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ABSTRACT

Labor management practices in Japan are quite different from those in the United States. Based on recent developments in contract theory, we develop a conceptual framework to understand why the differences have been maintained for a long period of time. Our basic message will be that the American and Japanese systems are examples of two different equilibria. The distinguishing feature of these two equilibria will be the extent to which exit is used as a method of contract enforcement. In the U.S., there is a greater tendency for the use of exit because active markets exist for senior workers. In contrast, there is virtually no market for mid career workers in Japan. We also discuss the implications of this fundamental difference on the structure of the internal and external labor markets.

1. Introduction

The recent remarkable performance of the Japanese economy has created an industry in the selling of the "Japanese system" to western firms. It is perceived that one of the reasons for Japan's success lies with its unique employment practices and the higher productivity. Recent books, such as Ouchi (1981), extol the virtues of life-time employment, group incentives and other features of the Japanese employment practices. Ouchi suggests that if American firms would adopt some of these practices, they, too, would enjoy some of the benefits that are now accruing to the Japanese. Weitzman (1984) argues that the Japanese system could also provide a permanent solution to the problems of stagflation and unemployment.

These optimistic views of the Japanese system pose some fundamental problems for economists. A basic principle in economics is that firms will tend to choose techniques and institutions which maximize profits. Therefore, if the Japanese system is more efficient, one should observe its adoption by American firms as rapidly as existing institutions allow. This does not seem to be the case at the moment, except possibly in the automobile industry. Secondly, even if the Japanese system is ill suited to the American economy as a whole, there is the puzzle of why both countries have evolved two quite different and apparently stable systems.

The standard story that is preferred in the management literature is that there are fundamental cultural differences between the two countries. While this is certainly the case, this cannot be the whole story. A closer examination of the Japanese firms reveals that they use a large number of incentive devices for workers, both pecuniary and non-pecuniary. In this essay we will review some of the differences between Japanese and American labor practices, and argue that many of these practices can be understood by

using economic principles alone.¹

Our basic argument is that the American and Japanese systems are examples of two different labor market equilibria. The distinguishing feature of these two equilibria will be the extent to which exit is used as a method of contract enforcement. The basic hypothesis, first put forward by Hirschman in his important book (1970), is that there is in America, compared to Japan, a greater tendency for the use of "exit" than for use of "voice". An example of the use of "exit" is when the quality of a product falls, customers express their displeasure by moving to a different supplier. Alternatively, customers can use "voice" and complain to the producer. As Hirschman points out, this has the advantage of not only signaling to the producer that there is a problem, but also the nature of the problem. In this way voice can potentially be more efficient due to the use of a naturally richer mode of communication.

Hirschman uses Japan argues that Japan's type of market equilibrium has its origins in the smaller size of its community. Historically there is less use of exit as a method of controlling the actions of individuals. Consequently, organizations developed under the constraint that people could not easily leave a situation when a problem arose or a conflict developed. In other words, institutions are structured on the assumption of a less mobile, more stable, workforce. In the case of the modern manufacturing firm this implied that workers would enjoy the benefits of lifetime employment.

The United States, in contrast, had an economy that was expanding geographically, as well as economically, and consequently needed a mobile work force. As Tocqueville (1968) documented in his classic work *Democracy in*

¹See Aoki (1982, 1984, 1986), Ishikawa (1986), and Okuno (1984) for examples of the economic approach to the Japanese firm.

America, American culture has long valued the right of an individual to leave a situation which he or she feels is undesirable.² Consequently, firms and unions have developed institutions to efficiently deal with this type of behavior.

In this paper we begin with a brief discussion of some of the major features of the Japanese and American systems as described in recent applied work. These studies tend to support the hypothesis that the ease of exit is significantly different in the two countries. Secondly, we discuss some of the recent work in contract theory, and how it can explain some of the institutional differences between the Japanese and American labor markets, particularly the institution of life-time employment. We would like to suggest that while culture may help explain why the systems are different, the nature of the institutions themselves can be explained using economic principles alone. In the final section we discuss some of the implications of our analysis.

2. Some Stylized Facts

In this section, we summarize major institutional features of Japanese labor management practices and contrast some of these practices with those found in the United States. Since there are many books and articles which study them in detail, our discussion here will be brief.³ The discussion will consider three aspects of the Japanese system. First, we review the life time

² See in particular Chapter 13, Book 2 and Chapter 17, Book 3. There de Tocqueville discusses not only Americans' passion for wealth, but also their universal passion for change (exit). For example, he states that "In the United States a man builds a house in which to spend his old age, and he sells it before the roof is on".

³See for example Clark (1979), Cole (1971, 1979), Dore (1973), and Koike (1984).

employment institution that forms the starting point for our subsequent analysis. Second, we describe some of the characteristics of the internal labor market and, finally, the mechanics of the labor market are discussed.

2.1. 'Life-Time' Employment

A worker in a large Japanese corporation has a virtual guarantee of a 'life-time' tenure. A worker will not be laid off except in extreme circumstances. For example, a short-term downturn in demand will not cause layoffs. Only in those cases where things are so bad that other means such as work sharing and transfers to other sections and to other related companies (e.g., subcontractors and automobile dealers in the case of automobile manufacturers) do not work, will there be layoffs. It is certainly the case that in the United States many workers expect to work at the same firm for the rest of their lives. However, as Hashimoto and Raisian (1985) have pointed out; security of tenure is more prevalent in Japan. What seems to be fundamentally different is while white collar workers in the United States traditionally have good job security, this is not the case for blue collar jobs. In Japan life-time employment encompasses virtually all of the firm's regular employees.

It should be noted that 'life-time' tenure means life until retirement at some age usually between 55 and 65. Quite often, the retirement age is so young that a worker must find another job when he retires from the firm. Usually the only job that he can obtain is a low-paid one in a smaller company. In many cases, firms make an effort to arrange jobs for retired workers.

2.2. Major Features of the Internal Labor Market

One of the most important differences between the Japanese and American internal labor markets lies in the structure of wages and job descriptions. In American firms the job and the performance standard for an individual worker are clearly specified. Wages are attached to the job, not necessarily to an individual worker's characteristics such as skill level or level of education. Much of an American worker's increase in wage comes not from seniority per se, but from progress to better paying jobs.⁴

In Japanese firms, job descriptions are quite vague. An individual worker performs many different jobs and helps other workers who are facing difficulties; an older, skilled worker is supposed to help and train a young, unskilled worker. There is usually no job description for an individual worker: a job description is provided only for a section (or a group) which consists of several workers and a section chief (or a foreman). A worker in a Japanese firm obtains higher wages when he or she becomes more senior.⁵ This is true even when the worker's job remains the same. In this sense, wages are not based on job categories but on the age of a worker.

Most firms pay one-shot retirement allowances which depend on how long the worker has worked for the firm. Retirement allowances are very small if the length of employment is shorter than ten years, but they are sizable if

⁴See Doeringer and Piore (1972).

⁵According to 1986 Wage Census conducted by the Ministry of Labor, the wage profile (excluding bonuses) for an average high school graduate is as follows: 146.4 (thousand yen per month) between ages 18 and 19; 175.1 between ages 20 and 24; 212.8 between ages 25 and 29; 257.3 between ages 30 and 34; 293.3 between ages 35 and 39; 332.2 between ages 40 and 44; 345.3 between ages 45 and 49; 343.5 between ages 50 and 54; 298.2 between ages 55 and 59; 236.7 between ages 60 and 64; 201.5 between ages 65 and older.

the length exceeds 25 years.⁶ In addition to retirement allowances, many firms have pensions for their employees. Pension terms are also more attractive for workers who have stayed in the same firm until retirement.

In most firms, there is a single union consisting of both blue-collar and white-collar workers. In some cases, a union leader is an elite white collar worker who will later become a management executive. Negotiations between the management and the union determine the average increase in wages and the total amount of 'bonus' payments (which we will discuss next), but the management retains a certain degree of discretionary power over how wage gains will be allocated among individual workers.

By way of contrast company unions are in general decline in the United States. Strong unions tend to be those organized by type of skill or industry, bargaining with several different firms. Firms may often have to bargain with several different trade unions.

In Japan a 'bonus' is paid twice a year which is negotiated between the management and the union. However, the amounts of the bonuses are determined largely by the performance of the firm. Unlike a change in basic wages, a change in the bonus has no effect on wages (and bonuses) in the following years. The bonus system therefore gives the firm flexibility to deal with fluctuation in demand.

A work group has significant autonomy in controlling the allocation of jobs to its members. In typical American firms, the management and engineers

⁶According to a survey (Taishokukin Nenkin Jijo, 1987) by Research Institute for Labor Management (Romu Gyosei Kenkyusho), retirement allowances for a 'typical' worker in a large corporation is as follows. For male high-school graduates employed by a corporation with more than 3000 employees, the sum of retirement allowances and the present value of pensions is 267 (thousand yen) with 5 years of service; 902 with 10 years of service; 2,110 with 15 years; 4,407 with 20 years; 7,943 with 25 years; 12,834 with 30 years; 17,475 with 35 years; 20,460 with 39 years.

determine the allocation of jobs, and workers must follow the instructions. In Japanese firms, workers contribute to improvements in work organization on the shop floor. By delegating authority to work groups, they can make better use of the first hand knowledge of workers, but again this sort of decentralization creates serious incentive problems.

There is a lot of training inside a Japanese firm. One reason is that educational institutions (such as universities) in Japan do not provide practical training. They tend to be more academically oriented than American counterparts. For example, there are very few business schools in Japan. As a result, training in a Japanese firm is not limited to firm-specific skills but a lot of general training is provided.

In the United States there is also a large element of training on the job, although for many skilled workers it is their "papers" which allow them to get a job. Blue collar workers such as welders or machinists will often bear the cost of their education in some specific skills, but will be more susceptible to changes in demand for their skills.

2.3. Labor Market Characteristics

Finally, we comment on some of the important labor market characteristics in Japan. First, mobility of workers is in general lower in Japan than in the United States. Especially, mobility is very low for workers employed by large firms. When they are young, there is some mobility, but for a worker over 30 years old it is extremely difficult to find a better job in other firms.

Second, although mobility of regular workers is very low, Japanese firms make extensive use of temporary workers who are either part-time workers or sent by smaller subcontract firms. Regular workers help train and supervise those workers. In many cases, regular workers are multi-job workers who can

handle many different jobs while temporary workers can only do one, or a few jobs.

Third, there is much less vertical integration in Japanese firms than in United States firms. For example, Toyota has a disproportionately smaller number of workers than GM, and the major reason for this is that GM produces more parts within the firm than Toyota does.

3. The Labor Market in the U.S. and Japan

Many researchers have established that the system of seniority based wage rates forms a large positive component of wage growth in the United States.⁷ As in Japan, senior workers in the United States face inferior alternatives to their current job, and consequently have a lower quit rate. There are many explanations of this phenomenon, notably the human capital theory, agency theory and the insurance motive.⁸ The most prominent of these is the human capital theory pioneered by Becker (1962, 1975). According to this theory workers develop firm specific skills over time, which increases the value of the match. Williamson, Wachter and Harris (1975) have argued that the existence of this surplus leads to a bargaining relationship between the worker and the firm, the outcome of which results in workers receiving a wage that is greater than the available alternatives. Furthermore, the American institution of attaching wages to jobs is explained by the resulting lower bargaining cost for the firm. Alternatively, if workers have varying alternative opportunities, then the firm may raise wages above market clearing to reduce quits by older workers. Carmichael (1983) has used this story to

⁷See Mincer(1974), Mincer and Jovanovic(1981), and Bartel and Borjas(1981).

⁸See the surveys by Taubman and Wachter(1986), and Parsons(1986).

explain the existence of promotion ladders.

The agency theory, due to Lazear (1979, 1981) and others, argues that due to the costs of monitoring, workers have an incentive to shirk. A rising wage profile in effect forms a bond, which a worker forfeits if fired. In equilibrium the rising wage profile can lower the cost of monitoring workers. However, one of the implications of the rising wage profile is that workers will be receiving more than their alternative later in life, which, according to Lazear, explains the institution of mandatory retirement.

Finally, Harris and Holmström (1982) introduce a model in which downward rigid wages insure workers against adverse productivity shocks in the future. In this model wages rise whenever a worker is offered an alternative that is greater than his or her current wage (See also the work of Freeman (1977)).

These theories start with the evidence that senior workers are not offered market clearing wages, which is essentially the same starting point for the theory of the Japanese firm.⁹ Therefore differences between the structure of internal labor markets in the United States and Japan should be a matter of degree only.

Mincer and Higuchi (1987) argue that the observed steeper wage profiles in Japan are due to a higher level of human capital accumulation, resulting from Japan's greater rate of technical change. A higher level of technical change implies that on-the-job training and retraining is greater. This higher level of firm specific human capital would imply, using the theories we have cited above, that wage-tenure profiles should be steeper in Japan than in the United States.

Though this work provides some important new insights, it cannot

⁹See Aoki(1984).

satisfactorily explain some of the institutional differences between the two countries. In particular, if Japan and the U.S. differ only in degree, then why do we observe wages attached to jobs in the U.S. and not in Japan? Human capital theory would predict in general that wages be attached to individuals, not jobs. Furthermore, given that firm specific human capital is higher in Japan, and that retraining is an integral part of the system, then why do we observe earlier retirement in Japan?¹⁰ Greater firm specific human capital should imply later, rather than earlier, retirement.

While we agree with the contention by Mincer and Higuchi (1987) that Japanese institutions may not be explained solely on the basis of cultural differences, we do feel that recent theoretical and applied work may supplement human capital theory to provide a better understanding of the differences in institutions.

First, a series of empirical papers by Altonji and Shakatko (1987), Abraham and Farber (1987), and Topel (1985) have shown that the seniority effect is small for United States samples. They find that most wage growth is associated with total labor market experience. One of the implications of their findings is that wages seem to be best explained by human capital theory that is based on generalized training rather than firm-specific human capital. In particular these results are evidence against the standard formulation of the agency model, as formulated in Lazear (1979, 1981).

However, these results do not contradict all formulations of the agency model. MacLeod and Malcomson (1988) study a model in which there are incomplete markets, in the sense that worker effort and worker types are not publicly observable but the job occupied and its wage are observable. It is

¹⁰This point was first made by Hashimoto and Raisin (1985).

shown that these assumptions can endogenously result in a hierarchical wage structure with many of the features associated with internal labor markets in the United States. That is, workers are promoted through the ranks to better paying jobs. Variance of wages increases with age, while workers newly entering a job are more productive than those who have held the same job for some time. In equilibrium there is little turnover, with those workers at the lowest skill level facing long term unemployment. Finally, if a worker does leave his or her job, the model predicts that the worker will find a similar job at a slightly lower wage.

Even though this is a pure agency model, it is consistent with the recent evidence on wages discussed above. Furthermore, unlike human capital theory, it provides a consistent explanation, based on reputation effects, of why wages are attached to jobs, and not individuals. In this model wages are explicitly associated with a rank, or job, in a hierarchy, and not to the individual. This mechanism plays a very important role in the enforcement of the contract. The job-wage pair provides a publicly observable signal of the capabilities of the individual occupying the job. That is, if the worker were to look for another job, then the new employer would use the previous job as a measure of the individual's ability. Therefore attaching wages to jobs is a reputation mechanism that ensures that the labor market is more competitive.¹¹ A natural prediction of this model is that a worker's wage will be a direct function of his or her market experience.

Thus, the work of MacLeod and Malcomson (1988) helps us to understand the labor market in the United States. Our next task is to conceptualize the

¹¹A similar view seems to hold in the management literature. For example Lawler(1982), an authority on pay and performance, notes that one of the advantages of attaching wages to jobs is that it "ensures that its compensation costs are not dramatically out of line with its competitors."

Japanese labor practices. In contrast to an American firm, the Japanese firm isolates its workers from the outside labor market by steep wage profiles and retirement allowances that depend on the length of employment. This makes it easier for the firm to deal with various incentive problems. For example, when the firm does not have to worry about the possibility that its workers quit, it has much more freedom in choosing compensation schemes and internal organization. An important implication of this is that the Japanese firm does not have to attach wages to jobs. Instead, wages can be made to depend directly on individual characteristics such as the length of tenure.

In order to maintain steep wage profiles, however, the firm must invest in reputation. With upward sloping wage profiles, the firm has an incentive to fire older workers and replace them with younger workers. It must therefore commit itself to no-firing policy and convince workers that it keeps its promise.

The model of MacLeod and Malcomson (1988) provides an additional insight on why the Japanese system can be maintained as a stable equilibrium. This model is studied using dynamic game theory, and as with most dynamic games with asymmetric information, there can be many equilibria, each one parameterized by the beliefs of agents in the economy. In MacLeod and Malcomson (1988) it is assumed that the market's beliefs about a worker's ability adjusts only slightly when he or she separates from a firm. This is not, however, the only possible equilibrium.

Suppose that wages are not attached to jobs, and that a worker's rank or capability is difficult to learn from his or her work experience. Further suppose that in equilibrium workers rarely leave their current employer. In this case it is possible to have an equilibrium in which firms have very pessimistic beliefs about the abilities of job changers. A consequence of

these beliefs would be that workers leaving their employer in mid career would face a large drop in real income. This will make exit costs much larger than those predicted by upward sloping wage profiles.

Let us conclude this section with a review of the stylized differences between American and Japanese labor markets implied by the discussion above. In general, the American labor market is characterized by more competition for workers of all ages. Not only is this view supported by recent empirical work, but it can also provide a simple explanation of the institution of attaching wages to jobs. For the Japanese worker the labor market opens only twice in a lifetime. The first time is after leaving school. At this time there is a great deal of competition for new employees, who expect, after possibly a short period of shopping around, to be at the same firm until retirement at age 55. At this time workers reenter the labor market for the second time.

In the following section we discuss the implications of lifetime employment for the organization of the internal labor market.

4. The Economics of Lifetime Employment

The purpose of this section is to discuss some of the costs and benefits of life-time employment, and how these effects can explain some of the features of the Japanese system. Two aspects of life-time employment are considered here: risk sharing and the effect of incomplete contracting. Let us first deal with its most obvious cost from an American perspective, namely the problem of risk and the ability of a firm to survive a downturn.

4.1. Risk Sharing

The major argument in favor of a free and competitive labor market is its

ability to adjust to changes. Many economists dislike trade unions since they tend to bargain for job security, which can adversely affect firm productivity in a downturn. The Japanese approach may not be as efficient when demand for the product of the firm fluctuates. However, the industrial structure of the economy has adjusted to incorporate the constraints placed upon it by life-time employment. For example, there is extensive use of temporary workers and subcontracting to smaller firms. In downturns the firm is able to "layoff" its subcontractors, who in turn will lay off their temporary workers, or simply engage in work sharing. This may appear to be inefficient, but recent work on reputation mechanisms suggests that such arrangements may in fact be more efficient.

In the standard neo-classical view of the labor market, when firms face shocks, they adjust factors of production efficiently, which may, for example, involve laying off an appropriate number of workers. The type of new employment that the laid-off worker finds will depend in part on the verifiable information available to his or her new employer. As we discussed above, the U.S. labor market has dealt with this problem by having well defined job descriptions and associated wages. The difficulty with this is that there exists a great deal of other information about the worker that will not be verifiable, such as the worker's ability to cooperate and get along with fellow employees. Furthermore, work by Satterthwaite (1979) has shown that, in a model with asymmetric information and search costs, increasing the number of agents in the market can in fact lead to a higher price and a less efficient market.¹² What this suggests is that in large labor markets there are reasons to believe that the reputation effect may be imperfect. In the

¹²See Pauly and Satterthwaite (1981) for some empirical evidence supporting this model.

case of Japan, the use of subcontracting can therefore be viewed as an efficient solution to two problems. On one hand, firms wish to be flexible and reward good work. Given that employees face long term contracts, the burden of adjustment must fall upon the subcontracting relationship. This has the effect of decreasing the size of the contracting firm. On the other hand, when there are many agents in a market, information congestion can make it difficult for reputation mechanisms to work. Aggregating workers into contracting firms improves the operation of the reputation mechanism, while at the same time providing job security for the worker with the contracting firm. This does not of course imply income security.

The other major risk sharing mechanism in Japan is profit sharing. If firms cannot layoff workers, and wages are fixed *ex ante*, then this would likely increase the risk of bankruptcy. As Weitzman (1984, 1985) has argued, profit sharing not only spreads risk, but also increases the demand for labor, which is likely to result in lower unemployment in the long run. In fact Weitzman seems to credit much of Japan's post war success on the institution of profit sharing, which he believes could also greatly improve economic performance in the U.S.

Finally, a long term contract means that the firm can insure workers against idiosyncratic risk on the job due to specific training. This is particularly important in Japan where technological change has been very rapid. For example, suppose that upon entry the firm trains the worker to do a specialized task, say typesetting. Ten years later technical change has made these skills obsolete. However, if the worker's income depends only on "performing well" and not on the spot market rate for typesetters, then the

¹³See Allen(1984), Klein and Leffler(1981), and Satterthwaite(1979) for a formal discussion of the role of reputation mechanisms.

worker is more willing to accept retraining and a new job assignment.

In the United States where wages are attached to jobs, this technical change would make a typesetter into an unskilled worker in need of retraining. In a competitive market the typesetter's lifetime income would take a once and for all drop, until it was equal to that of an unskilled worker of the same age.¹⁴ It is therefore not surprising that organized labor in many Western firms often strongly oppose technical change. The life-time contract, by providing income insurance, will lower the cost of introducing efficiency enhancing innovation. In addition, profit sharing, discussed above, will further increase the incentive for workers to accept efficient technical change.

4.2. Incomplete Contracting

By a labor contract we will mean the implicit and explicit conditions that govern the employment relation. This usage differs from the traditional concept of a contract as a binding agreement. As both Bull (1987) and MacLeod and Malcomson (1987) have discussed in some detail, there are important parts of the contract, such as the level of effort, that are difficult to verify by a third party, such as courts of law or labor arbitrators. However, the level of effort supplied by a worker is obviously an important part of the contract. Thus the labor contract is incomplete due to the impossibility of making it conditional on effort in a binding way. Bull (1987) and MacLeod and Malcomson (1987) argue that this incompleteness is solved through the use of self-enforcing contracts. The self-enforcing aspects of the contract will be called the implicit conditions. For example, the implicit conditions may

¹⁴See Carmichael and MacLeod(1988) on this point.

specify the level of effort that a worker agrees to supply for an agreed upon reward schedule, which may involve firing the worker who shirks. In general such a contract is unlikely to be self-enforcing unless there is some additional institutional structure in the firm.

To begin, note that there is a great deal of monitoring of workers in the Japanese firm. This means that the enforcement problem is not of the form that is normally studied in the principal-agent literature.¹⁵ In that model the contracting problem arises due to the difficulty of measuring a worker's effort. In practice (especially in the Japanese firm), however, the major difficulties arise due to the non-contractible aspect of effort. That is, it is very difficult in practice to get an objective measure of a worker's performance. Without an objective measure of performance it is not possible to make income contractually dependent on effort. Instead, a worker must be rewarded based on the recommendations of his or her supervisors or co-workers.

If income is positively correlated with reported performance, the firm will always have an incentive to misrepresent the worker's true performance. This problem could be solved by having the firm agree to pay the worker a specified amount for life, but in that case there will be little incentive for the worker to do more than the minimum required to avoid dismissal. The observed institutions in the Japanese firm solves this double-sided moral-hazard.

The Retirement Decision

The workers and the firm are in essence playing a dynamic game. The best way to understand the equilibrium for such games is to proceed to the last

¹⁵See Hart and Holmstrom(1987) for an excellent survey of the principal-agent problem.

period of a worker's employment. In the period before retirement the firm is unable to use the threat of dismissal to enforce the contract. Therefore if the worker is not going to shirk it must be the case that his or her future utility at retirement be related to his or her final period performance. There are several ways this may be done in an incentive compatible way.

The first is to suppose that the retirement bonus depends on final period effort. The problem, as we have mentioned above, is that the firm will have an incentive not to pay the bonus. Bull (1987) has suggested that if the firm consistently cheats on the bonus payment, it would get a bad reputation. A bad reputation would cause workers to refuse employment with the firm, and therefore make the contract self-enforcing. Along a similar vein, Crémer (1986) has shown in the context of an overlapping generations model it is possible to support an equilibrium in which the cheating firm is punished by younger workers. A problem with both of these schemes is that it requires workers outside and inside the firm to have a very good knowledge of the way retired workers are treated, and whether the treatment was fair or not. In a scheme where the retirement bonus depends on final period efforts, these conditions are unlikely to be satisfied because final period efforts are not easy to verify by other workers. The starting point for our analysis here is the notion that an objective measure of performance is difficult, and therefore there would always exist some incentive for the firm to cheat at the margin.

Japanese firms have adopted a more sophisticated solution. The retirement pay for a worker is in general a fixed function of years of service, the 'life-time' wage profile, and final rank (or final wages). Since a demotion in the last year of service will cause a large fall in the retirement pay, this scheme is an effective incentive device at least until the last

year of service. Incentive problems still remain in the very last year of service, but they are not that serious. The last year is only 1/25 of the total years of service if the worker remains in the same firm for 25 years.

The fact that retirement is rather early in Japan (at around age 55) also alleviates incentive problems in the last period. It is the case that the firm will often help good workers find a new job. Workers that are particularly valued will be able to stay on with the firm on the board of directors.¹⁶ Notice that these actions by the firm can have a rather large effect on a worker's future income, at relatively low cost to the firm. This is certainly the case with the board of directors. The positions already exist, and must be filled. Therefore the firm faces no incentive to misrepresent a worker's performance when considering a board appointment.

The Internal Labor Market

Let us now consider the effect of the incomplete contracting problem on the internal labor market. As we have seen, the problem is to find a contract that will reward workers for good performance in a credible fashion. The work of MacLeod and Malcomson (1987, 1988) has shown that, with incomplete contracts, current income will not be conditional on current performance, as is generally assumed in the principal-agent literature. This means that only future income may depend on current performance.

As in the case of retirement, the firm will always have an incentive to misrepresent the performance of the worker. A Japanese solution to this problem is to negotiate the total wage bill between the firm and the company union. After the total wage bill is determined, the firm has no incentive to

¹⁶See Clark(1979).

misrepresent the performance of the worker, which makes it possible to introduce various incentive schemes such as a promotion ladder, incentive wages, and profit sharing.¹⁷ For example, from the literature on tournaments, notably Green and Stokey (1983), we know that the wage distribution can be structured so that workers produce the optimal amount of effort.

Furthermore, if there is explicit profit sharing for the aggregate wage bill, then this system also provides incentives for individuals to report efficiency enhancing innovations. If the innovation increases profits, then this necessarily implies an increase in income for the worker. In the American system in which wages are attached to jobs, workers have no incentive to promote innovation since all the rents would accrue to the firm, and not to the workers. Even if the firm tried to encourage worker induced productivity improvements, the ratchet effect may nullify these incentives.¹⁸

This approach can also explain why the earnings profile in Japan is steeper than in the United States. Lazear and Moore (1984) find evidence to support the contention that, in long term employment contracts, the wage profile must be more steeply sloped to provide an incentive effect. Furthermore, as Lazear (1979, 1981) has shown, a steep wage profile will decrease a worker's propensity to quit.

Team Incentives

Another widely cited advantage of the Japanese system is its extensive

¹⁷This argument is similar to Malcomson (1984)'s concerning the merit of a promotion ladder. He argued that the moral hazard problem on the side of the firm can be avoided by introducing a promotion ladder. His argument is that the number of promoted jobs is easy to verify so that the firm can commit itself to the number of promotions. See Carmichael(1983a) for a similar argument.

¹⁸See Freixas, Guesnerie and Tirole(1985). Kanemoto and MacLeod (1988) showed that the market for older workers will eliminate the ratchet effect.

use of cooperation and teamwork. Workers are often organized into teams that have the responsibility of distributing work among themselves. Also there will be bonuses that accrue to the team as a whole. The advantage of such a system is that it permits less supervision of certain activities, and a greater decentralization of information flows. However, it has often been suggested that the use of teams may be inefficient due to the incentive that workers have to free ride on the efforts of their co-workers.¹⁹

Holmström (1982) has demonstrated that the existence of a residual claimant can resolve this problem, but as Eswaran and Kotwal (1984) show, this scheme will not in general be incentive compatible. MacLeod (1987, 1986) provide two solutions to this problem, both of which are feasible in the context of the Japanese firm. In MacLeod (1986) it is shown that if there are costs of exit, then there will exist perfect equilibria that support efficient team production. The argument is very simple. If a worker shirks, then co-workers can punish this worker by slacking off as a group. Given that exit is costly, this can effectively discipline prospective cheaters. Extending this type of argument, Kanemoto and MacLeod (1987) showed that efficient team production is possible under the institutional structure observed in typical Japanese firms.

A different argument is used in MacLeod (1987). A simple solution to the problem of efficient team production can be achieved by placing teams in competition with each other. Like the promotion model, this scheme will be incentive compatible from the firm's point of view. Furthermore, as we know from Nalebuff and Stiglitz (1983), if there is a common productivity shock that is unobservable by the firm, a tournament will ensure that the teams

¹⁹See Alchian and Demsetz(1972) and more recently Holmstrom(1982).

efficiently respond to this private information.

5. The West versus The East: Concluding Comments

In this essay we have argued that many of the institutions associated with the Japanese firm can be viewed as part of an equilibrium strategy in an economy characterized by high mobility costs for labor. These high exit costs can explain many of the virtues of the Japanese system, such as a more efficient matching of workers to jobs and diminished costs of supervision due to the dependence on teamwork. Having now explained how many of these institutions are the result of economic forces, one may then ask to what extent the United States may import these institutions.

First, is it feasible for American firms to import the Japanese management style as has been recommended by authors such as Ouchi (1981)?²⁰ Ouchi has recommended that American managers change their corporate culture from one that stresses the individual, to one that places a greater dependence on the group. Before assessing the possibility of carrying out such an exercise, we need to be more precise about what we mean by corporate culture and place it into a context that is more amenable to economic analysis.

Following Kreps (1984), corporate culture can be interpreted as the collection of agreed upon behavior for a firm. As we have already discussed in the previous section, an economic analysis alone is unlikely to identify a unique equilibrium. What a corporate culture can do is to focus on a particular equilibrium and thereby signal to new members of the organization what is appropriate behavior. If this behavior is self-enforcing then the corporate culture will be self-sustaining over time and correspond to

²⁰See Schein(1982) for a discussion of the possibilities for importing the Japanese system from the perspective of corporate culture.

equilibrium behavior.

For Japanese management practices to be successful, it must be the case that the firm's management is moving from one equilibrium to another. In section 3 we argued that for the Japanese system to be an equilibrium it must be the case that exit costs are high and that firms are able to form reputations for maintaining employment. In today's mobile environment, it is not at all clear that such preconditions apply everywhere. Both large and small firms may face problems meeting these conditions. For large firms that have in the past laid employees off during downturns, it would be very expensive for them to build a reputation for long term employment. For new, smaller firms it may be cheaper to build a good reputation from scratch. They face a higher probability of bankruptcy, however, and therefore cannot credibly commit themselves to long-term employment contracts.

Of course there are firms that meet these conditions, yet these are also the firms that are already employing some aspects of Japanese-style labor contracts. Koike (1977), for example, has found in western firms many examples of labor practices that we have characterized as typically Japanese. An implication of our analysis is that, for markets which have large stable firms, there will be greater use of long term labor contracts with many of the characteristics of the Japanese firm. Therefore, those economies with lower labor turnover should also have lower unemployment and steeper wage-tenure profiles.²¹ This certainly is consistent with the evidence comparing the U.S. and Japan, such as Hashimoto and Raisian (1985). Furthermore, this analysis can also explain why Japanese firms seem to be able to introduce the Japanese system into the west, while western firms have great difficulty in changing

²¹Lazear and Moore(1984) provide evidence to support the contention that the steepness of the age-earnings profile provides incentives for greater effort.

the labor contract. A Japanese firm would enter with a strong reputation for good contractual behavior already in place. U.S. firms face the additional cost of investing in a reputation.

Thus, we would conclude that for industries and job occupations for which it is feasible, aspects of the Japanese system are in evidence. If the cost of exit is low, however, the Japanese system is not likely to be feasible, even if it is more efficient. Furthermore, as MacLeod (1987) has shown, if American workers value their right to act independently, then a Japanese system that requires a great deal of coordination and commitment among workers may not be feasible. This would also imply that eliminating unemployment using share contracts, as suggested by Weitzman, may also be difficult. This is not because the share economy does not have the required macroeconomic characteristics, but because it requires a labor market structure that simply may not exist in the us.

Finally, it should be recognized that the Japanese system is largely a post World War II phenomenon, and therefore it has yet to demonstrate its ability to survive in the long run. Not only is there pressure to move to a more competitive labor market that allows for more job mobility, but due to the aging population there has been a move to increase the retirement age from 55. As we have discussed above this could have quite a negative impact on the feasibility of the life-time employment system as it currently exists.

REFERENCES

- Abraham, K. G. and H. S. Farber, (1987), "Job Duration, Seniority, and Earnings," *American Economic Review*, 77, 278-97.
- Alchian, A. A. and H. Demsetz, (1972), "Production, Information Costs, and Economic Organization," *American Economic Review* 62, 777-795.
- Allen, F., (1984), "Reputation and Product Quality", *Rand Journal of Economics* 15, 311-327.
- Altonji, J. C. and R. A. Shakotko, (1987), "Do Wages Rise with Job Seniority," *Review of Economic Studies*, 54, pp. 437-60.
- Aoki, M., (1982), "Equilibrium Growth of the Hierarchical Firm: Shareholder-Employee Cooperative Game Approach," *American Economic Review* 72, 1097-1110.
- Aoki, M., (1984), *The Cooperative Game Theory of the Firm*, Oxford University Press: New York.
- Aoki, M., (1986), "Horizontal vs. Vertical Information Structure of the Firm," *American Economic Review* 76, 971-983.
- Bartel, A. P. and G. J. Borjas, (1981), "Wage Growth and Job Turnover: an Empirical Analysis," in *Studies in Labor Markets*, Ed. by S. Rosen, University of Chicago Press: Chicago.
- Becker, G. S., (1962), "Investment in Human Capital: A Theoretical Analysis," *Journal of Political Economy* 70, Suppl., 9-49.
- Becker, G. S., (1975), *Human Capital: a Theoretical and Empirical Appraisal, with Special Reference to Education*, New York, NBER.
- Bull, C., (1987), "The Existence of Self-Enforcing Implicit Contracts," *Quarterly Journal of Economics* 102, 147-159.
- Carmichael, L., (1983), "Firm-Specific Human Capital and Promotion Ladders,"

- Bell Journal of Economics* 14, 251-258.
- Carmichael, L., (1983), "The Agent-Agent's Problem: Payment by Relative Performance," *Journal of Labor Economics*, 1.
- Carmichael, L., (1987), "Efficiency Wage Models of Unemployment: A Survey," *Economic Inquiry*, forthcoming.
- Carmichael, L. and W. B. MacLeod, (1988), "Commitment, Flexibility and Technical Change," mimeo.
- Clark, R., (1979), *The Japanese Company*, Yale University Press: New Haven.
- Cole, R. E., (1971), *Japanese Blue Collar*, University of California Press: Berkeley.
- Cole, R. E., (1979), *Work, Mobility, and Participation*, University of California Press: Berkeley.
- Crémer, J., (1986), "Cooperation in On-Going Organizations," *Quarterly Journal of Economics* 101, 33-49.
- d'Aspremont, C. and L. -A. Gerard-Varet, (1979), "Incentives and Incomplete Information," *Journal of Public Economics* 11, 25-45.
- Doeringer, P. B. and M. J. Piori, (1971), *Internal Labor Markets and Manpower Analysis*, Lexington, Mass., D. C. Heath.
- Dore, R., (1973), *British Factory-Japanese Factory*, George Allen and Unwin: London.
- Eswaran, M. and A. Kotwal, (1984), "The Moral Hazard of Budget-Breaking," *Rand Journal of Economics* 15, 578-581.
- Freeman, R. B. and J. L. Medoff, (1984), *What do unions do?*, New York, Basic Books.
- Freeman, S., (1977), "Wage Trends as Performance Displays Productivity: A Model and Application to Academic Early Retirement," *The Bell Journal of Economics* 8, 419-443.

- Freixas, X., R. Guesnerie, and J. Tirole, (1985), "Planning under Incomplete Information and the Ratchet Effect," *Review of Economic Studies* 52, 173-191.
- Hall, R. E., (1982), "The Importance of Lifetime Jobs in the U. S. Economy," *American Economic Review* 72, 716-724.
- Hart, O. D., (1983), "Optimal Labour Contracts Under Asymmetric Information: An Introduction," *Review of Economic Studies* 50, 3-35.
- Hart, O. D. and B. Holmström, (1985), "The Theory of Contracts," in *Advances in Economic Theory*, Ed. by T. Bewley, Cambridge University Press: Cambridge.
- Hashimoto, M., (1979), "Bonus Payments, On-the-Job Training and Lifetime Employment in Japan," *Journal of Political Economy* 87, 1086-1104.
- Hashimoto, M. and J. Raisian, (1985), "Employment Tenure and Earnings Profiles in Japan and the us," *American Economic Review* 75, 721-735.
- Hirschman, A. O., (1970), *Exit, Voice and Loyalty*, Harvard University Press: Cambridge.
- Holmström, B., (1982), "Moral Hazard in Teams," *Bell Journal of Economics* 13, 324-340.
- Ishikawa, T., (1986), "On the Sources of Wage Flexibility in the Japanese Labor Market," mimeo.
- Kanemoto, Y. and W. B. MacLeod, (1987), "Long-Term Labor Contracts with Team Production: Towards a Theory of the Japanese Firm," mimeo.
- Kanemoto, Y. and W. B. MacLeod, (1988), "The Ratchet Effect, the Market for Senior Workers, and Intertemporal Commitment," mimeo.
- Klein, B. and K. B. Leffler, (1981), "The Role of Market Forces in Assuring Contractual Performance," *Journal of Political Economy* 89, 615-641.
- Koike, K., (1977), *Shokuba no Rodo Kumiai to Sanka (Trade Union and*

- Participation on the Shop Floor*], Tokyo Keizai Shinpo Sha: Tokyo.
- Koike, K., (1984), "Skill Formation Systems in the U.S. and Japan: A Comparative Study," in *The Economic Analysis of the Japanese Firm*, Ed. by M. Aoki, North-Holland: Amsterdam.
- Lawler III, E. E., (1982), "The Strategic Design of Reward Systems," in *Strategic Human Resources*, edited by Fombrun, Tichy, and Devanna, Wiley and sons: New York.
- Lazear, E. P., (1979), "Why is There Mandatory Retirement," *Journal of Political Economy* 87, 1261-1284.
- Lazear, E. P., (1981), "Agency, Earnings Profiles, Productivity, and Hours Restriction," *American Economic Review* 71, 606-620.
- Lazear, E. P. and R. L. Moore, (1984), "Incentives, Productivity, and Labor Contracts," *Quarterly Journal of Economics* 99, 275-95.
- MacLeod, W. B., (1986), "Equity, Efficiency and Incentives in Cooperative Teams," *Advances in the Economic Analysis of Participatory and Labor Managed Firms*, forthcoming.
- MacLeod, W. B., (1987), "Behaviour and the Organization of the Firm," *Journal of Comparative Economics* 11, 207-220.
- MacLeod, W. B. and J. M. Malcomson, (1987), "Implicit Contracts, Incentive Compatibility, and Involuntary Unemployment," forthcoming in *Econometrica*.
- MacLeod, W. B. and J. M. Malcomson, (1988), "Reputation and Hierarchy in Dynamic Models of Employment," forthcoming in the *Journal of Political Economy*.
- Malcomson, J. M., (1981), "Unemployment and the Efficiency Wage Hypothesis," *Economic Journal* 91, 848-866.
- Malcomson, J. M., (1984), "Work Incentives, Hierarchy, and Internal Labor

- Markets," *Journal of Political Economy* 92, 486-507.
- Malcomson, J. M., (1986), "Rank-Order Contracts for a Principal with Many Agents," *Review of Economic Studies* 53, 807-817.
- Medoff, J. L. and K. G. Abraham, (1980), "Experience, Performance and Earnings," *Quarterly Journal of Economics* 95, 703-706.
- Mincer, J., (1974), *Schooling, Experience and Earnings*, National Bureau of Economic Research: New York.
- Mincer, J. and Y. Higuchi, (1987), "Wage Structures and Labor Turnover in the U.S. and Japan," NBER Discussion Paper No. 2306.
- Mincer, J. and B. Jovanovic, (1981), "Labor Mobility and Wages," in *Studies in Labor Markets*, Ed. by S. Rosen, University of Chicago Press: Chicago.
- Nalebuff, B. and J. E. Stiglitz, (1983), "Prizes and Incentives: Towards a General Theory of Compensation and Competition," *Bell Journal of Economics* 13, 21-43.
- Okuno, M., (1984), "Corporate Loyalty and Bonus Payments: An Analysis of Work Incentives in Japan," in *The Economic Analysis of the Japanese Firm*, Ed. by M. Aoki, North-Holland: Amsterdam.
- Okuno, M., (1987), "Monitoring Cost, Agency Relationship, and Equilibrium Modes of Labor Contract," *Journal of the Japanese and International Economies* 1, 147-167.
- Ouchi, W. G., (1981), *Theory Z : How American business can meet the Japanese challenge*, Addison-Wesley: Reading, Mass.
- Parsons, D. O., (1986), "The Employment Relationship: Job Attachment, Work Effort, and the Nature of Contracts," in *Handbook of Labor Economics*, Ed. by O. Ashenfelter and R. Layard, North-Holland: Amsterdam.
- Pauly, M. and M. Satterthwaite, (1981), "The Pricing of Primary Care Physicians Services," *The Bell Journal of Economics*, 12, 559-569.

- Salop, J. and S. Salop, (1976), "Self-Selection and Turnover in the Labor Market," *Quarterly Journal of Economics* 90, 619-627.
- Satterthwaite, M., (1979), "Consumer price, equilibrium industry price and the number of sellers," *Bell Journal Economics* 10, 483-503.
- Schein, E. H., (1982), "Does American Management Style Have a Message for American Managers?," *Sloan Management Review* 23, 55-68.
- Schonberger, R. J., (1982), *Japanese Manufacturing Techniques*, The Free Press: New York.
- Shapiro, C., (1982), "Consumer information, Product quality, and Seller reputation," *Bell Journal of Economics* 13, 20-35.
- Taira, K., (1970), *Economic Development and the Labor Market in Japan*, Columbia University Press: New York.
- Taubman, P. and M. L. Wachter, (1986), "Segmented Labor Markets," in *Handbook of Labor Economics*, Ed. by O. Ashenfelter and R. Layard, North-Holland: Amsterdam.
- Tocqueville, Alexis de, (1968), *Democracy in America*, Fontana: London.
- Topel, R. H., (1985), "Job Mobility, Search and Earnings Growth: A Reinterpretation of Human Capital Earnings Functions," mimeo. UCLA.
- Weitzman, M. L., (1984), *The Share Economy*, Harvard University Press: Cambridge.
- Weitzman, M. L., (1985), "The Simple Macroeconomics of Profit Sharing," *American Economic Review* 75, 937-953.
- Williamson, O. E., M. L. Wachter and J. E. Harris, (1975), "Understanding the Employment Relationship: the Analysis of Idiosyncratic Exchange," *Bell Journal of Economics* 6, 250-278.