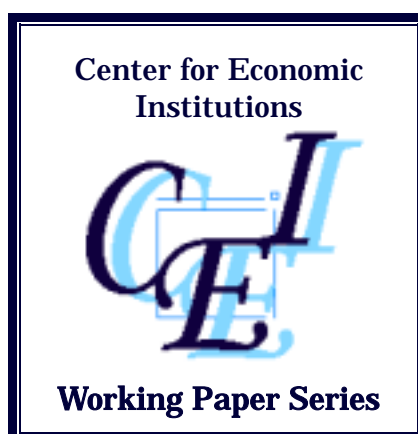


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*EXECUTIVE PAY IN JAPAN: THE ROLE OF  
BANK-APPOINTED MONITORS  
AND THE MAIN BANK RELATIONSHIP*

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## **Abstract**

The tournament model has the feature that executive compensation depends on the wages paid to workers at lower levels of the corporate hierarchy. The agency model shows 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 aspects 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 56 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.

**Keywords:** Executive pay; tournaments; agency; monitoring; main bank relationship.

**JEL classification:** J33, G30, J44, L63.

## 1. Introduction

Rewards for executives often include share ownership or 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 resolve 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.

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.<sup>1</sup> 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 (direct salary plus

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<sup>1</sup> A major benefit of tournaments is that they preserve the ordinal rank of "contestants" for highly correlated productivity shocks. Holmström (1979) shows that common or systematic risk, shared with other firms, is ‘filtered out’ in relative performance incentive contracts. That is, ranking performed on the basis of idiosyncratic noise controls for the common influences on productivity. Green and Stokey (1983) discuss the efficiency of tournaments versus contracts in this light. Lazear and Rosen (1981) analyze compensation schemes that pay executives based on performance relative to their peers in the same firm. Dye (1984) lists the potential costs associated with tournament structures. For example, they may have unfortunate 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 Lazear, 1989). However, Holmström and Tirole (1989, p.114) note that tournaments are commonplace within firms. Vancil (1987) describes many CEO succession rites as a "horse race."

share options and performance-related bonuses, e.g.) 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.<sup>2</sup>

In the empirical part of this 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

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<sup>2</sup> Masson (1971) was one of the first studies to investigate the joint hypothesis of executive shareholding and improved corporate performance. With respect to more recent, predominantly U.S., literature, Benston (1985) finds that the annual net gains or losses executives incurred due to changes in the value of their shareholdings in their companies far exceeded their annual salaries. He argues that this effectively tied their ‘fortunes’ to their companies’ ‘fortunes.’ Further confirmation that ownership is important comes from Coughlan and Schmidt (1985), Murphy (1985, 1999), as well as Morck *et al.* (1988). Shleifer and Vishny (1988, p.10), 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. However, substantial costs of divesting shares may be sufficient to at least moderate this claim. For example, the share price may decline when a top executive offloads shares. An efficient share market would expect increased shirking and hence the executive’s block of shares will sell at a discount. In some, but not all, cases this may induce him to retain his shares. In fact, executives appear reluctant to offload because of the adverse signaling consequences and because of an implicit contract with shareholders that they not liquidate holdings obtained as payouts from share-based compensation arrangements. See Lewellen *et al.* (1987, p.292).

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).<sup>3</sup> Our focus is related, because if the main bank has performed 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 assumption is that banks can better observe the behaviour 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 level of directors' compensation is significantly smaller in 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.<sup>4</sup>

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<sup>3</sup> On the other hand, recent studies suggest that the monitoring by banks has been largely ineffective (e.g., Hanazaki and Horiuchi, 2000).

<sup>4</sup> 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 CEO's in such firms may be monitored not only through the firms' financial performance, but

The next section introduces a standard tournament model and discusses the issues involved once the tournament is resolved. In response to the latter concerns, our focus is redirected to the incentives that would increase CEO effort. Accordingly, section 3 incorporates performance-based compensation 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. The final section provides some concluding comments.

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

Assume that individuals are equally talented and that they work for two periods (denoted  $t = 1, 2$ ). Each agent belongs to one of two generations. At any point in time, individuals of both generations are employed. In the present context, this enables us to analyze the actions of a representative individual in isolation from individuals in different generations. It also implies a form of internal hierarchy within each firm.

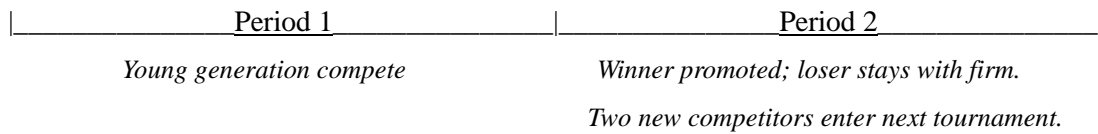
In period 1, there are two contestants who compete for the position of CEO. The incumbent CEO retires at the end of period 1. In the second period, one of the contestants is declared the winner and promoted. The loser could choose to leave the firm or to stay with the firm in a non-aspirant, non-executive capacity. In the former case, the implied game structure typifies what is termed an ‘up-or-out’ employment contract. However, in what follows, we assume that the loser chooses to stay with the firm and to not compete to become the next CEO. That is, we assume that the value of staying with the same company exceeds

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also through the direct monitoring by large shareholders.

a reservation alternative, which may be motivated by accumulated specific human capital considerations.<sup>5</sup> The basic structure of the game is illustrated in Figure One.

**Figure One**  
**The labor market tournament**



The common inter-temporally separable utility function for each contestant is  $U(y_1, y_2, x_1, x_2) = U(y_1, x_1) + \beta U(y_2, x_2)$ , where subscripts designate the time period,  $x$  is effort supplied,  $y$  is consumption or income and  $\beta \in (0,1]$  is the rate of time preference. We assume that  $U_{x_t} < 0$ ,  $U_{x_t x_t} < 0$ ,  $U_{y_t} > 0$  and  $U_{y_t y_t} \leq 0$ , for  $t = 1, 2$ . The firm is perfectly competitive and offers agents contracts guaranteeing at least the reservation utility level.

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 we discuss it at greater length below.

For simplicity, let  $i$  and  $j$  be the indices of two opponents, or middle managers. (We leave aside the issue of the optimal number of ‘contestants.’) Let  $x_i$  and  $x_j$  denote  $i$ ’s and  $j$ ’s intensity of effort, respectively. Letting  $V_{ij}$  represent the value to worker  $i$  playing against an opponent  $j$ , a general formulation for the problem is to choose  $x_1$  and  $x_2$  to maximize

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<sup>5</sup> We leave aside the implications this assumption may have for firm growth, see O’Flaherty and Siow (1992, 1995).



$$(1) \quad V_{ij} = \{P(\text{wins})[U(W, x_1) + \beta U(W + \delta, x_2)] + P(\text{loses})[U(W, x_1) + \beta U(W, x_2)]\}.$$

Note that  $W$  and  $W + \delta$  are mid-level manager and CEO and fixed salaries, respectively. Hence,  $\delta$  is the additional salary or ‘prize’ received by the winner of the tournament; it also indexes the degree of pay inequality within a hierarchically organized enterprise.

In period 2, both workers will always choose the *minimum* verifiable effort level in the second period. That is,  $x_2^* = x_L$  since, in the simple game described thus far, there exists no mechanism by which to increase effort above minimum (mutually verifiable) levels.

Define  $P(\text{wins}) = P_i(x_{i1}, x_{j1})$  as the probability that player  $i$  succeeds over player  $j$ .

Further, value is defined as wealth rather than utility. This is a useful simplifying assumption since it avoids speculation on the form of the restrictions on the utility function. Since both the winner and loser set  $x_L$  in period 2 then, by substitution into equation (1), the value function for a risk neutral contestant can be represented as follows<sup>6</sup>

$$(2) \quad V_{ij} = (1 + \beta)W - c(x_{i1}) - \beta c(x_L) + P_i \beta \delta,$$

where  $c(\cdot)$ , the cost of effort function, is assumed convex and increasing.

The first order condition assuming an interior solution is (i.e., maximizing  $V_{ij}$  with respect to  $x_{i1}$ )

$$(3) \quad -c'(x_{i1}) + \beta \delta \frac{\partial P_i}{\partial x_{i1}} = 0.$$

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<sup>6</sup> 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).

To illustrate how the optimal compensation structure is determined, assume that the output of agent  $i$  conditional upon his effort is described by

$$(4) \quad q_{it} = x_{it} + \varepsilon_{it},$$

where for  $t = 1, 2$ ,  $\varepsilon_{it}$  is a random measurement or monitoring error. Given that the agent with greater period 1 output wins the contest, the probability that agent  $i$  wins is

$$(5) \quad P_i = \text{Prob}(q_{i1} > q_{j1}) = \text{Prob}(x_{i1} + \varepsilon_{i1} > x_{j1} + \varepsilon_{j1}) = \text{Prob}(x_{i1} - x_{j1} > \xi_1) = G(x_{i1} - x_{j1}),$$

where  $\xi_1 = (\varepsilon_{j1} - \varepsilon_{i1})$ , the difference in observational errors, has density  $g(\cdot)$  and c.d.f.  $G(\cdot)$ , with  $E\xi_1 = 0$ ,  $G(-\xi_1) = G(\xi_1)$ , and  $G(0) = \frac{1}{2}$ .

The optimal compensation contract in the case of the pure tournament can be shown to be (see Appendix)

$$(6) \quad \{W^*, \delta^*\} = \left\{ \frac{M}{(1+\beta)} \left( (x_1^* + \beta x_L) - \frac{1}{2g(0)} \right), \frac{M}{\beta g(0)} \right\},$$

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 as a bonding scheme and shifts total *expected* lifetime pay to the second period.

Of more importance for the rest of the paper, note that the lack of contractual enforceability, or more specifically the finite horizon of the game, implies that the ‘pure’ tournament has the undesirable feature that the second period effort of the winner as well as the loser is never set above  $x_L$ , the minimum verifiable effort level in period 2. In the next section, we show that after the workers’ output capabilities have been revealed in the tournament stage of the game, an efficient (although not necessarily unique) solution involves the use of performance-based incentives for the CEO.

### **3. The two-period tournament model with performance bonuses**

As far as the ‘stylized facts’ are concerned, it would appear that executive effort is sensitive to shareholding once the tournament is ‘won.’ Apparently, it is also the case that a CEO’s effort exceeds the effort supplied at lower levels in the hierarchy and there appears to be no “resting on one’s laurels” (see Fortune, 1986, for instance). The magnitude of CEO share ownership or equivalently, profit-linked bonuses, seems a logical explanation for this behavior. Of course, executive compensation schemes are not only based on rank-order, but also upon profit-sharing as well as indirect rewards for increased effort via holdings of the company’s shares.

Increased period 2 effort 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. As Garen (1994) notes, agency considerations play a central role in setting executive compensation. To state the obvious, unless the firm can institute a ‘perpetual’ tournament, some additional incentive is required to resolve the end-period problem and spur the eventual winner’s effort. We now introduce managerial shareholding or performance-based compensation into the pure tournament of the previous section.

Define  $x_w(\alpha)$  as the winner's effort level over-and-above  $x_L$  in period 2, which in turn depends upon  $\alpha$ , the share of residual income. We assume that this 'marginal effort' function is both non-stochastic and common knowledge to both the agent and the principal. At this stage, we leave aside description of the optimal contract and denote the period 2 residual income of the firm by  $\Pi_2$ . We assume that the function  $x_w$  is increasing and strictly concave in  $\alpha$ , with  $x_w(0) = 0$ . The principal announces the contract,  $\{W, \delta, \alpha\}$ , ex ante. This essentially ties down all second period variables in that the loser still automatically provides  $x_L$  (nb., we continue to assume that he stays).

To the extent that  $x_w(\alpha)$  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, as Malcomson (1984) notes. This would be tantamount to adding another round to the tournament. In addition, profit sharing is a rather blunt weapon 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  $x_w(\alpha)$  is formed, then it makes sense to base compensation on  $\alpha$  in some way. Practically speaking, we note two possible rationales for knowledge of  $x_w(\alpha)$  to be acquired. First, there is a tournament, so that competing 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 focus on the fraction of the firm's equity held by a CEO,  $\alpha$ . As in the last section,

$$(7) \quad V_{ij} = \{P[U(W, x_1) + \beta U(W + \delta + \alpha \Pi_2, x_2)] + (1 - P)[U(W, x_1) + \beta U(W, x_2)]\} \\ = (1 + \beta)W - c(x_1) - \beta c(x_L) + \beta P(\delta + \alpha \Pi_2 - R(\alpha)),$$

where we have assumed that  $c(x_2) = c(x_L + x_w) = c(x_L) + R(\alpha)$ .  $R(\alpha)$  denotes the cost of the extra effort induced by the promised share of residual income, it is assumed to be an increasing and strictly convex function of  $\alpha$ , with  $R(0) = 0$ .

Second period profits (i.e., after a winner has been declared) are

$$(8) \quad \Pi_2 = M(2x_L + x_w) - 2W - \delta - A(\alpha),$$

where  $A(\alpha)$  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  $\alpha$  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.<sup>7</sup>

We examine second period strategies by first considering the 'loser.' Clearly, the loser of the contest obtains utility  $W - c(x_L)$ , some fixed value of utility with certainty. In period 2, the loser provides the minimum verifiable amount of effort, since effort provides

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<sup>7</sup> 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  $\alpha$  beyond which  $A' < 0$ , since, by definition, the alignment costs associated with share ownership disappear when  $\alpha = 1$ . On the other hand, the recent literature on delegation 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. See Vickers (1985), Sklivas (1987), Fershtman and Judd (1987), Brander and Poitevin (1992), Garvey and Gaston (1997), and Gaston (1997).

disutility. The following results would not be tangibly affected by having the loser leave the firm in period 2.

Now consider the ‘winner’ or incoming CEO. His second period strategy is to choose period 2 effort to maximize

$$(9) \quad V_w = W + \delta + \alpha \Pi_2 - c(x_2).$$

The winner will choose second period effort such that  $\alpha M = c'(x_2^*)$ , i.e., the winner sets his effort such that the marginal private return equals the marginal private cost. Clearly, effort increases in  $\alpha$ . Also, note that  $c'(x_2)(\partial x_2 / \partial \alpha) = c'(x_2)x'_w(\alpha) = R'(\alpha)$ , which implies that  $\alpha M x'_w(\alpha) = R'(\alpha)$ .

From equation (7), the first-order condition with respect to first period effort for the agent is (assuming interior solutions and a symmetric equilibrium)

$$(10) \quad \beta \Delta g(0) = c'(x_1^*).$$

where  $\Delta = \delta + \alpha \Pi_2 - R$ . First period effort,  $x_1$ , is increasing in  $\Delta$ . When  $\alpha = 0$  the solution reverts to the pure tournament case considered in the last section. Alternatively, if  $\delta = 0$  the prize takes the form of incentive pay only. (In fact, there is nothing to restrict  $\delta^*$  to be strictly positive.) Since  $\alpha^*$  is set by the principal to resolve the second period incentive problem, then  $\delta^* = \Delta^* - \alpha^* \Pi_2 + R(\alpha^*)$ , with  $\Delta^*$  given by equation (10).

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

$$(11) \quad E(\Pi_1 + \beta(1 - \alpha)\Pi_2) = 0.$$

The principal’s maximization problem can be characterized as choosing a contract,  $\{W, \delta, \alpha\}$ , that maximizes a worker’s expected utility evaluated at its equilibrium values. In

order to characterize this contract we substitute equation (11) into equation (7), i.e., the optimal contract maximizes

$$(12) \quad V = Mx_1 + \beta M \left( x_L + \frac{x_w(\alpha)}{2} \right) - c(x_1) - \beta c(x_L) - \frac{\beta}{2} (A(\alpha) + R(\alpha)).$$

Assuming interior solutions we have

$$(13) \quad \begin{aligned} \frac{\partial V}{\partial W} &= (M - c'(x_1)) \frac{\partial x_1}{\partial W} = 0 \\ \frac{\partial V}{\partial \delta} &= (M - c'(x_1)) \frac{\partial x_1}{\partial \delta} = 0, \text{ and} \\ \frac{\partial V}{\partial \alpha} &= (M - c'(x_1)) \frac{\partial x_1}{\partial \alpha} + \frac{\beta}{2} (Mx'_w - A' - R') = 0. \end{aligned}$$

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

$$(14) \quad Mx'_w(\alpha^*) = A'(\alpha^*) + R'(\alpha^*).$$

Hence,  $\alpha$  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 from equation (9) that the winner determines his effort from  $\alpha Mx'_w = R'$ , hence, equation (14) can be rewritten as

$$(15) \quad (1 - \alpha^*) Mx'_w(\alpha^*) = A'(\alpha^*).$$

In determining  $\alpha^*$ , the firm takes into account the increased alignment costs of increased share ownership by the new CEO. If these added costs are negligible, then efficiency dictates that  $\alpha^*$  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. The first Proposition deals with provision of first period incentives and the second Proposition deals with provision of second period incentives, i.e., given the need to provide first-period incentives. (Proofs are contained in the Appendix.)

**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 indicates that improved monitoring of workers, i.e., at levels of the corporate hierarchy below the very top level, will reduce the importance placed on tournament-based incentives. Proposition 2 relates to 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.

The second Proposition also shows that, 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 due to 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 performance pay in Japan**

*A. The empirical model.* Testing any theoretical model's predictions is always difficult. In the present case, even assuming the availability of suitable data, an obvious difficulty is that *all* constituent parts of any firm's compensation and personnel policies are jointly determined. Further, by their very nature, a firm's compensation policies are likely to be integral features of a firm's governance structure. Notwithstanding such complex methodological issues, this paper seeks to provide evidence that sheds light on the tournament and agency implications for the compensation of upper-level management. In particular, we focus upon top executive compensation in Japan. Japanese executive pay characteristically takes two forms – direct salary and a performance-related bonus. 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, Figure 4).

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 should be 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 or bonus 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.

$$(16) \quad Y = \alpha_0 + \alpha_1 P + \alpha_2 X_1 + \alpha_3 X_2 + \alpha_4 P * X_2 + \varepsilon,$$

where  $Y$  denotes the vector of dependent variables, i.e., the directors' bonus pay and the pay gap. In terms of the model of the previous sections, the former variable, *Bonus*, reflects the need to address the *second* period moral hazard problem. The latter variable is our proxy for the winner's prize,  $\Delta$ , and reflects the need to resolve the *first* period moral hazard problem. *Paygap* is calculated as ratio of the directors' average total compensation and average employee wages.

The performance variable,  $P$ , is profit before tax. (We also use the firm's share price as an alternative performance measure in the sensitivity analysis.)  $X_1$  denotes the vector of control variables, which affect the tournament. The most notable control 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; Xu 1997). The result that the prize increases in the number of equally able contestants can be readily seen from inspecting either equation (1) or equation (7). As the

probability 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*) has 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 (1998), 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). Firm size is invariably one of the most important determinants of all the various components of executive pay (see Murphy, 1999 and Oi and Idson, 1999).<sup>8</sup> We use the natural logarithm of sales as our measure of firm size.

The final variable in  $X_1$  is the measure of the importance of the main bank relationship. We include this for reasons outlined in our introductory comments, i.e., it has been argued that the ‘main bank’ has played a major role in monitoring companies. By extension, *if* this is the case, then monitoring by main banks 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. The main bank dummy is taken from Hanazaki and Hachisuka (1997). In their study, ‘main bank’ relationship is based on bank loans and shareholdings. Specifically, a main bank relationship exists if *all* of the following conditions are satisfied

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<sup>8</sup> Why larger firms pay more is one of the most long-standing, yet largely unresolved, issues in labor economics. Specifically, how can larger firms stay competitive if their labor costs are higher? The size wage premium is empirically and economically large, e.g., it is comparable in magnitude to the unconditional gender wage gap. Needless to say, there has been a proliferation of theories and explanations (see Oi and Idson, 1999 for a recent survey).

- i. The same bank provides the largest single proportion of the firm's borrowing from private financial institutions in 1981, 1985 and 1990;
- ii. The coefficient of variation of the proportion of the largest lending bank in firm's borrowing is less than 20 during the period 1981 to 1990;
- iii. The shareholding of the largest lending bank, together with its affiliated banks, exceeds five percent.

$X_2$  denotes the vector of control variables, which affect the second period incentives. We include a variable that indicates the presence of at least one bank appointee on the Board of Directors. This variable is intended to capture monitoring of top executives only. The Boards of Directors of large Japanese firms may have one or more bank appointees. Such appointees are hypothesized to monitor the behavior of the firm's top executives. While there has been considerable debate on the effectiveness of bank monitoring on corporate performance, there have far fewer empirical studies about how these monitors affect the incentives of the firm's top executives. There is a potential endogeneity problem, of course. 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. However, arguing against this view is the fact that the presence of a bank-appointed monitor is relatively stable across time in our sample (see Appendix table 1).

Finally, we include  $S$ , the director's holdings of the company's shares. 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 1997, it was illegal for Japanese companies to use stock options to compensate their

executives. 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.

*B. The Data.* The data cover listed companies in the electronics industry for the time period from 1989 to 1998. 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 not been internally promoted. Data on other variables, such as share prices, are taken from the *Worldscope* database.

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. The number of companies with at least one director from a bank comprises about one half of our sample and about one third of the firms have a main bank relationship. A further breakdown of our data is given in Appendix table 1, where the descriptive statistics are classified by the presence of a bank appointee on the Board, *B*, and whether there is a main bank relationship, *MB*. (Interestingly, the correlations in table 1 reveal that, while positive, the correlation between *B* and *MB* is just 0.25.)

The breakdown in Appendix table 1 is immediately informative. One of the more striking features of the data is the apparent difference in the structure of directors' compensation between companies with and without bank directors. The *Paygap* and directors' average bonus pay are larger for the companies without bank directors and companies without main bank relationships. Superficially, at least, this lends support to important features of the model discussed above. However, the same pattern of results continues to hold in a multivariate regression setting, as we show below. Also, it is important to note that companies without bank directors do *not* outperform companies with bank directors. In fact, average profits are higher in the latter. Thus, for our sample of firms in Japanese electronics industry at least, *it is not a simple matter of firms with bank-appointed directors performing poorly and hence, paying less.*<sup>9</sup> The descriptive statistics in Appendix table 1 are not inconsistent with the significant positive relationship

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<sup>9</sup> In fact, the Pearson correlation coefficient between the existence of a bank appointee on the Board of Directors and profits is just -0.12 and that between the main bank relationship and profits is 0.03 (see table 1).

found between bank control rights and German firm performance (see Gorton and Schmid, 2000, p.12).

*C. The findings.* The estimates for equation (16) are displayed in table 2. Overall, despite its obvious level of abstraction, we consider that our theory of executive compensation fares quite reasonably, at least as judged by the coherence of the signs of the coefficient estimates to the hypothesized sign patterns.

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*.<sup>10</sup> However, as predicted the coefficient estimates for the promotion probability and firm size are completely the opposite for *Bonus*, i.e., the promotion probability has no effect, but firm size is very important.

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 surprising 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 1.6 percent (i.e.,

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<sup>10</sup> A potential caveat on our interpretation is that our measure of promotion probability is highly negatively correlated with various firm size measures. Hence, given the importance of size for various compensation measures (see footnote 8), it could be argued that our finding simply confirms the well-known size-compensation correlation. On the other hand, Ariga *et al.* (1992) document the fact that across many Japanese industries that 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 dropping log sales from the main regression specification (see Appendix table 2). In particular, note that the promotion probability increases in its economic significance.

$-2.87 \times (1.22/2.24)$ ). 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. 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 profitability of the enterprise also leads to higher incentive and bonus pay. This was expected, of course, any other result would have been theoretically indefensible. The findings for the existence of a main bank relationship and of a bank-appointed director on the Board are of particular interest. An increasingly common view is that bank monitoring in Japan was poor or that poorly performing firms sought the intervention of their main bank. Accordingly, it could be argued that both variables capture the effects of negative financial performance and therefore, like 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 were either insignificantly different from zero (see Appendix table 1). 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.)

As for the effect of the presence of a bank appointee on the Board of Directors on reducing pay performance sensitivity, the estimates are supportive of our theory's predictions. 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 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.

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 Appendix table 2). For example, in order to examine effect of alternative measures of profitability we use the firm's share price as well as a redefined profit variable. The latter variable, which takes the value zero when profits before tax are negative, was investigated in view of the fact that bonuses are never negative, even when profits are zero. We also examined the key results when the year dummies were excluded as well as when the firm size variable was excluded from the regression specification. The latter specification was estimated due to a concern that large firms are more profitable and are likely to have smaller promotion probabilities.

To provide an overview, the most important determinant of both *Paygap* and *Bonus* is corporate profitability. The only exception appears to be for the redefined profit variable in the *Paygap* model, which becomes statistically insignificant, although retaining the correct

sign. However, this may reflect the fact that the new variable is also capturing year effects (i.e., most of the negative profit observations in our sample of firms occur in 1993 and 1994). The size of the *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) 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* 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 weaker evidence that bank-appointed Board directors reduce the sensitivity of pay to performance for top executives. Hence, whether bank appointees to Boards of Directors effectively monitor the actions of top executives, reducing the need for forms of incentive compensation that more closely align top executives' interests with those of the firm's shareholders, is more contentious.

## **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 near to, or at, the top 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 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 were 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, by reducing financial uncertainty, the existence of a main bank relationship should reduce the importance of tournament-based incentives within firms.

We tested the model's key implications using panel data for 56 Japanese electronics firms, for the period 1989 to 1998. 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. That is, executive pay in Japan is best 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. 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 Equation (6)

Note that  $\frac{\partial P_i}{\partial x_{i1}} = \frac{\partial G(x_{i1} - x_{j1})}{\partial x_{i1}} = g(x_{i1} - x_{j1})$ , so that equation (3) can be written as

$$(A1) \quad \beta \delta g(x_{i1} - x_{j1}) = c'(x_{i1}).$$

A symmetric Nash equilibrium implies that  $x_{i1} = x_{j1} = x_1$ , so that

$$(A2) \quad \beta \delta g(0) = c'(x_1^*).$$

Since  $c(\cdot)$  is increasing and strictly convex, effort is increasing in  $\delta$ . The firm's expected profit is

$$(A3) \quad E\Pi = 2(Mx_1 - W) + \beta(2Mx_L - 2W - \delta).$$

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

$$(A4) \quad M(x_1 + \beta x_L) = (1 + \beta)W + \frac{\beta \delta}{2}.$$

We can substitute the zero profit condition into the first order condition for the contestant to determine  $\{W^*, \delta^*\}$ . Combining (A2) and (A4), we have

$$(A5) \quad W^* = \frac{M(x_1^* + \beta x_L)}{(1 + \beta)} - \frac{c'(x_1^*)}{2(1 + \beta)g(0)}.$$

Evaluating  $V_{ij}$  at the optimum values and assuming that players are symmetric, so that  $P_i = \frac{1}{2}$ , by substituting (A4) into equation (2) we obtain

$$(A6) \quad V_{ij} = M(x_1 + \beta x_L) - c(x_1) - \beta c(x_L).$$

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. Equation (6) follows directly.

## B. Proof of Proposition 1

The optimum first prize for a tournament where effort is imperfectly monitored is obtained by combining equations (10) and (13), i.e.,

$$(A7) \quad \Delta^* = M / \beta g(0).$$

This expression is the amount that elicits optimum first period effort by contestants, regardless of what happens during the second period of the game. Obviously,  $\Delta^*$  varies directly with  $M$  and inversely with  $\beta$ . Next, recall that  $\xi = (\varepsilon_{j1} - \varepsilon_{i1})$  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  $\Delta^* = 2Mz/\beta$ . In general, an increase in the variance of  $\xi$  puts more weight in the tails of  $g(\cdot)$  and decreases  $g(0)$ . Since  $\Delta^*$  falls in  $g(0)$ , then  $\partial \Delta^* / \partial \sigma^2 > 0$ .

## C. 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 from the definition of  $\Delta$ . Part (ii) can be derived by supposing that there exists a monitoring technology with fixed cost,  $m$ . In particular, suppose that by incurring  $m$  the firm can institute the level of effort or performance standard

$x_2^*(m) = x_L + x_W(\alpha^*)$ , with  $\alpha^*$  defined by equation (15). Now consider the following

contract

$$(A8) \quad \{W^*, \delta^*\} = \left\{ \frac{M}{(1+\beta)} \left( (x_1^* + \beta x_L) - \frac{1}{2g(0)} \right) + \frac{\beta}{2(1+\beta)} (Mx_W - m), \frac{M}{\beta g(0)} \right\}.$$

Clearly, for  $m$  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. In comparison to the pure tournament, the

advantage of the monitoring scheme hinges on the cost of additional effort for the winner and the additional upfront payment. If the latter exceeds the former, it follows that the monitoring solution to the second period incentive problem involves no change in the absolute size of the prize, but higher salaries for workers at *all* levels of the corporate hierarchy.

**Table 1: Descriptive Statistics**

Variable	Mean	Std. Dev.	Min	Max	Source
<i>Paygap</i> , Directors' average total compensation ÷ employees' average wages	2.24	0.70	1.02	7.01	<i>a, b</i>
<i>Bonus</i> , Directors' average annual bonus, millions of ¥	2.39	2.01	0.00	8.74	<i>a, b</i>
<b>Profit before tax, millions of ¥</b>	10373.56	26439.19	-34055.33	219150.80	<i>a</i>
Firm size, log sales, millions of ¥	11.43	1.35	9.06	15.26	<i>a</i>
Promotion probability, number of directors ÷ number of employees, percent	1.22	1.01	0.04	7.14	<i>a, b</i>
<b>External promotion</b>	0.28	0.45	0.00	1.00	<i>b, c</i>
<i>S</i> , Total director shareholdings, percent of total shares	1.80	3.16	0.02	18.72	<i>a</i>
<b><i>MB</i>, Main bank relationship</b>	0.32	0.47	0.00	1.00	<i>d</i>
<b><i>B</i>, Bank-appointee on Board of Directors</b>	0.51	0.50	0.00	1.00	<i>b</i>

Correlation matrix		a.	b.	c.	d.	e.	f.	g.	h.	i.
a.	<i>Paygap</i>	1.00								
b.	<i>Bonus</i>	0.56	1.00							
c.	<i>Profit</i>	0.29	0.54	1.00						
d.	<i>Firm Size</i>	0.37	0.57	0.66	1.00					
e.	<i>Promotion prob.</i>	-0.33	-0.41	-0.35	-0.69	1.00				
f.	<i>External promotion</i>	-0.16	-0.05	-0.19	-0.16	0.09	1.00			
g.	<i>S</i>	0.05	-0.04	-0.06	-0.26	0.13	-0.16	1.00		
h.	<i>MB</i>	-0.12	0.03	0.04	0.13	-0.14	0.00	-0.13	1.00	
i.	<i>B</i>	-0.09	-0.12	0.04	0.08	0.04	-0.01	-0.00	0.25	1.00

Notes:

- Data sources: *a. Nikkei Needs Database*; *b. Toyo Keizai Yakuin Shikiho* (the Directory of Directors) ; *c. Toyo Keizai Keiretsu Soran* (the Directory of Company Keiretsu); *d. Hanazaki and Hachisuka (1997)*.
- Total observations = 560; 10 years (1989-98) and 56 firms.

**Table 2**  
**The Determinants of Executive Compensation**

	<i>Paygap</i>		<i>Bonus pay</i>	
	Hypothesized sign	Random effects	Hypothesized sign	Random effects <sup>‡</sup>
Profit, $P$ ( $*10^4$ )	+	0.056** (0.026)	+	0.300*** (0.079)
Firm size	0?	0.049 (0.060)	+	1.014*** (0.188)
Promotion probability ( $\div 10^2$ )	-	-0.287*** (0.063)	0?	-0.096 (0.198)
External promotion	+	-0.025 (0.080)	0?	-0.349 (0.260)
Main bank, $MB$	-	-0.286* (0.149)	-?	-0.119 (0.495)
$P*MB$ ( $*10^4$ )	0	-0.012 (0.027)	-?	-0.061 (0.080)
Bank director, $B$	0	0.039 (0.087)	-	-0.214 (0.294)
$P*B$ ( $*10^4$ )	0	-0.032 (0.021)	-	-0.137** (0.065)
Executive shareholding, $S$	0	-1.503 (1.341)	-	3.615 (4.118)
$P*S$ ( $*10^3$ )	0	0.110 (0.076)	-	-0.131 (0.203)
Intercept	.	2.131*** (0.731)	.	-8.837*** (2.296)
$R^2$ / Log likelihood		0.19		-894.69
Wald $\chi^2$ (18)		90.77		209.20
Observations		560		560

Notes: All regressions include year dummies. \* (\*\*) \*\*\* Significant 10, (5), 1 percent level.

<sup>‡</sup> Tobit random effects estimates. Asymptotic standard errors in parentheses.

**Appendix table 1: Descriptive Statistics classified by  
Bank-appointee on Board of Directors and Main Bank Relationship**

Variable	<i>B</i> = 0	<i>B</i> = 1	<i>t</i>	<i>MB</i> = 0	<i>MB</i> = 1	<i>t</i>
<i>Paygap</i>	2.31	2.18	2.17**	2.30	2.12	2.92***
<i>Bonus</i>	2.65	2.15	2.96***	2.35	2.48	0.71
<i>Profit</i>	9176.04	11520.84	1.05	9587.74	12032.53	1.02
<i>Firm size</i>	11.33	11.53	1.80*	11.31	11.68	2.98***
<i>Promotion probability</i>	1.18	1.26	0.89	1.31	1.02	3.24***
<i>External promotion</i>	0.28	0.28	0.13	0.28	0.28	0.04
<i>Executive shareholding</i>	0.02	0.02	0.05	0.02	0.01	3.14***
<i>Main bank, MB</i>	0.20	0.43	5.98***			
<i>Bank-appointed director, B</i>				0.43	0.69	5.98***
Observations	274	286		380	180	

Notes:

- Data sources, see table 1. Total observations = 560; 10 years (1989-98) and 56 firms.
- Columns 4 and 7: Absolute value of *t*-statistic for test of difference in means. \* (\*\*) \*\*\* Significant 10, (5), 1 percent level.

**Appendix table 2: The Determinants of Executive Compensation, Alternative specifications**

	(1)		(2)		(3)		(4)	
	<i>Paygap</i>	<i>Bonus pay</i> <sup>‡</sup>	<i>Paygap</i>	<i>Bonus pay</i> <sup>‡</sup>	<i>Paygap</i>	<i>Bonus pay</i> <sup>‡</sup>	<i>Paygap</i>	<i>Bonus pay</i> <sup>‡</sup>
Profit, $P$ ( $\times 10^4$ )	0.033 (0.027)	0.194** (0.085)	0.964** (0.478)	7.890*** (1.325)	0.071*** (0.025)	0.413*** (0.081)	0.059** (0.025)	0.384*** (0.083)
Firm size	0.062 (0.060)	1.093*** (0.187)	0.058 (0.057)	1.156*** (0.191)	0.036 (0.059)	0.818*** (0.187)		
Promotion probability ( $\div 10^2$ )	-0.285*** (0.063)	-0.079 (0.204)	-0.212*** (0.063)	0.119 (0.297)	-0.291*** (0.062)	-0.166 (0.207)	-0.321*** (0.053)	-0.748*** (0.181)
External promotion	-0.025 (0.080)	-0.353 (0.262)	-0.022 (0.081)	-0.315 (0.250)	-0.046 (0.080)	-0.444 (0.276)	-0.029 (0.080)	-0.474* (0.272)
Main bank, $MB$	-0.300** (0.149)	-0.107 (0.481)	-0.397** (0.176)	-0.573 (0.526)	-0.287* (0.148)	-0.088 (0.456)	-0.283* (0.153)	-0.002 (0.498)
$P*MB$ ( $\times 10^4$ )	0.001 (0.029)	-0.039 (0.087)	2.009* (1.144)	7.573** (3.852)	-0.012 (0.027)	-0.047 (0.084)	-0.012 (0.027)	-0.043 (0.085)
Bank director, $B$	0.016 (0.089)	-0.325 (0.300)	-0.031 (0.102)	0.104 (0.331)	0.072 (0.087)	0.002 (0.301)	0.043 (0.088)	-0.152 (0.309)
$P*B$ ( $\times 10^4$ )	-0.020 (0.022)	-0.086 (0.068)	0.097 (0.387)	-2.029* (1.146)	-0.036* (0.021)	-0.163** (0.068)	-0.033 (0.021)	-0.157** (0.068)
Executive shareholding, $S$	-1.451 (1.348)	3.524 (4.235)	-3.302 (2.133)	-0.217 (6.210)	-0.618 (1.287)	11.196*** (4.185)	-1.818 (1.320)	-0.678 (4.403)
$P*S$ ( $\times 10^3$ )	0.104 (0.077)	-0.078 (0.253)	0.891 (0.676)	-0.725 (1.991)	0.109 (0.076)	-0.153 (0.281)	0.117 (0.076)	-0.039 (0.273)
Intercept	2.006*** (0.737)	-9.616*** (2.289)	1.892*** (0.714)	-11.721*** (2.581)	2.207*** (0.726)	-7.396*** (2.334)	2.725*** (0.141)	3.375*** (0.465)
$R^2$ / Log likelihood	0.19	-900.77	0.18	-831.24	0.18	-925.68	0.18	-908.95
Wald $\chi^2$	84.51	195.33	88.82	221.95	72.56	138.66	90.12	168.46
Observations	560	560	520	520	560	560	560	560

Notes: \* (\*\*) \*\*\* Significant 10, (5), 1 percent level. ‡ Tobit random effects estimates. Asymptotic standard errors in parentheses. Column (1): use redefined profit variable,  $P_+$ , where  $P_+ = \text{Profit}$ , if  $\text{Profit} > 0$  and  $P_+ = 0$ , if  $\text{Profit} \leq 0$ ; (2) use Share price in lieu of Profit before tax; (3) delete Year dummies; (4) delete Firm size.



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