

# Why Companies in Japan Are Introducing Performance-based Treatment and Reward Systems\*—The Background, Merits and Demerits

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## 1. Introduction

Recently, companies in Japan, especially large companies, have been reviewing their employee treatment and reward systems. Companies in Japan had adopted a treatment and reward system based on a work performance ability system, but this was abolished and a movement to introduce a system that emphasizes an employee's performance and achievement has been gaining momentum. Table 1 shows the number of articles with headings using the phrase performance-based pay system or achievement-based pay system on the front pages of the morning or evening editions of four newspapers published by Nikkei Inc. According to this table, it can be seen that the number of companies that introduced a treatment and reward system based on the performance or achievement has increased since 2000. This paper examines the background and the merits and demerits to this trend, based on the incentive theory discussed in economics circles as to why companies in Japan are introducing performance-based treatment and reward systems.

**Table 1. Number of articles in newspapers concerning the performance principle (four newspapers published by Nikkei Inc., total of the morning and evening editions)**

Year	Number of articles	Year	Number of articles
1995	2	2000	32
1996	5	2001	38
1997	25	2002	25
1998	17	2003	56
1999	34	2004(January to February)	12

\* As this paper is written to re-evaluate the recent introduction of the performance-based pay system in Japanese companies from the viewpoint of the economics of human affairs, it is not necessarily intended for researchers. Therefore, it deals with the contents at a "textbook" level and is not a "specialist" thesis.

## 2. Merits and demerits of performance-based reward systems

Designing the optimum reward system is the biggest issue for company personnel directors, and at the same time, it is also a major research topic in the sphere of the economics of human affairs. Roughly speaking, the optimum reward system gives not only maximum profit to companies, but also the maximum incentive to workers at the companies concerned. If a company pays a worker independently from his/her performance, he/she might not act in the interest or benefit of the company. When asymmetrical information exists between a company and its workers, a moral hazard problem is caused only by a perfectly fixed salary system.

Then what is the optimum reward system? The economics of human affairs takes an approach to this problem based on the principal-agent theory. Companies should work to align the behavior of workers who belong to their organization towards the goals of their organization. To do so, there needs to be smooth communication between companies and workers, and workers need to be motivated. In the real labor market, information conveyance via price is difficult, and the asymmetric information problem exists between companies and workers. The mechanism to overcome such a problem is called an “incentive,” and incentives must be present in the optimum reward system.

### 2.1 Deriving the Optimum Reward System<sup>1</sup>

In the economics of human affairs, the reward system of companies is discussed using the expression:

$$w = \alpha + \beta x \quad (1)$$

The left side,  $w$ , of the expression (1) is the wage paid to a worker, and the right side,  $x$ , is the output of a worker that the company can observe.<sup>2</sup> Moreover,  $\alpha$  and  $\beta$  are coefficients.

The worker makes an effort to produce Output  $x$ . The higher the effort level  $e$  is, the higher the production level of the Output  $x$  is, which does not depend on only  $e$ , but on “Fate”  $\eta$ , as well. Let’s use a concrete example to explain this

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<sup>1</sup> Milgrom and Roberts (1992) argued in detail about the optimum income model that assumed risk-averse workers. Section 2.1 is written for readers who are not familiar with this, and it may be skipped.

<sup>2</sup> The worker’s Output is specifically the results of work, product of work or role in work. Output here does not necessarily indicate sales etc. which can be directly represented monetarily.

“Fate” variable through the following example about a certain car dealer. A worker at this company must work hard to sell as many cars as he can. Car sales are influenced not only by how hard this worker works, but also by the strength of demand for cars by customers, etc. The strength of the demand for cars by customers is influenced by business trends and the preferences of customers, etc, which are decided indifferently to the effort of the worker. Simply put, the sales total  $x$  of cars in a certain month depends on “Fate”  $\eta$  in addition to the degree of the worker’s effort level  $e$  and the strength of customer demand.

Thus, the following expression is obtained:

$$x = e + \eta \quad (2)$$

where  $e$  is the worker’s effort level, and  $\eta$  is “Fate”, the elements other than the worker’s effort which influences the worker’s output, which is a random variable with a mean of zero ( $E(\eta)=0$ ) and the variance  $v$ . Hence expression (2) means that if the worker’s effort level rises, the average output  $x$  rises, too, but the output is also influenced by “Fate” stochastically.

By combining expression (1) and expression (2)

$$w = \alpha + \beta(e + \eta) \quad (3)$$

is obtained. Since  $E(\eta) = 0$ , the expected value of expression (3) is:

$$w^e = \alpha + \beta e \quad (3)'$$

Compared with expressions (3) and (3)', we can see that the wage  $w$  depends not only on the effort level  $e$ , but also on “Fate”  $\eta$ , but the average wage  $w^e$  (expected value of the wage) depends only on the effort level. This means that the wage of a certain month might be high according to “Fate,” but only a worker’s effort level will decide their wage on average.

In the expression (1), what value the coefficients  $\alpha$  and  $\beta$  take determines whether the wage system is performance-based or not. If  $\alpha$  is positive and  $\beta$  is 0, the wage system for the worker is the fixed reward system because  $\alpha$  is always paid unrelated to the performance of the worker. If  $\beta$  is positive, the wage paid to the worker also responds to the worker’s output, which is a floating reward system.

As described above, the optimum reward system should be a system that not only maximizes the profit of companies but also improves the worker’s work incentive. Workers prefer high wage income; however, they do not prefer to make extra effort. Assuming that a worker is risk neutral, the utility function concerning his/her wage income-effort is defined as follows:

$$U(w^e, e) = w^e - \delta \frac{e^2}{2} \quad (4)$$

where  $\delta$  is the coefficient showing the degree to which the worker does not like expending effort.<sup>3</sup>

On the other hand, assume that the company employs one worker and costs other than labor do not exist. The management purpose of this company is to maximize the (expected) profit  $\Pi$ . That is,

$$\begin{aligned} E(\Pi) &= pE(x) - w^e \\ &= (p - \beta)e - \alpha \end{aligned} \quad (5)$$

where  $p$  is the price of the product, and  $p - \beta$  is the profit per unit of the product.

In this situation, how will the worker determine their effort level?

By solving the following expressions:

$$\begin{aligned} \text{Max}_e : U(w^e, E) &= w^e - \delta \frac{e^2}{2} \\ \text{s.t. } w^e &= \alpha + \beta e \end{aligned}$$

the worker's optimum effort level is obtained. That is,

$$e^* = \frac{\beta}{\delta} \quad (6)$$

This means that (a) an incentive is necessary to make workers work hard and (b) the worker's effort level reaches a maximum at  $\beta = p$ .<sup>4</sup> Expression (6) is also a condition for companies to give workers efficient work incentives, which is called the Incentive Compatibility Constraint.

Do workers elect to work for companies that use this reward system? The optimum reward system argued in the economics of human affairs takes it as a premise that the labor market is flexible and that workers always hold the "Outside Option,"—that is, they are prepared to change jobs anytime. If a worker works at this company, his/her utility level is:

<sup>3</sup> The characteristics of this utility function are that the marginal utility concerning the wage income is  $\frac{\partial U}{\partial w^e} = 1$  and the marginal utility concerning the effort is

$\frac{\partial U}{\partial e} = -\delta e$ . Therefore, under this assumption, the more the worker marginally increases their effort level, the more cost is required, until the point where the utility level remains the same even if the wage income rises.

<sup>4</sup> The maximum value of  $\beta$  is  $p$  as shown at the expression (5). At  $\beta = p$ , the profit of the company is zero.

$$U(w^e, e) = \alpha + \beta e^* - \delta \frac{e^{*2}}{2} \quad (7)$$

whereas expression (7) fulfills expression (6). Only when the utility level at this point is greater than the utility level  $u$  obtained by the “Outside Option” is he/she certain to elect to work at this company. That is,

$$\begin{aligned} &\text{if } U(w^e(e^*), e^*) \geq u, \\ &\text{then he/she elects to work at this company.} \end{aligned} \quad (8)$$

Here since  $w^e(e^*) = \alpha + \beta e^* = \alpha + \frac{\beta^2}{\delta}$  expression (8) becomes

$$\alpha + \frac{\beta^2}{\delta} - \delta \frac{\beta^2}{2\delta^2} \geq u$$

which is reduced to

$$\alpha + \frac{\beta^2}{2\delta} \geq u \quad (8)'$$

which is called the Participation Constraint.

Companies will decide the value of  $\alpha$  and  $\beta$  under the above-mentioned Incentive Compatibility Constraint and the Participation Constraint. In the meantime, in terms of the Participation Constraint workers prefer to work at this company if their utility level is greater than the utility level obtained at the “Outside Option,” therefore companies only need to set the level of  $\alpha$  to be

$$\alpha = u - \frac{\beta^2}{2\delta}$$

Then expression (5) becomes

$$\begin{aligned} E(\Pi) &= (p - \beta)e^* - \alpha \\ &= (p - \beta)\frac{\beta}{\delta} - \left[ u - \frac{\beta^2}{2\delta} \right] \\ &= \frac{p\beta}{\delta} - u - \frac{\beta^2}{2\delta} \end{aligned} \quad (5)'$$

Companies only have to decide  $\beta$  to maximize expression (5), that is

$$\text{Max} E(\Pi)$$

Then,

$$\beta = p \quad (9)$$

Put simply, companies only have to make the value of  $\beta$  equal to the price  $p$  of the product.

Therefore, the optimum reward system of companies becomes

$$\alpha = u - \frac{p^2}{2\delta} \quad (10)$$

$$\beta = p$$

and workers accept working at the utility level  $e^*$  equal to the utility level obtained at the “Outside Option,” which is

$$e^* = \frac{\beta}{\delta}$$

whereas  $u \leq \frac{p^2}{2\delta}$  and  $\alpha < 0$ . In general, the reward system where  $\alpha < 0$  and  $\beta = p$  is called the Franchise Agreement.

## 2.2 Problems with the Work Performance Ability System

Now assume that a company adopts the fixed reward system and

$$w = \alpha$$

Then, the wage income which a worker receives is  $\alpha$  regardless of the effort level, and the expected wage  $w^e$  becomes equal to  $\alpha$ , too. At this point, the increase in wage income that he/she receives is zero even if the worker increases their effort level, and the worker's optimum effort level becomes zero. This result is just the moral hazard problem mentioned above.

Many Japanese companies have thus far adopted an income management system using the work performance ability system. The work performance ability system is basically a qualification system rated according to the job performance ability of individual workers, which is not necessarily the fixed reward system. However, because work performance ability increases through taking on-the-job training and accumulating experience, as a result it will strongly correlate to workers' age and years of service. In fact, in research that measures the wage function in Japan it is often reported that age and years of service have a positive influence on wages. Of course, the promotion standards in the work performance qualification system are provided by individual firms. There is not a small promotion gap between workers, and an income gap can also be observed. However, the income gap is generally small, and though the work performance qualification system is nominally based on “ability,” it is actually a system applied according to years of service where income is determined by years of service.<sup>5</sup>

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<sup>5</sup> In the meantime, so far most of the measurement consequences of the wage function have shown that the values of the presumed coefficient are larger and the interpretability

Take the example of a company that introduced a performance-based personnel system in 2000. It is a trading company that specializes in FA (Factory Automation) systems, electronic devices, and information communication devices, etc. The company is listed in the first section of the Tokyo Stock Exchange and about 1,000 workers are employed at the company. (The average age is 38 years old and the average years of service is 14 years.) Earnings in 2001 were about 170 billion yen in a consolidated financial statement. Earnings in the construction, environment, and FA sections occupied 70 % of the total for this company in early 1990s, but now earnings in the electronic device and the information communication device sections have reached up to 70-80 % of total earnings.

Until 2000, the personnel system at this company was the general work performance qualification system (Figure 1). However, the councilor, sub-councilor, counselor, and sub-counselor positions in the work performance qualification system, that is, all of the management staff, was combined into a

**Figure 1. Line and work group/position grade in a certain trading company**

Line and work group/position grade in B company						
Since 2000						
Before 2000	Comprehensive work line				General work line	
Qualification	Work group	Qualification	Position grade		Work group	Qualification
Councilor Sub-councilor Counselor Sub-counselor	Senior Compre- hensive Work		Manager Management staff of organization	Professional Position specialized in work		
Director General work, 1st grade General work, 2nd grade	Compre- hensive work	Director General work 1st grade General work 2nd grade	Comprehensive work		General work	Chief Sub-chief Specialist General work - 1st grade - 2nd grade - 3rd grade

Source: Personnel materials in a certain trading company.

is more powerful for age rather than years of service. Based on this, Ono developed the “life security hypothesis,” and Ohashi also developed the “life security hypothesis.” If Japanese companies have thus far designed their income system in consideration of the life security of the worker, it is very easy for the income system to cause moral hazard problems for workers, as noted in the discussion below.

single general upper management position work group in a reform of the system in 2000. At that time, the company began to be run with two official positions, managers and professionals. The position grade in the new personnel system at this company ranges from P1 to P5 (Figure 2).

**Figure 2. Work group/position grade group for the senior comprehensive work in a certain trading company**

Work group/position grade group for the senior comprehensive work in B company

Position grade	Manager				Professional	
P1	Executive manager					
P2		Senior manager				Senior professional
P3						
P4		Business manager	Project manager	Business professional	Project professional	
P5						
Job group		Job title				
Executive manager		Director of the headquarters/Representative of the branch/Enterprise manager/Vice-representative of the branch/Group leader of the enterprise headquarters/ Director of the branch/Vice-director of the branch/section chief/group leader/Exclusive duties other than executives in the organization				
Senior manager						
Business/project manager						
Business/project professional						

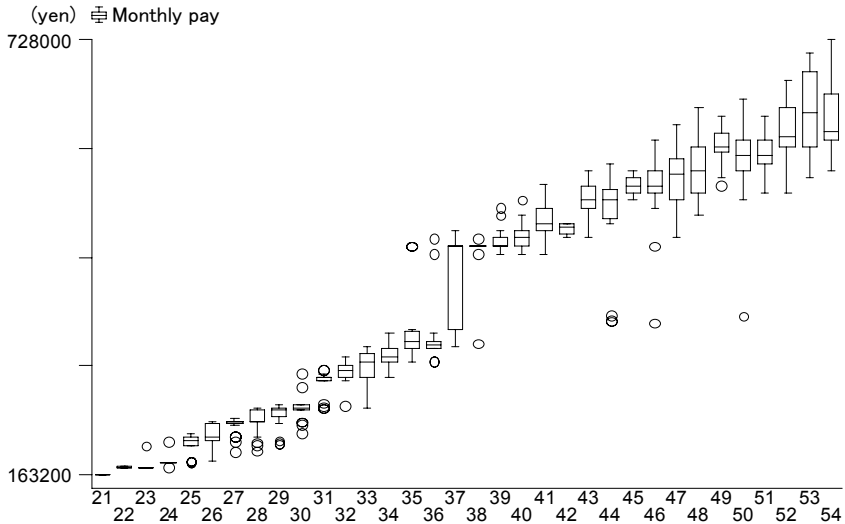
Source: Personnel materials in a certain trading company.

Before the personnel system was reformed, the age-income profile of this company in 1996 is shown in Figure 3 (The horizontal axis represents the age, and the vertical axis represents the monthly pay [not including bonuses]). This figure shows that the income profile when the work performance qualification system was in use was the standard seniority wage system, where wage income increases with age (or years of service). It was a company where the wages of the middle and senior age groups fluctuated at a range of roughly 150 thousand yen with small wage disparity.

Thus during the era of the work performance qualification system, a fixed reward system based on years of service was formed. There is a possibility that the moral hazard problem occurred here. In fact, as shown later, in this company the assessment point (original score) of workers with a high work performance qualification were not always higher than the assessment point of workers with a low work performance qualification, and there was also a year-to-year decrease



**Figure 3. Age and wage profile before the personnel system reform (1996)**



Source: Revised from the personnel data from a certain trading company.

in the assessment point of the former. The result of treating workers who were not always high in their job performance achievement ability by their years of service was that there remained many workers with insufficient performance achievement and low work morale.

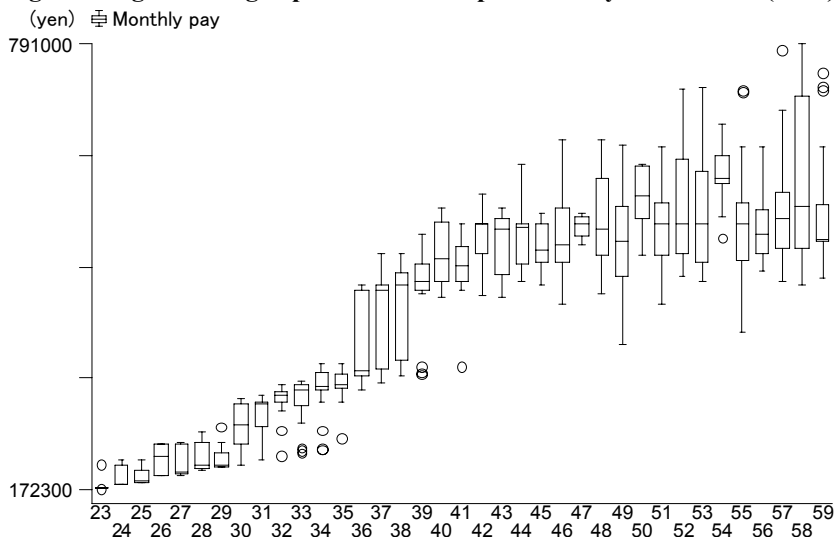
After reforming the personnel system (i.e. the performance-based principle was introduced), although the age-income profile of the general staff group remained the same as before 2000 because the personnel system there was not reformed, in the case of the management staff group the average values are roughly horizontal and incomes fluctuate up to about 300 thousand yen (Figure 4).

### 2.3 Problems with the Performance-based Principle

However, in solving the personnel problem by adopting the performance-based reward system, the following problems may be caused:<sup>6,7</sup>

<sup>6</sup> The problem point enumerated below corresponds to the point where it is impossible to explain the present personnel system by the use of the simple Principal-agent theory. As seen above, the real, appropriate assumption is not set up as a precondition derived by the optimum income system. However, by observing how the First Best

**Figure 4. Age and waged profile after the personnel system reform (2001)**



Source: Revised from the personnel data from a certain trading company.

### Non-negative income restriction

One of the important consequences of the optimum reward system derived above is  $\alpha < 0$ . Simply put, this means that if a worker's output is small, he/she must return the negative part  $\alpha$  to the company. However, a system with negative income is unrealistic for employers.

Now assuming that the "Outside Option" for workers is zero and that the optimum reward system is in place with a restriction that  $\alpha$  is non-negative,  $\beta = \frac{p}{2}$  and  $\alpha = 0$  are obtained. At this point the worker's effort level is  $e^* = \frac{2\beta}{2\delta}$ . That actually shows that the First Best optimum income, based on Principal-agent theory, has problems, and that when the constraint that the fixed income  $\alpha$  is non-negative is assumed, the incentive strength and the worker's effort level become half those in the case of the franchise agreement.

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solution is obtained by changing the assumption, one can forecast the problems of the income system that actually could possibly happen. Though there are criticisms that the personnel economics still remains at a high abstract level and cannot explain the real personnel system, it is significant in the sense that it can focus on the problems of the income system.

<sup>7</sup> Various other problems are pointed out. Refer to Prendergast (1999) for details.

### Risk-averse workers

Moreover, the optimum reward system derived above was a result obtained by assuming that workers were risk-neutral. However, it is generally thought that workers are risk-averse. That is, the higher the expected wage income of a worker is, the higher the utility level is, whereas the more  $Var(w)$  fluctuates, the more the utility level decreases. When assuming a risk-averse worker, a worker's utility function using the following expression is obtained:

$$U(w, e) = w^e - \lambda Var(w) - \delta \frac{e^2}{2} \quad (11)$$

where  $\lambda$  is the parameter which shows the degree of the worker's risk aversion. At this time, the Incentive Compatibility Constraint is:

$$e^* = \frac{\beta}{\delta}$$

which is the same as that obtained when assuming a risk-neutral worker, while the Participation Constraint is:

$$\alpha + \beta^2 \left[ \frac{1 - \lambda v 2\delta}{2\delta} \right] \geq u \quad (12)$$

where  $v$  is equal to  $Var(x)$ . Expression (12) shows that the greater  $v$ , that is the fluctuation of output  $x$ , becomes, the fewer the workers who will continue to work at this company under given  $\alpha$  and  $\beta$ .

Moreover, the optimum reward system of a company becomes:

$$\alpha = u - \frac{p^2}{(p + 2\lambda\delta v)^2} \left[ \frac{1 - \lambda v 2\delta}{2\delta} \right] \quad (13)$$

$$\beta = \frac{p}{p + 2\lambda\delta v} \quad (14)$$

That is, when taking a risk-averse worker as the premise, the value of  $\beta$  becomes at least smaller than that of the franchise agreement, which weakens the Incentive strength by that much.

### Flexible labor market

As a precondition for the optimum reward system, it is assumed that the labor market is flexible and that it is comparatively easy to leave and change jobs. If it is difficult to leave and change jobs and the Outside Option is zero, the value of  $\alpha$  becomes a non-positive value from expression (10). Simply put, the reward system will become such that the worker pays a compensation to the company beforehand (like a franchise joining fee) or the worker compensates

the company when their accomplishments are lacking.

In reality, the actual situation doesn't go to such extremes, but when the Outside Option is insufficient, the following problems occur: Lazear (2000) reported that, as a consequence of introducing a reward system corresponding to production at the car glass repair company Safelite in the United States, workers' incentives not only rose, but also a sorting effect occurred where only workers with high productivity continued to work while workers with low productivity left. It is thought that the earnings of companies increased due to the simultaneous influence of the incentive effect and the sorting effect in the performance-based reward system, for which it is prerequisite that a flexible labor market exists where it is easy to leave and change jobs. Lazear analyzed the labor market in the United States to confirm the sorting effect, but to the author's knowledge, it is uncertain whether the sorting effect occurred in companies in Japan that changed to the reward system.

The Research Section of the Japan Institute for Labour Policy and Training carried out a "Survey on the corporate governance of companies and CRS." The following four possible answers were provided for question 14 in the survey, regarding the future of the company's lifetime employment policy: 1. Hereafter, in principle lifetime employment will be maintained. 2. A partial correction is unavoidable. 3. A basic review is necessary. 4. A lifetime employment policy has never been in place.<sup>8</sup> Table 2 shows the answer to question 14. 60 % of companies answered that they would maintain lifetime employment policies. When including companies that assume that a partial correction is unavoidable but that will basically maintain lifetime employment, nearly 90 % of companies indicated that they will maintain lifetime employment policies. This result indicates that the effect will be limited to the extent that the sorting effect will become ineffective even if Japanese companies introduce the performance-based pay system. Rather, it may cause an adverse effect on the company's

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<sup>8</sup> The research above was done by mail in October, 2005. Moreover, to understand the shareholder's influence, all listed 2531 companies (the first and second section of the Tokyo Stock Exchange, the first section and second of the Osaka Stock Exchange, the first and second section of the Nagoya Stock Exchange) were targeted in the research. The number of effectively collected responses was 450 companies (effective rate of collection was 17.8%). Response rates were 16.9% with companies with less than 300 employees, 33.3% with 300 to 999, 36.2% with 1000 to 4999, and 11.8% with more than 5000, respectively. Moreover, among companies that responded, 48.2% were manufacturing companies, and 49.9% were non-manufacturing companies.

profit to the extent that worker's dissatisfaction will rise.

**Table 2. Policy about the life-time employment henceforth**

Number of surveys	Continue to apply the life-time employment in principle	Partial change is indispensable	Basic review is necessary	Lifetime employment policy has never been in place	No answer
451 (100.0%)	258 (57.2%)	119 (26.4%)	28 (6.2%)	29 (6.4%)	17 (3.8%)

Source: *Survey on the Corporate Governance of Companies and CRS* (The Japan Institute for Labor policy and Training, Research Section, 2006).

### Objective assessment vs. subjective assessment

One of points under discussion in criticism of the performance-based pay system is that it is difficult to recognize workers' performance objectively, so that it is not possible to treat workers according to their performance. Apart from workers such as salespeople whose sales figures can be easily observed and whose performance index can be easily verified by a third person, it is clearly difficult for many workers to acquire a performance index. Therefore, the point that an objective performance index cannot be obtained is a weakness in the performance-based reward system.

Even if an objective performance index was acquired, a worker's incentive does not necessarily improve, and the reward system that maximizes the profit of a company is not necessarily established. Baker, Gibbons and Murphy (1994) provide the following good example: The manager in charge of a district of a certain company is provided a bonus only when the earnings of the same district expand more than that of the previous year. The manager manipulates delivery dates to clients in order to secure profit growth, ultimately resulting in a negative effect on the company. At the same time, in an example of a company that introduced a system in which part of the earnings of a car repairman were set as a percentage of car repairs, the repairman frequently convinced clients to order needless repairs, so that the repair factory had to be closed depending on the administrative guidance. Basically, even if an objective performance index is acquired, the wrong incentive may be given to workers.

In a certain private job placement company in Japan, sales are used as part of the assessment index for employees who are in charge of the recruiting

companies and the number of job introductions is used for employees who are in charge of the job seekers. In the context of using such different assessment indices, the idea is to give the person in charge of the recruitment an incentive to find high quality job seekers and to give the person in charge of the job seekers an incentive to improve the quality of job matches. If the assessment index for the person in charge of the recruiting companies was the number of the job introductions, the company would introduce jobs without thinking about the content of the job opportunity. As a result, companies able to get potential employees would decline, which would not profit the company. Moreover, if the assessment index of the person in charge of job seekers was sales, the person in charge might introduce only positions with a high annual salary without thinking about the quality of the match with the job seeker. When this matching is poor, the job seeker will leave the company a short period after he/she is employed and the job placement company can not request a commission for introducing an applicant to the recruiting company, which means a possible decrease in the profits of the company. So this job placement company devised a method so as not to give the wrong incentive to their workers, by changing the assessment index according to the work category.

Lazear (1989) argued that it is more efficient to give a weak incentive to the worker in a dysfunctional incentive reward system. He extended the Tournament Model by Lazear and Rosen (1981) and showed that, in a model of a tournament with a generous reward, some workers increased their effort level to remain in the tournament, while other workers were idle during much of the same period. Therefore, he argued that it is efficient to make the prize of the tournament less the sum of idle work.

Moreover, in general the work that a worker is doing often consists of two or more activities. Let's assume that one activity is associated with the performance index of the individual, but other activities are not associated with that at all. In this case, the worker may give priority to the activity that is associated with their individual performance index, and might come to neglect the remaining activities. The multitasking problem which Holmstrom and Milgrom (1991) pointed out is exactly such a problem. This multitasking problem is also said to occur in Japanese companies that introduced the performance-based pay system. According to the author's research, among consumer electronics dealers who introduced to the management staff a reward system that was

synchronized with the numbers of sales, it was not uncommon for the management staff to prioritize sales to the extent that it had a detrimental effect on management of subordinates. Above all, it was impossible to give education and training opportunities to subordinates. Now this company is trying to introduce the education of subordinates as the assessment index for the management staff.

With the so-called performance-based pay system in Japanese companies, in many cases, an objective performance index is not necessarily used (of course, there may be exceptions). A variety of assessment indices such as a job index or a role index seemed to be used, but in any case a subjective assessment strongly influences the personnel assessment. Rather, many companies use a subjective assessment. The purpose management system is one of the important systems that support the assessments in the performance-based pay system, but the subjectivity of evaluators strongly influences the assessment. Even if assessment training is done, the assessment is still significantly subjective. There are many arguments that say that the performance-based pay system does not work, but subjective assessments are not thought to be wrong in recent studies of the economics of human affairs.

The work achievements of workers often consist of two or more action processes. Processing such an action well influences the overall performance, but it is hard for a third person to personally observe the process itself, and therefore it is also impossible to assess this objectively. However, supervisors and colleagues in the office often subjectively understand the quality of the action process of the worker and furthermore understand their contribution to the company. Through the company's assessment based on such an understood reputation, the company and the worker can cooperate and accept the profits with each other.

### **3. Background to the Introduction of the Performance-based Pay System**

Japanese companies, especially large companies, have greatly reviewed their personnel strategies since the latter half of the 1990s. A variety of personnel system reforms have been carried out such as positively adopting various systems of employment, reviewing the employment management that centered on the regular employees and adopting so-called performance-based pay system, and reviewing the reward system based on years of service. What is the background to this review of such personnel strategies in Japanese companies?

Did increasing labor management costs have an influence?

The collapse of the bubble economy and the subsequent long-term economic slowdown was often indicated as a reason. Increasingly severe international competition due to globalization is also often mentioned. Furthermore, another reason is that Japan's rapidly aging population also led to the rapid aging of the companies' personnel structures. Other factors can be pointed out, but the most important factor is the increase in the labor management costs. A rise of personnel expenses became a large problem in corporate management.

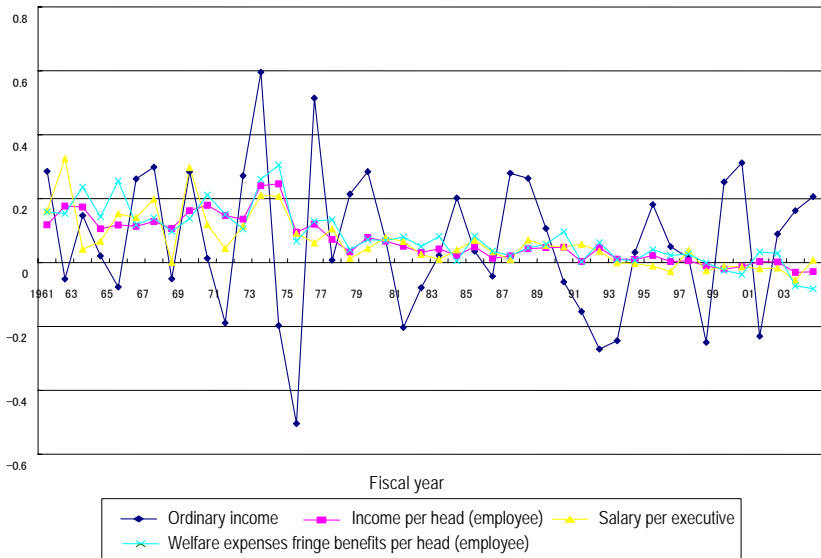
Certainly, there was a structural mechanism in the work performance qualification system that was adopted by a lot of companies so far wherein the treatment level increased by years of service inside the income management system. Labor management costs have risen as the average age of the workers rose. However, the authors question if it is rash to think that only the rise of labor management cost is a factor in the personnel strategy review of recent years.

The reason for this is that labor management costs ought to have pressed the corporate management several times in the past. In Figure 5 each increased rate over the preceding year is plotted for ordinary income, the salary per head and welfare expenses fringe benefit from the 'Financial Statement Statistics of Corporations' of the Ministry of Finance Japan (investigation each year). The salary per head and the welfare expenses fringe benefit per head had consistently shown a positive growth rate until the latter half of 90's and had a growth rate of 10% or more over the preceding year in the 60's and 70's. On the other hand, the growth rate over the preceding year in ordinary income was about 10% on the average in 60's and 70's with a negative growth rate in some years. Especially in 1974 and 1975, a decrease in ordinary income (negative 20% and negative 50%) appeared. Additionally, the ordinary income rate was also negative several times over the preceding year after the latter half of the 80's, too, which was the first time this happened in recent years.

Then, did reasons other than the increase in labor management costs influence the strengthening review of the personnel strategies in each company in recent years? What are the real reasons? The reasons that this paper focuses on are the technological innovation in the white-collar office including ICT (information and communications technology) showing the eminent advancement of recent years and the change in the corporate governance structure.



**Figure 5. Increase rate over the preceding year for ordinary income, the salary per head and welfare expenses fringe benefits**



### Influence of technological innovation<sup>9</sup>

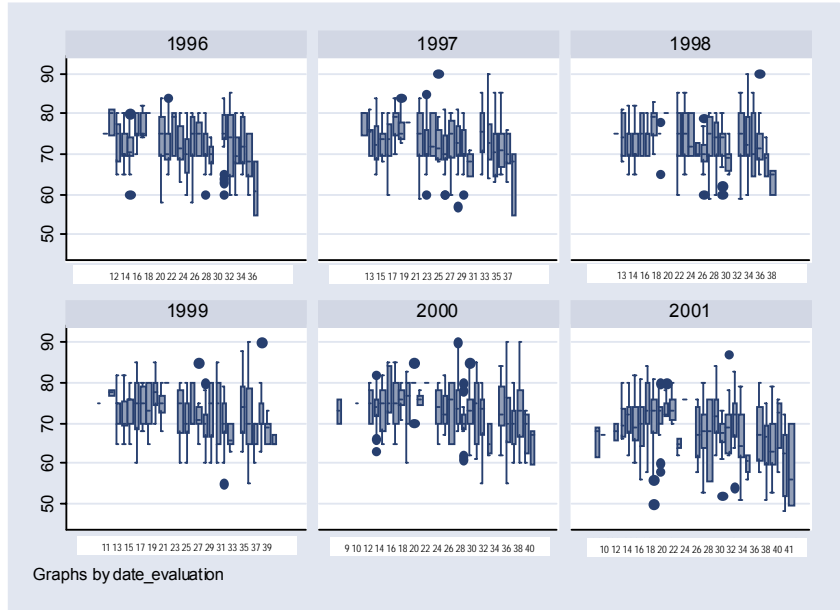
The sales of the FA department etc. occupied 70 % of all sales in early 90's in the trading company mentioned above, but the sales of electronic devices and information and communication devices reached 70-80 % of all sales around 2000. As the business environment for the trading company greatly changed, the skill elements concerning sales for the salesperson changed greatly. In the construction, environment, and FA system sections long-term deals were effective, and a salesperson's personality, intuition and knack were the main elements in doing business. However, as the electronic devices and the information and communication devices became the main target in doing business, Internet dealing became the main method for deals. The salesperson's personality, intuition and knack were not always necessary. Instead, issue-solution type and proposal type business—whereby a total solution is offered to the client—has become the mainstay. In actual fact, at the trading company mentioned in the example above, salespeople in their late forties to fifties had

<sup>9</sup> Refer to Chapter 6 of Tsuru, Abe, and Kubo (2005) for details of this part.

been worried about the effect of this environmental change. They recently faced a problem in that they could no longer make sales of products for which they had relied on their personality and experience to sell.

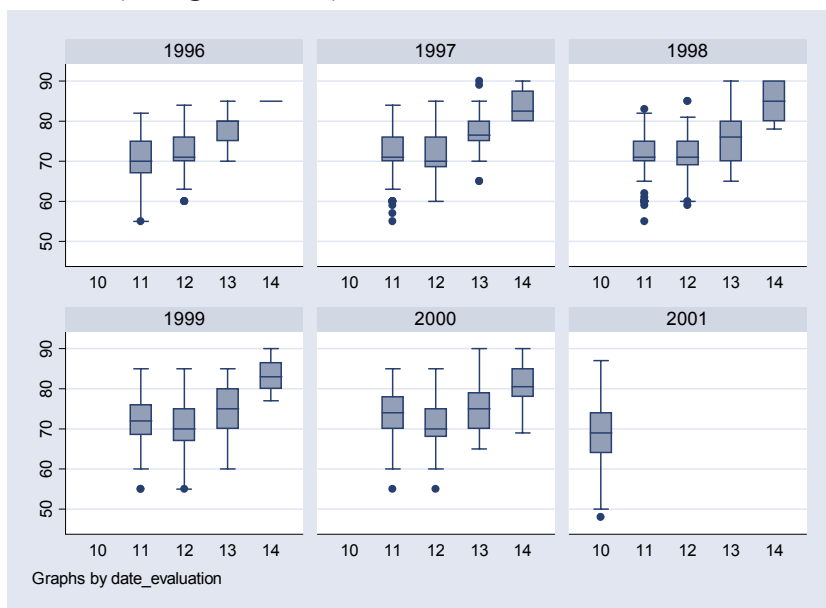
Figure 6 shows the distribution of the evaluation score according to years of service. The fluctuation of the evaluation score has expanded from 1996 before the reform of the personnel system until 2001 after those reforms. When looking at qualification, the average of the evaluation score did not necessarily rise between 1997 and 1999 regardless of the level of administrative qualification (number 10 in the figure shows a high level while number 14 indicates a low level), and it remained at the same level (Figure 7). At those periods in 2000 when the work performance qualification system was carried out, the average evaluation score was lower in number 12 than in number 11 for the lower qualification. This means that as a consequence of managing the work performance qualification system according to years of service, the qualification of the person had to be raised due to his/her years of service and age, the result

**Figure 6. Distribution of the evaluation score according to years of service (management staff)**



Source: Revised from the personnel data from a certain trading company.

**Figure 7. Distribution of the evaluation score according to qualification  
(management staff)**

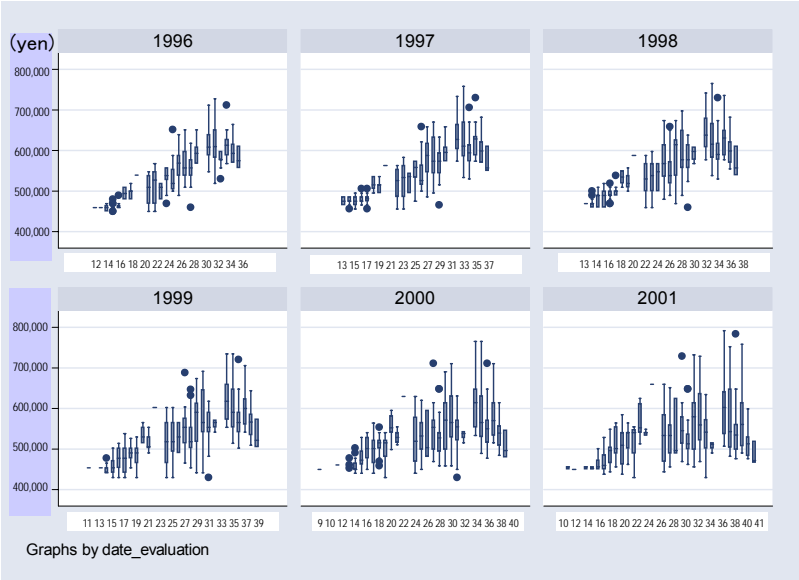


Source: Revised from the personnel data from a certain trading company.

did not go up so much as it leveled up, and sufficient performance was not attained. The person for whom the qualification could not be leveled up was also leveled up before the reform of the personnel system. Consequently, years of service could not be used as the ability index.

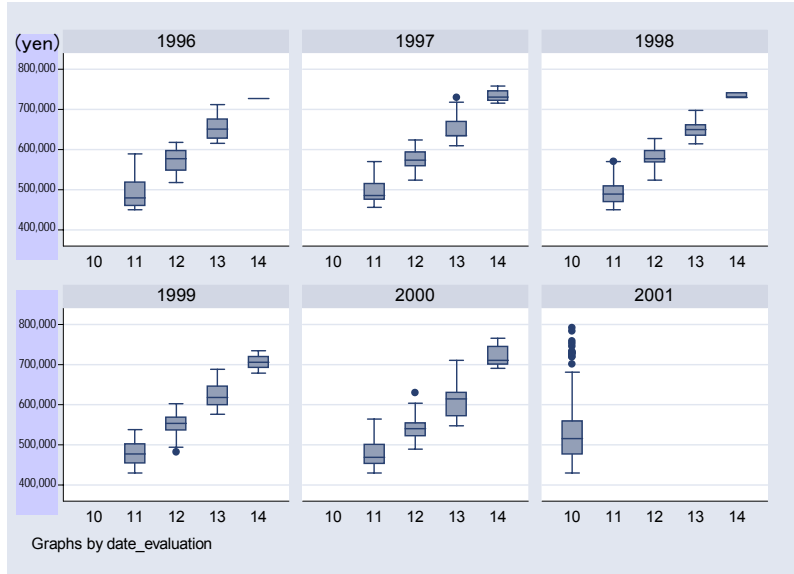
On the other hand, as is shown in Figure 8 and Figure 9, the correlation between the evaluation score and years of service has weakened, but income has kept a strong correlation with years of service. That is to say, some persons were receiving too much income. The gap between ability and salary had expanded before the reform of the personnel system as the consequence of the decision of the qualification according to years of service. In particular, when Figure 7 and Figure 9 are compared, the correlation between the qualification and the wage is very high in Figure 9. If the qualification goes up, the income goes up, but there is no such relation between the evaluation score and the income. That is, there are many workers whose evaluation is low but whose income is high (In particular, workers of number 12 and 13 are problematic).

**Figure 8. Distribution of the monthly pay according to years of service**



Source: Revised from the personnel data from a certain trading company.

**Figure 9. Distribution of monthly pay according to qualifications**



Source: Revised from the personnel data from a certain trading company.

Table 3 shows the corresponding relation between the rating in the old work performance qualification system and the rating in the new role grade system in the year of 2000. The vertical axis represents the work performance qualification (from number 11 to 14, a large number means a high qualification) in the old system and the horizontal axis represents the role grade (from number 1 to 5, a large number means a high grade) in the new personnel system. For instance, person number 13 in the old work performance qualification system corresponds to number 3 in the new role grade system, but actually also corresponds to numbers 1 and 2 in the new role grade system. Put simply, originally there were only 40 out of 63 people who should be ranked number 3 and number 4. The remaining 23 people were ranked lower. However, because the work performance qualification system had been applied according to years of service, the right result was not found.

**Table 3. Rating situation in the work performance qualification system and the rating situation in the role grade system**

		Role grade					Total
		1	2	3	4	5	
Work performance qualification	11	91	61	1	0	0	153
	12	50	51	8	5	0	114
	13	5	18	24	16	0	63
	14	0	0	0	7	5	12
Total		146	130	33	28	5	342

Numerical value in the table is the real number.

Next, looking at Table 4 (dummy 0 of the evaluation score means the persons rated low at the transition period from the old system to the new system, dummy 2 means the persons rated high, and dummy 1 means the persons rated standard), persons (0) rated at the subordinate position were similarly rated low in the old system, compared with the persons (1 or 2) rated at the standard and upper position. Therefore, the persons rated low in the new system were also rated low in the old system (from 1996 to 2000). Likewise, the persons' rated standard still remained in the middle. The persons rated high (2) were also high in the rank in the old system.

However, looking at the average wage, it is 545,164 yen for the person (0) of the low rank in 1996 and is 529,369 yen for the person (1) of the standard rank. In other words, the income of the person whose evaluation score is lower

**Table 4. Average evaluation score and monthly wage by ranking  
in the role grade system**

Average evaluation score by ranking

	dummy			Total
	0	1	2	
1996	67.42	73.80	79.48	72.51
	5.03	4.46	2.70	5.95
	85	146	35	266
1997	68.12	74.15	80.14	73.06
	4.61	4.57	4.44	5.93
	85	157	35	277
1998	68.02	74.02	80.85	73.10
	4.61	4.65	4.62	6.03
	86	179	35	300
1999	66.41	73.51	81.20	72.45
	4.61	4.66	3.81	6.29
	86	200	35	321
2000	67.54	74.33	80.77	73.26
	4.77	4.45	4.37	5.93
	87	220	35	342
2001	63.18	69.71	73.37	68.48
	6.22	6.51	4.87	7.05
	87	237	35	359
Total	66.77	73.08	79.30	72.04
	5.27	5.31	4.96	6.48
	516	1139	210	1865

Average monthly income by ranking

	dummy			Total
	0	1	2	
1996	545164.71	529369.86	614457.14	545612.78
	51047.09	60092.68	70830.51	64938.26
	85	146	35	266
1997	550188.24	540509.55	638685.71	555884.48
	49710.94	59788.47	69456.61	66187.10
	85	157	35	277
1998	550883.72	542949.72	656000.00	558413.33
	49082.50	63117.26	66691.56	69544.64
	86	179	35	300
1999	522465.12	522075.00	647685.71	535875.39
	45333.97	62270.35	57218.24	69569.09
	86	200	35	321
2000	505436.78	522186.36	661971.43	532230.99
	33825.37	55420.32	54338.52	67316.05
	87	220	35	342
2001	493379.31	522466.57	678600.00	530639.49
	24443.69	53846.96	55952.29	69815.27
	87	237	35	359
Total	527732.56	528934.66	649566.67	542185.30
	48647.79	59320.29	65172.55	68866.72
	516	1139	210	1865

Numerical value in the table is Average, Standard Deviation, and Number of observation in order from the top.

and whose rank is lower than an average person is high in the old system, which continued until 1999. This reversal collapsed after 2000, and the wage of the person (0) of the low rank became lower than that of the person of the standard rank (1).

Basically, there were also some persons with low ability among those persons who were working for many years and who received a high qualification at the time when the work performance qualification system was applied. These persons received a high income on the work performance qualification system. However, in contrast to these persons, others received a low qualification because of their few years of service despite their high performance, and received a low income on the work performance qualification system.

Why have these situations occurred? The business environment changed suddenly, as mentioned above, and the employees were asked to create added value. Ability has risen together with years of service in the business at the trading company where personality, intuition, and knack had been important, but the correlation between years of service and ability has been weakened by technological innovation. After 1996, a reversal of ability and wage came to be observed.

#### Connections with change in the corporate governance structure<sup>10</sup>

Companies have also faced the reform of the corporate governance structure based on the changes in the business environment because of economic globalization. The opinions of institutional investors and individual investors became more influential, the composition of shareholders changed and a trend emphasizing stakeholders (persons concerned) also became intense. At the same time, the changes in corporate governance considerably influenced personnel strategy.

According to Aoki (2001), Abe and Hoshi (2006), and Hoshi (2002) there seems to be a supplementary relationship between business finance, corporate governance, and personnel strategy. However, research that proves and analyzes such a relationship has not advanced much because of a lack of date, etc. In the following, we will examine what kind of change the corporate governance

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<sup>10</sup> Refer to the Japan Institute for Labour Policy and Training (2006) for details of this part.

structure gave to personnel strategy, especially the wage system, by using the “Survey on the corporate governance of companies and CRS” (hereafter, referred to as Research), which was carried out by the Research Section of the Japan Institute for Labor Policy and Training.

The concrete analysis was performed as follows: The existence of a personnel and labor management system at each company was obtained in the question 13 of Research (Table 5 is the basic statistics). Here a variable was created where one is when the system is completely applied and zero otherwise, and this was assumed to be a dependent variable. Question 13 investigates the presence of 16 systems in total, but here only the system that is related with the

**Table 5. Situation regarding the introduction of the personnel and labor management system**

	Number of surveys	Under enforcement	Under examination	No plan	No answer
(1) Work performance qualification system	451 (100.0%)	339 (75.2%)	19 (4.2%)	78 (17.3%)	15 (3.3%)
(2) System that reflects the individual performance to the monthly wage	451 (100.0%)	264 (58.5%)	38 (8.4%)	135 (29.9%)	14 (3.1%)
(3) System that reflects the sector's performance to the monthly wage	451 (100.0%)	74 (16.4%)	56 (12.4%)	307 (68.1%)	14 (3.1%)
(4) System that reflects the performance of the whole company to the monthly wage	451 (100.0%)	79 (17.5%)	56 (12.4%)	300 (66.5%)	16 (3.5%)
(5) Flexible working hours system	451 (100.0%)	105 (23.3%)	118 (26.2%)	207 (45.9%)	21 (4.7%)
(6) Management by objectives	451 (100.0%)	356 (78.9%)	51 (11.3%)	29 (6.4%)	15 (3.3%)
(7) Training for examiners	451 (100.0%)	291 (64.5%)	96 (21.3%)	50 (11.1%)	14 (3.1%)
(8) Trouble-shooting system for evaluation	451 (100.0%)	167 (37.0%)	107 (23.7%)	159 (35.3%)	18 (4.0%)
(9) In-office public offering system, self report system	451 (100.0%)	282 (62.5%)	75 (16.6%)	78 (17.3%)	16 (3.5%)



reward system is analyzed. In addition, by using the attributes which were obtained through research, the following dummies and conditions are collated: Attribute dummy of tops of companies that is composed of owner type, trueborn type and type of retiring high-ranking officials landing a private corporation (in this case, the trueborn type is assumed to be the reference); Share possession rate according to the attribute of shareholders that consist of top ten shareholders, financial institutions, brokerage firms, individuals and foreigners (in this case, the individual share possession rate is assumed to be the reference.); Experience of the operation crisis; Industry dummy; Company scale dummy. Each of them is assumed to be an explanatory variable.

The estimated result is shown in Table 6. Firstly, when the work performance qualification system was set to the dependent variable, only estimated coefficients of the share possession rate of the brokerage firm became a statistically significant negative value. The reason why the share possession rate of the brokerage firm gives a negative influence is not certain, but this influence is not seen elsewhere in companies' tops and shareholder attributes. Simply put, "(1) the work performance qualification system" is a general practice except with brokerage firms with a high share possession rate.

Next, the "share possession rate of foreigners" was presumed to be a statistically significant positive value when "(2) system that reflects the individual performance to the monthly wage" was set to the dependent variable. This result suggests that the higher companies share possession rate by foreign shareholders, the more they introduced the so-called performance-based pay system. Except for this, there was no influence by companies' tops and shareholder attributes. It is found that companies where there was an "operation crisis" in the past introduced the "(3) system that reflects the sector's performance to the monthly wage" at the high rate. Moreover, the significant coefficient was not statistically presumed as for the "(4) system that reflects the performance of the whole company to the monthly wage," and neither top nor the shareholder attribute had any influence.

Thus there is a tendency for the so-called performance-based reward system, where the individual's achievement is reflected in the monthly wage, to be introduced in the companies with a high share possession rate by foreigners. Many foreign shareholders are in investment trusts and funds, but they are strongly apt to make much of ROA (return on investment) and ROE (return on

**Table 6. Influence of the corporate governance on the personnel and labor management system**

	(1) Work performance qualification system	(2) System that reflects the individual performance to the monthly wage	(3) System that reflects the sector's performance to the monthly wage	(4) System that reflects the performance of the whole company to the monthly wage	(5) Flexible working hours system	(6) Management by objectives	(7) Training for examiners	(8) Trouble-shooting system for evaluation	(9) In-office public offering system, self report system
Owner type	-0.061 (0.057)	0.058 (0.065)	0.054 (0.054)	0.003 (0.055)	-0.064 (0.055)	-0.070 (0.051)	-0.031 (0.063)	-0.150 (0.063)**	-0.084 (0.066)
Type of retiring high-ranking officials landing a private corporation	0.009 (0.076)	-0.012 (0.099)	-0.016 (0.069)	0.108 (0.091)	0.047 (0.087)	0.057 (0.060)	0.130 (0.079)	0.019 (0.100)	0.034 (0.092)
Share possession rate of top ten shareholders	-0.232 (0.180)	0.229 (0.229)	0.276 (0.170)	0.160 (0.187)	0.237 (0.203)	-0.258 (0.162)	-0.232 (0.210)	0.068 (0.231)	-0.237 (0.219)
Share possession rate of the financial institution	-0.004 (0.193)	0.242 (0.253)	0.155 (0.184)	-0.151 (0.208)	0.259 (0.220)	0.373 (0.192)*	0.605 (0.243)**	0.670 (0.255)***	0.723 (0.251)***
Share possession rate of the brokerage firm	-2.373 (1.244)*	0.649 (1.578)	1.032 (1.165)	-0.348 (1.526)	-1.132 (1.747)	-0.926 (1.115)	-1.634 (1.478)	-1.237 (1.700)	-1.975 (1.484)
Share possession rate of foreign shareholders	-0.332 (0.228)	0.948 (0.315)***	0.222 (0.226)	0.258 (0.237)	0.458 (0.256)*	0.067 (0.226)	0.171 (0.289)	0.154 (0.310)	0.451 (0.298)
Existence of operation crisis	-0.069 (0.048)	0.032 (0.058)	0.111 (0.046)**	0.061 (0.048)	0.067 (0.052)	0.051 (0.042)	0.071 (0.054)	0.101 (0.059)*	0.058 (0.055)
Number of observation	358	356	351	340	343	350	345	347	355

Standard error in parenthesis.

\*, \*\* and \*\*\* means that coefficients are statistically significant at 10%, 5% and 1% respectively.

equity), and they tend to seek the short-term gain for company managers. Moreover, their “voice” is so strong that company managers cannot disregard it. It is thought that such stakeholders’ existence promotes the efficient management of companies, resulting in the personnel strategy with the performance-based pay system, too.<sup>11</sup>

Looking at personnel and labor management system other than the reward system, this result shows that “(5) flexible working hours system” is introduced by the companies with a higher share possession rate by foreign shareholders. The flexible working hour system is a kind of “discretionary work time system.” Where it is necessary to entrust the concrete implementation method to workers’ discretion because of nature of the business, and when workers cannot be familiar with the employer’s concrete control and supervision and calculation of labor time based on the ordinary method is inappropriate, certain hours are considered to be labor hours after making an agreement between labor and management. Such a form of employment system and working hour system is called the “discretionary work time system.”

The flexible working hours system has two types: the “flexible working hours system of special business type” and “flexible working hours system of planning business type.” There, workers get evaluated by attaining the purpose, in that sense, it is different from the concept of paying the income to “working hour”, and is the working hours system to consider the value and treatment to “performance.” The result of the flexible working hours system introduced in the companies with the high share possession rate of foreign shareholders is thought to have a supplementary relation with the consequence that the performance-based pay system is adopted in the companies with the high share possession rate of foreign shareholders.

However, the share possession rate of foreign shareholders do not produce a statistically significant influence on “(6) management by objectives,” “(7) training for examiners,” “complaint processing system to the (8) trouble-shooting system for evaluation” or “(9) in-office public offering system, self report system.” It is the share possession rate of the financial institution to influence these systems, and these systems are introduced by the financial institutions of

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<sup>11</sup> Whereas Tirole (2001), Hoshi (2002), and Abe and Hoshi (2007) theoretically discussed the corporate governance and the complementarity of the personnel strategy.

higher share possession rate.<sup>12</sup> It is thought that these systems are in the relation that supplements the application of the performance-based pay system, but it might lack the balance in the application of the personnel system that these systems do not exist in the companies with higher share possession rate of foreigners that strongly tend to have the performance-based reward system.

“The target setting is not performed well,” “an appropriate assessment is not applied,” “there is dissatisfaction about the evaluation,” or “there is dissatisfaction about the assignment and destination of arrangement” etc: Persons who hold the opinion that the performance-based reward system does not suit Japanese companies often voice such complaints. However, the reward system itself is not the problem, but rather the fact that the system supporting it is unfinished may be instead be the problem.

#### **4. Conclusions—Debating the Performance-based Income System vs. the Work Performance Qualification System is Nonsense**

Various problems have been pointed out in the performance-based reward system, which was actively introduced in Japanese companies since the latter half of the 90's.

In particular, many believe that neither the achievement nor the productivity of the companies rises even if the performance-based pay system is introduced, nor should we return to the traditional system because the performance-based pay system does not suit the Japanese.

However both performance-based pay system and traditional work performance qualification system have their own problems. It is difficult to decide which one is effective because they are affected by the labor market of each age and by the climate of business management.

Moreover, neither the achievement nor the productivity of companies necessarily increases even if the performance-based pay system is introduced. The workers can be committed to the company's objections and this can improve their motivation, by which they influence productivity and achievement. So they cannot improve the motivation and be committed to the corporate target, just by changing the system. Some mechanism is necessary in addition

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<sup>12</sup> As for “Complaint processing system to the assessment” when the management top is the “owner type,” it has a negative influence and when “(in the past) there was the operation crisis” it has a positive influence.

to the reward system.

This paper explained the theory of the optimum reward system taken up in the economics of human affairs, pointed out might cause the moral hazard problem in the work performance qualification system, and at the same time discussed about the problems of the “real” performance-based reward system. Anyway both are not complete systems in the meaning that they are not the First Best reward system.

However, what brought about the situation whereby Japanese companies worked on the personnel system reform after the 1990s, and the performance-based pay system was introduced? In this paper, the focus was applied to not labor cost, as is often pointed out, but to the technological innovation and the influence by the change in the corporate governance. The author insisted that the business environment's of companies changed by the technological innovation and the change of the corporate governance, and at the same time as aging of the employees advanced number of companies which try to apply the performance-based pay system increased. Regardless, there may have been few companies that launched personnel system reform for the positive reason that the meritocracy had failed there. Whether the work performance grade or the role grade is applied, there are few companies which apply personnel assessment only by the objective performance index in the Japanese performance-based pay system. In relation to this, there is also the criticism that the performance-based pay system does not work well since the performance index are not sufficiently prepared, but the author thinks that the performance-based pay system work well even by the subjective index. Rather, the author intuitively thinks the fact that workers are aware of the introduction of the performance-based pay system would lead to the system becoming an incentive to them.

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