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THE THEORY OF CONTRACTS AND LABOR PRACTICES IN JAPAN AND THE UNITED STATES

by

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ABSTRACT

Labor management practices in Japan are quite different from those in the United States. We begin with the assumption that markets are incomplete, and use recent developments in contract theory to develop a conceptual framework to understand why the differences have been maintained. 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 for 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 that result in 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 that maximize profits. Therefore, if the Japanese system is more efficient, one should observe its adoption by American firms as rapidly as existing institutions allow. 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 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 discuss how these practices can be understood by using economic principles alone.[1]

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[1]See Aoki (1982, 1984, 1988), Ishikawa (1986), Okuno (1984, 1987), Okuno–Fujiwara (1989), and Kanemoto and MacLeod (1987, 1889) for examples of the economic approach to the Japanese firm.

The basic argument is that the American and Japanese systems are examples of two different responses to the problem of obtaining high quality labor. As MacCauley (1963) has observed for the United States, many long term relationships involve conditions and expectations for which there is no explicit contract. This is even more so in Japan where the number of lawyers per capital is almost fifteen times smaller.[2] Even when there is no explicit contract, there still must be some mechanism for the enforcement of the contract. As Klein and Leffler (1981) have argued, the market will create institutions, such as reputations, that will help enforce the contract. The starting point for our analysis will be the recent literature on the theory of incomplete labor contracts.

One of the characteristics of incomplete market models is for a given set of fundamental conditions, there is no unique solution to the problem of contract enforcement.[3] The purpose of this paper is to suggest that one can interpret the differences between the paradigm Japanese and American labor practices as two different equilibrium responses to the problem of contract enforcement. 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 (1970), is that there is in America a greater tendency for the use of "exit" than for use of "voice" than in Japan.[4] 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

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[2]Gould (1984), p. xv.

[3]This is shown in MacLeod and Malcomson (1989). Also see the survey by Carmichael (1989).

[4]Hirschman (1970) p. 81.

of communication.

Hirschman argues that Japan's type of market equilibrium has its origins in the smaller size of its community and rigid boundaries. 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, work force. In the case of the modern manufacturing firm this implies that workers should enjoy the benefits of lifetime employment.

The United States, in contrast, has an expanding, geographically diverse economy and consequently needs a mobile work force. As Tocqueville (1968) documented in his classic work *Democracy in America*, American culture has long valued the right of an individual to leave a situation which he or she feels is undesirable.[5] 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 a significantly different in the two countries. Secondly, we discuss some of the recent work in contract theory that is able to formalize the distinction between voice and exit equilibria. 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.

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[5]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".

2. Some Stylized Facts

In this section, we summarize major institutional features of Japanese labor management practices and contrast some of them with those found in the United States. Since there are many books and articles which present these facts in detail, our discussion here will be brief, concentrating mostly on the issue of life–time employment and compensation.[6]

A worker in a large Japanese corporation has a virtual guarantee of 'life–time' tenure as part of the *nenko* system, and will not be laid off except in extreme circumstances. There will be layoffs only in those cases where things are so bad that work sharing or transfers to other sections or related companies (e.g.,subcontractors and automobile dealers in the case of automobile manufacturers) does not work. It is also 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.

Life–time employment as an accepted institution is mainly a post world war II phenomenon, which became established as Japan adapted its labour law based on the American model.[7] As Gould (1984) has pointed out, even though firms are legally required to provide 30 days' notice of dismissal, in practice the courts also require just cause, which includes demonstrating that there exists no viable alternative to a layoff. Evidence presented in Mincer and Higuchi (1988) also

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[6]See for example Clark (1979), Cole (1971, 1979), Dore (1973, 1987), Koike (1984) and Aoki (1988).

[7]See Gould (1984), Ch. 2 and pp. 106–116.

suggests that turnover rates in Japan are lower in the post world war II period than during the inter–war period.[8] These observations would suggest that economic and legal environment of the post war period had a large impact on the employment system that is presently considered distinctively Japanese.

It should also be noted that 'life–time' tenure means employment 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 or she retires from the firm. Usually the only job that he or she can obtain is a low–paid one in a smaller company, though in many cases firms make an effort to arrange jobs for retired workers, or keep on particularly valued workers for more senior administrative positions. At retirement 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 the length exceeds 25 years. In addition to retirement allowances, many firms have pensions for their employees. Pension terms are more attractive for workers who have stayed in the same firm until retirement.

A second important difference between the Japanese and American 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.[9]

In Japanese firms, job descriptions are quite vague. An individual worker performs many different jobs and helps other workers who are facing difficulties; an

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[8]See Mincer and Higuchi (1988), figure 1.

[9]See Doeringer and Piore (1972).

older, skilled worker is supposed to help and train young, unskilled workers. 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). It is common for workers to be skilled at several jobs, and will often be reallocated to different jobs in different parts of the plant.

In typical American firms, the management and engineers 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 this sort of decentralization creates serious incentive problems.

There is extensive and intensive 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, Japanese firms provide a great deal of training in general as well as the specific skills.

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, and will be more susceptible to changes in demand for their skills.[10]

In a Japanese firm a worker obtains higher wages when he or she becomes more senior. 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 seniority of a worker. In the

[10]See Carmichael and MacLeod(1988) for a model of this effect.

U.S. wage growth is associated with movement up a job ladder. That is, senior workers will have access to more preferred, higher paying jobs.

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, but the management retains a certain degree of discretionary power over how wage gains will be allocated among individual workers. By way of contrast unions in the United States tend to be organized by type of skill or industry, bargaining with several different firms.[11]

The 'bonus' in the Japanese firm is normally paid twice a year. The size of the bonus is negotiated between the management and the union, though it is normally related to 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.

These different approaches to remuneration seem to have different implications for life–cycle earnings in the two countries. Recent work 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. More recent work by Brown (1989) finds further support for the hypothesis that wages are not determined by seniority, but by productivity growth.

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[11]Freeman and Rebick (1989), however, find that, like the United States, unions are in decline in Japan, with union density falling from 35% to 28% in the period 1975 to 1987.

In Japan the work of Hashimoto and Raisian (1985) and Mincer and Higuchi (1988) find that the wage–tenure profile is steeper in Japan than in the United states. In the next section we discuss the conventional explanation for this effect based on human capital theory.

3. Human Capital Theory and Life–Cycle Earnings

The conventional approach to understanding life–cycle earnings and performance is base human capital theory developed in the important work of Becker (1962, 1975) and Mincer (1958, 1962).[12] In this theory the earnings of a worker are explained by the worker's productivity. Thus life–cycle increases in income are a consequence of the acquisition of human capital from schooling and on the job training, which increase the value of the worker output.

Mincer and Higuchi (1988) 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 that wage–tenure profiles should be steeper in Japan than in the United States. A second implication of this increased level of human capital accumulation is a higher level of attachment to the firm. Thus it would seem that high levels of human capital accumulation can explain some of the more important distinctive features of the Japanese system.

The fact that wage tenure profile is steeper, and that one also has a higher level of human capital accumulation, does not explain why it has occurred. All countries are free to compete in world markets as they wish, yet the Japanese performance has been characterized by high growth rates relative to most other

[12]See also the survey by Willis (1986).

market based economies. Furthermore, if high wages for senior workers is explained by a higher level of human capital, then why do we observe earlier retirement in Japan.[13] Greater firm specific human capital should imply that the firm should renegotiate the wage contract, and keep the worker until a later retirement date. The observed early retirement is particularly surprising given the longer life expectancies in Japan compared to most other countries.

We would suggest that another explanation is possible. If the labor market institutions themselves generate a more productive worker, then *ceteris paribus* the marginal productivity of training should be higher, and therefore the level of human capital accumulation would be greater. Such an approach would also be consistent with the facts as observed by Mincer and Higuchi (1988). In the next section we discuss how this approach might also help explain cross–country differences in productivity growth.

4. Agency Theory, Incomplete Contracts and Labor Market Equilibrium

Human capital theory explains the wages of workers based on their characteristics. Agency theory, beginning with the important work of Alchian and Demsetz (1972), Ross (1972), and more recently Lazear (1979, 1981), reverses the causation. These models begin with the assumption that monitoring the output of workers is costly, and therefore firms are not certain to catch workers that shirk. In Lazear's (1979, 1981) model workers are offered a rising wage profile which is equivalent to a loan to the firm that is not fully paid back until retirement. The rising wage profile therefore forms a bond, which a worker forfeits if fired due to shirking Firing the worker results in the worker losing the future returns on the loan to the firm. Lazear (1979) shows that this rising wage profile can lower the

[13]This point was first made by Hashimoto and Raisin (1985).

cost of monitoring workers. An implication of the rising wage profile is that workers will be receiving more than their alternative later in life, therefore workers after a certain date would never voluntarily leave the firm. Mandatory retirement occurs on the date at which the lifetime productivity of the worker is equal to lifetime earnings.

There are however several conceptual and practical problems with this theory. First, what stops the firm from firing a worker late in life when the worker's marginal product is greater than wage? Since the right to fire the worker is essential to ensure no shirking, a conflict exists between self–interested behavior on the part of the worker and ex post profit maximization by the firm. Second, these models depend on the assumption of costly monitoring. Mincer and Higuchi (1988) point out that this does not seem to be a reasonable assumption for Japanese firms. Workers in these firms are in fact closely supervised both by managers and fellow workers in their team.

The recent literature on self–enforcing contracts provides an alternative to the costly monitoring story that can deal with these difficulties. Hart and Moore (1988) begin with the observation that many relationships face the following form of market incompleteness. Consider a situation in which a farmer hires a worker for one day of wage of $10. Further suppose that the farm is in a remote location. If the farmer pays the worker $10 at the beginning of the day, the worker may work for the morning and simply leave. How is the farmer to prove that the required work was not carried out? Similarly, suppose instead payment occurs at the end of the day. At that time the farmer may decide to pay the worker only $5. Since the original contract was informal, then the worker must simply accept this payment and leave. The problem in these examples arise from the fact that even if there exists recourse to the courts, there may be no way for the courts to verify the facts of the case.

This example may seem special, but many employment contracts involve the worker performing in ways that are very difficult for a court to observe. These might include providing courteous service to clients, or achieving academic excellence. These are situations in which the workers and the supervisors both understand the level of performance of the worker, but providing objective information to a court is simply impossible. Call this non–contractible output by the worker "extra effort". We shall show that one interpretation of life–time employment and seniority wages is a self–enforcing contract which ensures that workers produce extra effort and that firms reward them appropriately for this effort.

To illustrate the different approaches to contract enforcement, consider the following simple scenario in which a firm employs a worker for several periods. Let the discount rate be δ, and suppose that the per period utility of the worker is given by:

$$u(w,e) = \begin{cases} w & \text{if } e = \underline{e} \\ w - v & \text{if } e = \bar{e}, \end{cases}$$

where we assume that effort can take on two values only, namely $\underline{e} < \bar{e}$. The low effort level corresponds to the minimum effort that the firm can expect from the worker without the use of special incentive mechanisms. The high level of effort corresponds to "extra effort". Since this extra effort costs the worker v per period, the firm must design an incentive mechanism to guarantee worker performance.

The kinds of behavior that correspond to extra effort include being careful to assemble goods on the assembly line, suggesting improvements to the production process, or helping new workers learn better technique. All these types of behavior are characteristic of the better run Japanese plants. Although this type of effort is easily observable by the supervisors, it is very difficult, if not impossible, to obtain an objective measure of this "extra effort".

Suppose that the worker's alternative utility on the market each period is U^*. At a competitive equilibrium the worker is paid only his or her alternative utility. Furthermore because extra effort is non–contractible, as MacLeod and Malcomson (1989) show, current wage cannot depend on current effort. Letting w denote the current wage, then the utility of the worker who produces extra effort is given by:

$$\overline{U} = w - v + \delta U^*. \tag{1}$$

Since the wage is independent of effort and the labor market is perfectly competitive, producing no extra effort results in a utility,

$$\underline{U} = w + \delta U^*. \tag{2}$$

In this case $\underline{U} > \overline{U}$, and therefore the worker will never produce extra effort. Therefore if the labor market is perfectly competitive, and extra effort is not contractible, then in equilibrium workers will never produce extra effort. To induce extra effort with incomplete contacting, a necessary condition is that future utility depends on current performance. If U^* represents the future utility of the worker when extra effort is produced, and U^O is the future utility when it is not, then from equations (1) and (2) the worker will produce extra effort if and only if the following inequality holds:

$$U^* - U^O \geq v/\delta. \tag{3}$$

If the worker does not produce extra effort, the firm must carry out an action to lower the worker's utility in the future. One can divide the institutions used for contract enforcement into two categories. The first are those that use the threat of separation as an incentive device (following Hirschman (1970) we shall call this an exit based system). The second class consists of mechanisms that depend on firm based reward systems such as promotions and bonuses (or a voice based system). In practice firms use a combination of the two types of reward systems. The point we wish to make here is that a firm's choice of reward system depends on labour

market conventions.

Exit Based Incentive Mechanisms

An exit based incentive mechanism enforces implicit contracts with workers via the threat to terminate employment for any worker that does not produce extra effort. The theoretic foundations for this enforcement mechanism goes back to Adam Smith's idea that a higher wage will encourage industry.[14] As we can see from equation (3), if U^0 represents the utility available in the labor market, then the utility on the job, U^*, must be strictly greater. This higher utility can be achieved by paying the worker a wage above the market clearing wage, for which Leibenstein (1957) has coined the term efficiency wage. Under the assumption that the worker is long lived, the efficiency wage is given by the formula:

$$U^* = (w - v)/\delta = U^0 + v/\delta. \tag{4}$$

There are however some conceptual problems with viewing this outcome as an equilibrium. If we suppose that there is a large number of firms willing to enter the market, and if there is a fixed supply of identical workers, this should imply full employment. Given that all workers are the same, an unemployed worker should be able to find another identical job immediately. In this case we would have $U^* = U^0$, and the efficiency wage cannot be an equilibrium.

A market based solution to this problem has been suggested by Shapiro and Stiglitz (1984). In their model they suppose that the worker must go through a period of unemployment before finding a new job. Carmichael (1985) convincingly argues that if all workers are the same then either there is no unemployment, or workers must pay a bond to obtain a job. In the latter case firms would have an incentive to continue firing workers, and hiring new workers to collect the bond.

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[14]On p. 91 of Smith (1776, 1976) we have "Where wages are high, accordingly, we shall always find the workmen more active, dilligent, and expedious, than where they are low,".

MacLeod and Malcomson (1989), and more recently MacLeod and Malcomson (1990) provide a solution to this problem. They show that an equilibrium does indeed exist in the incomplete contract model that can include the Shapiro and Stiglitz (1984) equilibrium and the bonding solution of Carmichael (1985) as special cases. However, for an equilibrium to exist we must extend the conventional competitive equilibria to incorporate equilibrium beliefs as well as actions.

To see this let w* denote the efficiency wage. At this wage the number of firms entering the market will be less than the number of workers seeking jobs, and therefore unemployed workers will have strictly lower utility than employed workers. In fact the efficiency wage will be set so that the level of unemployment will ensure that condition (4) is satisfied, where U^0 denotes the utility of a worker entering the unemployment pool. The question is why new firms do not enter the market at a lower wage to decrease the level of unemployment.

This will not occur if both firms and workers hold the following mutually consistent beliefs. The firms believe that, should they offer a lower wage, the worker will shirk, and therefore they will lose money. Furthermore if the firm charges a bond (to eliminate the involuntary nature of unemployment), it will fire the worker and hire another worker in the following period. The worker believes that the firm will follow the strategy we have just described, and therefore their optimal strategy is to shirk if employed at a wage less than the efficiency wage. Notice that in this scenario the agents hold mutually consistent beliefs that ensures that charging less than an efficiency wage is unprofitable.

With these beliefs the efficiency wage equilibrium exists because both workers and firms believe that behaving otherwise is not optimal. The basic message is that beliefs must be generated that introduce a cost to cheating. Other ways that this cost may be generated is via a dual labor market structure. In this

case we have two sectors, a high paying skilled sector that requires extra effort, and a low paying sector that does not require extra effort. The beliefs supporting the equilibrium involve fired workers holding the reputation that they are not suitable for employment in the primary sector. The wage differential is supported as described in the previous paragraph. In a dual labor market equilibrium there is no unemployment, but the market is still inefficient. The high wages in the primary sector mean that the primary sector employs too few workers.

An important feature of all these dual labor market models is that they produce equilibrium turnover of workers. Firms respond to productivity shocks by laying off workers. The efficiency wage is set at the lowest level consistent with contract enforcement. This means that though laid off workers are worst off, they are likely to find another similar job eventually. This effect is demonstrated clearly in a version of the incomplete markets model with workers of differing ability.

This case has been studied in MacLeod and Malcomson (1988). In this model the firm is organized in a hierarchy of jobs. These jobs have publicly observable descriptions and are ranked according to the level of skill required. In this model contract enforcement occurs via reputation effects. A worker fired from a high skill job is assumed to have been promoted above his or her level of competence, and must move into a lower paying job. In equilibrium only the workers of the lowest skill levels are unemployed. The hierarchy is constructed to be as fine as possible and still maintain incentives. Therefore any given worker losing a job is not likely to go to the bottom of the labor market, but will find a similar, though inferior, job.

One of the attractive features of this model is that it generates predictions that correspond to many of the stylized facts in the US labor market.[15] Here wages are attached to jobs, not to workers. Over their careers workers increase their

[15]See Parsons (1986) for a discussion of the stylized facts.

income by moving to better paying jobs, though at each point in time their wages reflect their current productivities. Finally, 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.

Voice Based Incentive Mechanisms

In Japan, as we point out in section 2, firms have been constrained not to use exit as an enforcement mechanism. The Japanese labour law has developed in a way that makes it difficult for the firm to fire regular employees. Therefore the success of the Japanese firm must lie on the introduction of self–enforcing mechanisms that do not depend on market enforcement. The problem faced by the firm is similar to the problem of obtaining effort in a labour cooperative. For example, consider a firm consisting of three individuals, the manager/owner and two workers. Suppose the revenue of the firm is given by $R = F(e_1, e_2)$, where e_i represents the level of extra effort by worker i, and $F(\cdot,\cdot)$ is a concave revenue function that is increasing in both arguments.

If R were a contractible variable then it is easy to construct a contract that will result in workers producing extra effort. Let R* denote the level of revenue if both worker produce at the optimum. Then the firm could pay each worker a wage $\overline{w} = R^*/2$ if this level is achieved, or a lower wage $\underline{w} < \overline{w}$ if not. Holmström (1982) has shown that for appropriately chosen wages there exists an equilibrium at which both workers choose the efficient level of effort.[16] However, as Eswaran and Kotwal (1984) point out, the manager has an incentive to report that the target R* has not been reached to earn the firm a profit $2(\overline{w} - \underline{w})$. In practice the output R of a team of workers is also likely to be difficult to verify. Therefore at the margin one would

[16]However MacLeod (1987) has shown that if workers behave "independently" (defined precisely in this paper) then this mechanism will not work.

expect the firm to cheat upon its contract with the workers by reporting that they have worked less than their true output.

There is however a simple solution to this problem that has been suggested by a number of authors. Carmichael (1983), Malcomson (1984) and Bhattacharya (1986) point out that a self enforcing contract is possible in this case by setting up a tournament. In the context of the Japanese firm this will take the form of a ranking hierarchy through which the firm promotes workers. The workers can be induced to perform well by having to compete to move to higher ranks. This institution is self–enforcing because the total wage bill is fixed *ex ante*, with only the distribution of the wages determined *ex post* depending on the performance of the individual workers. In the example above one fixes the total wage, W, and selects two wages $\overline{w} > \underline{w}$, such that $\overline{w} + \underline{w} = W$. The worker with the higher observed effort will be paid $\overline{w}$, and the other worker will be paid $\underline{w}$ (with random assignment if they both perform at the same level). In this case the total expenditure on wages is agreed upon *ex ante*, and therefore the firm does not have an incentive to misrepresent the performance of workers.

Japanese firms implement a tournament scheme using a ranking hierarchy.[17] Every worker in the firm is assigned a well defined rank and grade. Their income rises as they move up the ranks in the firm, with both seniority and performance used as a criterion for promotion. The rank of a worker will be independent of their current job. In contrast to the wages–attached–to–job system in the U.S., this gives the Japanese firm greater flexibility in job assignment because a worker's reward is based only on performance and not the particular job that he or she is currently assigned.

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[17]See Aoki (1988), Chapter 3 for a good discussion to the ranking hierarchy as an incentive mechanism. A formal model of a tournament scheme with fluctuating demand is analyzed in Kanemoto and MacLeod (1989).

Retirement pay is also an integral part of this system. In the period before retirement the firm is unable to use the threat of dismissal to enforce the contract. But, retirement pay for a worker is in general a fixed function of years of service and final rank (or final wages). Since lack of promotion in the last year of service will affect 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 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.[18] 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.

Together, the potential for a rising wage over one's lifetime, and early retirement with a bonus linked to final rank provide an incentive for the worker to produce extra effort. All workers expect to see a certain fraction of workers promoted regularly. If this did not occur, then the workers would perceive that the firm is cheating on its implicit contract and are unlikely to provide extra effort. Thus the ranking hierarchy, combined with a retirement payment conditional on final rank is a self–enforcing contract between the firm and workers to promote extra effort and flexible job assignment.

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[18]See Clark(1979).

Another widely cited advantage of the Japanese system is its extensive 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]

Again the ranking hierarchy can encourage team work. As long as supervisors stress the importance of cooperative behavior for promotion, this type of behavior is reinforced. Notice that this does not occur in exit based systems. If the income of workers is based on market based criteria, such as schooling, the current job held and skills, then they have little incentive to share their skills and time with coworkers. Difficulty of finding an objective measure of cooperation makes it unlikely for the market to develop a reputation signal for a worker's "cooperative skills". Since the ranking hierarchy in Japanese firms can reward this type of behavior, while exit based systems cannot, it is not surprising that the level of cooperative behavior in teams is higher in Japan than in the United States.

Finally, it might be argued that Japan uses a dual market system as in the United States. This is because not all workers enjoy regular positions at large firms. Many workers are hired on a temporary basis, and workers at small firms tend to get lower wages and less secure jobs. In addition workers leaving a job is likely to move to a lower paying job subsequently. One way of viewing this structure is simply as an extension of the ranking hierarchy. A worker's ability to get a good job will depend on school performance. Those individuals going to better schools,

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

and having better performance will have access to the better jobs. The competition in the school system in Japan is intense. Therefore it would seem that the dual labor market structure has more impact as an incentive mechanism that encourages "extra effort" *ex ante*. The dual labor market structure in the American efficiency wage literature is an *ex post* incentive mechanism, which uses the threat of dismissal to a secondary labor market job as an incentive mechanism.

In summary, the distinguishing difference between the two types of labour markets is the role that dismissal plays in market enforcement. In the U.S. turnover is normal. Institutions that enforce contracts given the right for firms to lay workers off include equilibrium unemployment and reputation effects generated by having workers assigned to jobs with clearly defined characteristics. In contrast turnover is lower in Japan. This has two consequences. The first is that the cost of leaving a firm is likely to be much higher due to its very adverse reputation effect. Second, because the average worker is not laid off, the work environment must be designed to encourage "extra effort". This can be achieved through the use of a ranking hierarchy inside the firm, with retirement benefits linked to one's final position in this hierarchy. Not only does this provide incentives to perform well, it also gives the firm greater flexibility in task assignment.

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 within the firm and diminished costs of supervision due to the dependence on teamwork. Long term attachment also implies that mobility costs are higher. Therefore a major virtue of the American system is the extra flexibility

that firms are able to enjoy with respect to their employment practices. In industries with fluctuating demand and low levels of firm specific human capital, this type of labor market is likely to be efficient.

The major theoretical point we have made in this essay is that recent contract theory stresses the importance of expectations in the choice of employment contract. In the U.S. higher mobility implies that there is a lower, though significant, cost due to layoffs. This will imply less worker/firm attachment and therefore lower investment in relation specific human capital. In the early development of manufacturing, flexibility might have been more important than skills, which would have led to the types of labor market institutions we observe in the U.S. today. However, the advent of flexible manufacturing techniques in the post World War II period has placed a premium on a high quality work force. The lifetime employment system combined with a ranking hierarchy has served to encourage skill acquisition on the part of workers, and to maintain a high level of effort.

An important question is the feasibility of importing this system by American firms 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. Since there are many contracts that are self–enforcing, economic analysis alone is unlikely to identify a unique

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

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 equilibrium behavior.

For Japanese management practices to be successful, it must be the case that the firm's management agrees to move from one equilibrium to another. In section 4 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).

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

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 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 reputation.

Thus, we would conclude that for industries and job occupations for which it is feasible, aspects of the Japanese system are in evidence.[22] 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 U.S.

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.

[22]Examples would be white collar workers in large U.S. corporations such as GM and IBM.

REFERENCES

K. G. Abraham and H. S. Farber. (1987) Job duration, seniority, and earnings. *American Economic Review*, 77, 278–97.

A. A. Alchian and H. Demsetz. (1972) Production, information costs, and economic organization. *American Economic Review*, 62, 777–795.

J. C. Altonji and R. A. Shakotko. (1987) Do wages rise with job seniority. *Review of Economic Studies*, 54, pp. 437–60.

M. Aoki. (1982) Equilibrium growth of the hierarchical firm: shareholder–employee cooperative game approach. *American Economic Review*, 72, 1097–1110.

M. Aoki. (1986) Horizontal vs. vertical information structure of the firm. *American Economic Review*, 76, 971–983.

M. Aoki. (1988) *Information, Incentives, and Bargaining in the Japanese Economy*, Cambridge University Press: New York.

G. S. Becker. (1962) Investment in human capital: a theoretical analysis. *Journal of Political Economy*, 70, Suppl., 9–49.

G. S. Becker. (1975) *Human Capital: a Theoretical and empirical Appraisal, with Special Reference to Education*, New York, NBER.

S. Bhattacharya. (1986) Tournaments, termination schemes, and forcing contracts. Bell Comunications Working Paper.

J. N. Brown. (1989) Why do wages increase with tenure. *American Economic Review*, 79, 971–991.

L. Carmichael. (1983) Firm–specific human capital and promotion ladders. *Bell Journal of Economics*, 14, 251–258.

L. Carmichael. (1985) Can efficiency wage unemployment be involuntary. *American Economic Review*, 75, 1213–14.

L. Carmichael. (1989) Self–enforcing contracts, shirking, and life cycle incentives. *Journal of Economic Perspectives*, 3, 65–83.

L. Carmichael and W. B. MacLeod. (1989) Multiskilling and technical change in the Japanese firm. mimeo. Queen's University.

R. Clark. (1979) *The Japanese Company*, Yale University Press: New Haven.

R. E. Cole. (1971) *Japanese Blue Collar*, University of California Press: Berkeley.

R. E. Cole. (1979) *Work, Mobility, and Participation*, University of California Press: Berkeley.

P. B. Doeringer and M. J. Piori. (1971) *Internal Labor Markets and Manpower Analysis*, Lexington, Mass.: D. C. Heath.

R. Dore. (1973) *British Factory–Japanese Factory*, George Allen and Unwin: London.

R. Dore. (1987) *Taking Japan Seriously*, Stanford University Press, Stanford, Cal.

M. Eswaran and A. Kotwal. (1984) The moral hazard of budget–breaking. *Rand Journal of Economics* 15, 578–581.

R. B. Freeman and M. E. Reibick. (1989) Crumbling pillar? declining union density in Japan. *Journal of the Japanese and International Economies*, 3, 578–605.

W. Gould. (1984) *Japan's Reshaping of American Labor Law*, MIT press: Cambridge, MA.

O. D. Hart and J. Moore. (1988) Incomplete contracts and renegotiation. *Econometrica*, 56, 755–785.

M. Hashimoto and J. Raisian. (1985) Employment tenure and earnings profiles in Japan and the U.S. *American Economic Review*, 75, 721–735.

A. O. Hirschman. (1970) *Exit, Voice and Loyalty*, Harvard University Press: Cambridge.

B. Holmström. (1982) Moral hazard in teams. *Bell Journal of Economics*, 13, 324–340.

T. Ishikawa. (1986) On the sources of wage flexibility in the Japanese labor market. mimeo., University of Tokyo.

Y. Kanemoto and W. B. MacLeod. (1987) Long–term labor contracts with team production: towards a theory of the Japanese firm," mimeo., University of Tsukuba.

Y. Kanemoto and W. B. MacLeod. (1989) Optimal labor contracts with non–contractible human capital. *Journal of the Japanese and International Economies*, 3, 385–402.

B. Klein and K. B. Leffler. (1981) The role of market forces in assuring contractual performance. *Journal of Political Economy*, 89, 615–641.

K. Koike. (1977) *Shokuba no Rodo Kumiai to Sanka (Trade Union and Participation on the Shop Floor)*. Tokyo Keizai Shinpo Sha: Tokyo.

K. Koike. (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.

E. P. Lazear. (1979) Why is there mandatory retirement. *Journal of Political Economy* 87, 1261–1284.

F. P. Lazear. (1981) Agency, earnings profiles, productivity, and hours restriction. *American Economic Review* 71, 606–620.

F. P. Lazear. (1981) Agency, earnings profiles, productivity, and hours restriction. *American Economic Review* 71, 606–620.

E. P. Lazear and R. L. Moore. (1984) Incentives, productivity, and labor contracts. *Quarterly Journal of Economics*, 99, 275–95.

H. Leibenstein. (1957) Underemployment in backward economies. *Journal of Political Economy*, 65, 91–103.

S. MacCauley. (1963) Non–contractual relations in business: a preliminary study," *American Sociological Review*, 28, 55–67.

W. B. MacLeod. (1987) Behavior and the organization of the firm. *Journal of Comparative Economics*, 11, 207–220.

W. B. MacLeod and J. M. Malcomson. (1988) Reputation and hierarchy in dynamic models of employment. *Journal of Political Economy*, 96, 832–854.

W. B. MacLeod and J. M. Malcomson. (1989) Implicit contracts, incentive compatibility, and involuntary unemployment. *Econometrica*, 57, 447–480.

W. B. MacLeod and J. M. Malcomson. (1990) Efficiency wages, bonding and the level of employment. mimeo., Queen's University.

J. M. Malcomson. (1984) Work incentives, hierarchy, and internal labor markets. *Journal of Political Economy*, 92, 486–507.

J. Mincer. (1958) Investment in human capital and personal income distribution. *Journal of Political Economy*, 66, 281–302.

J. Mincer. (1962) On–the–job training: costs, returns and some implications. *Journal of Political Economy*, 70, 50–79.

J. Mincer and Y. Higuchi. (1988) Wage structures and labor turnover in the U.S. and Japan. *Journal of the Japanese and International Economies*, 2, 97–133.

M. Okuno. (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.

M. Okuno. (1987) Monitoring cost, agency relationship, and equilibrium modes of labor contract. *Journal of the Japanese and International Economies*, 1, 147–167.

M. Okuno–Fujiwara. (1989) On labor incentives and work norm in japanese firms. *Journal of the Japanese and International Economies*, 3, 367–384.

W. G. Ouchi. (1981) *Theory Z: How American business can meet the Japanese challenge*, Addison–Wesley: Reading, Mass.

D. O. Parsons. (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.

E. H. Schein. (1982) Does american management style have a message for american managers? *Sloan Management Review*, 23, 55–68.

C. Shapiro and J. E. Stiglitz. (1984) Equilibrium unemployment as a worker discipline. *American Economic Review*, 74, 433–44.

A. Smith. (1776, 1976) *The Wealth of Nations*, The University of Chicago Press: Chicago.

A. Tocqueville. (1968) *Democracy in America*, Fontana: London.

R. H. Topel. (1985) Job mobility, search and earnings growth: a reinterpretation of human capital earnings functions. mimeo. UCLA.

M. L. Weitzman. (1984) *The Share Economy*, Harvard University Press: Cambridge.

R. J. Willis. (1986) Wage determinants: a survey and reinterpretation of human capital earnings functions. in *Handbook of Labor Economics*, Ed. by O. Ashenfelter and R. Layard, North–Holland: Amsterdam.