded a weakly significant negative coefficient (\(P = 0.087\)). Thus, for our sample of electronic firms, B does not capture a financial distress effect.

4.6. Further sensitivity analysis

The sensitivity of our results can be gauged by the robust sign pattern of the coefficient estimates for the key variables in alternative model specifications (see Table A.1 in Appendix A). For example, in order to examine the effect of alternative measures of profitability, we use the firm’s profit before tax in column (1). The same pattern of results continue to hold; in fact, the effect of the bank-appointed Board member on Bonus ratio strengthens. In column (2), we examine the key results when the firm size variable is

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16 The Pearson correlation coefficient between the existence of a bank appointee on the Board of Directors and the rate of return is just \(-0.04\) and that between the Main Bank relationship and rate of return is \(-0.04\) (see Table 1). (The correlation coefficient between B and profits before tax is \(+0.04\) and that between MB and profits before tax is \(+0.01\).)
excluded from the Paygap regression and the promotion probability is excluded from the Bonus ratio regression. The latter specifications were estimated due to a concern that large firms are more profitable and are likely to have smaller promotion probabilities. In column (3), we replace sales by assets as an alternative measure of firm size, and once again, the results are virtually identical to those reported in Table 3. Column (4) reports the shortest model specifications selected by a series of LR tests. Once again, note that the key results survive. That is, the effects of the promotion probability, the main bank dummy, and the bank director dummy have the hypothesized signs.

To provide an overview, the most important determinant of both Paygap and Bonus ratio is corporate performance. The size of Paygap mainly reflects the need to provide incentives for workers throughout their career with the firm. In this sense, the probability of promotion is the most crucial determinant of Paygap. Main Bank monitoring is also found to be an important (and robust) although somewhat weaker determinant. This finding therefore runs somewhat counter to the recent research that argues that banks were, at best, passive monitors of firms in which they had a financial stake.

The size of the Bonus ratio reflects the provision of incentives to top executives once they have progressed through the tournament phase of their careers. The most important determinants are firm size and corporate profitability. We find consistent evidence that bank-appointed Board directors reduce the sensitivity of pay to performance for top executives. Hence, bank appointees to Boards of Directors may have been effective monitors of the actions of top executives, thereby reducing the need for forms of incentive compensation that more closely align top executives’ interests with those of the firm’s shareholders.

5. Concluding comments

Executive pay is a popular topic for investigation for labor economists, industrial relations and human resource management specialists. The more recent debate about the nature, and possible excessiveness, of executive compensation is also part of the wider debate concerning the optimal governance of the modern corporation. In this paper, we examined some important features of executive rewards in Japan. Specifically, it was argued that executive pay performs at least two major functions. First, executive compensation represents the winner’s prize or the end product of the successful culmination of a lifelong career with an employer that has involved a series of competitions at various rungs of the corporate ladder. Tournament models have the feature that the structure of executive compensation is not independent of the wages paid to workers at lower levels of the corporate hierarchy.

The other major role of executive compensation is that it should provide adequate incentives to the executives who are at the very top of the corporate hierarchy. Agency models show that compensation based on firm performance is a means by which incentives

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17 The procedure used to obtain the shortest model is as follows: (1) start from the model with no variable exclusions (reported in Table 3); (2) drop the variable with the smallest $t$- (or $z$-) statistic; (3) use an LR test to determine whether there is a significant reduction in the likelihood.
can be provided to executives, once a promotion tournament has been resolved. In this paper, we combined features of both theories to develop a hybrid model of executive compensation structure that is ‘part tournament’ and ‘part principal-agent’. This seems to be in accord with actual executive compensation schemes, particularly for Japan. Among the model’s key implications are that the existence of an outsider who monitors the firm’s management should lower the sensitivity of pay to firm performance and raise direct salaries for top executives.

In Japan, banks are major stakeholders in corporations and in addition, it has been argued that banks have played an important role as monitors of companies. As Gorton and Schmid (2000, p. 7) note, “there is no empirical literature that addresses the issue of the allocation of control rights to the firm across different types of stakeholders.” In part, this paper sought to redress this deficiency. Specifically, we examined the nature of directors’ financial incentives in firms that have Main Bank relationships and have directors that have been appointed by banks. Among our model’s primary implications was that pay–performance sensitivity is smaller in firms with external monitors. When monitors can observe the behavior of directors, the relative importance of financial performance in executive compensation contracts will be smaller. Furthermore, to the extent that the presence of a Main Bank relationship can help to lower financial and output uncertainty, then firms with a Main Bank relationship should have less reliance on tournament-based incentives to provide incentives for workers.

We tested the model’s key implications using panel data for 55 Japanese electronics firms, for the period 1989–1999. Overall, we found evidence that both agency and tournament considerations are important for the compensation of top executives. Thus, executive pay—its magnitude, as well as structure, reflect information asymmetries and moral hazard considerations in the entire corporation. However, in large measure, top executive pay in Japan largely reflects the rewards of a long and successful career climbing the corporate ladder. In other words, for the industry and time period that we consider, we find that executive pay in Japan may be better viewed through the lens of the tournament model, rather than the agency model. In some ways this is not surprising. Japanese corporations are reputed for implicit contracting and the lifetime employment systems for their employees. Tournament models that explicitly incorporate internal labor market structures are therefore likely to be close to the mark.

Among the other interesting findings is that there is some support for the view espoused by some Japanese commentators that bank-appointed members on a firm’s Board of Directors may actually help to monitor the decisions and activities of top executives. In general, our findings indicate that executive compensation is both smaller and less sensitive to firm performance in those firms with a Main Bank relationship and/or a bank-appointed member on their Boards of Directors. In addition, in our sample of firms, it is not a matter of firms with bank-appointed directors performing poorly and hence, paying less to all employees including executives. While there may well be other reasons, we have argued that the findings are consistent with a monitoring role being performed by banks.

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18 Nakatani (1984) shows that the performance of firms with Main Bank relationships has a smaller variance, compared to the performance of firms without such relationships.
Hopefully, our findings contribute to an understanding of the issue of whether the close links that Japanese firms ‘enjoy’ with their bankers has been a blessing or a bane. More modestly, we view our paper as yet another step, in what has been a long journey, towards an improved understanding of the determinants of executive compensation.

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Appendix A. Derivation of Eq. (5)

Since \( \frac{\partial P_i}{\partial x_{i1}} = \frac{\partial G(x_{i1} - x_{j1})}{\partial x_{i1}} = g(x_{i1} - x_{j1}) \), Eq. (4) can be written as

\[
\beta \delta g(x_{i1} - x_{j1}) = c'(x_{i1}).
\]  

(A.1)

A symmetric Nash equilibrium implies that \( x_{i1} = x_{j1} = x_1 \) and \( P_i = 1/2 \), so that

\[
\beta \delta g(0) = c'(x_1^*).
\]  

(A.2)

Since \( c(\cdot) \) is increasing and strictly convex, effort is increasing in \( \delta \).

The firm’s expected profit is

\[
EI = 2(Mx_1 - W) + \beta(2Mx_L - 2W - \delta).
\]  

(A.3)

We assume that firms are risk neutral and part of a competitive economy, so that expected profits are zero, i.e.,

\[
M(x_1 + \beta x_L) = (1 + \beta)W + \frac{1}{2} \beta \delta.
\]  

(A.4)

Combining (A.2) and (A.4), we have

\[
W^* = \frac{M(x_1^* + \beta x_L)}{1 + \beta} - \frac{c'(x_1^*)}{2(1 + \beta)g(0)}.
\]  

(A.5)

Evaluating \( V_{ij} \) at the optimum values, by substituting Eq. (A.4) into Eq. (3), we obtain

\[
V_{ij} = M(x_1 + \beta x_L) - c(x_1) - \beta c(x_L).
\]  

(A.6)

Since \( \beta c(x_L) \) is a fixed cost, differentiating with respect to \( x_1 \) yields: \( M = c'(x_1^*) \), i.e., the tournament results in the first best allocation. Eq. (5) follows directly.
Table Appendix
The determinants of executive compensation, alternative specifications

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
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<tbody>
<tr>
<td></td>
<td>Paygap(^a)</td>
<td>Bonus ratio(^b)</td>
<td>Paygap(^a)</td>
<td>Bonus ratio(^b)</td>
</tr>
<tr>
<td>Firm performance (P)</td>
<td>0.242***      (0.079)</td>
<td>0.083***      (0.018)</td>
<td>0.140***      (0.045)</td>
<td>0.143***      (0.045)</td>
</tr>
<tr>
<td>Firm size</td>
<td>0.051 (0.058)</td>
<td>0.037***      (0.009)</td>
<td>0.043***      (0.010)</td>
<td>0.075 (0.060)</td>
</tr>
<tr>
<td>Promotion probability (10(^{-3}))</td>
<td>−0.305***     (0.066)</td>
<td>0.061 (1.027)</td>
<td>−0.342***     (0.054)</td>
<td>−0.291***     (0.067)</td>
</tr>
<tr>
<td>External promotion</td>
<td>−0.086 (0.080)</td>
<td>−0.022 (0.017)</td>
<td>−0.090 (0.080)</td>
<td>−0.081 (0.080)</td>
</tr>
<tr>
<td>Main Bank (MB)</td>
<td>−0.252*      (0.151)</td>
<td>0.006 (0.025)</td>
<td>−0.252*      (0.151)</td>
<td>0.005 (0.023)</td>
</tr>
<tr>
<td>Bank director (B)</td>
<td>−0.048 (0.077)</td>
<td>−0.030*      (0.015)</td>
<td>−0.020 (0.077)</td>
<td>−0.023*      (0.013)</td>
</tr>
<tr>
<td>Executive shareholding (S)</td>
<td>−1.192 (1.412)</td>
<td>0.227 (0.250)</td>
<td>−2.332 (1.395)</td>
<td>−0.881 (0.246)</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.223***     (0.716)</td>
<td>−0.235**     (0.112)</td>
<td>2.791***     (0.143)</td>
<td>−0.331***     (0.113)</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>−488.03</td>
<td>282.98</td>
<td>−488.76</td>
<td>299.55</td>
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<tr>
<td>LR (\chi^2)</td>
<td>81.17</td>
<td>245.90</td>
<td>79.71</td>
<td>276.53</td>
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<tr>
<td>Observations</td>
<td>605</td>
<td>605</td>
<td>605</td>
<td>605</td>
</tr>
</tbody>
</table>

Notes: Asymptotic standard errors in parentheses. Column (1): \(P = \) profit before tax in millions of \(¥ \times 10^6\); (2) firm size or promotion probability; (3) firm size = \(\ln\) assets; (4) shortest model specification selected by a series of LR tests.

\(^a\) Maximum likelihood estimates.
\(^b\) Tobit random effects estimates.
* Significant 10 percent level.
** Significant 5 percent level.
*** Significant 1 percent level.
Proof of Proposition 1. The optimum first prize for a tournament is obtained by combining Eqs. (9) and (12), i.e.,

$$D^* / C_3 = \frac{M}{\beta g(0)}.$$  \hspace{1cm} (A.7)

This amount elicits optimal first period effort by contestants, regardless of what happens during the second period of the game. Clearly, $D^*$ varies directly with $M$ and inversely with $\beta$. Next, recall that $\xi = (\varepsilon_{\text{II}} - \varepsilon_{\text{I}})$ has density $g(\cdot)$ and c.d.f $G(\cdot)$. High costs of monitoring period 1 effort can be proxied by an increase in the variance of $\xi$, $\sigma^2$. For example, if $\xi$ is uniformly distributed on $(-z, z)$, then $g(0) = 1/2z$, and $D^* = 2Mz/\beta$. In general, an increase in the variance of $\xi$ puts more weight in the tails of $g(\cdot)$ and decreases $g(0)$. Since $D^*$ falls in $g(0)$, then $\partial D^* / \partial \sigma^2 > 0$.

Proof of Proposition 2. For part (i), the fact that total bonus pay and the prize component of the total direct salary are inversely related follows directly from the definition of $A$. Part (ii) of the Proposition 2 can derived by assuming the existence of a monitoring technology, with cost $m$, such that $x_2(m)$ is an increasing and concave function. Now suppose that by incurring cost $\tilde{m}$ the firm can institute the performance standard $x_2(\tilde{m}) = x_L + \tilde{x}_W$, where $\tilde{x}_W$ is the effort level that would be induced by an incentive pay scheme with $\alpha'$ defined by Eq. (14), i.e., $\tilde{x}_W = x_W(\alpha')$. Now consider the following contract

$$\{W, \delta, \alpha\} = \left\{ \frac{M}{(1 + \beta)} \left( x_1^* + \beta x_L - \frac{1}{2g(0)} \right) + \frac{\beta}{2(1 + \beta)} (M \tilde{x}_W - \tilde{m}) \right\} \left( \frac{M}{\beta g(0)} \right), 0 \right\}.$$

(A.8)

It follows that, for $\tilde{m}$ sufficiently low, the monitoring scheme dominates the compensation scheme associated with performance bonuses, since effort in periods 1 and 2 are the same for the winner and loser and the period 1 wage is higher.\footnote{The existence of such a monitoring technology raises two questions. First, why the first best second period effort level is not achievable, and secondly, how such a monitoring scheme would be enforced. In the former case, we assume that $x_2(m)$ is sufficiently concave for this to be so. In the latter case, we assume that $m$ represents the direct cost of a monitor or auditor.}

References


