Employment Tenure and Earnings Profiles in Japan and the United States

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A long-term employment relationship in Japan has been cited often as a principal reason for Japan's high labor productivity. Yet, recent discussions suggest that Japan may not be unique in enjoying strong employer-employee attachment. What are the facts? Are they consistent with the existing theories of long-term employment? These questions motivate the analysis of this paper. In light of the controversy about whether employment tenure differs between the two countries, an analysis is required as well for earnings profiles. Are they different? Are observed differences in tenure and in earnings profiles consistent with each other? Reexamination of the evidence leads us to conclude that, contrary to the impression created by recent literature, long-term employment is more prevalent in Japan than in the United States. Also, earnings-tenure profiles are more steeply sloped in Japan than in the United States. Finally, employment tenure in small Japanese firms is not universally short, as popular discussions suggest.

The paper is organized as follows. In Section I, we compare employment tenures in Japan and the United States. We also examine firm-size differences in employment tenure for the two countries. To assess the consistency of our findings with the recent theories on employment contracts, we examine differences in earnings profiles between Japan and the United States in Section II. The paper ends with a summary and concluding remarks in Section III.

I. Employer-Employee Attachments in Japan and the United States

The practice of lifetime employment in Japan has been viewed as a symbol of unique industrial relations in that country. Under this practice, an employee is hired by a firm immediately upon graduating from school, receives training on the job, and remains with the same employer until his retirement. Recently, journalists and academicians have taken issue with this.[1] Some have argued that the prevalence of lifetime employment in Japan is much too exaggerated. They point out that such practice applies to only about 30 percent of the male labor force. Furthermore, most workers are forced into retirement at age 55 with only modest company pensions and public social security that does not begin until the age 60.[2] Others have

[1] See, for example, B. Bruce-Briggs (1982), Mitsuo Tajima (1982), Kazuo Koike (1977), Robert Hall (1982), and Walter Oi (1983a,b).

[2] See Bruce-Briggs. Note, however, that the mandatory retirement age in Japan has been rising steadily during the past ten years or so, though most retirement still occurs at ages below 60. In Japan, payment of lump sum amounts at the time of retirement rather than an

noted that long-term employment is much more prevalent in the United States than one might have thought, and even more prevalent than in Japan (for example, Robert Hall). A nonspecialist trying to ascertain the facts about lifetime employment in the two countries might find the recent literature confusing, but on balance would likely view the reported evidence as pointing to the conclusion that long-term employment is not unique to Japan.

The idea that long-term employment may be more prevalent in the United States than in Japan originates in Kazuo Koike's study (1977; see also 1978), which is cited by at least two prominent U.S. economists. Hall relies on Koike's evidence in commenting that "...tenure of fifteen years or longer is actually more common in the United States, in spite of the celebrated *nenko* system of lifetime employment in Japan" (p. 717). Walter Oi also refers to Koike's evidence when he says: "The myth of the protected and coddled Japanese worker was so pervasive that I never questioned its validity. A very different picture is painted by Koike..." (1983b, p. 70). It is natural to begin by reexamining Koike's evidence, which has generated much interest. To be fair, it should be noted that the evidence in question occupies only a small portion of Koike's extensive and valuable study.

Figure 1 reproduces Koike's data showing that the percent of male workers with fifteen or more years of tenure is indeed greater in the United States than in Japan. We think that this comparison is misleading because the Japanese data is for 1962. The permanent employment practice became widespread in Japan only after the mid-1950's. Before then long-term employment was limited to highly skilled and management-level workers in large firms. It is not surprising, then, to find that the proportion of workers with fifteen years or more tenure is

annuity is common practice. Our preliminary examination reveals that the average lump sum payment is not much different from the present value of average pensions given to American workers. Since the Japanese retire earlier than Americans, however, annual payments are smaller in Japan.
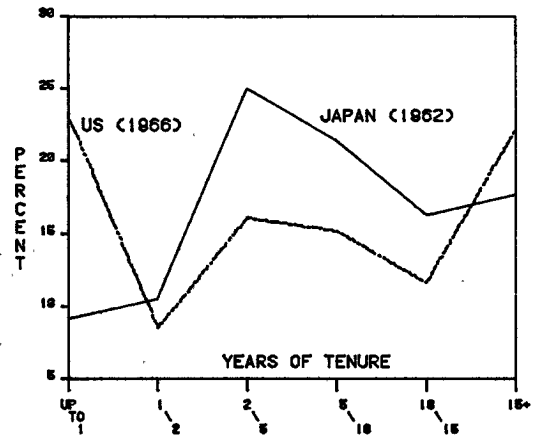

FIGURE 1

not large in 1962. Postwar confusion in the Japanese economy makes the pattern observed by Koike even more plausible. A proper comparison must be based on more recent data for Japan than 1962. To this end, Figure 2 compares the distribution of tenure for the two countries in the late 1970's. The comparison of the two figures clearly indicates that long-term employment is distinctly more common in Japan than in the United States.[3] This conclusion is further corroborated by other evidence discussed below.

Table 1 compares the prevalence of long-term employment in the two countries. Column 6 lists the fifteen-year job retention rates. These are the estimated probabilities that males in a given age-tenure category will be with the same employer fifteen years later.[4] The rates are calculated as the proportion of workers in a given age-tenure category in the initial year with a correspondingly higher age and tenure fifteen years later. Although the Japanese employment surveys only infre-

[3] It is worth noting that even in earlier years (see Figure 1), the proportion of 40 to 54-year-old males with 15+ years of tenure is greater in Japan (43.4 percent) than in the United States (34.1 percent). In Figure 2, the tenure values of (2–5), (5–10), and (10–15) for Japan actually indicate (3–4), (5–9), and (10–14), respectively. This discrepancy is due to the fact that the published data are grouped differently for the two countries.

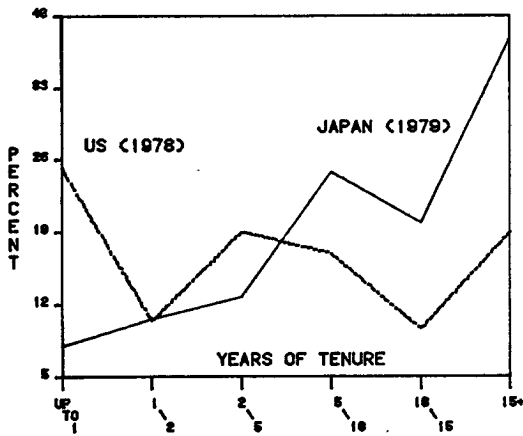[4] Calculations for Tables 1 and 2 use Hall's procedures.

FIGURE 2

quently contain information on employment duration, the necessary data for this calculation fortunately are available for a comparable period in the two countries. Following Hall, the number of workers is divided by the civilian noninstitutional population, rather than by the number of employed persons, to take account of all sources of mobility including mobility between labor-force and non-labor-force activities as well as among different employers.

According to Table 1, for Japan in 1962, 33.5 percent of males ages 15–19 were in the 0–5-year tenure category. Fifteen years later in 1977, 12.2 percent of males ages 30–34 were in the 15–20-year tenure category. (Percent distributions for terminal years, 1977 for Japan and 1978 for the United States, are not reported in Table 1 to save space.) Therefore, the fifteen-year job retention rate for these males is 36.4 percent. As this table clearly illustrates, job retention rates are considerably higher in Japan than in the United States. For example, among those who are 20–24-years old with tenure of 5+ years, 65 percent in Japan retain the same job fifteen years later, but only 30 percent do so in the United States. In both countries, job retention rates are lower among younger workers and among those who are in a low-tenure category at the start. This finding is expected, as young workers are often in the process of shopping for their ultimate employment, while those with low tenure at the

TABLE 1—DISTRIBUTION OF MALE POPULATION BY AGE AND TENURE

| | | | | | 15-Year Retention Rates: | | | |
| | | | Percent With Tenure | | 1962–77 | | Percent With Tenure | |
Age (1)	Tenure (Years) (2)	Percent of Population (3)	<1 Yr. (4)	>10 Yrs. (5)	(%) (6)	Age (7)	<10 Yrs. (8)	>20 Yrs. (9)
		1962			Japan		1977	
15–19	0–5	33.5	13.1	0	36.4	30–34	40.0	0.3
20–24	0–5	51.7	8.9	1.0	45.1	35–39	25.2	9.4
	5+	14.4			65.3			
25–34	0–5	27.4	5.0	19.8	42.7	40–49	18.6	30.9
	5+	42.3			73.0			
35–39	0–5	15.7	3.5	37.6	37.7	50–54	16.4	37.5
	5+	49.4			75.9			
		1963			United States		1978	
14–19	0–5	25.1	16.8	0	5.6	30–34	76.4	0.1
20–24	0–5	64.7	35.9	0.5	13.0	35–39	62.9	1.5
	5+	5.1			30.0			
25–34	0–5	54.3	22.3	9.5	22.2	40–49	48.3	15.6
	5+	32.9			47.3			
35–44	0–5	34.9	14.5	36.5	24.4	50–59	34.1	29.6
	5+	54.3			54.5			
45–49	0–5	28.8	11.7	45.0	17.2	60–64	22.0	23.8
	5+	59.3			40.1			

Sources: Calculated from the *Basic Survey of Employment*, 1962 and 1977 for Japan and the *Special Labor Force Report*, No. 36 (1973) and No. 235 (1978) for the United States.

TABLE 2—THE NUMBER OF DIFFERENT JOBS PER MALE WORKER: JAPAN (1977) AND UNITED STATES (1978)

| | New Jobs Started per Year[a] | | | | Cumulative Number of New Jobs to the Age | |
| | Per Person | | Over The Age Interval | | | |
Age	Japan[b] (1)	U.S. (2)	Japan (3)	U.S. (4)	Japan (5)	U.S. (6)
16–19	0.19	0.50	0.76	2.00	0.72	2.00
20–24	0.26	0.48	1.30	2.40	2.06	4.40
25–29	0.13	0.35	0.65	1.75	2.71	6.15
30–34	0.08	0.25	0.40	1.25	3.11	7.40
35–39	0.07	0.18	0.35	0.90	3.46	8.30
40–54	0.05	0.13	0.75	1.95	4.21	10.25
55–64	0.07	0.07	0.70	0.70	4.91	10.95
65–69	—	0.04	—	0.20	—	11.15
70+	—	0.01	—	0.01	—	11.16

Sources: Calculated from the *Basic Survey of Employment* (Japan), 1977, and the *Special Labor Force Reports* (United States), No. 238, 1978.

[a] Cols. 1 and 2 are twice the ratio of persons with new jobs to population, and cols. 3 and 4 are, respectively, cols. 1 and 2 times the age span.

[b] Persons with new jobs in Japan refer to those who changed jobs within a year plus those who were not working a year ago but who are working now. For the U.S., persons with new jobs are those with tenure of 6 months or less.

start are characterized by relatively high turnover.

Columns 4, 5, 8, and 9 in Table 1 provide related information on tenure distributions. Both the proportions with tenure of less than one year in the early 1960's (col. 4) and less than ten years in the late 1970's (col. 8) are smaller in Japan than in the United States. Note also that the proportion of older employees who have worked for the same company for twenty or more years is higher in Japan than in the United States (col. 9). This finding is contrary to the recent claim that such a proportion is greater in Western countries than in Japan.[5] It also reinforces the conclusion drawn from the comparison of Figures 1 and 2 that employment tenures are longer in Japan, and that this pattern is not an artifact of the age-demographic compositions of the respective populations.

Table 2 summarizes our attempt to answer the question: how many jobs will a typical male worker hold during his working life? The appropriate information is contained in columns 5 and 6 and depicted in Figure

3. As described in the notes to the table, this information is determined incrementally using information contained in columns 1–4. For the United States, the number of new jobs per year in column 2 is calculated as twice the reported ratio of population with tenure of six months or less. For Japan, the relevant information is available in terms of the number of persons who changed jobs within the past year plus those who were not working a year ago but are working now. The ratio of this number to population would seem to be a natural counterpart to the U.S. figures. However, there is no way of knowing how often these individuals changed jobs during the year. We simply assume that all these workers have had tenure of six months or less, and double the ratios, as in the U.S. calculations. By doubling the ratio for Japan, we may be overstating the number of new jobs started in that country. Yet, if we did not augment the Japanese magnitudes, the statistics would not be comparable to the U.S. magnitudes, and furthermore would understate the rate of turnover in Japan.[6] Even

[5] See Tajima. Keep in mind that mandatory retirement occurs mostly at age 55 in Japan; thus, the comparison of older workers must be with those under age 55 for Japan.

[6] The U.S. magnitudes are understated to the extent that turnover occurs for individuals who do not hold a job even for six months. This understatement is exacerbated for Japan since the interval length for initial
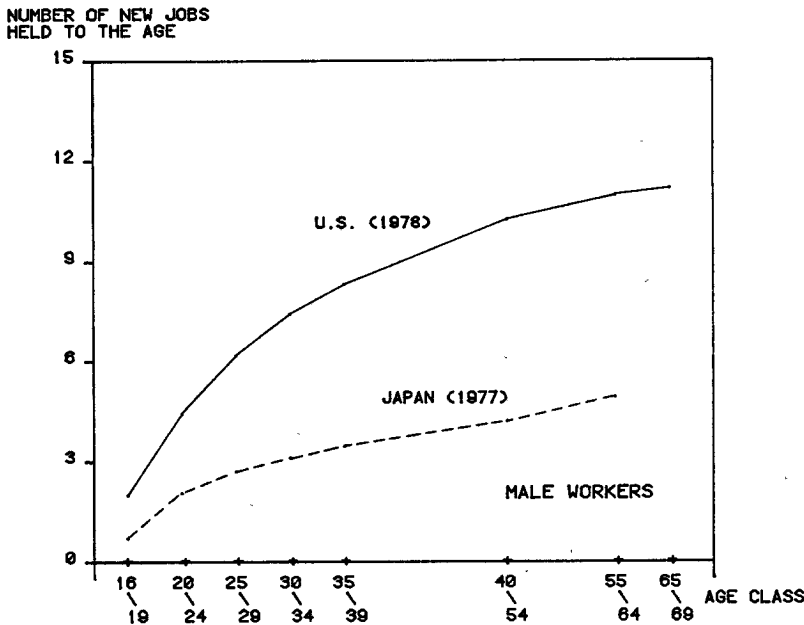
NUMBER OF NEW JOBS
HELD TO THE AGE

FIGURE 3

with the likelihood of overstatement, we find the cumulative number of jobs held to be much smaller in Japan than in the United States (compare cols. 5,6, and Figure 3). By the time a typical worker reaches age 65, he would have had approximately five jobs in Japan and eleven jobs in the United States.

According to Table 2, job shopping is more intense for both countries in the early working years. By age 24, the average Japanese male has held 2.06 jobs out of 4.91 jobs he will hold in his working life. An average American male has held 4.4 jobs out of 11 or so jobs he will hold. Interestingly, a typical worker has held a similar percent (40 percent) of the eventual number of jobs by age 24 in both countries.[7] During the next

ten years, by age 34, the Japanese male will have held an additional 1.1 jobs, but the American male will have held 3.0 jobs. Close to retirement (age 40–54 in Japan and 55–64 in the United States), 0.05 jobs per year are added in Japan and 0.07 jobs per year in the United States. It is apparent from this table that job turnover during the life cycle is much greater in the United States than in Japan.[8]

With regard to firm-size differences, Japanese scholars have often emphasized what

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tenure is one year. We feel it is important to make every attempt to have the statistics between the two countries be comparable, so we doubled the Japanese magnitudes. In our judgement, this procedure overstates the true comparable Japanese magnitudes, but it has the effect of making the contrasts between the two countries to be lower-bound estimates of the true contrasts, and serves our purposes well.

[7]Note that we are talking about the life cycle pattern of job changes in this table. American youths generally

change jobs more often than youths in other industrialized countries. In the early 1970's, the percent of youths between the ages of 18 and 24 with work experience who had changed employers more than 4 times was a striking 27.6 percent for the United States, a figure which was much higher than those for France (17.4), England (14.3), Sweden (10.8), Switzerland (10.5), West Germany (5.7) and Japan (2.7). (See Robert Cole, 1979, p. 95.)

[8]Our calculations for females also indicate that U.S. women change jobs more than Japanese women (results available on request). It should be noted that labor turnover in Japan was not always low. Indeed, turnover in the early 1900's was quite high (Koji Taira, 1970, ch. 6), and the industrial relations were far from being harmonious during early post-World War II years (Haruo Shimada, 1983).

TABLE 3—PERCENT OF EMPLOYED MALES BY TENURE AND FIRM SIZE: 1979

	Japan					United States				
Years	All (1)	Tiny (2)	Small (3)	Medium (4)	Large (5)	All (1)	Tiny (2)	Small (3)	Medium (4)	Large (5)
<1	7.9	10.4	9.7	7.7	3.8	19.4	29.7	22.3	16.0	11.2
1–4	21.5	24.8	22.2	21.6	13.5	30.6	37.7	37.1	32.2	24.4
5–9	22.2	20.4	22.4	23.9	21.8	19.4	16.0	18.5	21.3	21.7
10–14	17.7	16.4	16.6	18.9	19.1	11.7	7.6	8.9	12.6	15.4
15–19	11.9	9.1	10.0	12.3	16.2	6.5	3.9	5.2	7.3	8.4
20+	18.8	18.7	16.0	15.7	25.6	12.4	5.0	7.9	10.5	18.8
Median	8.2	8.0	8.0	8.1	12.0	4	2	3	5	7
Eventual Tenure	25.0	23.6	22.4	23.6	30.8	15.6	9.6	12.2	15.4	20.6

Sources: Calculated from the *Basic Survey of Employment* (Japan), 1979, and the *Current Population Survey* (United States), 1979.

Note: Employed males in private industries. Tiny = 1–9 for Japan and 1–25 for United States, Small = 10–99 for Japan and 26–99 for United States, Medium = 100–999, and Large means 1000+ for both countries. Eventual tenure is calculated as twice the mean tenure.

they consider to be the unique role of firm size in the Japanese economy, as evidenced in the literature on the "dualistic" labor market (see, for example, Konosuke Odaka, 1967; Yasukichi Yasuba, 1976; Carl Mosk and Yoshi Nakata, 1983). In the United States, however, firm size has not been central to the study of wages and employment (for exceptions, see Richard Lester, 1967; Stanley Masters, 1969; Albert Rees and George Schultz, 1970). Recently, however, perhaps stimulated by the availability of firm-size information in the recent supplement to the *Current Population Survey*, there has been renewed interest in firm-size differences in wage and employment characteristics (see Wesley Mellow, 1982; Walter Oi, 1983a, b). We focus at this point on how job tenure differs by firm size, as reported in Table 3, and offer additional information on firm-size differences in other economic magnitudes in Table 4. The latter table is noteworthy because firm-size differences in other selected variables are quite similar in the two countries. Thus, rather than being unique to Japan, the so-called dualistic market phenomenon may reflect little more than some underlying causal factors which operate in the two countries, or any country for that matter.

In Table 3, we present tenure distributions by four firm-size categories for each of the countries. Also, we present the median tenure and a crude estimate of the eventual tenure of jobs that are currently held. The latter

statistic is computed by doubling the mean tenure value, a procedure that is common in the unemployment duration literature (see Stephen Salant, 1977; George Akerloff and Brian Main, 1981). All of these statistics indicate that the employer-employee attachment is stronger in Japan than in the United States. There is also a definite tendency for longer tenures to occur in larger firms. One reason for firm-size differences in job tenure is the well-known higher failure rate for small firms than for large firms. If the differential failure rate were the sole factor, however, the compensating principle would lead one to predict higher wages in smaller firms. Available evidence suggests that the opposite is true. For example, Haruo Shimada has shown that, in both countries, wages are higher in larger firms throughout workers' life cycles (1981, pp. 71–74). Also, according to Robert Cole's study of workers in Yokohama (1979, pp. 87–90), the proportion of job leavers due to involuntary discharge, which presumably includes the case of business failures, is, if anything, highest in the largest firms and lowest in the smallest firms. Thus, there must be more to firm-size differences in job tenure than just the differential failure rates.[9] Failure

[9]Another reason for lower turnover in larger firms may be that workers in these firms have more opportunities to change jobs without changing employers. Indeed, according to Cole's evidence (pp. 80–81), intrafirm mobility increases with firm size in both Yokohama and Detroit.

TABLE 4—FIRM-SIZE DIFFERENCES[a]

	All Industries				Manufacturing				Nonmanufacturing			
	Small (1)	Med. (2)	Large (3)	(3/1)	Small (1)	Med. (2)	Large (3)	(3/1)	Small (1)	Med. (2)	Large (3)	(3/1)
Earnings[c]							**Japan 1980**					
(a) Actual	196.7	214.9	257.3	1.3	195.6	213.9	251.2	1.3	197.3	215.6	263.1	1.3
(b) Contract	181.6	193.0	223.7	1.2	176.8	187.1	212.1	1.2	184.1	197.0	234.7	1.3
(c) Bonus	482.3	731.2	1069.7	2.2	480.6	739.3	980.4	2.0	483.2	725.7	1154.3	2.4
Ratio: c/a	2.5	3.4	4.2		2.5	3.5	3.9		2.4	3.4	4.4	
c/b	2.7	3.8	4.8		2.7	4.0	4.6		2.6	3.7	4.9	
Hours Worked												
(a) Contract	194	182	167	0.9	195	180	165	0.8	193	183	169	0.9
(b) Overtime	15	18	21	1.4	19	21	23	1.2	13	16	19	1.5
Ratio: b/a	0.08	0.10	0.13		0.10	0.12	0.14		0.07	0.09	0.11	
Education[b] (Percent)												
Low	41.2	29.7	26.1	0.6	52.3	37.3	33.5	0.6	35.4	24.5	19.1	0.5
College	11.9	22.2	25.7	2.2	8.4	17.4	18.0	2.1	13.8	25.5	33.0	2.4
Tenure (Years)	8.5	10.2	13.9	1.6	9.5	11.6	14.7	1.5	8.0	9.4	13.1	1.6
Age	39.0	37.0	37.1	1.0	40.4	37.2	36.8	0.9	38.3	36.9	37.4	1.0
Earnings ($)							**United States 1979**					
Annual	13445	16715	18500	1.4	13883	15882	18712	1.3	13357	17103	18284	1.4
Weekly	267.5	329.5	359.6	1.3	270.2	306.3	361.6	1.3	267.0	340.3	357.6	1.3
Hours Worked												
Weeks/Yr.	49.8	50.7	51.3	1.0	51.0	51.7	51.7	1.0	49.5	50.2	51.0	1.0
Hours/Wk.	42.0	42.8	42.4	1.0	41.7	42.5	42.6	1.0	42.0	42.9	42.2	1.0
Education[b] (percent)												
Low	27.9	19.0	15.7	0.6	34.2	27.9	19.5	0.6	26.7	14.8	11.9	0.4
College	16.3	29.4	27.0	1.7	9.2	15.4	18.9	2.1	17.7	35.9	35.1	2.0
Tenure (Years)	5.3	7.7	10.3	1.9	6.0	8.8	11.6	1.9	5.1	7.2	9.0	1.8
Age	36.2	37.6	38.4	1.1	36.8	38.3	39.0	1.1	36.1	37.3	37.8	1.0
Union (Percent)	16.3	33.2	44.7	2.7	19.1	34.4	51.8	2.7	15.7	32.6	37.6	2.4

[a] Employed males in nonagricultural private industries.
[b] Low means less than 12 years of schooling, college means 16 or more years of schooling.
[c] 1000 Yen: Actual and Contract Earnings are Monthly, Bonus is Annual.

rates are relevant, however, insofar as they affect the incentive to invest in firm-specific capital.

Although job tenure is longer in large Japanese firms, it is quite long even in the tiny and small firms. This finding raises doubts about the popular belief that life-time employment is only a large-firm phenomenon. Indeed, some recent studies indicate that there exists a significant degree of "paternalism" among small-scale Japanese employers.[10] Moreover, Cole's evidence noted

above casts doubt on the common observation that firing in Japan is done mostly by small firms. Our evidence together with Cole's suggests that small Japanese firms managing to survive do exhibit a tendency for long-term employment. Thus, the common assertion that Japanese small firms operate much like casual labor markets is not entirely accurate.

To summarize, long-term employment relationships are more prevalent in Japan than in the United States, though both our evidence and that of Hall's indicate that employer-employee attachment is by no means

[10] In an illuminating ethnographic study of a small pencil maker in a low-income section of Tokyo, George De Vos and Hiroshi Wagatsuma (1973), describe how small firms try to emulate the traditional "paternalism" employment relationship. Employees are let go only in the event of business failure or antisocial behavior. Yasuba (pp. 285–86) argues that the traditional paternalistic and personalistic human relations continued into employer paternalism in small firms during the early

years of Japan's modernization. Cole distinguishes between the "personalized paternalism" of small firms and the "administrative paternalism of the large firm" (pp. 21–22). Admittedly, the concept of paternalism is not economic, but we find these references significant insofar as they underscore the existence of long-term employment relationships even among small firms.

weak in the United States. In both countries, one observes a tendency for larger firms to have a stronger employment relationship. Contrary to popular belief, however, employment tenure in small Japanese firms is not universally short.

II. Earnings Profiles in Japan and the United States

We now investigate the difference in earnings profiles between the two countries. Although some evidence is available on this issue (for example, Masatoshi Kuratani, 1973; Shimada, 1981), it is useful to reexamine the evidence for two reasons. First, not only are our data more recent than the data used in the previous studies, but they enable us to control for firm-size effects directly, a feature lacking in the previous studies. Second, previous studies relied solely on the regression coefficient of tenure on earnings, or the slope of the earnings profile, to draw conclusions. For reasons discussed below, a proper and fuller comparison is based instead on the number of years it takes to reach the peak earnings and the value of the peak earnings as well as the slope.

The recent literature offers a variety of reasons for expecting the earnings-tenure profile to be related to employment duration. Notable explanations include the firm-specific human capital, the screening, and the agency hypotheses.[11] The literature is unsettled as to the relative merits of these hypotheses, however. To assess which hypothesis dominates as an explanation of the differences between the Japanese and the U.S. labor markets is a formidable task, and is beyond the scope of this paper. Rather, the purpose of this section is to determine if Japan-U.S. differences in employment tenure and the shape of earnings profiles are con-

sistent with the prediction, common to these hypotheses, that jobs with longer employment duration will have more steeply sloped tenure profiles.

In specifying an earnings function, two key variables are experience acquired in the current firm (i.e., tenure) and previous experience. The sum of the two experience components is the total, or potential work experience. We estimate Mincer-type earnings regressions, which hold constant total experience (see Jacob Mincer, 1974, and Mincer and Boyan Jovanovic, 1981). In particular, we examine coefficient estimates of the following earnings function for each of the two countries:

$$(1) \quad \ln Y = a_0 + a_1 j + a_2 j^2 + b_1 n$$
$$+ b_2 n^2 + cjn + zd + e,$$

where $\ln Y$ is the logarithm of earnings, j is the total years of work experience (i.e., age minus years of schooling minus 6), n is the number of years of tenure in the current firm, z is a vector of other explanatory variables, e is the disturbance term, the a's, b's, and c are constants, and d is a vector of constants.

The human capital literature distinguishes general and firm-specific capital components. The empirical specification in equation (1) accommodates this distinction, but interpretation of the coefficients on tenure variables as solely reflecting specific human capital effects does not necessarily follow. These coefficients could reflect the combined impacts of a number of competing hypotheses, notably screening and agency. Inclusion of the total experience magnitudes in the specification in our view does not misrepresent other hypotheses. Both screening and agency hypotheses are silent regarding the role of total experience when analyzing the earnings-tenure relationship. However, neither hypothesis rules out the existence of positive effects of total work experience on earnings, that is, general human capital effects.

We are concerned primarily with the pure effects of tenure on earnings net of total experience effects. The functional form of

[11] The specific-capital hypothesis is by now familiar. See Gary Becker (1962), Hashimoto (1979), and Lorne Carmichael (1983). According to Joanne Salop and Steven Salop (1976), employers may use upward-sloping earnings profiles to discourage those with high propensity to quit from seeking employment (the screening hypothesis). Edward Lazear (1979) offers the agency hypothesis, which views steeply sloped earnings profiles as a device to discourage employee shirking.

equation (1) allows for interaction between the two experience profiles: slopes of either profile obviously depend on the amounts of both experience magnitudes, since $\partial \ln Y / \partial j = a_1 + 2a_2 j + cn$ and $\partial \ln Y / \partial n = b_1 + 2b_2 n + cj$. We investigated more elaborate interaction schemes, but found little difference in the qualitative findings. Therefore, this paper reports results using the simplified interaction scheme.

The dependent variables are the logarithms of monthly earnings including bonuses for Japan, and of usual weekly earnings for the United States. As for the explanatory variables, the total years of experience is estimated conventionally as age minus years of schooling minus 6. For Japan, we use dummy variables for schooling; the data are reported by category rather than years. High school means 12–13 years, junior college means 14–15 years, and university means 16+ years of schooling. The excluded category is less than 12 years of education. For the United States, educational attainment is measured in years, but we also include two dummy variables, high school for those who have at least 12 years of education, and university for those who have 16 or more years. These dummy variables are meant to capture the effects of completing either high school or college. Finally, union member is a dummy variable to distinguish union from nonunion members. This information is available for the United States sample only.

The data used to estimate equation (1) are from the *Basic Survey of Wage Structure* (Shugyo Kozo Kihon Chosa, 1980) for Japan and the public use tapes of the *Current Population Survey* (*CPS*, March and May, 1979) for the United States, and are for male workers in nonagricultural private industries. The Japanese data are cell means of earnings, bonus payments, years of tenure, and age of worker, cross classified by firm size, education class, age class, and industry. The *CPS* data contain individual observations, and the May 1979 *CPS* includes information on firm size, a feature which is particularly useful for this research.

Table 5 reports the *OLS* regression estimates of equation (1) for Japan and the United States, separately for three firm-size groups. Small firms are those employing fewer than 100 workers, medium firms, between 100 and 999, and large firms, more than 1000 workers. Both total experience and tenure variables are statistically significant at better than the 1 percent level in all cases.[12] These coefficients generate the usual concave earnings profiles for both total experience and tenure profiles.[13] The interaction of total experience and tenure is negative for Japan, though significant only for small firms, but is positive for the United States with high statistical significance for medium and large firms. These interaction coefficients suggest that, in Japan, previous years of experience, a component of total experience, tend to penalize the earnings growth due to tenure. In contrast, in the United States, previous years of experience boost the tenure effects on earnings. This difference in the interaction effects in the two countries may be related to our earlier findings of job changes being more frequent in the United States than in Japan.[14]

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[12] The *F*-values for the significance tests of total experience are 280.4, 143.3, and 8.1 for Japanese small, medium, and large firms, respectively, and 180.3, 82.0, and 94.5 for the U.S. small, medium and large firms, respectively. The *F*-values for the tenure variables are 53.7, 29.4, and 53.7 for Japanese small, medium, and large firms, respectively, and 27.6, 9.6, and 38.2 for the U.S. small, medium and large firms, respectively.

[13] Because of the interactive earnings specifications, to generate a *ceteris paribus* profile for tenure requires that total experience be fixed at some level. The same is true for the total experience profile. We checked the profile properties at respective mean values of total experience and tenure. The means for Japanese small, medium, and large firms, respectively, are: for total experience, 22.3, 19.4, and 19.4 years; for tenure, 8.5, 10.2, and 14.6 years. For the U.S. small, medium and large firms, respectively, the means are: for total experience, 18.1, 18.5, and 19.2 years; for tenure, 5.3, 7.7, and 10.3 years.

[14] In the U.S. regressions, the union coefficient is positive and significant only for small firms while it is insignificant for medium and large firms. Since no interactions are specified between the union and the occupation and/or education variables in these regressions, one must use caution in interpreting the union coefficient. It certainly would be premature to infer that unions have little effect on wages in medium and large firms. Workers in larger firms have higher levels of education, and highly educated union members are less likely than others to have been promoted in the past, a likelihood which lowers their wages. Support for this conjecture is

TABLE 5—REGRESSIONS OF MALE EARNINGS FOR JAPAN AND THE UNITED STATES[a]

	Japan Firm Size (1980)			U.S. Firm Size (1979)		
	Small (1)	Medium (2)	Large (3)	Small (4)	Medium (5)	Large (6)
Constant	4.6163	4.6519	4.7213	4.3879	4.6152	4.791
	(284.5)	(265.6)	(180.8)	(68.3)	(53.1)	(78.1)
Total Experience:						
j	0.0377	0.0523	0.0210	0.0502	0.0477	0.0372
	(15.4)	(18.8)	(4.9)	(22.2)	(15.6)	(16.4)
j^2	−0.0005	−0.0008	−0.0003	−0.0010	−0.0010	−0.0007
	(−12.4)	(−18.9)	(−4.1)	(−21.5)	(−14.4)	(−13.0)
Tenure:						
n	0.0614	0.0278	0.0692	0.0196	−0.0019	0.0121
	(9.1)	(5.2)	(11.7)	(4.8)	(−0.4)	(4.3)
n^2	−0.0003	−0.0001	−0.0013	−0.0006	−0.0003	−0.0003
	(−0.8)	(−0.5)	(−5.6)	(−4.0)	(−2.1)	(−3.6)
Interaction: $j \times n$	−0.0012	−0.0002	−0.00001	0.0003	0.0006	0.0003
	(−6.1)	(−1.9)	(−0.1)	(1.8)	(3.3)	(2.3)
Years of Schooling	–	–	–	0.0367	0.0362	0.0296
				(5.6)	(4.2)	(5.0)
Schooling Dummies[b]						
High School	0.1278	0.1368	0.1048	0.1630	0.1735	0.1286
	(15.2)	(12.7)	(5.8)	(4.9)	(3.9)	(4.5)
Junior College	0.2552	0.2635	0.2822	–	–	–
	(12.9)	(12.1)	(7.2)			
University	0.3700	0.3923	0.4579	0.0630	0.0808	0.1590
	(28.9)	(29.3)	(20.8)	(1.7)	(1.8)	(5.6)
Union Member	–	–	–	0.2533	0.0099	−0.0020
				(10.0)	(0.4)	(−0.1)
MSE	c	c	c	0.2626	0.1804	0.1590
$\overline{R}^2$	c	c	c	0.316	0.307	0.279
N	384	378	366	3139	1590	3750

Sources: Basic Survey of Wage Structure (Shugyo Kozo Kihon Chosa), 1980, and the *Current Population Survey*, March and May 1979.

[a] The *t*-values are shown in parentheses; the dependent variable = logarithm of earnings in private nonagricultural industries.

[b] Schooling dummies indicate: For Japan, High School = 12–13 years, Junior College = 14–15 years, and University = 16+ years of schooling; and for the United States, High School is for those who have at least 12 years of education and University for those who have 16+ years.

[c] Since Japanese estimates are derived from weighted regressions, these statistics are not readily available as summary statistics in the computer output. Furthermore, when grouped data are used, these statistics are not comparable to those obtained by using data on individual observations.

What do these regressions indicate about the effects of firm-specific tenure on earnings? The effects of total experience and tenure are captured by the slopes of the two

provided in the samples broken down by education. Union coefficients are significantly positive regardless of firm size in regressions in the sample of those with less than high school education. In contrast, union coefficients are negative, and significant for medium and large firms, in regressions using those with 16+ years of education. These results are available upon request. Finally, the coefficients for the schooling variables contain few surprises.

profiles. The slopes change, however, as one moves along each of the profiles, and their comparisons across firm-size groups or between the two countries will be affected by the choice of the point on the profiles where such comparisons are made.[15] A proper

[15] As a result, care must be taken when interpreting the slope as a meaningful indicator. For example, slope is commonly used as an indicator of investments in human capital. In particular, a greater slope would not necessarily indicate greater investment opportunities. Imagine two earnings profiles, A and B, where A has a steeper slope than B, but A reaches its peak sooner and

TABLE 6—PERCENT GROWTH IN EARNINGS ATTRIBUTABLE TO EXPERIENCE AND TENURE
SINCE ENTERING THE CURRENT FIRM, BY FIRM SIZE

Tenure (Years)	Small Firms		Medium Firms		Large Firms	
	Total	Tenure	Total	Tenure	Total	Tenure
Japan						
5	56.0	36.8	44.7	17.5	50.7	40.5
15	180.2	123.0	151.9	70.3	166.9	140.0
20	222.6	148.6	203.1	99.2	213.9	181.0
25	235.5	147.8	242.9	123.4	239.8	203.2
30	215.3	117.9	264.7	138.1	238.8	200.5
35	167.7	65.2	264.7	140.3	210.9	173.5
Peak[a]	235.6	150.4	267.4	141.0	242.8	205.2
	(24)		(33)		(27)	
Starting Pay[b] (Monthly Yen)	115,935		121,185		129,663	
United States						
5	36.9	11.7	23.3	< 0	25.3	7.1
15	108.4	40.7	67.2	4.1	74.4	26.1
20	131.5	52.2	84.0	10.2	93.0	36.4
25	140.0	57.9	94.8	18.7	105.4	45.6
30	131.9	56.7	98.6	28.9	109.7	52.6
35	109.1	49.0	94.8	39.3	105.6	56.7
Peak[a]	140.0	57.9	98.6	28.9	109.7	52.6
	(25)		(30)		(30)	
Starting Pay[b] (Weekly $)	160.83		187.90		201.61	

Notes: Calculated from Table 5. These figures represent the percentage differences between the current earnings and the starting pay due to total experience and tenure. Total experience effects are derived from $d \ln Y/dj$ as indicated in fn. 16.

[a] The figures indicate the peak growth rates due to total experience (peak years are in parentheses) and the associated growth rates due to tenure.

[b] The starting pay is estimated at zero experience and tenure and the mean values of explanatory variables.

comparison requires an examination of the number of years it takes to reach the peak earnings and the value of the peak earnings itself as well as the slope of the earnings profile.

In view of these considerations, we report in Table 6 what the estimated regression coefficients imply for the percentage growth rates in earnings between the year when a worker joins the current firm and various years of tenure. In constructing the table, we asked the following question: if a worker enters the current firm right after completing schooling and stays with the firm until he retires, by how much would his earnings

grow as he accumulated years of tenure? We calculate separately the growth rates attributable to total experience and to firm-specific tenure. The table reports both total and firm-specific earnings growth, although our primary interest is in the latter.[16] In addition, Table 6 reports the peak values of the total growth percentages, the years when they occur, the associated growth due to firm-specific tenure, and the starting pay. We think that the most meaningful country and firm-size comparisons of growth are made between the initial and the peak years. The starting pay is estimated by evaluating equa-

at a lower peak value than B. In this case, B may easily reflect greater ultimate investments than A, though its slope is smaller than that for A at a particular tenure value.

[16] The total earnings growth due to the accumulation of total experience can be decomposed as follows: $d \ln Y/dj = \partial \ln Y/\partial j + \partial \ln Y/\partial n$, since we are assuming $dn/dj = 1$, or that the worker stays with the firm throughout his working life. The two partials can be evaluated by using the estimated regression coefficients.

tion (1) at zero values of j and n, and the means of the explanatory variables.

A worker entering a small Japanese firm enjoys a 56.0 percent growth in his earnings by the fifth year, at which time a 36.8 percentage point growth is associated with firm-specific tenure. He reaches his peak growth of 235.6 percent in the twenty-fourth year, at which time a 150.4 percentage point growth is generated by firm-specific tenure.[17] An eye-opening pattern in this table concerns the Japan-U.S. differences in the growth rates due to firm-specific tenure as well as total experience. For all firm-size groups, growth rates between the peak earnings year and the initial year are greater in Japan than in the United States. Note also that within firm-size groups, peak years are similar in the two countries.[18] Thus, it is slopes of earnings profiles that are driving our comparisons between Japan and the United States. More importantly, growth rates attributable to tenure are far greater in Japan than in the United States.[19]

Do the observed Japan-U.S. differences in earnings profiles reflect the heterogeneity of the sample in the two countries? Worker quality and the industrial composition, for example, are different between the two countries.[20] To what extent are our findings upheld once these differences are netted out? To shed light on this question, we performed the analysis by disaggregating the data by industry and education. As it turns out, Japan-U.S. differences in the earnings-tenure profile persist in both manufacturing and nonmanufacturing industries and within education class.[21]

According to the findings in this section, both the earnings-tenure and earnings-total experience profiles are more steeply sloped in Japan than in the United States, holding constant firm size. These findings together with the finding in Section I of a longer employment tenure in Japan than in the United States are consistent with the existing theories of employment contracts.

III. Summary and Conclusion

Contrary to the impression created by the recent literature, Japanese male workers do have longer employment tenure than American workers. Also, Japanese workers have steeper earnings profiles that peak in about the same year after entering the current firm as American workers. In particular, growth rates in earnings attributable to tenure are far greater in Japan than in the United States. These findings are robust to disaggregation by industrial composition and educa-

[17] In the human capital perspective, these figures imply somewhat larger ratios of specific capital to total growth rates than those found by Mincer and Jovanovic (pp. 38–42). The main reason for the difference between their estimates and ours is that we are performing a simulation for a hypothetical individual who stays with the firm throughout his working life (see fn. 13), whereas they evaluate these ratios at a point in time implicitly taking into account the probabilities of separation.

[18] Firm-size differences in the percentage growth due to firm-specific tenure exhibit a mixed pattern, however. In Japan, workers in large firms experience the greatest growth, but the difference between workers in small and medium firms is negligible. The differences between small and large firms, as well as between medium and large firms, are statistically significant at the 1 percent level (t-values are 2.75 and 3.99, respectively). Thus, large firms appear to be distinct from either medium or small firms. In the United States, the relationship between the percentage growth and firm size appears U shaped, with the growth rate somewhat higher in small firms than large firms. However, the only statistically significant difference is between medium and large firms with a t-value of 2.16.

[19] Table 6 is based on workers who begin working in the current firm immediately after completing schooling. A more realistic case may be where workers join the current firm after working in other firms for some years. We have examined cases with various years of previous experience (results available upon request) and conclude that the findings in Table 6 are robust.

[20] In our samples, workers in service and trade industries predominate in U.S. small firms to a greater extent than in Japan. The percent of small-firm workers in these industries is 51 percent for the United States and 37 percent for Japan. Comparable figures for large firms are 27 percent for the United States and 16 percent for Japan. For the difference in worker quality, as measured by education, see Table 4.

[21] These results are not reported to save space but are available upon request. Also, our general findings resemble those reported in an interesting book by Shimada (1981), which uses the data for earlier years. However, his regression specifications differ from ours, and we are able to control for firm size directly in the U.S. data whereas Shimada was unable to do so with his data.

tional attainment. The pattern of Japan-U.S. differences in the employment tenure and the earnings profiles are consistent with three prominent hypotheses in the literature—the specific human capital, the screening, and the agency hypotheses.

It is beyond the scope of this paper to investigate the relative contribution of each of the hypotheses to the differences we uncovered between the two countries. However, a few remarks may be in order on the screening and the agency hypotheses, which are the recent challenge to the traditional specific-capital hypothesis. It is worth noting that the screening hypothesis does not necessarily deny the existence of specific capital. Indeed, according to a behavioral version of this hypothesis, employers' desire to minimize the loss of specific capital caused by turnover is the principal motive for screening potential employees (see Salop and Salop). The agency hypothesis, however, predicts upward-sloping earnings profiles even if specific capital is nonexistent. Among the two behavioral hypotheses, therefore, we consider the agency hypothesis to be the more challenging alternative to the specific-capital hypothesis.

In view of the above consideration, we conclude this paper by considering briefly how our evidence bears on the comparison of the agency with the specific-capital hypothesis. According to the agency hypothesis, workers in effect post bonds in early years for their performance, and the bonds are greater the higher the monitoring costs. The slope of the earnings-tenure profile may be viewed as indicating the extent of bonding. Our findings indicate that Japanese workers post larger bonds than American workers. Is this finding consistent with the agency hypothesis? The answer depends in part on the relative employer-employee transaction costs in the two countries. Hashimoto (1979) has analyzed the Japanese practice of bonus payments by arguing that such transaction costs are lower in Japan than in the United States.[22] If this argument is valid,

bonds should be smaller in Japan than in the United States, which is contrary to what we find. Our evidence then would seem to contradict the agency hypothesis, if the transaction-cost assumption is valid. Such a conclusion is premature, however, and a definitive verdict must await further evidence on the relative transaction costs in the two countries.[23]

The pattern of Japan-U.S. differences in employment tenure and earnings-tenure profiles is consistent with there being more specific human capital in Japan than in the United States. The specific-capital hypothesis, however, predicts mandatory retirement to occur at a later age in Japan than in the United States. In fact, mandatory retirement typically occurs earlier in Japan (between ages 55 and 60) than the United States, an uncomfortable fact to those who subscribe to the specific-capital hypothesis. Since the setting of a mandatory retirement age reflects a multitude of factors, including life expectancy and worker productivity, what is relevant perhaps is the change in, rather than the level of, the retirement age. It is interesting to note that, during the past ten years or so, a number of employers have raised their mandatory retirement age above the traditional age of 55, though most retirement still occurs below 60. In view of this, it would seem premature to understate the relative importance of the specific capital hypothesis in explaining Japan-U.S. labor market differences. To develop a strong case for this hypothesis, however, one needs to study the factors responsible for the difference and change in Japanese and U.S. retirement practices. Such a study would further our

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[22] In the bonus system, workers put enormous trust in management, which announces the profit conditions of the firm. Why would workers accept such a payment scheme in which a large portion of their annual earnings depends on management's word unless the costs of transaction were low? The bonus system increases wage flexibility. Wage flexibility is by no means unique to Japan, however. Although bonus-type arrangements tend to be confined in the United States to management level workers, recent evidence suggests that nonmanagement workers also experience wage flexibility (see Raisian, 1983).

[23] See our 1984 working paper for some evidence supporting this assumption.

understanding of the determinants of Japan-U.S. differences in employment tenure and earnings profiles.

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