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UNIVERSITY OF CALIFORNIA, SAN DIEGO

Essays on the Japanese Labor Market

A dissertation submitted in partial satisfaction of the
requirements for the degree
Doctor of Philosophy

in

Economics

by

Jess Diamond

Committee in charge:

Professor Takeo Hoshi, Chair
Professor Julian Betts
Professor Stephan Haggard
Professor Garey Ramey
Professor Ulrike Schaede

2011

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The dissertation of Jess Diamond is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

Chair

University of California, San Diego

2011

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VITA AND PUBLICATIONS

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Jess Diamond, Takeo Hoshi, “Corporate Governance and Personnel Strategy: An Analysis of the Survey of the Employment System and Personnel Strategy”, *The Research Report on The Survey on Corporate Governance, CSR and Personnel Strategy*, 2010.

ABSTRACT OF THE DISSERTATION

Essays on the Japanese Labor Market

by

Jess Diamond

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University of California, San Diego, 2011

Professor Takeo Hoshi, Chair

In studying the Japanese economic miracle that occurred after the devastation of World War II, many researchers focused on unique features of the Japanese labor market to explain the country's high and growing productivity. One of the most prominent of these features was *regular employment*, an arrangement characterized by the twin pillars of lifetime employment and seniority-based wages. At its core was the long-term employment relationship between a worker and his firm that provided heavy investment in the worker's human capital. Over time the Japanese labor market has undergone many changes, but one of the most important has been the rise and apparent decline of regular employment. In its wake a dual labor market has emerged, consisting of a regular employment sector reduced in size and a growing *non-standard* employment sector.

Chapter 1 investigates the impact of the dual labor market on workers' earnings. The

theory of human capital predicts that the greater investment in human capital of regular employees should raise the returns to regular employment above those to non-standard employment. This chapter investigates whether or not this is the case by building a model of how the dual labor market impacts incentives to invest in workers' human capital and how such investment affects workers' earnings. I then investigate whether or not this model is supported by the data. I find that tenure in regular employment is a more important factor in wage growth than previous work experience, regardless of whether that experience was in regular or non-standard employment. Not only are returns to tenure in regular employment greater than those to past regular and non-standard employment, by and large, there does not appear to be a difference between the returns to past experience in regular employment and past experience in non-standard employment. Furthermore, although tenure in regular employment is an important determinant of wage growth, tenure in non-standard employment is not.

Chapter 2 extends the investigation into the impact on workers of the dual labor market by investigating how workers' future employment opportunities are impacted by their employment histories. Specifically, this chapter uses a probability model to investigate in which sector of the dual labor market an individual worker will most likely be employed given his previous history of employment in the regular and non-standard employment sectors. Using this model, I also investigate how the dual labor market affects the employment opportunities of workers of different ages and how these effects have changed over time. My results suggest that starting one's career in non-standard rather than regular employment reduces one's probability of being in regular employment in the future. I also propose a dynamic unobserved effects model in order to separate the effect of unobserved individual heterogeneity from that of true state dependence and find that there is a large degree of state dependence even after controlling for individual heterogeneity so that people are likely to remain in the whichever employment sector they currently find themselves.

Among the most important changes that have occurred in Japanese corporate finance over the past 30 years has been the liberalization and internationalization of capital markets, leaving management less protected from the demands of shareholders. Chapter 3 shifts the focus of analysis from workers to firms and investigates whether or not the capital structure of firms affect their personnel strategies and employment policies. In particular, this chapter asks whether the importance of a particular stakeholder to a firm's financing affects which stakeholders the management of the firm prioritizes and how this affects the firm's views on lifetime employment and employee training. I find that the financial structure of the firm is correlated with which

stakeholders are regarded as important or influential by the firm. Similarly, I find longer average lengths of service at older firms and firms with lower rates of profitability. I also find that older firms and firms with lower rates of profitability are more likely to reconsider their policies on lifetime employment. Finally, I find that firms are less likely to report that they will support lifetime employment in the future the higher is the percentage of shares owned by either foreign shareholders or individual shareholders.

Chapter 1

Non-Standard Employment and Earnings in Japan

1.1 Introduction

Since the 1970s Japan's labor market has been experiencing a dramatic shift, transforming into what [Rebick(2005)] refers to as a *dual labor market*. This dual labor market is comprised, on the one hand, of a sector of highly stable employment in medium and large firms with employment security up until the age of mandatory retirement and, on the other hand, of a much less stable secondary sector of part-time workers, temporary contract workers and workers in small firms. Much of this latter group has come to be referred to as *non-standard workers*. Figures 1.1 and 1.2 track these changes in the structure of Japan's labor force since 1987¹. The graphs decompose workers into regular employees, non-standard employees, workers in family businesses and the self-employed. They show that for both men and women, non-standard employees are a growing segment of Japan's labor market and that the number of non-standard female employees already exceeds the number of regular female employees.

Although exact definitions differ slightly from survey to survey, generally speaking non-standard employment includes part-time workers, temporary contract workers, workers that are sent from employment agencies (and will be referred to as "dispatch workers") and workers who work on commission. Besides differences in working hours and job content between standard and non-standard positions, firms' incentives to investment in workers' skills may differ greatly too. Non-standard workers are usually not given the intense training that regular employees receive. Furthermore, laws that guarantee benefits such as health insurance to regular employees do not extend to other employees and, until the 2004 revision of Japan's Labor Standards Law and new court interpretations regarding dismissal of employees, rigid rules on lifetime employment meant that employers could not easily dismiss workers hired as regular employees [[Schaede(2008)]]. The emergence of such stark differences in work arrangements have contributed to public angst in Japan of a "society of disparities" (*kakusa shakai*)².

To understand the essential differences between regular and non-standard workers, it helps to look more closely at the essential characteristics of regular workers. These characteristics are based on the stylized version of Japan's intertwined systems of seniority-based wages and lifetime employment. Originating in the seminal work of [Abegglen(1958)], whose field study at manufacturing plants identified these seemingly uniquely Japanese peculiarities, economists applied the ideas of [Mincer(1958)] to propose that a worker would be more productive if he had

¹Source: Figure II-1 2007 Employment Status Survey (*Shugyo Kozo Kihon Chosa*)[of Internal Affairs and Communications(2007)]

²For a more detailed explanation of the differences between regular and non-standard employees see [Houseman and Osawa(1995)] and [Houseman and Osawa(1998)]

greater investment in his skill formation through on-the-job training, off-the-job training, or any other accumulation of human capital to analyze Japan's employment practices. Their reasoning recognized that in order for the firm to recoup the costs of higher investment in the worker's skills through higher productivity, it needed the worker to remain with the firm long enough to do so. One way that a firm could convince the worker to remain was to steepen the wage profile so that the worker would earn relatively little early in his career, although his wage would grow more quickly over time. Under this *seniority-based wage system* a worker would be reluctant to leave an employer as this would mean forfeiting the higher wages at the end of his career. Such an arrangement would, in essence, serve as bond posted by the worker along the lines of [Lazear(1979)]. A shrewd worker might reason that the firm would keep him only so long as his marginal productivity exceeded his wage and that as soon as his wage rate became too high, the firm would let him go. It was thus necessary that the firm commit to a system of lifetime employment by promising to employ the worker until retirement. This commitment could be enforced in the labor market through the firm's reputation for honoring its commitments. Thus was born the image of the Japanese worker who would be guaranteed employment with a firm until retirement and growing wages in exchange for his consent to be relocated, both among jobs and geographically, as the firm felt fit. In short, the firm asked for worker loyalty.

Economists began their empirical investigation of the systems of lifetime employment and seniority-based wages beginning with [Hashimoto and Raisian(1985)], who compared data on wages and job tenure from Japan and the United States to conclude that Japan was much closer to a lifetime employment system than the United States and that Japanese workers indeed faced a more steeply sloped wage-tenure profile than their American counterparts. [Kato(2001)] confirmed these results on tenure length. Using micro data from Japan and the United States, [Mincer and Higuchi(1988)] concluded that approximately two-thirds of the difference in worker turnover between the two countries could be explained by the difference in steepness of the respective wage profiles. They also assigned the difference in human capital formation between the two countries to the difference in economic growth and argue that labor policies at Japanese firms are designed to adapt to rapid technological change. Nevertheless, it should be noted that in a more recent study, [Ohtake(1998)] uses micro data from *The Basic Survey on Wage Structure* for Japan and from the *CPS* for the US to argue that the earnings-tenure profiles of the two countries converged during the 1980s. Focusing on the existence of seniority-based wages, the work of [Lazear(1979)] was applied to the Japanese employment system to argue that a policy of mandatory retirement implies that the firm must be paying its workers wages that exceed

their marginal productivity and hence would be consistent with the existence of seniority-based wages, while [Murakami(1991)] confirmed its widespread use by showing that a full 88% of firms with at least 30 employees in Japan have a policy of mandatory retirement.

Non-standard workers, in contrast to regular workers, are characterized primarily by the flexibility of their employment contracts. On the one hand, non-standard employment offers workers the opportunity of employment without the demanding time commitments and other responsibilities of regular employment positions. A survey by the Ministry of Health, Labor and Welfare ([MHLW(2006b)]) showed that approximately 69% of non-standard workers wanted to continue in their current type of employment, although, with the exception of the 15-19 year old cohort, that percentage increased with age. But these workers can be easily dismissed and the Survey on the Diversification of Employment³ ([MHLW(2008)]) shows that reduction of costs is consistently given as a principle, if not *the* principle, reason by firms for increasing non-standard employment.

Simply by the nature of their employment arrangements then, it can be seen that firms do not possess the same incentives to invest in the skill formation and human capital accumulation of their non-standard employees. The impact on human capital accumulation, and thus wages, of this difference in incentives is the central theme of this paper.

But what has caused the growth of non-standard employment in Japan? One explanation for the dramatic transformation of the labor market towards non-standard employment, offered by [Rebick(2005)], is that it has been driven mainly by a change in the industrial structure of Japan that began in the 1960s and that ignited the use of part-time workers starting with the energy crisis of the early 1970s. This phenomenon combined with greater female participation in the labor force to generate the growth in non-standard employment.

Another popular explanation, driven by an acceleration of the move towards non-standard employment in the 1990s, was that under the pressures of low demand and rising personnel costs in the 1990s, firms substituted expensive regular employees with cheaper part-time workers. [Genda(2000)] takes exception with this labor substitution argument and shows that, during the period 1991-2000, only 3%-6% of firms of at least 5 employees simultaneously increased the number of part-time workers and decreased the number of full-time workers. However, although small in number, these firms were responsible for 11%-20% of full-time jobs that were lost. Nevertheless, this observation ignores the fact that many firms may have partially substituted part-time employees for full-time employees by employing relatively more part-time workers

³The Japanese Ministry of Health, Labor and Welfare

while not reducing the number of full-time workers.

Finally, the early 2000s saw the Koizumi administration push to increase the flexibility of Japan's labor market and to clarify the relationship between firms and non-standard workers. Revised court interpretations of Japanese labor law aided the administration's drive for greater flexibility and these forces may have contributed towards an expansion of the non-standard sector.

It seems, then, that the development of Japan's dual labor market has been driven by different forces at different times. In the 1970s the source was a change in Japan's industrial structure and an increase in the participation of women in the workforce. In the 1990s, it was a method for firms to reduce costs in the face of a large negative demand shock. In the 2000s, it appears as though structural reforms in the labor market are driving the development of the dual labor market. Despite the differing underlying forces, a key observation is that the implication for the human capital accumulation of Japanese workers remains the same - the non-standard employment contract does not provide an incentive for the firm to invest in its workers' skills, while the regular employment contract does. This, in turn, is likely to have an impact on workers' future earnings and employment opportunities as well as firms' competitiveness.

The primary aim of this paper is to investigate the effect on workers' earnings of being employed in non-standard employment rather than regular employment. Using a Mincer wage regression framework, I ask whether it is indeed the case that earnings growth is driven primarily by the regular component of employment, which is meant to capture investment in human capital.

1.2 The Model

In order to think about how a dual labor market might impact earnings, I follow the approach of [Mincer(1974)] and derive a wage equation that allows for differences in investments in and returns to the different types of employment, such as regular and non-standard employment.

Let E_t represent a worker's potential earnings at time t . The model assumes that investment in training can be expressed as a proportion, k_t , of potential earnings. Furthermore, let ρ_t be the return to investments in training in period t . This leads to the following expression for potential earnings:

$$\begin{aligned}
E_{t+1} &= E_t + \rho_t k_t E_t \\
&= E_t(1 + \rho_t k_t)
\end{aligned} \tag{1.1}$$

Repeated substitution of the above expression yields

$$E_t = \prod_{j=0}^{t-1} (1 + \rho_j k_j) E_0 \tag{1.2}$$

By definition, $k_t = 1$ for all years of formal education and I assume that the return to investment in formal education is constant and equal to ρ_s for all years of formal schooling. After formal schooling, however, an individual may be engaged in regular or non-standard employment, with rates of return to those investments constant over time but differing depending on whether he is in regular or non-standard employment. Specifically,

$$\rho_t = \begin{cases} \rho_r & \text{if in regular employment} \\ \rho_n & \text{if in non-standard employment} \end{cases} \tag{1.3}$$

However, at this point it is important to consider where these returns come from. They come from the accumulation of the worker's human capital and, as discussed above, these skills can be either firm-specific or general. In the case of investment in firm-specific human capital, a worker will not be able to transfer those skills if he changes jobs. In the extreme case, investment in firm-specific skills are completely useless at any other firm and the return to the investment in previously acquired firm-specific human capital should be zero if the worker changes firms. This can be expressed as

$$\rho_n = \rho_g$$

$$\rho_r = \begin{cases} (1-f)\rho_g & \text{for past experience} \\ (1-f)\rho_g + f\rho_f & \text{for present job} \end{cases}$$

where ρ_g is the return to general human capital investment, ρ_f is the return to firm-specific human capital investment and f is the fraction of human capital investment that is specific to the firm. The return to tenure should thus combine the return to both firm-specific and general skills, while the return to previous work experience at other firms should correspond only to the return to general skills. In practice, workers receive both firm-specific and general training

to some degree, but the dual labor market assumes that the firm lacks the incentive to invest in the firm-specific human capital of a non-standard worker. However, the firm may very well still invest in the transferable general skills of the worker. In this case it is reasonable to assume that the return to non-standard employment will be similar even if the worker changes jobs. In contrast, the model assumes that the investment in the human capital of the regular worker is highly firm-specific and thus the rate of return to tenure should be higher than the return to either regular or non-standard work experience acquired elsewhere.

Taking logs of (1.2), one can write

$$\ln E_t = \ln E_0 + s \ln(1 + \rho_s) + \sum_{j \in Y_R} \ln(1 + \rho_r k_j) + \sum_{j \in Y_N} \ln(1 + \rho_n k_j) + \sum_{j=t-X}^{t-1} \ln(1 + \rho_z k_j) \quad (1.4)$$

where s is the number of years of formal schooling, Y_R is the set of years in which the individual worked in the regular employment sector, Y_N is the set of years in which the individual worked in the non-standard employment sector, X is the length of tenure and ρ_z is the return to the investment in human capital at the current job, which might be either regular or non-standard.

Rewriting equation 1.4 in terms of the returns to investment in general and firm-specific human capital produces

$$\begin{aligned} \ln E_t = & \ln E_0 + s \ln(1 + \rho_s) \\ & + \sum_{j \in Y_R} \ln(1 + (1 - f) \rho_g k_j) \\ & + \sum_{j \in Y_N} \ln(1 + \rho_g k_j) \\ & + \sum_{j=t-X}^{t-1} \ln(1 + [\rho_g + I_R f(\rho_f - \rho_g)] k_j) \end{aligned} \quad (1.5)$$

where I_R is a dummy variable that equals 1 if the individual is in regular employment and 0 if he is in non-standard employment. As long as ρ_s , ρ_g and ρ_f are small, we can approximate the above expression with

$$\ln E_t \approx \ln E_0 + \rho_s s + (1 - f) \rho_r \sum_{j \in Y_R} k_j + \rho_g \sum_{j \in Y_N} k_j + (\rho_g + I_R f[\rho_f - \rho_g]) \sum_{j=t-X}^{t-1} k_j \quad (1.6)$$

I thus divide an individual's total years of experience into years of experience in regular employment, years of experience in non-standard employment and years of experience in the

current job. At this point, I assume that post-school investment in training, k_t declines linearly over the working life of an individual in a particular employment status. In other words,

$$k_t = \begin{cases} \kappa_R(1 - \frac{x_R(t)}{T_R}) & \text{if in regular employment} \\ \kappa_N(1 - \frac{x_N(t)}{T_N}) & \text{if in non-standard employment} \\ \kappa_O(1 - \frac{x_O(t)}{T_O}) & \text{if in the current job} \end{cases} \quad (1.7)$$

where $x_R(t)$, $x_N(t)$ and $x_O(t)$ are the years of experience in regular employment, non-standard employment and the current job respectively at time t and T_R , T_N and T_O are the total amounts of time over the course of his life that a worker spends in regular employment, non-standard employment and the current job. Thus, an individual's total working life is equal to $T_R + T_N + T_O$. To avoid unnecessary notational complication, I omit the t from the experience variables above. It is also important to recognize that in reality f will change from job to job. In particular, f should increase with new jobs as it is unnecessary to invest in general skills that a worker has already accumulated in previous jobs. For simplicity, I ignore this and continue as though f remains constant (in which case it can be considered as an average f). Under these assumptions, potential earnings at time t can be expressed as

$$\begin{aligned} \ln E_t &\approx \ln E_0 + \rho_s s \\ &\quad + \rho_g(1-f)\kappa_R x_R \left(1 - \frac{1}{2T_R} - \frac{x_R}{2T_R}\right) \\ &\quad + \rho_g \kappa_N x_N \left(1 - \frac{1}{2T_N} - \frac{x_N}{2T_N}\right) \\ &\quad + (\rho_g + I_R f[\rho_f - \rho_g])\kappa_O x_O \left(1 - \frac{1}{2T_O} - \frac{x_O}{2T_O}\right) \\ &= A_1 x_R^2 + A_2 x_R + A_3 x_N^2 + A_4 x_N + A_5 x_O^2 + A_6 x_O \end{aligned} \quad (1.8)$$

where

$$\begin{aligned}
A_1 &= -\frac{(1-f)\rho_g\kappa_R}{2T_R} \\
A_2 &= (1-f)\rho_g\kappa_R\left(1-\frac{1}{2T_R}\right) \\
A_3 &= -\frac{\rho_g\kappa_N}{2T_N} \\
A_4 &= \rho_g\kappa_N\left(1-\frac{1}{2T_N}\right) \\
A_5 &= -\frac{(\rho_g + I_R f[\rho_f - \rho_g])\kappa_O}{2T_O} \\
A_6 &= (\rho_g + I_R f[\rho_f - \rho_g])\kappa_O\left(1-\frac{1}{2T_O}\right)
\end{aligned}$$

Observed earnings is equal to potential earnings minus the cost of investment in training, yielding

$$\begin{aligned}
\ln w_t &\approx \ln E_t - \kappa_O\left(1 - \frac{x_O}{T_O}\right) \\
&= A_1 x_R^2 + A_2 x_R + A_3 x_N^2 + A_4 x_N + A_5 x_O^2 + \tilde{A}_6 x_O + \tilde{A}_7
\end{aligned} \tag{1.9}$$

where $\tilde{A}_6$ and $\tilde{A}_7$ are as follows:

$$\begin{aligned}
\tilde{A}_6 &= A_6 + \frac{\kappa_O}{T_O} \\
\tilde{A}_7 &= -\kappa_O
\end{aligned}$$

1.3 The Data

This study uses the *Keio Household Panel Survey (KHPS)*, an annual micro-level survey that covers 4005 households. The geographical distribution of the sample is given in Table 1.1⁴.

The survey covers questions concerning employment, education, lifestyle, time allocation, health and living environment and includes topics such as the composition of the respondent's household, his income, expenditures, assets and housing. Also included in the first year that the survey was conducted is a retrospective panel based on questions about respondents' educational and occupational histories from the age of 15 until the day of the survey. This study uses only data from the first year of the survey, 2004.

⁴Shikoku, the most sparsely populated of Japan's 4 main islands, does not have any large cities by the standard of this survey.

Table 1.2 is a table of means of selected variables. The numbers in parentheses are standard deviations. The education variables (No High School, High School, Junior College and College) are dummy variables that take the value 1 if that is the highest level of education completed by an individual. The "Junior College" variable includes technical schools. "Married" is a dummy variable that takes a value of 1 if the individual is married. "Household Members" is the total number of people in the respondent's household, including the respondent and any members that are temporarily living outside of the home and "Health" is a measure that an individual assigns to his own health ranging from 1 (best) to 5 (worst).

Focusing on the columns for regular and non-standard workers, the table shows that regular workers are slightly younger, more highly educated, more likely to have had a regular job within a year of graduation and report slightly worse health than non-standard workers for both men and women. However, regular male employees are more likely to be married and have larger households than their non-standard counterparts, while the opposite is true for women.

While these statistics suggest that regular and non-standard workers differ significantly on observables, none of these variables besides the education variables would appear to have a significant impact on wages from the standpoint of the model.

While human capital accumulation is not directly observable, the dataset provides information on both on-the-job and off-the-job training that sheds light on the subject. Figure 1.3 divides workers into regular and non-standard subgroups and shows, for 4 cohorts of total work experience, what percentage of the workers in that subgroup received some sort of training at their workplace during the last year. Regardless of the experience cohort, more regular workers received such training than non-standard workers.

Figure 1.4 divides the sample into the same experience cohorts and asks the question, "what percentage of those who received training during the last year were regular and what percentage were non-standard employees?" It shows that, regardless of the experience cohort, most of the workers who received training at their workplace during the last year were regular employees. Furthermore, the concentration of training among regular workers over non-standard workers increases with experience. This pattern may, however, simply reflect the fact that there are more regular workers than non-standard workers.

One might also be interested in knowing how much training the different workers received rather than simply whether or not they received training. The survey provides data on how many months of training workers received and how many times a week on average they attended training during those months of training. I used these data to calculate the approximate

number of training sessions each worker attended during the last year and present the results graphically in figure 1.5⁵.

The model presented, which is based on the theory of human capital, suggests that the nature of employee training should be governed by the nature of the employment contract. In particular, the theory of human capital suggests that in the case of training in general skills, the benefits of such training can be transferred with the worker to another firm should the worker decide to do so and the costs of such training should be thus assumed largely by the worker. In the case of firm-specific training, the opposite is true as the skills acquired will largely be unusable by the worker at another firm and so the benefits fall largely on the firm. Thus, the firm should largely bear the costs of such training. To the degree that the nature of training can be determined, respondents of the survey were asked to express how transferable the training that they received was and also who bore the costs of their training. The results of these questions are summarized in figures 1.6 and 1.7.

Graph 1.6 shows that for both regular and non-standard employees, the firm is overwhelmingly the primary provider of funding for training. Comparing the 2 types of workers reveals that firms are a more important source of funding for training for non-standard workers than for regular workers and although regular workers are (marginally) more likely to fund their own training than non-standard workers, the main source of the difference is government funding, which appears to be directed primarily at workers in regular employment. Graph 1.7 suggests that the training received by regular workers consists of acquiring skills that are more general in nature while the non-standard workers' training was directed more at firm-specific skills. While this may appear to contradict the dual labor market model proposed here, we cannot draw such a conclusion at this point. The reason is that workers' human capital accumulation extends beyond the off-the-job training described above. It includes both off-the-job training and on-the-job training. It may be the case that the firm focuses its off-the-job training on general skills in order to compensate for on-the-job training that is very intensive in firm-specific skill formation.

As difficult as it is to measure the degree of skill formation and human capital accumulation from off-the-job training, the problem is even more severe for on-the-job training. But one indication of the degree of on-the-job human capital accumulation may be garnered from the amount of time needed in order to perform a job unassisted; that is, how long it takes a worker to

⁵I calculate this number using the formula: number of training sessions per year = number of training sessions per week $\times$ 4 $\times$ months of training. Because of the small sample size as the years of experience increases, I combine the last 2 cohorts.

accumulate enough skills to be able to perform her job properly. The survey attempts to tackle this issue by asking respondents how long it takes in order to become fully qualified (in the sense of not requiring any assistance) at their job. The results from this question are presented in figure 1.8. It shows that a greater proportion of regular workers claim that more time is necessary to become fully qualified in their jobs while a greater proportion of non-standard workers say that they are able to master their jobs in a relatively short period of time. More than 60% of non-standard workers require 6 months or less of training to masters their job, while less than 20% require more than 1 year. For regular workers the reverse is true; approximately 20% of them master their jobs in 6 months or less while more than 60% require more than a year to do so.

1.4 Estimating The Earnings Profiles

Using the retrospective panel data collected in 2004, the first year in which the survey was conducted, I calculate the total number of years of regular employment experience, non-standard employment experience and other employment experience for each individual. The retrospective panel allows for the respondent to indicate whether she was in school, in regular employment, in non-standard employment, self-employed, in a side job, in a family business or was searching for work at a particular age since the age of 15. Thus, it is not possible to know how many months an individual was in a particular employment status in a year in which she changed jobs. I assume that that an equal amount of time was spent in each employment state when an individual reported multiple states in a given year.

Equation 1.9 is the form of the Mincer earnings model that I will estimate. In particular, I specify the following earnings function:

$$\begin{aligned} \ln Y = & \alpha + \beta_1 x_R^2 + \beta_2 x_R + \beta_3 x_N^2 + \beta_4 x_N + \beta_5 x_P^2 + \beta_6 x_P \\ & + D * (\gamma_1 j_R + \gamma_2 j_R^2) + (1 - D) * (\gamma_3 j_N + \gamma_4 j_N^2) \\ & + \delta s + \lambda' X + \varepsilon \end{aligned} \quad (1.10)$$

where $\ln Y$ is the logarithm of daily earnings, including bonuses, in Yen, x_R is the number of years of *regular* employment experience before the current job, x_N is the number of years of *non-standard* work experience before the current job and x_P is the number of years of *other* employment experience. The linear and quadratic terms for other employment, which includes self-employment, employment in a family business or side jobs, are included in the estimating

equation in order to control for the possibility of human capital accumulated through on-the-job training outside of a firm. D is a dummy variable equal to 1 if the individual is currently engaged in regular employment and equal to 0 if the individual is currently engaged in non-standard employment. The variable j_R is the number of years of tenure in regular employment at the current firm, while j_N is the number of years of tenure in non-standard employment at the current firm. Finally s is a vector of dummy variables indicating an individual's highest level of education completed, X is a vector of other explanatory variables, and ε is the disturbance term.

I estimate the model on all male firm employees and all female firm employees in the dataset separately. I limit my sample to firm employees because the model of wage determination that I have specified would not appear to be a reasonable representation for workers outside of the firm, such as the self-employed or those in family businesses.

I present 4 versions of the model, each one including different explanatory variables. Model 1 is the baseline model and includes working experience, tenure and their squared terms, as well as the education dummy variables and a constant. Although the *KHPS* dataset does not provide actual years of schooling, it does provide information regarding the highest level of education attained. I use this information to create dummy variables indicating the highest level of education attained, with college being the highest possible level of education.

It may be the case that there are added benefits from working for a larger, more renowned firm. To investigate this, in addition to the variables included in model 1, I include in model 2 dummy variables indicating the size of the firm in which the individual was employed. Small firms are defined as those with fewer than 100 employees, medium firms are those between 100 and 500 employees and large firm have more than 500 employees. There is a separate dummy variable for workers in the public sector.

[Genda(1998)] suggests that a large amount of the variation in wages is due to the industry differences in wages. In model 3, I include industry dummy variables to control for this effect. Finally, model 4 controls for job type in addition to including the variables in model 3. Table 1.3 provides summary statistics of the variables used in the 4 versions of the wage equation.

Following studies on wage differentials in Japan such as [Hashimoto and Raisian(1985)], [Mincer and Higuchi(1988)] and [Ohtake(1998)], I first estimate the wage equation using OLS by combining regular and non-standard working experience into total experience. The results are reported in tables 1.4 and 1.5. For men, almost all the coefficients of interest are precisely estimated and they show that the returns to tenure are about twice those to experience. In contrast,

the coefficients for the female sample are not precisely estimated. This appears to be mainly due to the fact that the sample of approximately 400 women exhibits insufficient variation, making precise estimation difficult.

1.5 Sample Selection

Examining table 1.2, it appears that there are significant differences between those in regular employment and those in non-standard employment. Furthermore, the findings of [Fujiki et al.(2001)Fujiki, Nakada, and Tachibanaki] suggest that individual workers choose to enter regular or non-standard employment based on personal preferences. To correct for possible selection bias, I follow the approach taken by [Lee(1978)] and use a Heckman 2-step procedure to estimate a simultaneous equations model with a binary variable (regular employment). Specifically, I assume that an individual becomes a regular or non-standard employee based on his and the hiring firm's decisions. The worker faces 2 possible wage equations, one for regular employment and one for non-standard employment:

$$W_{Ri} = \phi_{R0} + \phi_{R1}V_i + \phi_{R2}Q_{Ri} + \eta_{Ri} \quad (1.11)$$

$$W_{Ni} = \phi_{N0} + \phi_{N1}V_i + \phi_{N2}Q_{Ni} + \eta_{Ni} \quad (1.12)$$

where W_{Ri} and W_{Ni} are the regular and non-standard wage rates for individual i , V_i is a vector of personal characteristics and Q_{Ri} and Q_{Ni} are characteristics of the industries of the regular and non-standard jobs respectively. Individual i will choose to work in regular rather than non-standard employment if

$$W_{Ri} - W_{Ni} > K_i$$

where

$$K_i = \pi_1 + \pi_2V_i + \pi_3Q_i + \varepsilon_i$$

This first stage can take the form of a probit model where the individual enters into regular employment if $I_i > 0$, where

$$I_i = \delta_0 + \delta_1(W_{Ri} - W_{Ni}) + \delta_3V_i + \delta_4Q_i + v_i$$

In order to estimate this first stage, which measures an individual's likelihood of being a regular employee based on observables, I include, in addition to the variables included in

the second stage wage regression, other variables which should have an impact on a worker's probability of entering into either regular or non-standard employment but are not included in the second stage wage regression. While this is not strictly necessary, doing this prevents the estimated coefficients in the wage regression from being identified solely due to the nonlinearity of the inverse Mills ratio. To this end, I include age, age squared, a dummy variable that takes the value of 1 if the individual is married and zero otherwise, and a union participation dummy variable in the first stage probit estimation.

1.6 Results

I split the sample into men and women and report the results of the estimated 2-stage wage equations for 2004 in tables 1.6 through 1.9. For men in regular employment, the coefficients on the regular and non-standard work experience terms, as well as those on the tenure terms, are precisely estimated and the results suggest that both types of experience have a positive impact on wage growth. One hypothesis of the model is that it is only the transferable element of past regular employment that should have an impact on current earnings and thus the return to tenure should be greater than the return to past regular employment. Since I cannot measure the intensity of firm-specific training (i.e. f in equation 1.6) the estimated coefficient is a scaled estimate of the return to investment in firm-specific human capital. Nevertheless, I can still test whether or not the returns to past regular employment are different from the returns to tenure. Using an F-test, I find that indeed the returns to tenure are greater than the returns to past regular employment. However, there is not a statistically significant difference between the coefficients on the regular experience and non-standard experience terms. Finally, although not statistically significant, the negative coefficient on the inverse Mills ratio indicates positive selection into regular employment for men, meaning that those for whom entering regular employment is the better option are doing so.

For non-standard men, the results show that the coefficients for past regular employment experience are precisely estimated and F-tests across models indicate that they are larger than those for past non-standard employment. However, from an F-test I cannot conclude that the coefficients on the tenure terms are different from those on the past non-standard experience terms.

For women in regular employment, the only coefficients of primary interests that are precisely estimated are those on tenure in models 1 and 2. Nevertheless, although F-tests across models cannot reject the hypothesis that the coefficients on past regular and past non-standard

work experience are the same or that the coefficients on tenure and past non-standard work experience are the same, there is a statistically significant difference between the coefficients on past regular employment and tenure in regular employment. These results suggest that for women in regular employment, returns to tenure are greater than returns to past employment experience, as the traditional model of regular employment would suggest. The absence of such a difference between tenure and past non-standard employment appears to be driven largely by the imprecision of the estimated coefficients on the non-standard experience variables.

Similarly for the non-standard female employees, almost none of the experience or tenure variables of interest are precisely estimated. F-tests across models suggest that while there may be no difference between returns to past regular and past non-standard work experience, or between returns to tenure and past non-standard work experience, the returns to past regular work experience do appear to be higher than those to tenure in non-standard employment.

Comparing men and women in regular employment, the point estimates suggest that men enjoy higher returns to both past regular experience and tenure, while the returns to past non-standard work experience are similar. Similarly, comparing men and women in non-standard employment, the point estimates suggest that the returns to past regular employment are higher for men, the returns to past non-standard employment are higher for women, and the returns to tenure in non-standard employment are about the same.

What conclusions can be drawn from these results? Firstly, the returns to tenure in regular employment are generally higher than the returns to past regular employment experience and this is consistent with the model of regular employment that allows for investment in both firm-specific and transferable skills and the data that suggest that regular employees receive more investment in their human capital.

Secondly, returns to past regular and past non-standard employment appear to be about the same except for men in non-standard employment, who appear to enjoy higher returns from past regular employment experience. One interpretation is that, since only the transferable element of skills acquired through past regular employment experience matter for the current job, the actual amounts of transferable skills accumulated are similar between regular and non-standard employment.

Thirdly, there does not appear to be a difference between the returns to past non-standard employment experience and tenure in non-standard employment. This, too, is consistent with a model of non-standard employment where the investment in these workers' human capital is largely transferable so that returns in past and present jobs should be very similar.

Finally, the point estimates suggest that regular employment is more important to wage growth than non-standard employment, even after controlling for self-selection. This is important as it suggests that it is not simply the case that the underlying causes of lower wages in the non-standard sector are due to less able or less educated workers dominating this sector (although that does seem to be the case). These results suggest that all workers benefit more from regular employment than non-standard employment.

The imprecise estimates for the female sample make it particularly difficult to draw conclusions, but they do not contradict the conclusions drawn from the results on the male sample. Considering the role of women in the Japanese workforce, it is not inconceivable that the model of this paper is not an accurate description of wage formation for women. That is, it may be the case that *regular* employment means different things when applied to men and women. In fact, looking only at regular employees with college degrees, men have, on average, significantly more regular working experience, less non-standard working experience and longer tenure than their female counterparts and these differences increase with age. Such a result is consistent with the observed "U" shape of female labor force participation in Japan. A theory of wage determination should explicitly take this pattern of labor force participation into account when considering the firm's decision to invest in female workers' human capital accumulation or not.

1.7 Conclusion

This study provides an initial exploration into the impact of regular and non-standard employment contracts on wages in Japan using the Keio Household Panel Dataset. My results suggest that not only are the workers in regular and non-standard employment very different, but that the investment in their human capital formation through on-the-job training (OJT) and off-the-job training (Off-JT) is also very different. This, in turn, suggests that the incentives for firms to invest in the skill formation of their workers is linked to the nature of the employment relationship, with workers who are expected to stay with the firm for a long time being given jobs that require longer to master and are supported with higher levels of investment in training.

Using Mincer wage regressions, I showed that tenure in regular employment is a more important factor in wage growth than previous work experience, regardless of whether that experience was in regular or non-standard employment. Not only are returns to tenure in regular employment greater than those to past regular and non-standard employment, by and large, there does not appear to be a difference between the returns to past experience in regular employment and past experience in non-standard employment. Furthermore, although tenure in regular em-

ployment is an important determinant of wage growth, tenure in non-standard employment is not. I do not find any differences between the returns to past non-standard experience and tenure in non-standard employment. These results suggest that regular employment contributes more to wage growth than non-standard employment. My model suggests that the underlying driver of the disparity is differences in and returns to investment in human capital which, in turn, depend on the nature of employment contracts between workers and firms. This should be considered in deliberations on effective reforms to the Japanese labor market.

1.8 Figures

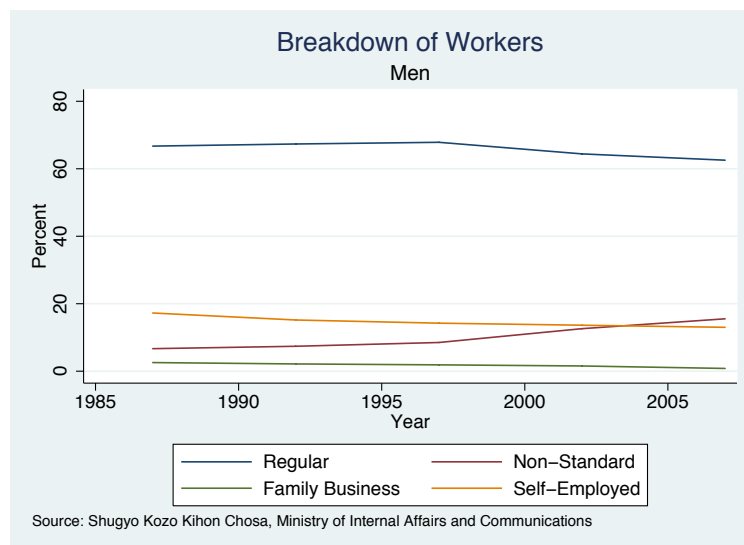


Figure 1.1: Male Labor Force: 1987-2007

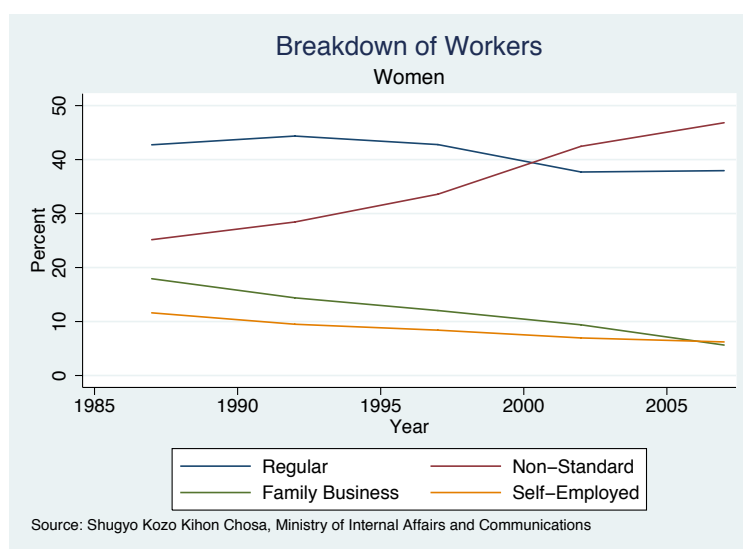


Figure 1.2: Female Labor Force: 1987-2007

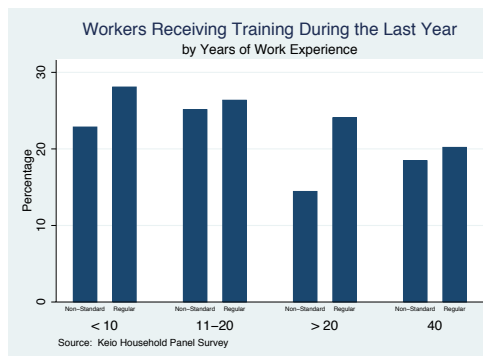


Figure 1.3: What Percentage of Workers Received Training During the Last Year

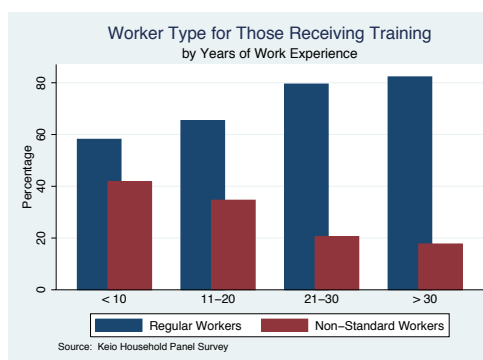


Figure 1.4: Distribution of Worker Type for Those Who Received Training

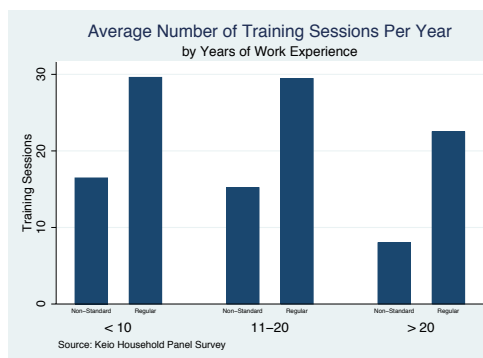


Figure 1.5: Amount of Training During the Last Year

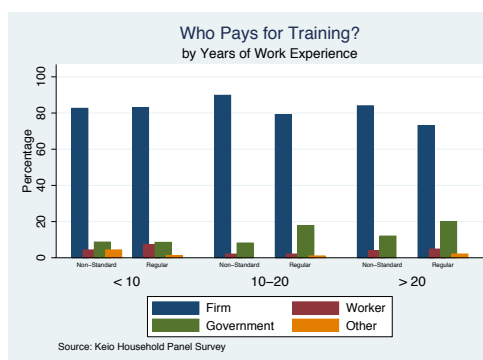


Figure 1.6: Source of Funding for Training Received During the Last Year

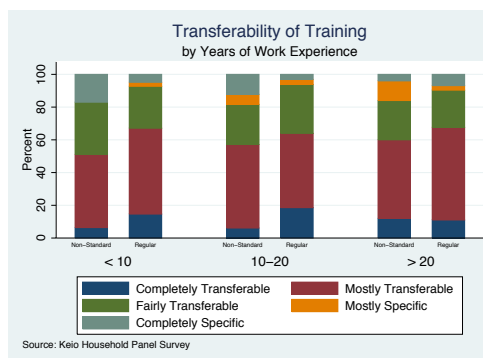


Figure 1.7: Transferability of Training Received During the Last Year

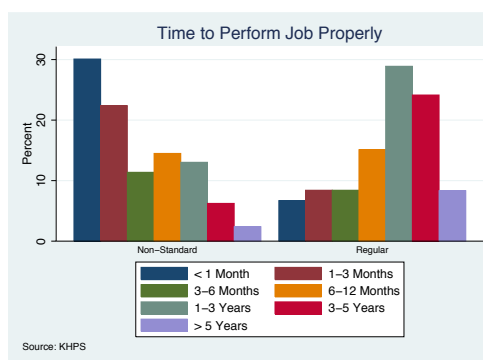


Figure 1.8: Amount of Time to Become Fully Qualified at Current Job

1.9 Tables

Table 1.1: Geographical Distribution of Households Surveyed

	14 Large Cities	Other Cities	Villages	Total
Hokkaido	61	80	38	179
Tohoku	32	162	101	295
Kanto	498	693	146	1337
Chubu	69	476	181	726
Kinki	174	404	81	659
Chugoku	36	142	55	233
Shikoku	0	83	42	125
Kyushu	75	235	136	446
Total	945	2275	780	4000

Table 1.2: Table of Means of Selected Variables

	Men				Women			
	Regular	Non-Standard	Unemployed	Out of Labor Force	Regular	Non-Standard	Unemployed	Out of Labor Force
Age	43.14 (11.26)	45.59 (17.53)	48.86 (14.81)	57.17 (15.27)	40.42 (12.36)	42.35 (12.46)	43.03 (13.58)	48.89 (14.65)
No High School	0.07 (0.25)	0.2 (0.40)	0.31 (0.47)	0.23 (0.42)	0.05 (0.21)	0.1 (0.30)	0.17 (0.38)	0.17 (0.38)
High School	0.44 (0.5)	0.35 (0.48)	0.48 (0.50)	0.38 (0.49)	0.48 (0.50)	0.59 (0.49)	0.62 (0.49)	0.52 (0.50)
Junior College	0.06 (0.24)	0.05 (0.22)	0.02 (0.12)	0.04 (0.20)	0.27 (0.45)	0.17 (0.38)	0.15 (0.36)	0.19 (0.39)
College	0.38 (0.49)	0.18 (0.38)	0.09 (0.29)	0.21 (0.41)	0.18 (0.39)	0.1 (0.30)	0.04 (0.20)	0.09 (0.28)
Regular Employee After Graduation	0.85 (0.36)	0.58 (0.50)	0.66 (0.48)	0.63 (0.48)	0.83 (0.37)	0.76 (0.43)	0.69 (0.47)	0.72 (0.45)
Married	0.78 (0.41)	0.51 (0.50)	0.56 (0.50)	0.68 (0.47)	0.5 (0.50)	0.68 (0.47)	0.6 (0.50)	0.84 (0.37)
Household Members	3.79 (1.48)	3.26 (1.55)	3.44 (1.57)	3.17 (1.49)	3.74 (1.72)	3.97 (1.43)	3.44 (1.45)	3.55 (1.51)
Health	1.85 (1.00)	1.78 (0.97)	2.14 (1.16)	2.32 (1.31)	1.96 (1.00)	1.9 (0.98)	2.17 (1.04)	2.12 (1.11)
Observations	1071	189	66	230	340	496	52	753

Table 1.3: Summary Statistics of Selected Variables used in Wage Equation

	Men				Women			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Age	41.08	10.78	19.95	59.99	40.09	11.13	20.01	59.99
Regular Experience	19.27	11.55	0.00	43.00	10.15	8.54	0.00	39.00
Non-Standard Experience	0.80	2.60	0.00	36.00	4.54	5.83	0.00	30.00
Tenure	12.93	11.19	0.00	43.83	6.50	7.38	0.00	39.83
Schooling	13.60	2.27	8.00	18.00	12.99	1.74	9.00	18.00
Married	0.72	0.48	0	1	0.63	0.48	0	1
Regular Employee After Graduation	0.81	0.39	0	1	0.81	0.40	0	1
Changed Job Last Year	0.09	0.28	0	1	0.19	0.40	0	1
Dependents	0.74	0.44	0	1	0.12	0.33	0	1
Small Firm	0.39	0.49	0	1	0.49	0.50	0	1
Medium Firm	0.21	0.41	0	1	0.22	0.41	0	1
Large Firm	0.29	0.46	0	1	0.21	0.41	0	1
Government	0.10	0.30	0	1	0.07	0.25	0	1
Observations	856				561			

Table 1.4: OLS of Earnings Using Combined Experience and Tenure - Men

	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Experience	.015 (.006)**	.020 (.005)**	.021 (.006)**	.020 (.006)**
Experience ²	-.0003 (.0002)	-.0004 (.0002)	-.0004 (.0002)*	-.0004 (.0002)
Tenure	.044 (.005)**	.043 (.005)**	.042 (.005)**	.041 (.005)**
Tenure ²	-.0003 (.0001)*	-.0004 (.0001)**	-.0004 (.0001)**	-.0004 (.0001)**
High School	.182 (.076)*	.162 (.074)*	.167 (.075)*	.141 (.075)
Junior College	.315 (.083)**	.298 (.080)**	.308 (.082)**	.240 (.083)**
College	.531 (.081)**	.469 (.078)**	.478 (.079)**	.388 (.083)**
Medium Firm		.112 (.044)*	.101 (.045)*	.111 (.044)*
Large Firm		.268 (.039)**	.257 (.040)**	.269 (.040)**
Government		.328 (.048)**	.310 (.072)**	.296 (.069)**
Const.	6.657 (.091)**	6.548 (.090)**	6.549 (.093)**	6.568 (.101)**
Industry Dummies	No	No	Yes	Yes
Occupation Dummies	No	No	No	Yes
Obs.	707	707	692	686
RMSE	.412	.396	.398	.391

***p < 0.001

**p < 0.01

*p < 0.05

Table 1.5: OLS of Earnings Using Combined Experience and Tenure - Women

	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Experience	-.007 (.007)	-.006 (.007)	-.006 (.007)	-.002 (.007)
Experience ²	.0001 (.0002)	.0001 (.0002)	.00007 (.0002)	-.00006 (.0002)
Tenure	.006 (.009)	.006 (.009)	.004 (.009)	.004 (.008)
Tenure ²	.0009 (.0003)**	.0009 (.0003)**	.0009 (.0003)**	.0008 (.0003)**
High School	.229 (.086)**	.232 (.085)**	.251 (.074)**	.200 (.077)**
Junior College	.410 (.098)**	.395 (.097)**	.357 (.086)**	.232 (.089)**
College	.528 (.098)**	.537 (.099)**	.501 (.090)**	.340 (.093)**
Medium Firm		.093 (.063)	.097 (.062)	.091 (.061)
Large Firm		.012 (.051)	.074 (.052)	.090 (.050)
Government		-.002 (.075)	.038 (.081)	-.079 (.082)
Const.	6.649 (.115)**	6.619 (.117)**	6.662 (.113)**	6.740 (.114)**
Industry Dummies	No	No	Yes	Yes
Occupation Dummies	No	No	No	Yes
Obs.	442	435	431	429
RMSE	.482	.479	.465	.441

***p < 0.001

**p < 0.01

*p < 0.05

Table 1.6: 2-Step Wage Regressions for Regular Men

	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Regular Experience	.013 (.005)*	.017 (.005)**	.019 (.005)**	.016 (.005)**
Regular Experience ²	-.0002 (.0002)	-.0002 (.0002)	-.0003 (.0002)	-.0002 (.0002)
Non-Standard Experience	.039 (.023)	.047 (.022)*	.043 (.022)*	.046 (.021)*
Non-Standard Experience ²	-.003 (.002)	-.003 (.002)*	-.003 (.002)	-.003 (.002)
Other Experience	.006 (.022)	.020 (.022)	.019 (.022)	.019 (.022)
Other Experience ²	.0002 (.001)	-.0004 (.001)	-.0002 (.001)	-.00005 (.001)
Tenure	.040 (.006)**	.039 (.005)**	.037 (.006)**	.035 (.005)**
Tenure ²	-.0003 (.0002)	-.0003 (.0001)*	-.0003 (.0001)	-.0003 (.0001)
High School	.152 (.072)*	.147 (.069)*	.149 (.069)*	.124 (.068)
Junior College	.300 (.091)**	.297 (.087)**	.304 (.088)**	.232 (.088)**
College	.483 (.075)**	.433 (.072)**	.439 (.073)**	.346 (.075)**
Medium Firm		.120 (.041)**	.105 (.042)*	.118 (.041)**
Large Firm		.285 (.039)**	.271 (.040)**	.284 (.039)**
Government		.334 (.056)**	.278 (.087)**	.268 (.085)**
Inverse Mills Ratio	-.199 (.139)	-.250 (.130)	-.244 (.136)	-.272 (.132)*
Const.	6.723 (.090)**	6.603 (.088)**	6.596 (.089)**	6.628 (.092)**
Industry Dummies	No	No	Yes	Yes
Occupation Dummies	No	No	No	Yes
Obs.	704	704	690	684
χ^2 statistic	434.233	541.406	539.892	588.938
Degrees of Freedom	22	28	36	41

***p < 0.001

**p < 0.01

*p < 0.05

Table 1.7: 2-Step Wage Regressions for Non-Standard Men

	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Regular Experience	.094 (.036)**	.065 (.036)	.118 (.023)**	.122 (.029)**
Regular Experience ²	-.003 (.001)**	-.002 (.001)*	-.004 (.0007)**	-.004 (.0009)**
Non-Standard Experience	-.235 (.150)	.083 (.177)	-.044 (.125)	-.019 (.154)
Non-Standard Experience ²	.019 (.016)	-.015 (.019)	-.002 (.013)	-.002 (.015)
Other Experience	.139 (.182)	-.132 (.202)	-.117 (.128)	-.076 (.132)
Other Experience ²	-.006 (.009)	.008 (.010)	.006 (.006)	.004 (.007)
Tenure	-.025 (.084)	.007 (.078)	-.035 (.055)	-.031 (.060)
Tenure ²	.003 (.004)	.002 (.004)	.002 (.002)	.002 (.003)
High School	.442 (.274)	.541 (.247)*	.725 (.169)**	.606 (.199)**
Junior College	.582 (.404)	.775 (.368)*	.677 (.299)*	.553 (.331)
College	1.189 (.267)**	.987 (.255)**	1.176 (.190)**	1.097 (.235)**
Medium Firm		-.116 (.230)	-.410 (.195)*	-.633 (.236)**
Large Firm		.292 (.222)	.027 (.155)	.029 (.175)
Government		1.198 (.355)**	1.241 (.251)**	1.025 (.328)**
Inverse Mills Ratio	-.253 (.302)	.329 (.334)	.059 (.243)	.107 (.295)
Const.	6.648 (.489)**	5.946 (.521)**	6.722 (.378)**	6.652 (.433)**
Industry Dummies	No	No	Yes	Yes
Occupation Dummies	No	No	No	Yes
Obs.	704	704	690	684
χ^2 statistic	61.544	90.14	215.324	226.445
Degrees of Freedom	22	28	36	40

***p < 0.001

**p < 0.01

*p < 0.05

Table 1.8: 2-Step Wage Regressions for Regular Women

	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Regular Experience	.0009 (.014)	.003 (.014)	-.001 (.014)	-.004 (.013)
Regular Experience ²	.0003 (.0006)	.0003 (.0006)	.0003 (.0006)	.0003 (.0006)
Non-Standard Experience	.029 (.031)	.034 (.031)	.047 (.031)	.046 (.030)
Non-Standard Experience ²	-.005 (.003)	-.005 (.003)	-.006 (.003)	-.005 (.003)
Other Experience	-.010 (.022)	-.012 (.021)	-.005 (.021)	-.007 (.020)
Other Experience ²	.0006 (.001)	.0007 (.001)	.0002 (.001)	.0004 (.001)
Tenure	.025 (.012)*	.025 (.012)*	.018 (.012)	.019 (.011)
Tenure ²	.0002 (.0004)	.0002 (.0004)	.0003 (.0004)	.0003 (.0004)
High School	.253 (.188)	.214 (.188)	.313 (.188)	.116 (.186)
Junior College	.412 (.194)*	.362 (.195)	.385 (.191)*	.150 (.189)
College	.545 (.196)**	.478 (.198)*	.523 (.194)**	.252 (.195)
Medium Firm		.041 (.074)	.029 (.073)	.009 (.069)
Large Firm		.108 (.078)	.157 (.079)*	.160 (.075)*
Government		.160 (.104)	.138 (.116)	.050 (.111)
Inverse Mills Ratio	.298 (.095)**	.293 (.095)**	.206 (.098)*	.160 (.094)
Const.	6.574 (.208)**	6.573 (.207)**	6.553 (.213)**	6.777 (.209)**
Industry Dummies	No	No	Yes	Yes
Occupation Dummies	No	No	No	Yes
Obs.	432	432	428	426
χ^2 statistic	168.384	174.646	176.419	198.881
Degrees of Freedom	22	28	36	41

***p < 0.001

**p < 0.01

*p < 0.05

Table 1.9: 2-Step Wage Regressions for Non-Standard Women

	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Regular Experience	-.011 (.016)	-.010 (.016)	-.011 (.016)	-.012 (.015)
Regular Experience ²	.00003 (.0008)	-.00003 (.0008)	.00009 (.0008)	.00006 (.0007)
Non-Standard Experience	.021 (.018)	.018 (.018)	.015 (.017)	.020 (.017)
Non-Standard Experience ²	-.001 (.0009)	-.001 (.0009)	-.0008 (.0008)	-.001 (.0008)
Other Experience	-.017 (.027)	-.019 (.026)	-.028 (.026)	-.028 (.025)
Other Experience ²	.0003 (.002)	.0005 (.002)	.0009 (.002)	.001 (.002)
Tenure	-.038 (.024)	-.041 (.023)	-.035 (.023)	-.028 (.022)
Tenure ²	.003 (.001)*	.003 (.001)*	.003 (.001)*	.002 (.001)
High School	.141 (.166)	.135 (.164)	.171 (.160)	.129 (.154)
Junior College	.258 (.181)	.238 (.179)	.237 (.174)	.110 (.169)
College	.389 (.182)*	.405 (.179)*	.378 (.175)*	.221 (.170)
Medium Firm		.179 (.086)*	.193 (.084)*	.176 (.080)*
Large Firm		.008 (.082)	.074 (.083)	.116 (.081)
Government		-.138 (.147)	-.170 (.190)	-.256 (.182)
Inverse Mills Ratio	.170 (.146)	.153 (.145)	.103 (.151)	.276 (.149)
Const.	6.739 (.187)**	6.733 (.188)**	6.739 (.212)**	6.793 (.204)**
Industry Dummies	No	No	Yes	Yes
Occupation Dummies	No	No	No	Yes
Obs.	430	430	426	424
χ^2 statistic	103.014	111.626	119.299	140.249
Degrees of Freedom	22	28	36	40

***p < 0.001

**p < 0.01

*p < 0.05

Chapter 2

Employment Status Persistence in the Japanese Labor Market

2.1 Introduction

In an attempt to balance the delicate tasks of protecting their citizens from the harsh uncertainties of the business cycle and harnessing the productive possibilities of workers and the firms that hire them, countries around the world have been experimenting with regulation in their labor markets with varying degrees of success. What has emerged in many of these countries is a dual labor market, consisting of a primary sector of stable long-term employment and a much less stable secondary sector of "non-standard" workers. While the composition of non-standard workers varies from country to country due to differences in regulations and definitions, it consists largely of part-time workers and workers on temporary employment contracts. Because of differences in the definition of non-standard employment, cross-country comparisons are difficult to make. However, figures 2.1 and 2.2 use common definitions to compare the importance of part-time and temporary employment across a group of OECD countries, many of whose labor markets have been the source of much attention for policymakers¹. These graphs show that not only is the secondary sector growing in many countries, but that it already accounts for a large part of these countries' workforces. Part-time workers constitute at least 10% of the labor market for most countries in figure 2.1 and in some cases exceed 20%. The picture for temporary employment is starker. Temporary employment accounts for more than 40% of all employment in almost all the countries in figure 2.2.

This study focuses on the particular case of Japan, whose labor market has been experiencing a dramatic transformation since at least the 1970s into a dual labor market that is comprised, on the one hand, of a sector of highly stable employment in medium and large firms with employment security up until the age of mandatory retirement and, on the other hand, of a much less stable secondary sector of part-time workers, temporary contract workers and workers in small firms. This latter group has come to be referred to as *non-standard workers*. Japan's dual labor market has been growing steadily over the last 30 years and by the early 2000s the number of women in non-standard employment exceeded the number of women in regular employment².

One important question is whether it is the same individuals who remain in either the primary sector or secondary sector year after year or different individuals moving between the 2 sectors. The first case would imply a high level of persistence within the 2 sectors of the dual labor market, while the alternative would suggest a high degree of mobility. If it is indeed the case that there is persistence within sectors of the labor market, it becomes important to investigate

¹The OECD defines part-time workers as those who work less than "30-usual weekly hours of work in the main job" and temporary employment "based on the type of work contract of their main job."

²Source: Figure II-1 2007 Employment Status Survey (*Shugyo Kozo Kihon Chosa*)

the causes of the persistence and to consider the implications, not only for the individual, but also for the macroeconomy. A consideration of these causes and effects should inform government policy.

This study uses an individual-level retrospective panel dataset to investigate the employment opportunities of workers in Japan's dual labor market. In particular, it aims to estimate the probability that a worker will be in either the primary sector of regular employees or in the secondary sector of non-standard employees conditional on her employment and educational histories. My results suggest that starting one's career in non-standard rather than regular employment reduces one's probability of being in regular employment in the future. I also propose a dynamic unobserved effects model in order to separate the effect of unobserved individual heterogeneity from that of true state dependence and find that there is a large degree of state dependence even after controlling for individual heterogeneity so that people are likely to remain in the whichever employment sector they currently find themselves.

The paper is organized as follows: In section 2.2 I provide an overview of Japan's dual labor market and highlight some of the relevant literature in this area. I also try to position the research on dual labor markets within the context of research on the Japanese economy in general. Section 2.3 describes the data used in this study. The description draws largely on a more detailed exploration of the data that I performed in chapter 1. I focus on variables relating to on-the-job and off-the-job training and summarize the variables of interest for the estimation.

Section 2.4 introduces a model to estimate the long-term effects of starting one's career in either the regular or non-standard employment sector. Section 2.5 extends the analysis to a dynamic setting using a linear panel data model and introduces a non-linear probability model to capture the magnitude of the dynamic effect. The particular challenges for my model are controlling for unobserved heterogeneity for non-linear models when using a panel dataset and allowing for a dynamic effect of the dependent variable. Section 2.6 presents the results of the estimation and section 2.7 discusses the results. Finally, section 2.8 concludes.

2.2 Japan's Dual Labor Market

[Rebick(2005)] traces the emergence of Japan's dual labor market to the 1970s and the increased participation of women in the workforce. He argues, furthermore, that the fundamental structure of today's primary sector, consisting of *regular* employees in Japan, was established long before the economic slowdown of the 1990s and has not undergone significant changes since then. The greatest changes have occurred in the secondary sector (or *non-standard* sector as

it is known in Japan), consisting of part-time and temporary contract workers, workers who work on commission, and workers who are sent to firms from employment agencies (also referred to as "dispatch workers"). Previously, the labor market's dualism focused on the differences between employment in larger firms and their subsidiaries. But, over time, the nature of this dualism shifted to one centered on the differences in employment within the firm as Japan's industrial structure shifted from one based heavily on manufacturing to one in which services play a more prominent role and the small business sector has shrunk.

This study focuses on the long-term implications for employment opportunities for workers in the dual labor market. There are 2 main lines of thought on the prospects of the dual labor market.

There is a growing body of literature, including work by [Ariga and Okazawa(2011)] and [Caballero et al.(2008)Caballero, Hoshi, and Kashyap], suggesting that greater labor mobility allows firms to improve productivity through restructuring and that decreasing labor mobility has a negative effect on TFP growth. The implication for a dual labor market is that a flexible secondary sector with higher labor mobility allows the economy to shift labor resources from firms and industries that are in decline to those that are expanding. This should improve the productive capacity of the economy and expand employment opportunities.

On the other hand, the theory of human capital suggests that workers develop their skills and accumulate human capital through education and work experience and thereby increase their productivity. This implies that the productivity of the worker depends not only on the length of time spent working, but also, and perhaps more importantly, on the nature of the work in which he is engaged, so that the same amount of time spent on a menial task or on a task exposing the worker to new and advanced skills with which he is unfamiliar should result in different amounts of human capital accumulated. Thus, the longer an individual spends working and the more exposed he is to training and human-capital-accumulating tasks, the more productive he will be and the more productive a firm of such workers will be. This second line of thought has a specific implication for Japan because regular workers are synonymous with workers with lifetime employment³. If it is indeed true that regular workers accumulate greater amounts of human capital, then time spent in non-standard employment should result in lower human capital accumulation and thus potentially lower earnings and more limited employment opportunities for workers in the future. In chapter 1 I investigated the earnings of regular and non-standard workers and found evidence supporting the idea that regular employees receive greater investment in their human

³For a more detailed explanation of the relationship between lifetime employment and human capital accumulation, please refer to [?].

capital than non-standard employees.

In the context of a dual labor market, the rationale for the existence of the systems of lifetime employment and seniority-based wages that are used to characterize the Japanese employment system would suggest that simply by the nature of their employment arrangements, firms do not possess the same incentives to invest in the skill formation and human capital accumulation of their non-standard employees as they do for their regular workers. Or rather, if a firm wanted to invest in a worker's skill formation and human capital accumulation, it would hire the worker as a regular employee and not as a non-standard employee. [Kambayashi and Kato(2009)] found that although lifetime employment is still very much a central fixture of Japan's labor market, the stability of employment for regular workers started to wane as Japan's recession continued.

There are certainly supply-side factors driving the growth in non-standard employment. One possibility is that workers choose non-standard employment over regular employment despite the lower wages because it affords them a better work-life balance. A 2006 survey by the Ministry of Health, Labour and Welfare ([MHLW(2006b)]) showed that approximately 50.3% of part-time workers, but only 17% of other non-standard workers, were in non-standard employment because the working hours were convenient, while 23.8% of part-time workers and 44.2% of other non-standard workers said that they were in non-standard employment because they were unable to find regular employment. Another reason workers may choose non-standard employment is the tax code. As [Abe and Ohtake(1995)] show, the distribution of annual income of part-time workers is clustered around the level of minimum taxable income for secondary household earners. [Houseman and Osawa(1995)] take this to suggest that women are choosing to work part-time in order to avoid paying income tax while still being able to retain their "dependent" status, making them eligible for government pension benefits and health coverage under their spouses' medical insurance plans as well as allowing their husbands to receive a special dependent deduction from taxable income.

During the 1990s much attention focused on the diminishing job security of middle-aged and older workers, but [Genda(2000)] asked "who really lost jobs in Japan during the 1990s?" and showed that the decline in labor demand fell largely on the young. With this in mind, the question of persistence in the labor market takes on an added importance. What are the implications for individuals who enter a labor market with high state dependence when the economy is hit with a negative shock? Are they doomed to jobs with low investment in human capital, low earnings and low job security?

2.3 The Data

The data in this study come from the *Keio Household Panel Survey (KHPS)*, an annual micro-level survey that covers 4005 households that was first conducted in 2004⁴. The KHPS covers general topics including employment, education, lifestyle, time allocation, health and living environment as well as more detailed subjects such as the composition of the respondent's household, his income, expenditures, assets and housing. In addition, a retrospective summary of individuals' employment histories was collected. Respondents were asked to fill out a table indicating, in each year since the age of 15, whether they were in school, searching for a job, or employed in regular employment, non-standard employment, self-employment, worked in a family business or had a side job. A graphical representation of the actual questionnaire that was used for the retrospective panel is provided in figure 2.3. Using these employment data along with data on education, I constructed an unbalanced panel of individuals' employment and educational histories.

To summarize one of the main features of the retrospective data up until 2003, tables 2.1 and 2.2 show the distribution of transitions among employment sectors using the pooled data. They suggest a high degree of persistence within employment sectors. Focusing on the 2 sectors of regular and non-standard employment, the tables suggest a smaller difference between the persistence of regular and non-standard employment for women compared to men. Table 2.2 also shows a larger incidence of being out of the labor force than being in regular employment in a year following non-standard employment for women. For both men and women, there is a larger incidence of regular employment than non-standard employment in a year following both a year of unemployment and a year of being out of the labor force with no work at all.

If one believes that the underlying dynamics governing the transition of workers among employment sectors is stable over time, then it is natural to ask what the stationary distribution implied by the transition matrix is. Table 2.3 presents the actual distribution across employment sectors for men in 1970 and 2003, as well as the stationary distribution of men across employment sectors using all the available data and also using data only from 1990 onwards. Table 2.4 presents the results for women.

For men, the implied stationary distribution implies that regular employment may or may not have overshoot its equilibrium value, depending on whether all the data or only the data from 1990 onwards are used. It appears that non-standard employment has overshoot its equilibrium value and will decrease in time, while there will be a large increase in other employment,

⁴For a more detailed description of the dataset, please refer to section 1.3 in the previous chapter .

which includes self-employment, family businesses and side jobs.

For women, it appears as though regular employment will increase in time while non-standard employment will decrease as a proportion of the population. More women will continue to enter the labor force and the proportion of women in other employment will increase too.

One may wonder how many people are in each employment sector and how much time on average people spend in each sector. Table 2.5 provides a description of some general patterns. "Regular Employment" is a dummy variable that takes a value of 1 if the individual was in regular employment at the time of the survey and 0 otherwise. Similarly, "Non-Standard Employment" is a dummy variable that takes a value of 1 if the individual was in non-standard employment at the time of the survey and 0 otherwise. In the sample, 54% of men were in regular employment and 10% were in non-standard employment, For women, 17% were in regular employment and 25% were in non-standard employment. "Regular Employment Experience" reports the mean and standard deviation of years of regular employment experience in the sample and "Non-Standard Experience" does the same for non-standard employment experience. "Ever Been in Non-Standard Employment" is a dummy variable that takes a value of 1 if an individual has ever been in non-standard employment and "Conditional Non-Standard Employment Experience" reports the mean and standard deviation of number of years spent in non-standard employment for the subsample of individuals who have spent any time at all in non-standard employment. The results show that 21% of men have spent some time in non-standard employment in their lives while more than half of the women have. Although, on average, men have spent less than a year in non-standard employment in their lives (just over 3 years for women), men that have ever been in non-standard employment have spent an average of 4.5 years there (the number for women is just over 6.5 years).

In Chapter 1, table 1.2 investigated the individual characteristics of workers in different types of employment. Focusing on the columns for regular and non-standard workers, the table shows that regular workers are slightly younger, more highly educated, more likely to have had a regular job within a year of graduation and report slightly worse health than non-standard workers for both men and women. However, regular male employees are more likely to be married and have larger households than their non-standard counterparts, while the opposite is true for women.

In Chapter 1 I also summarized the data on on-the-job and off-the-job training and concluded that the evidence supported the idea that regular employees receive greater investment in their human capital than non-standard employees. Regarding the nature of the off-the-job

training, however, non-standard workers receive, on average, more firm specific training and less transferable training than regular employees. In its Basic Survey on Ability Development ([MHLW(2006a)]), Japan's Ministry of Health, Labor and Welfare showed that approximately 76% of establishments provided off-the-job training to the regular employees, but only 35% provided such training to their non-standard workers. The favorable treatment of regular employees is consistent across industries and firm size. Regarding the provision of on-the-job training, 60% of establishments provided such training to their regular workers, but only 24% did so for their non-standard employees. Once again, these results were consistent across industries and firm size.

While not conclusive in any way, these data suggest that investment in skill formation and human capital accumulation is higher for regular workers than non-standard workers. It supports the idea that firms focus their resources on a core group of regular employees and use their secondary non-standard workers as a buffer to protect this core group against unexpected shocks. If this is the case, then those workers who are included in the group of regular workers should receive greater investment in their human capital throughout their careers and, as a result, should become more valuable to their firms and more productive over time, leading to an even closer relationship with the firm and higher wages. Those who are left in the non-standard sector, in contrast, are faced with perpetual uncertainty and are subject to the whims of the business cycle.

One concern is that the distinction between regular and non-standard employment might be simply due to differences in industry or occupation. Figures 2.4 and 2.5 display the distributions across occupations and industries of regular and non-standard workers. Although certain differences do stand out, such as the large number of specialists in regular employment that are absent in non-standard employment or the large number of service workers that are present in the non-standard sector that are less numerous in the regular sector, there is a large degree of overlap between the 2 employment sectors across both occupations and industries.

Another way to see that this is not simply a case of differences in occupations or industries is to follow those individuals who switch between the regular and non-standard sectors. Using the data from 2004-2007, I have grouped all such job switches and examined to what extent these changes included changes in industry or occupation. The results are reported in figure 2.6. Only 30% of job changes involved changes in industry and only 40% involved changes in occupation. Put differently, in 50% of cases where individuals switched between regular and non-standard employment, they remained in the same industry and occupation.

2.4 Employment Status Persistence

The central question that I seek to address in this section is "what is the effect on being in regular or non-standard employment on future employment outcomes?" I shall approach this question by restricting my analysis to men below the age of 60. The labor supply decisions of women are generally more complex than those of men and I shall leave those aside for the remainder of this paper. In choosing men below the age of 60, I am avoiding the effects of mandatory retirement.

To begin my analysis, I have grouped all individuals into cohorts based on the year in which they first entered the labor market. For each cohort, I calculate the proportion of individuals in regular employment and non-standard employment. For this purpose, I have included individuals in self-employment, family businesses and those with side jobs in the non-standard sector. I then divide all cohorts into 3 groups based on the proportion of regular or non-standard workers in the year of entry into the labor market - those with a high proportion, those with a medium proportion and those with a low proportion. In so doing, I exclude all cohorts after 1993 and cohorts with fewer than 20 observations. Figure 2.7 presents the average proportion of regular workers in each of the groups over their first ten years in the labor market. Figure 2.8 does the same for the average proportion of non-standard workers. Table 2.6 indicates which cohorts were included in which group in forming these series.

Figure 2.7 shows that although the differences among the three groups narrow within the first four years, they remain somewhat stable thereafter. It appears that even after 10 years, the low proportion group is approximately 5-7 percentage points below the high proportion group. Figure 2.8 shows a similar pattern for non-standard workers. While the gap between the low and medium proportion groups is largely eliminated after just one year, the high proportion group remains approximately 6 percentage points above the other two groups after 10 years.

These graphs suggest that entering the labor market in a "good" or "bad" year can have persistent effects on one's future employment opportunities. To see if this is indeed the case, I estimate the following latent variable model:

$$y_{it}^r = 1(y_{i,t}^{r*} = \beta y_{i0}^r + \gamma exp_{it} + \delta_t + \phi_{i0} + \varepsilon_{it} > 0) \quad (2.1)$$

where y_{it}^r is an indicator variable that takes a value of one if individual i is in regular employment in year t , y_{i0}^r is an indicator variable that takes a value of one if individual i was in regular employment in his first year in the labor market, exp_{it} is the number of years of work experience, δ_t is a year fixed effect and ϕ_{i0} is a cohort fixed effect. The omitted employment

category is non-standard employment which, in this estimation includes the self-employed and those in family businesses. The model is estimated only on those who are employed. In order to control for local labor market conditions, I include the local job-seekers ratio⁵.

In seeking to estimate the effect of being in either regular or non-standard employment in one's first year in the labor market on the probability of being in regular employment at some time in the future, it is important to address the endogeneity of an individual's initial job. It is likely that unobservable characteristics, such as natural ability or work ethic, affect whether an individual starts his career in regular employment or non-standard employment. In order to obtain consistent estimates, I need to instrument for the initial job. The instrument that I use for whether or not an individual is in regular employment during his first year (y_{i0}^r) is the proportion of new entrants into the labor market who are in regular employment. I estimate this number by calculating, for each individual, the number of workers who enter the labor market in the same year as he does and are in regular employment, and divide this number by the total number of people who enter the labor market during the same year that he does.

The results from the estimation of equation 2.2 are reported separately for individuals whose highest level of education is high school and those who have completed college in columns 1 and 2 of table 2.7. They suggest that, indeed, there is a large effect of entering the labor market in regular employment that increases an individual's probability of being in regular employment in the future. The effect is larger for high school graduates than college graduates. Another interesting difference between the two cases is that the probability of being in regular employment increases with experience for high school graduates, but decreases with experience for college graduates.

However, this specification does not allow for the possibility that the effect of starting one's career in regular employment impacts one's future opportunities differently depending on how far into the future one goes. In order to see if the effect does, in fact, vary with the time horizon, I follow the approach of [Genda et al.(2009)Genda, Kondo, and Ohta] and interact the regular employment in initial period dummy variable, y_{i0}^r , with a dummy variable indicating how many years of employment experience a worker has accumulated. Due to the constraints of the sample size, I create dummy variables indicating whether or not an individual has 0-5 years, 5-10 years, 10-15 years, 15-20 years or more than 20 years of employment experience since entering

⁵Local Job-Seekers Ratio (*kyujin bairitsu*) is measured at the regional level, with Japan divided into 8 regions. The 8 regions are Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku, Shikoku and Kyushu. Okinawa is considered as part of Kyushu. I assume that the region for each period is the same as the region in 2003 for every individual as the data for location are not available before 2003. [Genda et al.(2009)Genda, Kondo, and Ohta] make a similar assumption and show that it is a reasonable approximation.

the labor force and use these in place of the number of actual years since entering the labor force. The model is thus specified as:

$$\begin{aligned}
 y_{it}^r = & 1(y_{i,t}^r = \beta_{0-5}y_{i0}^r * exp_{it}^{0-5} + \beta_{5-10}y_{i0}^r * exp_{it}^{5-10} \\
 & + \beta_{10-15}y_{i0}^r * exp_{it}^{10-15} + \beta_{15-20}y_{i0}^r * exp_{it}^{15-20} + \beta_{20+}y_{i0}^r * exp_{it}^{20+} \\
 & + \gamma exp_{it} + \delta_t + \phi_{i0} + \varepsilon_{it} > 0)
 \end{aligned} \tag{2.2}$$

where exp_{it}^r is a dummy variable that takes a value of 1 if individual i had within r years of labor market experience in year t . The results are reported in columns 3 and 4 of table 2.7. They show that there is a measurable impact on high school graduates for their first 5 years in the labor market, but this impact dies out after 5-10 years. However, the impact for college graduates is larger and more persistent. Although the effect diminishes in magnitude over time, it can still be observed after 20 years in the labor market (although the result is not statistically significant after 10 years). One cannot determine at this point why there should be a larger persistence in the effect of the initial job for college graduates than for high school graduates. One possibility is that there is a more severe scarring effect for those who are expected to be of higher ability. Another possibility is that the effect is propagated through human capital accumulation and that investment in human capital is greater for more educated workers, implying that the costs of non being able to secure a regular job and thus missing out on vital investment in training are greater for the more educated.

2.5 Persistence In A Dynamic Unobserved Effects Model

The previous section sought to measure the effect of starting one's career in the regular sector on one's future employment opportunities. In this section, I attempt to broaden my investigation into the persistence within the dual labor market by measuring how likely a worker is to be in a particular sector of the dual labor market (say the non-sector) given that they were in that same sector during the previous year. To begin the analysis, I first estimate a dynamic linear probability model using the method of [Arellano and Bond(1991)]. The results are reported in table 2.8. The results suggest significant state dependence from one year to the next in both the regular and non-standard sectors.

But although the results show a positive correlation between employment in a particular sector between consecutive years, the magnitude of the state dependence is difficult to ascertain from the linear form of the model. Since one ultimately seeks a measure of the *probability* of

being in a particular employment sector next year conditional on being employed in that sector in the present year, one needs to model the non-linearities of a probability model accordingly. Let y_{it} be a dummy variable taking a value of 1 if individual i is in non-standard employment in period t . Then, I would like to estimate the following dynamic unobserved effects model:

$$P(y_{it} = 1 | y_{i,t-1}, \dots, y_{i0}, z_i, \alpha_i) = G(\rho y_{i,t-1} + z_{it} \delta + \alpha_i) \quad (2.3)$$

where z_{it} is a vector of contemporaneous explanatory variables, α_i is the unobserved individual heterogeneity and $z_i = (z_{i1}, \dots, z_{iT})$.

The inclusion of the lagged dependent variable allows me to test for the presence of state dependence after controlling for unobserved heterogeneity. But in specifying the model in this way, there are two central obstacles to consistently estimating the coefficients of interests. Firstly, the presence of the lagged employment status dummy variable means that strict exogeneity is no longer satisfied (although the z_{it} do satisfy a strict exogeneity assumption conditional on α_i). Secondly, I need to control for the unobserved individual heterogeneity, which may be correlated with an individual's job upon entry into the labor market. Although one cannot observe the time-invariant individual-specific effect, it may be correlated with observables and ignoring it might bias the estimates. For example, it may be the case that individuals with high ability are both more likely to find a job in the regular employment sector and more highly educated. Such a relationship would generate positive correlation between the observable explanatory variable (education) and the error term if ability is not accounted for and bias the estimated ρ and δ . In this case, not accounting for individual ability would make it appear as though the impact of being highly educated on finding a regular job is higher than it actually is as education picks up some of the effects of the unobserved ability and biases the estimated coefficient upwards. For this reason, a traditional random effects approach is not suitable.

In order to control for state dependence, after controlling for unobserved individual heterogeneity, I follow [Wooldridge(2005)] and propose the following approach. First, I obtain the joint distribution of $(y_{i1}, \dots, y_{iT})$ conditional on (y_{i0}, z_i) . In doing so, I can side-step the central difficulty of the initial conditions problem and can refrain from taking a position on the distribution of y_{i0} given (z_i, α_i) . Once this is done, I can use standard maximum likelihood methods simply conditioning on y_{i0} as well as z_i .

In order to obtain the joint distribution $f(y_1, \dots, y_T | y_{i0}, z_i)$, I first need to propose a density for α_i given (y_{i0}, z_i) .

To this end, I follow the approach taken by [Chamberlain(1982)]. I relax the assumption

that α_i is independent of z_{it} and make the parametric assumption that $\alpha_i = \psi + \xi_0 y_{i0} + \bar{w}_i \xi + a_i$, where $w_i \subseteq z_i$ and $a_i \sim N(0, \sigma_a)$ and is independent of (y_{i0}, z_i) . In this case, equation 2.9 can be written as

$$y_{it} = 1[\psi + \rho y_{i,t-1} + z_{it} \delta + \xi_0 y_{i0} + \bar{w}_i \xi + a_i + e_{it} > 0] \quad (2.4)$$

where $e_{it} \sim iidN(0, 1)$ and is independent of other variables. This implies that y_{it} given $(y_{i,t-1}, \dots, y_{i0}, z_i, a_i)$ follows a probit model and the density of $(y_{i1}, \dots, y_{iT})$ given (y_{i0}, z_i) is

$$f(y_1, \dots, y_T | z_i; \theta) = \int_{-\infty}^{\infty} \left[\prod_{t=1}^T f(y_t | 1, z_{it}, y_{i,t-1}, y_{i0}, z_i, a; \rho, \delta) \right] \frac{1}{\sigma_a} \phi\left(\frac{a}{\sigma_a}\right) da \quad (2.5)$$

where ϕ is the pdf of a Normal(0, σ_a) distribution. I can thus estimate ψ , ρ , δ , ξ_0 , ξ and σ_a using a random effects probit by simply including y_{i0} and $\bar{w}_i$ as explanatory variables in each time period.

2.6 Estimation Of The Dynamic Model

The dependent variable is a dummy variable that takes a value of one if the individual was in a given employment sector (regular or non-standard) in a particular year. As explanatory variables related to individuals' employment histories, I include years of regular employment experience, years of non-standard employment experience, lagged years of tenure in regular employment and lagged years of tenure in non-standard employment. I then determined the first year of participation in the labor force for each individual (so that, for example, the employment histories of those who entered college straight after high school begin only after graduation from college) and use that year as the initial observation in an individual's employment history. As before, I also include age and the local job-seekers ratio to control for labor market conditions.

Finally, the covariates whose averages over time I select to parameterize the unobserved heterogeneity (i.e. the $\bar{w}_i$ in equation 2.4) include years of regular employment experience, years of non-standard employment experience, lagged years of tenure in regular employment, lagged years of tenure in non-standard employment and age.

The model in equation 2.4 is estimated using the panel data covering 1963-2003 and the results for selected variables are presented separately in table 2.9 for non-standard and regular employment. The results show clear evidence of state dependence in both sectors, even after controlling for unobserved heterogeneity. In other words, even after taking the employment

history and unobserved individual-specific effects into account, workers who are in non-standard employment today are more likely than those who are not in non-standard employment today to be in non-standard employment again next year. In fact, a high school graduate is, on average, 11 percent more likely to be in non-standard employment in the following year if he is in non-standard employment in the present year. He is also 12 percent more likely on average to be in regular employment in the following year if he is in regular employment in the present year. This result is statistically significant. College graduates are 9 percent more likely, on average, to be in either regular or non-standard employment at some point during the following year if they have been in that employment sector at some point during the present year.

Although few of the other covariates are precisely estimated, one can summarize the patterns as follows. The probability that an individual will be in non-standard employment increases with experience in regular employment and age, but decreases with both experience and tenure in non-standard employment. It tends to fall with tenure in regular employment for high school graduates, but rises for college graduates.

The probability that an individual will be in regular employment decreases with experience in regular employment, but increases with tenure in regular and non-standard employment. It rises with experience in non-standard employment for high school graduates, but falls for college graduates, while the reverse is true for the relationship between being in regular employment and age.

A useful exercise in trying to understand the magnitude of the effect of being in non-standard employment on future employment opportunities is to consider the thought experiment of comparing two individuals, identical in every way except for one detail, and then use the model to predict how likely these two individuals are to be in either regular or non-standard employment during the following year.

In the first scenario, individual A is a 27 year old man with a university degree who worked for 3 years as a regular employee straight after graduation, but switched to a non-standard job during the last year. Individual B is identical to individual A except that he has been a regular employee all along. This thought experiment is an attempt to measure the size of the effect of a recent change in employment on young workers.

In the second scenario, individual A is a 30 year old man who graduated from high school but did not attend college. He has spent his entire career in part-time employment. Individual B is the same as individual A except that he found a regular job 1 year ago. This thought experiment is an attempt to measure the size of the effect of a switch into regular employment

after a long spell of non-standard employment for young-to-middle-age workers with low levels of education.

In the third scenario, individual A is a 45 year old man who graduated from college and started his career in non-standard employment. After one year in non-standard employment he switched to regular employment. Individual B is the same as individual A except that he switched into regular employment after 6 years in non-standard employment. This thought experiment is an attempt to measure the effect of an early spell of non-standard employment on workers later in their careers.

The results from this exercise are reported in table 2.10. Focusing on scenario 1, one can see that although the only difference between the two individuals is the most recent year of employment, the person who remained in regular employment is 40 times as likely to be in regular employment during the following year as the person who switched to non-standard employment. On the other hand, the person who switched to non-standard employment is 8 times ($1/0.12$) times as likely to be in non-standard employment during the following year as his regular employment counterpart.

In scenario 2, the only difference is a switch from non-standard employment to regular employment during the previous year for individual B. The results of this exercise show that this difference causes the model to predict that individual A, who did not switch, will be 8 times more likely than individual B, who did switch, to be in non-standard employment in the following year. On the other hand, individual B is predicted to be 70 times ($1/0.014$) more likely than his counterpart who did not switch to be in regular employment during the following year.

The results from scenario 3 counterintuitively suggest that individual B, who spent more time early in his career, is 0.3 ($1/3.4$) times as likely than individual A to be in non-standard employment and about as likely as individual A to be in regular employment in the following year. This result is driven by the fact that the negative effect from an early spell of non-standard employment has died out and is dominated by the decreasing probability of being in regular employment with experience in regular employment.

To investigate the possibility that persistence in the dual labor market has changed over time, I create 5 time period dummy variables, indicating if the given observation was in the period 1963-1972, 1973-1984, 1985-1991, 1992-1997 or 1998-2003. I then interact these time period dummy variables with the lagged employment status dummy variables and use them as explanatory variables. The model can be formulated as:

$$\begin{aligned}
y_{it} = & 1(\psi + \rho_{ns}^{63-72} D_{it}^{63-72} y_{i,t-1}^{ns} + \rho_{ns}^{73-84} D_{it}^{73-84} y_{i,t-1}^{ns} + \dots + \rho_{ns}^{98-03} D_{it}^{98-03} y_{i,t-1}^{ns} \\
& + \rho_{reg}^{63-72} D_{it}^{63-72} y_{i,t-1}^{reg} + \rho_{reg}^{73-84} D_{it}^{73-84} y_{i,t-1}^{reg} + \dots + \rho_{reg}^{98-03} D_{it}^{98-03} y_{i,t-1}^{reg} \\
& + \gamma_{63-72} D_{it}^{63-72} + \dots + \gamma_{98-03} D_{it}^{98-03} \\
& + z_{it} \delta + \xi_0 y_{i0} + \bar{w}_i \xi + a_i + e_{it} > 0)
\end{aligned} \tag{2.6}$$

where y_{it}^s is a dummy variable that takes a value of one if individual i was in employment status s at any point during year t and zero otherwise, and D_{it}^r is a dummy variable that takes a value of one if the given observation for individual i occurs in time period r (i.e. $t \in r$) and zero otherwise. The remaining variables remain as defined above.

Due to the fact that the data are taken from an unbalanced panel, I estimate the model only on individuals who are 30 years old or younger. This exercise then represents an attempt to estimate how persistence within the dual labor market has changed over time for young workers. The results of this exercise are reported in table 2.11. They suggest that persistence in the non-standard sector has gradually decreased over time for high school graduates. For college graduates it from the 1963-1972 period until 1985-1991, the bubble period. Since then it has increased as Japan entered its period of stagnation, although not to the levels seen in the 1963-1972 period.

For regular employment, persistence decreased for high school graduates from the 1963-1972 period until the 1992-1997 period, but increased slightly during 1998-2003. For college graduates, persistence in the regular employment sector has decreased almost consistently since the 1963-1972 period.

Finally, the model can be used to investigate how persistence differs across age groups. [Genda(2000)] argued that during the 1990s it was young workers who suffered disproportionately from the weak labor market. The model developed in this section provides a framework for analyzing one possible channel through which labor demand fluctuations may affect young and old workers differently - namely, through differences in employment status persistence across age groups. The results for this estimation are reported in table 2.12. In almost all cases persistence increases with age. The one possible exception is the non-standard employment sector for college graduates, where persistence appears to decrease until age 35-39 and then increases thereafter. These results do not appear terribly surprising considering what is known about the job attachment of younger workers. However, it is interesting to consider whether the welfare costs of being in non-standard rather than regular employment are larger for older or younger

workers. On the one hand, the opportunity cost of acquiring greater investment in human capital through regular employment is probably greater for younger workers. Firms are unlikely to invest in older workers to the same degree as they invest in younger workers because of the limited time left in which to recuperate the costs of investment through higher productivity and because older workers are more likely to have accumulated a significant amount of skills already. On the other hand, the greater persistence that older workers face imply that they are less likely than younger workers to switch into regular employment from non-standard employment and thus face a higher expected duration of time in non-standard employment. One may interpret this (relatively) positively as indicating that even though many young people in Japan find themselves in non-standard jobs, they are more likely to be able to remedy this situation. Nevertheless, which of these margins is more important is an important factor in determining whether the economy is better off concentrating non-standard employment among the young or the old.

2.7 Discussion

One might wonder if the results reported above are not missing a vital piece of information - the preferences of individuals. It would seem that a labor market with more flexible employment contracts would be a great benefit to workers. Might it not be the case that workers are choosing non-standard employment over regular employment because of the more flexible work arrangements that it offers? While we cannot observe the preferences of all individuals, the *KHPS* asks those workers in non-standard employment why they are in non-standard employment. The 4 options they are given are: 1) I want to work in regular employment, but no company will hire me, 2) the wages and working conditions are good, 3) I am unable to fulfill the requirements of a regular job for personal reasons, and 4) other reasons. Figure 2.9 presents data from this question for each year in the survey. It shows that approximately only between 20% and 30% of those in non-standard employment claim to be in non-standard employment because choose to be. More than half of workers consistently cite the inability to find a regular job or the inability to perform a regular job (possibly because of institutional constraints) rather than personal preference as the primary reason for their being in non-standard employment.

A similar pattern was reported in the study by the Ministry of Health, Labour and Welfare mentioned earlier ([MHLW(2006b)]). It reported that 50.3% of part-time workers, but only 17% of other non-standard workers, were in non-standard employment because the working hours were convenient, while 23.8% of part-time workers and 44.2% of other non-standard workers said that they were in non-standard employment because they were unable to find regular

employment. The same study also showed that 63.9% of part-time workers and 70.4% of other non-standard workers felt dissatisfaction towards their job and/or employer. These results would appear to be evidence against the hypothesis that individuals are freely choosing non-standard employment based on preferences.

The results above suggest that there is indeed a significant amount of state dependence in Japan's dual labor market and that persistence has actually been increasing in recent years. While regular employment offers the advantage of greater investment in skill formation and human capital accumulation (after all, firms have less incentive to invest in their workers if there is a greater chance that the worker might leave for another firm), such arrangements restrict worker mobility and the transfer of technology among firms that goes with it. In this sense, then, a debate about the merits and ills of the dual labor market is a debate about whether the returns from higher investment by firms in workers' skills or the returns from technology diffusion through greater worker mobility are larger. It is possible that the dual labor market structure, in some ways based on a system of lifetime employment, once enabled an efficient method for Japan to catch up technologically, but has since outlived its usefulness. [Mincer and Higuchi(1988)] asked why Japanese firms put so much emphasis on human capital investment. Their answer was that such a policy was a response to rapid technological change. In an environment where technology is quickly changing, not only are the skills required of a worker constantly changing, but there is great variation among firms regarding the technologies that they use. These factors create incentives for upgrading skills on the job for the specific technologies adapted by the firm. They also argued that the decision of whether to hire new workers from outside the firm or retrain workers within the firm when adopting the new technology was based on the nature of the new technology itself. If the required training was general in nature, then the firm would be indifferent between these two options. If the new technology built on the specific capital that the firm had already acquired, then it would prefer to retrain the workers it already had. However, if the new technology was embodied in skills that existed outside of and distinct from the firm, then the firm may prefer to hire outside workers.

Japan's economic growth has declined enormously since Mincer and Higuchi published their findings and one could reason that the need for investment in firm-specific human capital has been greatly diminished. It may also be the case that advances in technology might have become so great that it is not worth the investment for the firm to retrain a worker to perform a job for which he has not already accumulated expert knowledge. In this case, the traditional Japanese approach of job rotation and flexibility of work assignments may lose much of its

attraction. One could argue that this description is more accurate of today's Japan. If this is the case, then the returns to firm-specific investment in human capital would be lower than before and the firms would have less incentive to invest in their workers' skills. On the other hand, the returns to more general work experience and education would have increased.

But another possibility is that the institutions and economic conditions that made lifetime employment an effective employment arrangement might have changed so as to decrease its effectiveness. Theoretical models, such as that of [Kandel and Pearson(2001)], suggest that increased certainty about future demand should increase the proportion of regular employment used at a firm. During the early stages of the lifetime employment system Japanese firms indeed probably faced a more stable economic environment. It was a time of heavy government regulation, managed exchange rates, and technological catch-up through importation and imitation. These factors, combined with the stable long-term financing arrangements of the main bank system, might have given Japanese firms the certainty to make long-term commitments to workers. Why might a long-term contract have benefitted firms? Besides the possibly high returns to firm-specific technology and stable high demand for Japanese firms' goods, there is another possibility. When a country is playing technological catch-up, it already knows that the technology that it needs to improve efficiency exists and all it needs to do is to import the technology and learn it. This absorption of technology takes time, but the benefits are known before the commitment of time and resources is made.

Japan's economic environment today is very different. Government regulation has been greatly reduced, exchange rates are now floating, and Japan has caught up with the world's technology leaders. It is, in short, a more uncertain environment for Japanese firms. But, perhaps most importantly, technology must now be advanced through innovation rather than imitation. Under these circumstances, then, the system of lifetime employment appears less appealing and a more mobile and flexible set of institutions that encourages transmission of technology through worker mobility may be more suitable. Indeed, this is the spirit of the Schumpeterian creative destruction that [Caballero et al.(2008)Caballero, Hoshi, and Kashyap] suggest improves firm productivity.

In this case, labor market institutions that allow for greater mobility in order to promote the transfer of technology and knowledge would be more appropriate and the costs of worker training should shift from the firm to the individual, who now would accrue more of the benefits of such investment, and the state, who might play a role in ensuring that spillovers are captured. While not answering this question directly, [Ohtake(1998)] used the micro data from Japan's

Basic Survey on Wage Structure from 1980 and 1992 and the United States' *Current Population Survey* from January 1981 and March 1991 to compare earnings-tenure profiles in the two countries. While [Hashimoto and Raisian(1985)] found that Japan was much closer to a system of lifetime employment than the United States, [Ohtake(1998)] found that the earnings-tenure profiles converged during the 1980s. This finding that the rate of return to tenure (and hence, one could argue, to firm-specific human capital investment) had decreased would also be consistent with the notion that while Japan's economy had changed structurally, its labor market institutions had not adapted accordingly.

2.8 Conclusion

I use the *Keio Household Panel Survey*, an individual-level dataset, to investigate differences in Japan's regular and non-standard employment sectors. I limit my study to men and find that workers differ in key respects, such as education and training, between the 2 sectors. I also find that the 2 employment sectors are not divided simply along industry or occupation lines, but that many workers switching between employment in the regular sector and employment in the non-standard sector remain in the same occupation and industry.

I use an instrumental variables approach to measure the impact on future employment opportunities of starting one's career in either the regular or non-standard sector. My results suggest that starting one's career in non-standard rather than regular employment reduces one's probability of being in regular employment in the future. The effect appears to be larger and longer lasting for college graduates than for those whose highest level of education is graduation from high school.

Then, using a dynamic unobserved effects model, I find that there is a large degree of state dependence after controlling for individual heterogeneity so that people are likely to remain in the whichever employment sector they currently find themselves. Persistence in both sectors of the dual labor market appear to increase with age, so that older workers are more likely to remain in their current employment sectors than young workers. In tracking the level of persistence over time, I find that in both the regular and non-standard employment sectors persistence decreased for young workers during 1963-1991, but has been increasing since then.

From these results and the broader literature on the subject emerges an image of a labor market whose institutions have not kept up with changes in its structure and needs. Discovering the underlying source of state dependence within Japan's dual labor market and what changes will allow Japan's labor market to better adapt to its changed and changing economy is a chal-

lenge for future research.

2.9 Figures

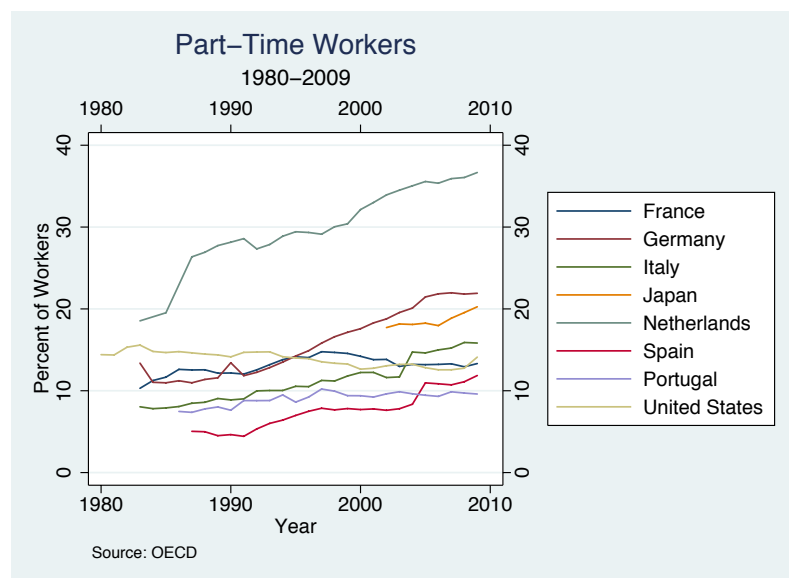


Figure 2.1: Percentage of Part-Time Workers: 1980-2009

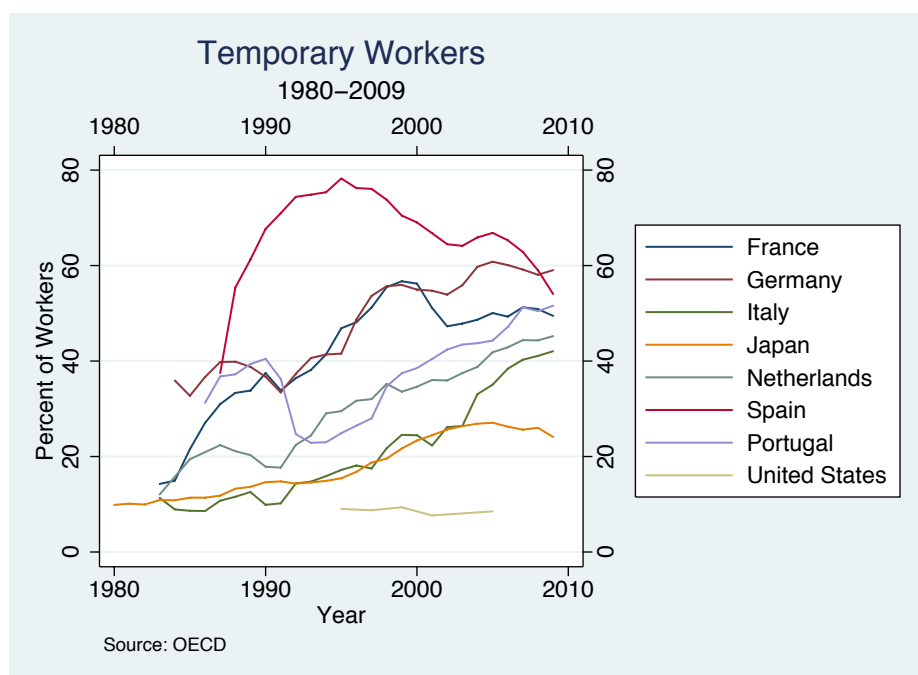


Figure 2.2: Percentage of Temporary Workers: 1980-2009

Age	Attended School	Searched for Job	Non-Standard	Regular	Self-Employed	Side-Job	Family-Business	Changed Job
15								
16								
17								
18								
19								
20								
...								
66								
67								
68								

Figure 2.3: Retrospective Panel Questionnaire

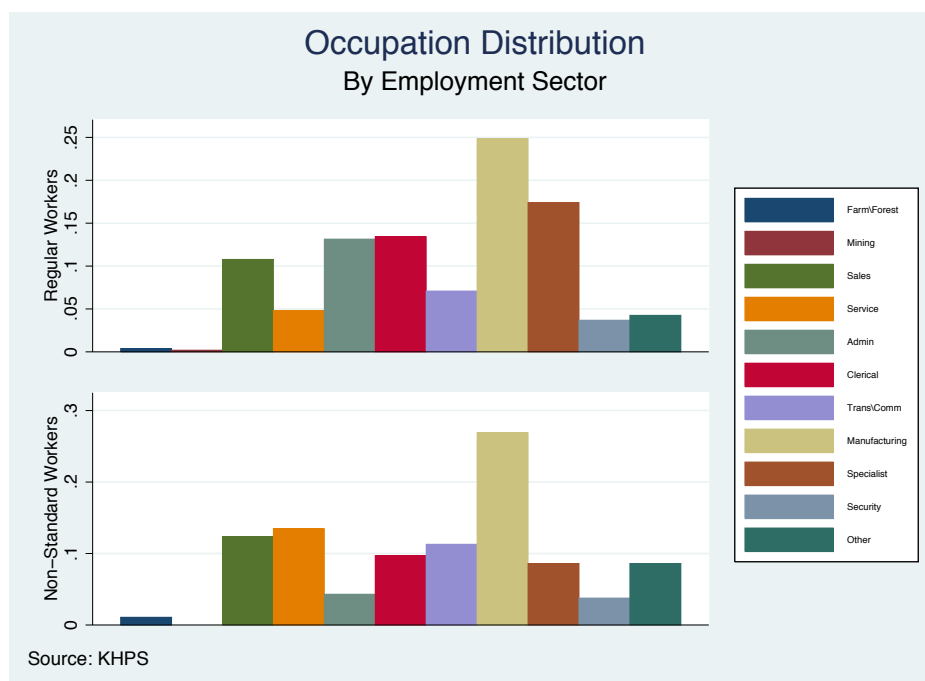


Figure 2.4: Occupation Distribution of Workers

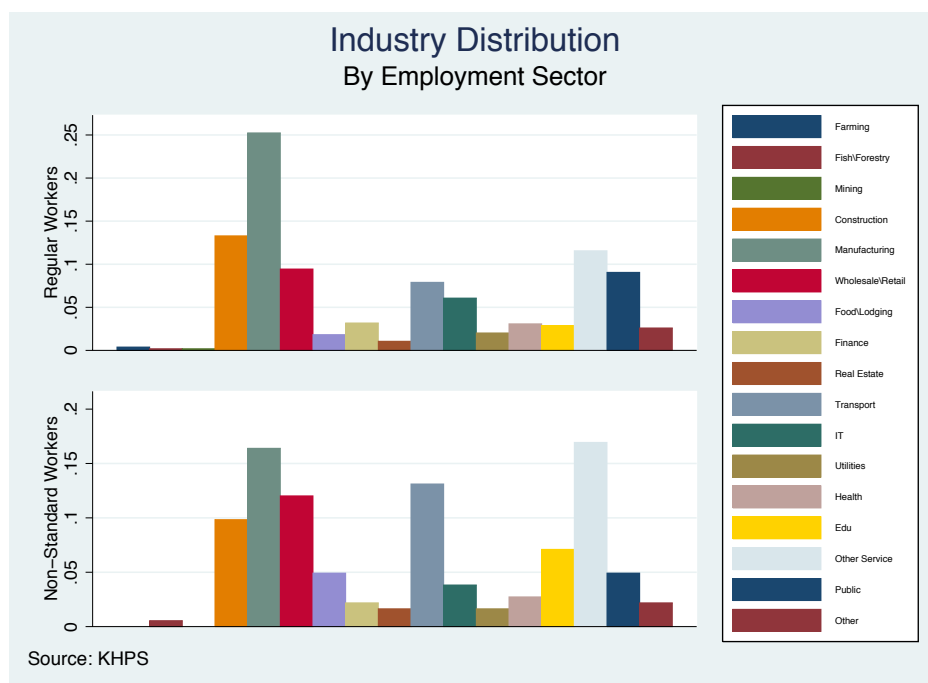


Figure 2.5: Industry Distribution of Workers

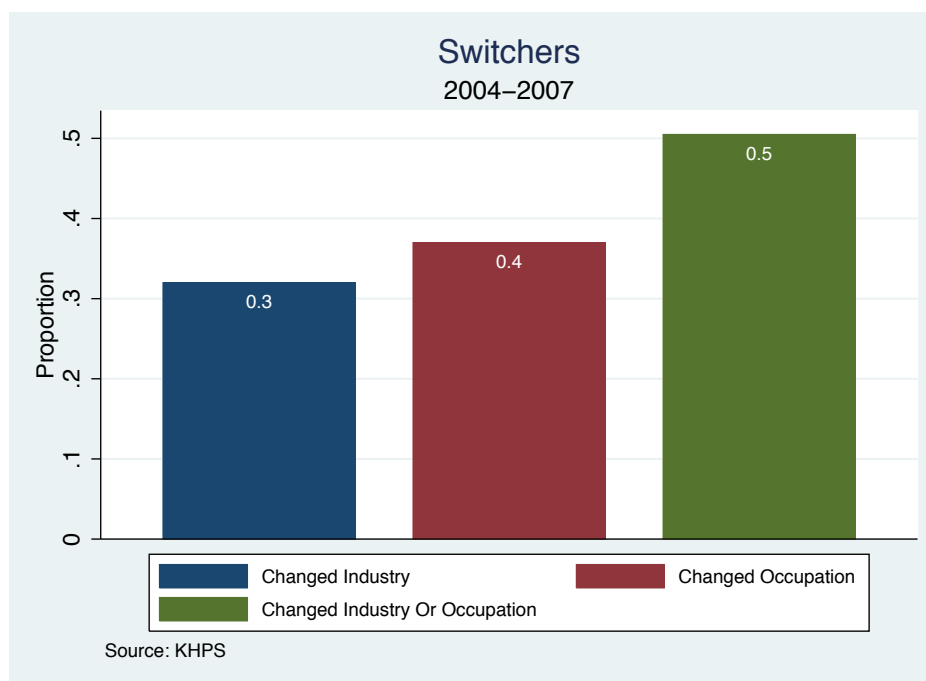


Figure 2.6: Switches Among Industries and Occupations

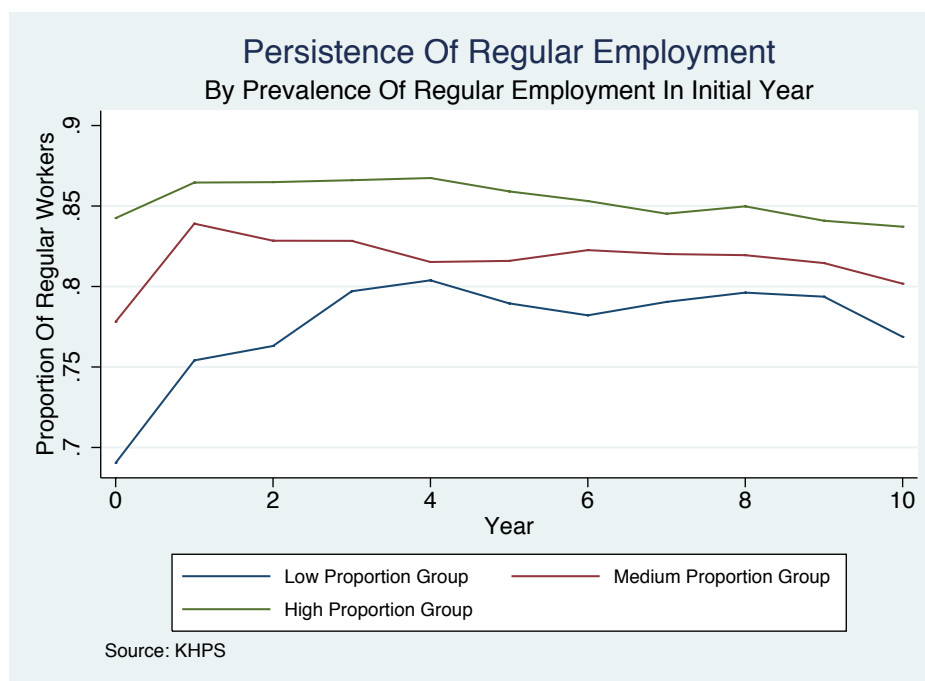


Figure 2.7: Proportion Of Workers In Regular Employment

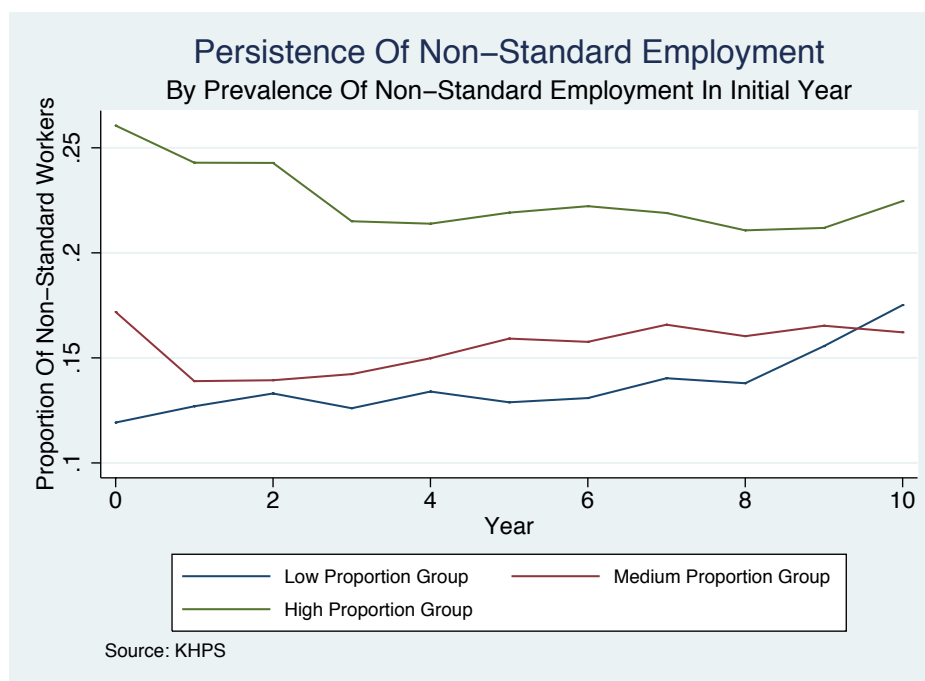


Figure 2.8: Proportion Of Workers In Non-Standard Employment

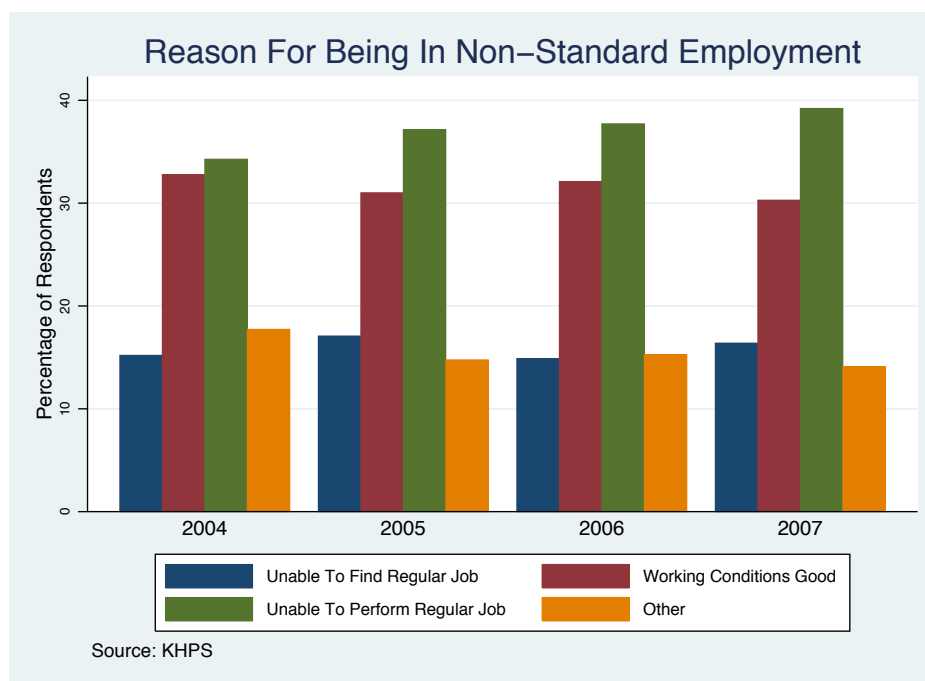


Figure 2.9: Reason For Being In Non-Standard Employment

2.10 Tables

Table 2.1: Employment Sector Transitions - Men

Date T-1	Date T				
	Regular Employment	Non-Standard Employment	Unemployed	Out of Labor Force	Other Employment
Regular Employment	97.93	0.36	0.28	0.57	0.86
Non-Standard Employment	11.78	82.11	1.06	2.56	2.5
Unemployed	30.75	11.5	51.17	3.05	3.52
Out of Labor Force	16.96	2.41	2.24	76.56	1.83
Other Employment	1.33	0.34	0.06	0.4	97.87

¹ Observations: 53446

² The unemployed are defined as those who searched for a job but did not work for the entire year.
Data limitations prevent identification spells of unemployment between jobs during a year.

Table 2.2: Employment Sector Transitions - Women

Date T-1	Date T				
	Regular Employment	Non-Standard Employment	Unemployed	Out of Labor Force	Other Employment
Regular Employment	90.45	1.65	0.36	5.98	1.56
Non-Standard Employment	3.8	88.27	0.36	6.18	1.4
Unemployed	25.13	15.54	47.67	8.55	3.11
Out of Labor Force	5.39	3.78	0.6	88.17	2.06
Other Employment	1.02	1.64	0.1	1.96	95.28

¹ Observations: 51298

² The unemployed are defined as those who searched for a job but did not work for the entire year.
Data limitations prevent identification spells of unemployment between jobs during a year.

Table 2.3: Stationary Distribution - Men

	<u>Actual Distribution In</u>		<u>Stationary Distribution Using</u>	
	1970	2003	All Data	Data Since 1990
Regular Employment	60.77	62.99	64.23	59.93
Non-Standard Employment	2.95	6.52	2.58	4.32
Unemployed	0.22	2.63	0.54	1.08
Out Of Labor Force	24.26	10.10	3.42	4.83
Other Employment	11.80	17.75	29.22	29.83

Table 2.4: Stationary Distribution - Women

	<u>Actual Distribution In</u>		<u>Stationary Distribution Using</u>	
	1970	2003	All Data	Data Since 1990
Regular Employment	32.82	26.40	31.34	27.40
Non-Standard Employment	4.37	26.03	15.67	23.96
Unemployed	0.24	1.11	0.69	0.97
Out Of Labor Force	45.22	31.38	28.14	30.07
Other Employment	17.36	15.18	24.16	17.61

Table 2.5: Summary Statistics

	Men	Women
Regular Employment	0.54 (0.50)	0.17 (0.38)
Non-Standard Employment	0.10 (0.29)	0.25 (0.43)
Regular Employment Experience	16.81 (12.64)	8.35 (8.10)
Non-Standard Employment Experience	0.94 (3.28)	3.38 (5.23)
Ever Been in Non-Standard Employment	0.21 (0.40)	0.51 (0.50)
Conditional Non-Standard Employment Experience	4.58 (5.96)	6.58 (5.67)
Observations	1980	1957

Table 2.6: Cohorts In Each Group

	Low Proportion Group	Medium Proportion Group	High Proportion Group
Regular Employment	1953	1954	1958
	1955	1963	1959
	1956	1970	1961
	1957	1972	1964
	1960	1973	1966
	1965	1974	1968
	1967	1979	1971
	1969	1980	1975
	1977	1981	1976
	1978	1986	1982
	1983	1988	1984
	1985	1989	1990
	1987	1991	
	1992		
	1993		
Non-Standard Employment	1959	1958	1953
	1961	1963	1954
	1964	1968	1955
	1966	1970	1956
	1971	1974	1957
	1972	1975	1960
	1973	1979	1962
	1976	1981	1965
	1980	1983	1967
	1982	1988	1969
	1984	1991	1977
	1986	1992	1978
	1989		1985
	1990		1987
			1993

Table 2.7: Probability Of Being In Regular Employment (IV Estimation)

	High School (1)	College (2)	High School (3)	College (4)
Probit Coefficients				
Regular Employment in First Year	1.333 (.027)**	1.434 (.043)**		
× Experience 0-5 Years			.279 (.100)**	.434 (.125)**
× Experience 5-10 Years			.055 (.102)	.293 (.136)*
× Experience 10-15 Years			-.030 (.111)	.262 (.162)
× Experience 15-20 Years			.025 (.124)	.279 (.192)
× Experience 20+ Years			.016 (.154)	.145 (.247)
Experience	.142 (.011)**	-.052 (.016)**	.177 (.013)**	-.008 (.021)
Local Job-Seekers Ratio	.043 (.031)	.120 (.059)*	.166 (.034)**	.103 (.061)
Average Marginal Effects				
Regular Employment in First Year	.317 (.005)**	.262 (.007)**		
Experience	.034 (.003)**	-.009 (.003)**		
Obs.	21972	10845	21972	10845
Percent Correctly Predicted	80.83	84.80	74.85	84.46

**p < 0.01

*p < 0.05

Table 2.8: Arellano-Bond Estimation

	Non-Standard Employment		Regular Employment	
	High School	College	High School	College
	(1)	(2)	(3)	(4)
Lagged Non-Standard Employment	.972 (.019)**	.937 (.027)**		
Lagged Regular Employment			.983 (.009)**	.863 (.022)**
Regular Experience	-.013 (.025)	-.075 (.032)*	.180 (.046)**	-.400 (.166)*
Non-Standard Experience	-.004 (.025)	-.064 (.032)*	.156 (.046)**	-.414 (.167)*
Lagged Regular Tenure	.005 (.001)**	.006 (.002)**	-.012 (.002)**	-.006 (.002)**
Lagged Non-Standard Tenure	-.052 (.011)**	-.038 (.019)*	.070 (.013)**	.072 (.032)*
Age	.0002 (.016)	.045 (.020)*	-.096 (.036)**	.229 (.101)*
Local Job-Seekers Ratio	-.005 (.008)	.012 (.011)	-.009 (.013)	-.020 (.022)
Obs.	21794	11049	21794	11049
χ^2 statistic	12030.2	4207.563	18529.66	7576.885

**p < 0.01

*p < 0.05

Table 2.9: Dynamic Probit Models

	Non-Standard Employment		Regular Employment	
	High School	College	High School	College
	(1)	(2)	(3)	(4)
Probit Coefficients				
Lagged Non-Standard Employment	3.175 (.072)**	3.442 (.137)**		
Lagged Regular Employment			3.027 (.065)**	3.164 (.116)**
Regular Experience	.041 (.034)	.054 (.070)	-.037 (.034)	-.125 (.060)*
Non-Standard Experience	-.034 (.034)	-.025 (.070)	.029 (.033)	-.044 (.059)
Lagged Regular Tenure	-.017 (.005)**	.004 (.008)	.003 (.004)	.012 (.008)
Lagged Non-Standard Tenure	-.093 (.019)**	-.074 (.060)	.065 (.019)**	.054 (.059)
Age	.014 (.033)	.009 (.068)	-.018 (.032)	.059 (.058)
Local Job-Seekers Ratio	.011 (.058)	-.079 (.108)	.064 (.055)	.103 (.103)
Average Marginal Effects				
Lagged Non-Standard Employment	.110 (.003)**	.087 (.005)**		
Lagged Regular Employment			.123 (.003)**	.090 (.006)**
Regular Experience	.001 (.001)	.001 (.002)	-.001 (.001)	-.004 (.002)*
Non-Standard Experience	-.001 (.001)	-.0006 (.002)	.001 (.001)	-.001 (.002)
Lagged Regular Tenure	-.0006 (.0002)**	.00009 (.0002)	.0001 (.0002)	.0003 (.0002)
Lagged Non-Standard Tenure	-.003 (.0006)**	-.002 (.002)	.003 (.0008)**	.002 (.002)
Age	.0005 (.001)	.0002 (.002)	-.0007 (.001)	.002 (.002)
Local Job-Seekers Ratio	.0004 (.002)	-.002 (.003)	.003 (.002)	.003 (.003)
Obs.	21316	10645	21316	10645
Percent Correctly Predicted	98.05	98.51	97.68	98.32

**p < 0.01

*p < 0.05

Table 2.10: Hypothetical Scenarios

	Probability Of Being In	
	Non-Standard Employment	Regular Employment
<u>Scenario 1</u>		
Individual A	0.932	0.119
Individual B	0.023	0.975
Relative Likelihood (A/B)	40.52	0.12
<u>Scenario 2</u>		
Individual A	0.990	0.012
Individual B	0.121	0.806
Relative Likelihood (A/B)	8.17	0.014
<u>Scenario 3</u>		
Individual A	0.017	0.996
Individual B	0.005	0.999
Relative Likelihood (A/B)	3.40	1.00

- ¹ Scenario 1: 27 year old male university graduate who worked in regular employment since graduation. Individual A switched to non-standard employment in the previous year; individual B did not.
- ² Scenario 2: 30 year old male high school graduate who worked in non-standard employment since graduation. Individual A stayed in non-standard employment in the previous year, but individual B switched to regular employment.
- ³ Scenario 3: 45 year old male college graduate who started in non-standard employment and switched into regular employment. Individual A switched into regular employment after one year in non-standard employment, but individual B switched to regular employment after 6 years in non-standard employment.

Table 2.11: Persistence Over Time

	Non-Standard Employment		Regular Employment	
	High School	College	High School	College
	(1)	(2)	(3)	(4)
Probit Coefficients				
Lagged Non-Standard Employment 1963-1972	4.364 (.276)**	6.196 (.580)**		
Lagged Non-Standard Employment 1973-1984	3.034 (.135)**	4.709 (.374)**		
Lagged Non-Standard Employment 1985-1991	2.898 (.124)**	2.806 (.224)**		
Lagged Non-Standard Employment 1992-1997	3.454 (.135)**	3.269 (.217)**		
Lagged Non-Standard Employment 1998-2003	3.232 (.108)**	4.029 (.234)**		
Lagged Regular Employment 1963-1972			3.772 (.230)**	4.786 (.482)**
Lagged Regular Employment 1973-1984			2.850 (.119)**	3.527 (.267)**
Lagged Regular Employment 1985-1991			2.857 (.116)**	2.829 (.209)**
Lagged Regular Employment 1992-1997			3.200 (.115)**	2.835 (.175)**
Lagged Regular Employment 1998-2003			3.123 (.105)**	3.341 (.179)**
Average Marginal Effects				
Lagged Non-Standard Employment 1963-1972	.148 (.010)**	.146 (.015)**		
Lagged Non-Standard Employment 1973-1984	.103 (.005)**	.111 (.010)**		
Lagged Non-Standard Employment 1985-1991	.099 (.005)**	.066 (.006)**		
Lagged Non-Standard Employment 1992-1997	.117 (.005)**	.077 (.006)**		
Lagged Non-Standard Employment 1998-2003	.110 (.004)**	.095 (.007)**		
Lagged Regular Employment 1963-1972			.150 (.010)**	.132 (.015)**
Lagged Regular Employment 1973-1984			.114 (.005)**	.097 (.008)**
Lagged Regular Employment 1985-1991			.114 (.005)**	.078 (.007)**
Lagged Regular Employment 1992-1997			.128 (.006)**	.078 (.006)**
Lagged Regular Employment 1998-2003			.125 (.005)**	.092 (.007)**
Obs.	21316	10645	21316	10645
Percent Correctly Predicted	98.10	98.66	97.67	98.37

**p < 0.01

*p < 0.05

Table 2.12: Persistence Across Age Groups

	Probit Coefficients				Average Marginal Effects			
	Non-Standard Employment		Regular Employment		Non-Standard Employment		Regular Employment	
	High School	College	High School	College	High School	College	High School	College
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age 15-19	2.918 (.222)**		2.548 (.176)**		.103 (.008)**		.106 (.008)**	
Age 20-24	2.825 (.105)**	3.260 (.265)**	2.561 (.084)**	2.414 (.204)**	.100 (.004)**	.091 (.008)**	.107 (.004)**	.076 (.007)**
Age 25-29	3.050 (.113)**	3.245 (.180)**	2.793 (.085)**	2.695 (.130)**	.108 (.005)**	.090 (.006)**	.117 (.004)**	.085 (.005)**
Age 30-34	3.047 (.110)**	3.305 (.228)**	2.957 (.092)**	2.981 (.139)**	.108 (.004)**	.092 (.007)**	.124 (.004)**	.094 (.006)**
Age 35-39	3.328 (.142)**	3.139 (.201)**	3.310 (.112)**	2.967 (.145)**	.118 (.006)**	.088 (.006)**	.138 (.005)**	.094 (.006)**
Age 40-44	3.526 (.163)**	3.292 (.263)**	3.274 (.117)**	3.329 (.186)**	.125 (.006)**	.092 (.008)**	.137 (.005)**	.105 (.008)**
Age 45-49	3.780 (.193)**	3.406 (.291)**	3.610 (.140)**	3.303 (.207)**	.133 (.007)**	.095 (.009)**	.151 (.006)**	.104 (.009)**
Age 50-54	3.839 (.211)**	3.374 (.275)**	3.742 (.158)**	3.351 (.241)**	.136 (.008)**	.094 (.008)**	.156 (.007)**	.106 (.010)**
Age 55-60	4.279 (.288)**	3.625 (.349)**	3.485 (.165)**	3.481 (.278)**	.151 (.011)**	.101 (.010)**	.146 (.007)**	.110 (.011)**
Obs.	22265	11486	22265	11486	22265	11486	22265	11486
Percent Correctly Predicted	97.97	98.42	97.52	98.13	97.97	98.42	97.52	98.13

**p < 0.01

*p < 0.05

2.11 Construction of Variables

Lagged Employment Status:

Lagged Regular Employment, **Lagged Non-Standard Employment**, **Lagged Other Employment** and **Lagged Searched** are all dummy variables that take a value of 1 if the individual was engaged in the specific type of employment at any point during the previous year, as indicated by the retrospective panel described in figure 2.3, and zero otherwise. Since one cannot observe an individual leaving the labor force during a year in which she is also engaged in other activities, **Lagged Out of The Labor Force** is a dummy variable that takes a value of 1 only if the individual spent the entire previous year out of labor force and zero otherwise.

Experience:

The **regular experience** and **non-standard experience** variables are calculated from the data in the retrospective panel described by 2.3. It is important to realize that one cannot determine exactly how much time an individual spent in a particular activity during a given year, only whether or not the individual was engaged in a specific activity at some point during the year. In order to determine how many years of experience in a particular activity an individual has acquired, I use the following assumptions: In years where the individual was engaged in only one activity (such as regular employment or attending school), I increase the years of experience in that activity by 1. In years where an individual experiences more than one activity, I assume that an equal amount of time was spent in each activity and simply increase the amount of experience in the activity by 1 divided by the number of different activities the individual was engaged in during the year.

Unfortunately, this method does not allow me to identify years in which an individual left the labor force for only part of the year.

Lagged Tenure:

The **lagged tenure** variables are calculated as the accumulated experience between jobs. The start or end of a job can be identified by the respondent's indicating either that they stop one type of employment status (e.g. regular or non-standard employment) and begin another, or that they changed jobs as indicated in the last column on table 2.3.

Education Dummy Variables:

Although one cannot observe exactly how many years of education an individual has in each period with complete accuracy, one can infer the level of education by working backwards from the present. The KHPS provides data on each respondent's highest level of education achieved so far and whether they graduated, dropped out or are still in school. Unfortunately, since the retrospective panel begins only at the age of 18, I am unable to determine the education and employment histories of those who did not graduate from high school and thus cannot include these individuals in my estimation. For those who have completed high school at least, I estimate when they graduated from college in the following manner: if college is their highest level of education, then the dummy variable **Graduated College** takes a value of 1 in their final year of schooling (and each year thereafter) as indicated on table 2.3. For those who continued on to graduate school, I assume that they graduated from college at the age of 22. Considering the highly structured nature of the Japanese education system, this does not appear to be a problematic assumption. Similarly, I assign a value of 1 to the dummy variable **Graduated Junior College** in the final year of schooling (and each year thereafter) as determined by table 2.3 if the individual's highest level of education is junior college and they graduated. Unfortunately, I cannot identify an individual who graduated from both junior college and college. These individuals will have a value of zero for **Graduated Junior College** and a value of 1 for **Graduated College**.

Job Offers to Job Seekers Ratio (*kyujinbairitsu*):

Published by the Ministry of Health, Labour and Welfare, these data are collected at Public Employment Security Offices (*koukyoushukugyouanteijou*). The index comes in 2 general types. The first is the "Effective Job Offers to Job Seekers Ratio." This measure divides the sum of the number of vacancies posted through the public employment security office in the current month and the number of unfilled vacancies from the previous month by the sum of the number of new job seekers using the public employment security office in the current month and the number of seekers from the previous month who are still searching. The second type is the "New Job Offers to Job Seekers Ratio." It simply divides the number of new vacancies posted through the public employment security office in the current month by the number of new job seekers using the public employment security office in the current month. Both indices are available for all workers, for part-time workers only and for all worker excluding part-time workers. Although collected at the regional level, they are publicly available only at the national level at a monthly frequency. In this study, I use the annual average effective job offers to job seekers ratio for

part-time workers only and for all workers excluding part-time workers.

Chapter 3

Corporate Governance and Personnel Strategy: An Analysis of the *Survey of the Employment System and Personnel Strategy*

3.1 Introduction

In chapters 1 and 2, I focused on changes in the Japanese labor market from the perspective of the worker. In this chapter I analyze some of these same changes from the perspective of Japanese firms. In particular, I ask how changes in the Japanese system of corporate financing have affected human resource management. Most models of corporate governance, based largely on the Anglo-American system, ignore the role of human resource management. The firm is viewed as a collection of contracts among different agents, with the contract regulating the relationship between the firm's management and the suppliers of funds attracting the greatest attention. Such a view is well summarized by [Shleifer and Vishny(1997)] define corporate governance as the ways in which the suppliers of finance to corporations assure themselves of getting a return on their investment."

Japan's system of corporate governance, on the other hand, has long laid importance on the relationships among other actors besides the firm's management and those who provide the financing. Such a view corresponds better with a conception of corporate governance as the study of the "design of institutions that induce or force management to internalize the welfare of stakeholders" [Tirole(2001)]. This broader class of stakeholders includes customers, suppliers and even the wider society in which a firm operates. While all of these relationships are interesting and important in their own right, in this study I focus on the relationship between the firm and its workers, a relationship that has been viewed as a cornerstone of Japanese corporate governance.

At the heart of Japanese corporate governance are the long-term relationships between the firm and its various stakeholders. Among the most studied of these long-term relationships is that between the firm and its suppliers of funds. Under the "main bank system," large Japanese firms have close ties to banks that, as well as being the largest holder of the firm's debt, typically also have an equity stake in the company and are expected to provide assistance to the company in times of distress. Japanese corporations also typically hold large equity stakes in each other in "cross-shareholding" arrangements.

Another much-studied long-term relationship that is characteristic of Japanese corporate governance is the relationship between the manager of the firm and the employees. This relationship is characterized by "lifetime employment," under which workers are guaranteed employment at the firm until some mandatory retirement age, and "seniority-based wages", under which workers' wages increase with time spent at the firm. As discussed in chapter 1, these two human resource management policies support the incentive of the firm to invest in the training

of its workers.

But while each of the above relationships is interesting in and of themselves, my primary interest lies in how they affect each other. It has been argued that the various long-term relationships found in Japanese corporate governance are mutually reinforcing¹. For example, the concentration on bank lending rather than capital market financing created by the main bank system makes it easier for a firm in distress to renegotiate its obligations and reduces the likelihood of corporate failure. This, in turn, makes it easier for the firm to make long-term commitments such as lifetime employment to its employees.

In this paper, I focus on the interaction between two particular sets of relationships. On the one hand, asymmetric information gives rise to a moral hazard problem between the manager of a firm and the supplier of capital. On the other hand, asymmetric information regarding the skills of workers gives rise to a moral hazard problem between the manager of a firm and the employees. These problems are solved through systems of corporate governance. However, the Japanese system of corporate finance has undergone enormous changes over the last 30 years. I seek to investigate whether these changes in corporate finance and the resulting changes in corporate governance may have induced changes to the system of human resource management in Japan.

The point of departure is the deregulation of Japan's financial markets in the 1970s, which brought permanent changes to the system of corporate finance in Japan. Firms could raise funds directly from capital markets more easily than before and so began to rely less on their main bank as an important source of funds. Cross-shareholdings among firms also began to unravel dramatically, as demonstrated by [Kuroki(2003)]. These changes were met with a remarkable increase in share ownership by foreign investors. The percentage of the Tokyo Stock Exchange's market value under foreign ownership increased from approximately 4% in the early 1990s to more approximately 28% by 2006.

In the area of employment practices, studies such as [Kambayashi and Kato(2009)] have investigated whether or not similar changes can be seen in the human resource management systems of firms. Their findings suggest that a weakening of the lifetime employment system can be seen towards of the 1990s, although it would be premature to announce the practice's demise. Similarly, [Abe and Hoshi(2007)] show that firms have been replacing the long-held preference of hiring new graduates with more mid-career hiring.

In this paper, I analyze how the solution to the moral hazard problem between the man-

¹See [Aoki(2001)]

ager of the firm and the supplier of capital affects the solution to the moral hazard problem between the manager of the firm and the employees and vice versa. In investigating whether certain financing arrangements are better suited to certain human resource management policies, I use data collected from two sources - financial data from the NEEDS database and human resource management data from the Survey of The Employment System and Personnel Strategy, conducted by the Japan Institute of Labor Policy and Training (JILPT) - to analyze the relationship between corporate financing and human resource management empirically.

Similar studies were conducted using the same survey on human resource management (Survey of The Employment System and Personnel Strategy) in [for Labour Policy(2007)] and [for Labour Policy and Training(2010)]. This study updates the analyses from these earlier studies with more recent data (from the 2009 survey) and investigates trends and differences over time. I find that the financial structure of the firm is correlated with which stakeholders are regarded as important or influential by the firm. Similarly, I find longer average lengths of service at older firms and firms with lower rates of profitability. I also find that older firms and firms with lower rates of profitability are more likely to reconsider their policies on lifetime employment. Finally, I find that firms are less likely to report that they will support lifetime employment in the future the higher is the percentage of shares owned by either foreign shareholders or individual shareholders.

The paper is structured as follows. Section 3.2 describes the theoretical model used to analyze the relationship between the financing arrangements of the firm and its human resource strategy. Section 3.3 provides an overview of the results from the 2005 survey. Sections 3.4, 3.5 and 3.6 compare the analysis of the 2009 study with that of the 2005 survey and identify which results continue to apply and which have changed. Section 3.7 lists the similarities and differences between the 2 surveys, and concludes by pointing out a direction for future research.

3.2 The Model

The model employed in this paper is taken from [Hoshi(2002)], which builds on the model of [Tirole(2001)] by introducing a moral hazard problem for workers in addition to the moral hazard problem between the manager and financier. By analyzing these problems simultaneously, I can investigate how the two distinct institutions of corporate financing and human resource management interact.

As in [Tirole(2001)], there is a manager of a firm who can choose between two projects. Both projects require an initial investment of I and yield a return of R if successful or zero if

unsuccessful. The two projects differ only in their probability of success, given by $p_H(p_L)$ for the good (bad) project. I assume that $p_H > p_L$, giving the good project a higher expected return than the bad project. However, the bad project provides the manager of the firm with a non-monetary benefit of B , while the good project does not. The manager is endowed with funds $A < I$ and thus requires outside financing of $I - A$. The moral hazard problem arises because the choice of which project to undertake is part of the manager's private information and cannot be observed by the outside investor. I compare two alternative forms of outside financing - one in which financing can be obtained from a bank that can monitor the manager and another in which financing is obtained from the stock market. I assume that the outside investor's required rate of return is zero.

I make the further assumption that the expected net present value is positive for the good project but negative for the bad project, so that $p_H R - I > 0$ but $p_L R - I + B < 0$. Since the investor's profit is maximized when the good project is taken rather than the bad project, he must provide the manager with the incentive to choose the good project. Let w_m be the manager's income, which is equivalent to the residual claim on the firm's revenue after the debt from the investor has been repaid. Then the incentive compatibility constraint needed in order to convince the manager to choose the good project is given by

$$(p_H - p_L)w_m \geq B \quad (3.1)$$

In other words, the expected income from the good project must be high enough to offset the private benefit lost by forgoing the bad project. Inequality 3.1 thus provides us with a lower bound on w_m in order for the manager to choose the good project. Given this lower bound, the maximum return that an investor can possibly expect is

$$p_H \left(R - \frac{B}{p_H - p_L} \right) \quad (3.2)$$

This amount is referred to as the manager's "pledgeable income" in [Tirole(2001)]. Given the restrictions on incentives, the investor will be willing to lend to the manager only if the project has a positive expected net value and this pledgeable income exceeds the financing gap, or

$$p_H \left(R - \frac{B}{p_H - p_L} \right) \geq I - A \quad (3.3)$$

But the adverse selection problem can be minimized by introducing bank monitoring

into this framework. At a cost of c_b , the bank can monitor the manager and reduce his private benefit to $b < B$. In this case the necessary condition for the bank to lend changes from 3.3 to

$$p_H \left(R - \frac{b}{p_H - p_L} \right) \geq I - A + c_b \quad (3.4)$$

The alternative to bank financing is for the manager to raise the funds directly from the stock market. In this case, I assume that the equity issued to investors, $I - A$, is large enough to give the investors control of the firm. Once the manager selects the project, market participants receive a signal that can be either "good" or "bad." If the manager chooses the good project, then the probability of observing a good signal is q_H , and if the manager chooses the bad project then the probability of observing a good signal is q_L , with $q_H > p_H$ and $q_L < p_L$. In other words, the signal is more informative than the outcome of the project about the manager's choice. Let V_G be the conditional probability that the projects succeeds given that the good signal is observed and let V_B be the conditional probability that the project succeeds when a bad signal is observed.

I introduce into this environment a special group of investors, called "turnaround specialists," who are able to increase the conditional probability of success when the signal is bad from V_B to $V_B + \delta$. Once a bad signal is observed, then turnaround specialists would be willing to pay up to $(V_B + \delta)R$ for the project while other market participants would not be willing to pay more than $V_B R$. For simplicity, I assume that the turnaround specialists have all the bargaining power in negotiations with the manager so that the market price of such a project is $V_B R$.

The results of [Holmstrom(1979)] show that the optimal incentive compensation must depend only on the signal, not the realized outcome of the project. If I let w_s be the payment made to the manager only when a good signal is observed, then he will choose the good project if and only if

$$\begin{aligned} q_H w_s &> q_L w_s + B \\ \Rightarrow (q_H - q_L) w_s &> B \end{aligned} \quad (3.5)$$

and the pledgeable income becomes

$$\begin{aligned} q_H (V_G R - w_s) + (1 - q_H) (V_B R) &= p_H R - q_H w_s \\ &= p_H R - q_H \frac{B}{q_H - q_L} \end{aligned} \quad (3.6)$$

The first equality comes from noticing that once the good project is chosen, it can be successful with a good signal (with probability $q_H V_G$) or successful with a bad signal (with probability $(1 - q_H) V_B$). Thus, the probability of success given that the good project is chosen is $p_H = q_H V_G + (1 - q_H) V_B$. Given this constraint, the manager is able to raise funds in the stock market and chooses the good project if

$$p_H R - q_H \frac{B}{q_H - q_L} \geq I - A \quad (3.7)$$

Equations 3.4 and 3.7 then provide the two financing alternatives. In both cases the manager chooses the good project over the bad project so that the moral hazard problem is solved. The two schemes differ, however, in the set of parameters under which outside financing can be raised.

Next, I analyze the role of human resource management. I assume that one worker is needed to complete either project. However, the probability of success of the good project falls to p_M (with $p_H > p_M > p_L$) if an unskilled worker is used rather than a skilled worker. For the bad project, the skill of the worker has no effect on the probability of success.

In order to become skilled, a worker can either acquire the skills himself, by providing an effort of E . The actual level of the worker's skill and the cost of acquiring high skills, E , are both assumed to be private information. This information asymmetry is what causes the potential for moral hazard. I further assume that there is a positive social benefit if the worker acquires the skills, so that $p_H R - E > p_M R$.

There are two potential ways in which this moral hazard problem can be avoided. The first is for the firm to bare the cost, e , of training the worker itself. In this case the worker does not have to provide any extra benefit himself and I further assume that it is at least as costly for the worker to privately acquire the skills as it is for the firm to provide the training, so that $e \leq E$. If I assume that the market wage for an unskilled worker is w^* , then the total cost to the firm of hiring an unskilled worker and training him is $w^* + e$.

Alternatively, the firm can hire a worker who has acquired the necessary skills himself. I assume that the firm is able to observe a signal of the worker's skill level. The probability that a "good" signal is observed when the worker has acquired the skills himself is r_H , while the probability that a good signal is observed when the worker is unskilled is zero. Thus, a good signal informs the firm perfectly that the worker is skilled. Let w be the market wage for a skilled worker. A worker will acquire the skills himself if and only if

$$r_H w - E \geq w^* \quad (3.8)$$

I assume that the firm holds all the power in its bargaining with the worker, so that inequality 3.8 holds with equality.

Thus, our model provides four possible institutional combinations to deal with the two sources of information asymmetry - a combination of one of two alternatives to address the moral hazard problem between the investor and manager - namely bank monitoring or a stock market signal to discipline the manager - and one of two alternatives to address the moral hazard problem between the worker and the manager - providing in-house training or hiring skilled labor on the open market in order to invest the worker with skills. In the case of the latter moral hazard problem - between the worker and the manager - the problem is completely solved. Under either option, the worker acquires the skills. However, the two options differ in how that training is financed and this difference affects the former moral hazard problem - between the investor and the manager - by altering the amount of pledgeable income at the manager's disposal. To understand how these two sets of institutions interact, I will compare their effect on the amount of pledgeable income.

The first combination is bank financing and in-house training. When the manager hires a unskilled worker he trains him at a cost of e and pays him a wage of w^* . This reduces the pledgeable income by a total of $w^* + e$. Combining this with inequality 3.4 results in the following condition on pledgeable income in order for the manager to be able to finance the good project through bank lending:

$$p_H \left(R - \frac{b}{p_H - p_L} \right) - w^* - e - c_b \geq I - A \quad (3.9)$$

The second possible combination is stock market financing and in-house training. Recall that under stock market financing, the firm is sold to the turnaround specialists if a bad signal is observed. I assume that in such a case the worker is fired and receives no compensation. In order to compensate him for the possibility of losing his job, the firm must offer the worker a higher wage before the signal is observed in order to induce him to work. Since with probability q_H a good signal is observed and the worker is trained in-house, while with probability $1 - q_H$ he receives zero, his ex-ante compensation must be $\frac{w^*}{q_H}$. This, combined with the actual cost of training, e , raises the total labor cost to $\frac{w^*}{q_H} + e$ and changes the condition on pledgeable income for stock market financing, inequality 3.7, to

$$p_H R - q_H \frac{B}{q_H - q_L} - \frac{w^*}{q_H} - e \geq I - A \quad (3.10)$$

The third combination is bank financing and self-training. The worker invests effort E to acquire the necessary skills and his wage, $w = \frac{w^* + E}{r_H}$, is determined by 3.8 holding with equality. Combining this with inequality 3.4, which governs the necessary condition on pledgeable income for bank financing, leads to

$$p_H \left(R - \frac{b}{p_H - p_L} \right) - \frac{w^* + E}{r_H} - c_b \geq I - A \quad (3.11)$$

The final combination is stock market financing and self-training. There are two signals in this combination - one for the stock market and one for the labor market. I assume that the stock market signal is observed first. With probability q_H a good stock market signal is observed and the firm will hire a worker at a wage of $w = \frac{w^* + E}{r_H}$. With probability $1 - q_H$ a bad signal is observed and the worker is not hired. Thus, combining inequality 3.7 with the cost of labor produces:

$$p_H R - q_H \frac{B}{q_H - q_L} - q_H \frac{w^* + E}{r_H} \geq I - A \quad (3.12)$$

At this point, I seek to understand which combinations of financing and training lead to the best outcomes. Put differently, I seek to understand which financing arrangement is best for a given training policy and, vice versa, which training policy is best for a given financing arrangement.

I first analyze how financing arrangements compare for a given training policy. The right hand sides of 3.9-3.12 are identical. By subtracting the left hand side of 3.10 from the left hand side of 3.9, I can determine the set of parameters under which one financing arrangement may be used but the other not when in-house training is employed. This expression is given by

$$\begin{aligned} Z_1 &= p_H \left(R - \frac{b}{p_H - p_L} \right) - w^* - e - c_b - p_H R - q_H \frac{B}{q_H - q_L} - \frac{w^*}{q_H} - e \\ &= q_H \frac{B}{q_H - q_L} - p_H \frac{b}{p_H - p_L} - c_b + \frac{(1 - q_H)w^*}{q_H} \end{aligned} \quad (3.13)$$

Similarly, taking the difference between the left hand sides of 3.11 and 3.12 yields an expression for the set of parameters under which one financing arrangement may be used but the other not when self-training is employed.

$$\begin{aligned}
Z_2 &= p_H \left(R - \frac{b}{p_H - p_L} \right) - \frac{w^* + E}{r_H} - c_b - p_H R - q_H \frac{B}{q_H - q_L} - q_H \frac{w^* + E}{r_H} \\
&= q_H \frac{B}{q_H - q_L} - p_H \frac{b}{p_H - p_L} - c_b - (1 - q_H) \frac{w^* + E}{r_H}
\end{aligned} \tag{3.14}$$

Z_1 compares in-house training under bank financing and stock market financing. Z_2 compares self-training under bank financing and stock market financing. The two expressions differ only in their final terms. For Z_1 , $\frac{(1-q_H)w^*}{q_H}$ is positive while for Z_2 $-(1-q_H)\frac{w^*+E}{r_H}$ is negative. This implies that there is a set of parameters for which bank financing is preferred to stock market financing when in-house training is used and, conversely, for which stock market financing is preferred to bank financing when self-training is used. In this sense bank financing is more amenable to in-house training while stock market financing is more amenable to self-training.

I can consider the problem from the opposite direction and analyze how the two training policies compare when I fix the financing arrangement. Subtracting the left hand side of 3.11 from the left hand side of 3.9 compares in-house training with self-training under bank financing and yields

$$Z_3 = \frac{(1-r_H)w^*}{r_H} + \frac{E}{r_H} - e \tag{3.15}$$

Subtracting the left hand side of 3.12 from the left hand side of 3.10 compares in-house training with self-training under stock market financing and yields

$$Z_4 = \frac{q_H(w^* + E)}{r_H} - \frac{w^*}{q_H} - e \tag{3.16}$$

Comparing Z_3 and Z_4 , one sees that

$$\begin{aligned}
Z_3 - Z_4 &= \frac{(1-r_H)w^*}{r_H} + \frac{E}{r_H} - \frac{q_H(w^* + E)}{r_H} - \frac{w^*}{q_H} \\
&= \frac{(q_H + r_H)(1-q_H)}{r_H q_H} w^* + \frac{1-q_H}{r_H} E \\
&> 0
\end{aligned} \tag{3.17}$$

This implies that there is a set of parameters for which in-house training is preferred to self-training when bank financing is used, but self-training is preferred to in-house training when stock market financing is used. In this sense, in-house training is more amenable to bank

financing, while self-training is more amenable to stock-market financing. These results suggest a complementarity between financing arrangements and human resource management - bank financing and in-house training go well together, while stock-market financing and self-training go well together. In the remainder of this paper I investigate the data from two sources - financial data from the NEEDS database and human resource management data from the Survey of The Employment System and Personnel Strategy - to assess the relationship between financing and human resource management empirically.

3.3 The 2005 Survey

The relationship between corporate governance and personnel strategy was analyzed in Part III Chapter I of JILPT (2007). I summarize the main results from that study in this section.

The first item of analysis was the relationship between the type of stakeholders that have a large degree of influence or are viewed as important by the firm on the one hand, and the firm's structure of equity ownership on the other. In general, stakeholders with a large share of equity are viewed by the firm as important and are influential. The statistically significant relationships were as follows. First, the greater the firm's dependence on bank loans, the older the firm or the smaller the firm, the more importantly the banks with whom the firm deals had been viewed up until the survey and the more importantly these banks would be viewed in the future. The same relationships were found regarding not only how importantly the banks were viewed, but also how influential they were and would continue to be. Second, the higher the ratio of ownership by foreign investors, the more importantly institutional investors had been viewed and the more importantly they would be viewed in the future. Institutional investors would also continue to be influential at firms with higher degrees of foreign ownership. On the other hand, the effects of firm size and age could be seen only on the influence of institutional investors in the past. Institutional investors tended to display strong influence on large or old firms up until the time of the survey. However, there were no such tendencies when firms were asked about the influence of institutional investors in the future. The larger the degree of ownership by individual investors or the younger the firm, the stronger the influence of individual investors both had been until the survey and would continue to be in the future. However, no relationship between the financial structure and the influence of individual investors was observed. Whether employees were viewed as important stakeholders or had much influence was largely unaffected by ownership structure. One relationship that was observed, however, was that the lower the share of ownership by individual investors or the higher the ratio of shares owned by banks, the

more influential, it was believed, employees would be in the future.

Second, the relationship between lifetime employment and the financial structure of the firm was investigated, but no statistically significant relationships were found. There was, however, a positive and statistically significant relationship between the size of the firm and the tendency to announce a policy to support lifetime employment. A positive relationship between the average length of continuous service of regular employees at a firm and the level of influence of employees as stakeholders was also observed.

For the relations between the financial structure and the system of employee education and training, the following were found. Firstly, the education and training of workers was viewed as the responsibility of the firm up until the time of the survey at firms where the influence of employees was strong. Also, there was a strong tendency for the education and training of workers in the future to be seen as the responsibility of the workers themselves at firms where the ratio of foreign ownership was high. However, no significant relationship was found between the corporate governance of firms and how importantly they viewed OJT in education and training to be. Finally, the relationship between the financial structure and benefit programs of firms was examined. There were positive relationships between the degree of foreign ownership and the existence of policies to reduce company housing and housing rental supports, as well as between the influence of employees up until the survey and the provision of both single living quarters and leisure facilities. However, in many cases no close relationship could be found between benefit programs and corporate governance.

3.4 Financial Structure and Corporate Governance

Comparing the 2005 and 2007 surveys, were there any changes in the relationships between the financial structures of firms and their corporate governance? Table 3.1 shows which stakeholders were ranked by firms as being one of their three most important or influential stakeholders up until the time of the survey and which stakeholders were ranked as being among their three most important or influential stakeholders in the future. The numbers in the table represent the percentage of firms that ranked the given stakeholder group among their three most important.

Although the general patterns of which stakeholders have been viewed as important and influential up until the survey and which would continue to be so are similar across years, there are differences in actual percentages reported across years. In most cases, customers were viewed as having been the most important stakeholder and would continue to be so in the future.

However, their influence has dramatically eroded over time and the change is particularly striking in 2009. Employees were the next most importantly regarded stakeholders and a large number of firms answered that that would continue to be the case in the future. In contrast to the case of customers, the importance of employees has been increasing over time. Although it appears that the importance of employees will decline in the future, there seems to be a reversal in that trend between 2005 and 2009.

Compared with the percentage of firms that regarded banks, trading partners and group firms as among the most important or influential in the past, the percentage of firms that would view these stakeholders as among the most important or influential in the future was smaller. In contrast, the percentage of firms that responded that individual and institutional shareholders would be among the most importantly regarded and influential in the future was higher than the percentage of firms that responded that these stakeholders had been viewed as among the most important and influential in the past. Both results are consistent across surveys.

I can conclude from Table 13.1 that firms expect a decline in the influence of and importance with which stakeholders that have played important roles in Japanese corporate governance over many years, such as banks, trading partners and group firms. On the other hand, they expect an increase in the influence of and importance of institutional and individual investors. Although the results regarding employees in 2005 suggested that employees' importance and influence would decline over time, this pattern appears to have been reversed in the more recent surveys and in 2009 I do not see very large disparities between the importance of employees in the past and in the future. Surprisingly, although the surveys of 2005 and 2007 showed little change in firms' attitudes towards customers, the 2009 survey suggests a large erosion of their influence in both the past and in the future.

In the rest of this section, I report our analyses of how the financial structure of the firm is correlated with the importance and influence of stakeholders using simple probit models. As indicators of firms' financial structures, I consider the ratio of borrowings to total assets, the percentage of shares owned by banks, the percentage of shares owned by foreign investors and the percentage of shares owned by individual investors. In calculating the ratio of borrowings to total assets, I divide the sum of short-term borrowings, long-term borrowings and long-term borrowings payable within 1 year by total assets. It is believed that the greater the dependence on bank borrowings, the higher the ratio of borrowings to total assets should be. These data are taken from the Nikkei NEEDS database.

In addition, I use firm size and year of establishment as control variables. For firm size, I

use (the log of) total assets and for year of establishment I create three dummy variables. In each case the dummy variable takes a value of 1 if the firm was established before 1945 for the first dummy, from 1946 to 1965 for the second dummy, and from 1966 to 1985 for the third dummy, and a zero if not. I add these control variables to the regression as explanatory variables. When included in the regression model, the estimated coefficients on these dummy variables represent how firms established in the given period differ from younger firms established in the period after 1986.

First, I examine what type of firms view their banks as most important. The dependent variable of the probit model is a dummy variable that takes a value of 1 if the firm listed its banks as among its three most important stakeholders in the past or in the future and a zero otherwise. The results are presented in Table 3.2.

Models (1) and (2) represents the simplest cases and include only the financial structure variables and a constant as explanatory variables. Models (3) and (4) add the firm size and establishment year dummy variables as control variables. The coefficient on the ratio of borrowings to total assets is positive and statistically significant in both models (1) and (3). In other words, those firms with higher ratios of borrowing to total assets in 2003 were more likely to list their banks among the 3 stakeholders they viewed most importantly in the past. In models (2) and (4) there is no significant relationship between the percentage of shares owned by banks and the importance of banks to the firm. If I focus on the control variables of models (3) and (4), I see that older firms are more likely to have viewed banks as important stakeholders and model (3) suggests that smaller firms are also more likely to view their banks among their three most important stakeholders. These results are broadly consistent with the results from the earlier surveys. Models (5)-(8) investigate whether or not the importance of its banks in the future depends on the firm's financial structure. For the financial structure variables and asset size variables, I use the values from 2009. The results are very similar to those of the models for the importance of the banks up until the time of the survey, except that size is no longer important in either model (7) or model (8). The higher the ratio of borrowings to total assets, the higher the probability that banks will continue to be among the most important stakeholders in a firm.

Table 3.3 reports the results of investigation of the relationship between foreign ownership and the importance of institutional investors. Because many foreign shareholders are institutional investors, I surmise that the importance of institutional investors may depend on the percentage of shares owned by foreign investors. Indeed the higher the percentage of foreign ownership (four years earlier), the higher the probability that firms answered that institutional

investors had been regarded among their three most important stakeholders in the past and the more likely the firm was to view institutional investors as among their most important stakeholders in the future. These results are consistent across both the simple probit models and the probit models with firm size and establishment year as control variables, although the importance of institutional investors does not seem to depend on establishment year. Model (4) does, however, suggest a negative relationship between firm size and the importance placed on institutional investors.

In Table 3.4, I investigate the relationship between the percentage of shares owned by individual investors and the importance of individual investors. There is a statistically significant positive relationship between the percentage of shares owned by individual investors and both the importance with which individual shareholders had been regarded up until the survey (models (1) and (2)) and the importance with which they will be regarded in the future (models (3) and (4)). The correlations with firm size are not statistically significant, but there is a statistically significant negative relationship between the importance of individual shareholders and the oldest firms.

Table 3.5 investigates the relationship between the importance of employees and firms' financial structures. For financial variables, I consider percentage of shares owned by banks, percentage of shares owned by foreign shareholders and percentage of share owned by individual investors one at a time. In almost all cases I do not find any statistically significant relationships with or without controlling for firm size and establishment year. The one exception to this is that firms with higher percentages of their shares owned by banks were more likely to have viewed employees among their most important stakeholders in the past (model (1)), although this result is no longer significant when I control for firm size and age (model (4)).

Similarly to tables 3.2 through 3.5, tables 3.6 through 3.9 investigate the relationship between stakeholders' influence and the firm's ownership structure. Table 3.6 shows that the higher the ratio of borrowings to total assets in 2003, the higher the probability that the firm's banks were influential in the past, and the higher the ratio of borrowings to total assets in 2009, the more likely it is that the firm believes that banks will maintain strong influence in the future. For the models that have the equity ownership of banks as an explanatory variable, the firms with low percentages of shares owned by banks tend to answer that banks exerted large influence in the past and would continue to do so in the future, but the result is not statistically significant. I also find the tendency for small firms to answer that banks exerted strong influence in the past and would continue to do so in the future, but again the result is not statistically significant.

when I control for firm size and establishment year. The coefficients on the establishment year dummies are not significant either, although the point estimates suggest that older firms view banks as being more influential.

Table 3.7 examines the relationship between the influence of institutional investors and the foreign ownership of the firm. The higher the percentage of shares held by foreign investors, the greater the influence of institutional investors has been in the past and will continue to be in the future, although the results regarding the influence of institutional investors in the past are not statistically significant.

Table 3.8 investigates the relationship between the influence of individual investors and the percentage of shares held by individual investors. It shows that the higher the percentage of shares held by individual investors, the greater has been the influence of individual investors in the past and the greater is that influence expected to be in the future, although the result is not statistically significant in models (2)-(4).

Finally, Table 3.9 explores the relationship between the influence of employees and the financial structure of the firm. I do not find any statistically significant relationship between the ownership structure and either the influence of employees in the past or their anticipated future influence. Neither firm size nor establishment year dummies comes in significantly either.

Comparing the results for the 2009 data to those for the 2005 data, almost all of them are qualitatively the same. Firstly, the greater the firm's dependence on borrowings, the more importantly banks were regarded in the past and will continue to be in the future. Moreover, the greater the firm's dependence on borrowings, the greater was the influence of banks in the past and the greater it will continue to be in the future. Secondly, the higher the percentage of shares held by foreign investors, the more important institutional investors have been regarded in the past and are anticipated to be in the future. Similarly, the higher the percentage of shares held by foreign investors, the higher the probability that institutional investors will continue to be influential in the future. Thirdly, the higher the percentage of shares held by individual investors, the more importantly individual investors have been regarded up until the time of the survey and the more importantly they will be regarded in the future. No significant relationship between this type of shareholder structure and the importance or influence of employees is observed.

The two surveys differ in certain respects. Although the establishment year of the firm had an effect in a number of cases in 2005, some of these effects are not observed in 2009. Besides the strong influence that banks have had in the past and are anticipated to have in the future for smaller firms, firm size does not appear to have any effect in the 2009 survey.

3.5 Corporate Finance, Corporate Governance and Lifetime Employment

In this section, I consider the lifetime employment system, a hallmark of the Japanese personnel practice, and analyze how it is impacted by the firm's ownership structure and corporate governance. In both the 2007 and 2009 surveys, Question 14 asked firms to select from 4 options what their lifetime employment policy was. The four options were: 1) in principle I will continue to support a system of lifetime employment, 2) a partial modification of the policy is necessary, 3) a fundamental reconsideration of the policy is necessary and 4) I do not have a policy of lifetime employment. From the answers to this question, I construct two dummy variables. The first takes a value of one if the option 1 was chosen and a zero otherwise. I call this dummy the supporting lifetime employment dummy. The second dummy variable takes a value of one if the option 3 was chosen and zero otherwise. I call this dummy the reconsidering lifetime employment dummy. In addition to Question 14, the 2009 survey asks the firms about the average length of continuous employment of regular employees in 2008. Since a more extensively implemented system of lifetime employment would imply a longer period of continuous employment on average, I can interpret the average length of continuous employment as a measure of the extent of lifetime employment up until the time of the survey.

Table 3.10 presents the distribution of responses to Question 14. Approximately two thirds of firms answered that they will continue to support lifetime employment in the future. That proportion is somewhat lower than the proportion for the same response in the 2007 survey. If I include the firms that believe that a partial modification of the lifetime employment system is necessary but in principle will continue lifetime employment, approximately ninety percent of firms plan to continue lifetime employment. Previously, each time the economy encountered a downturn the destruction of lifetime employment was proclaimed, but even today lifetime employment is still deeply rooted (at least for the publicly listed companies that responded to this survey).

In examining the relationship between lifetime employment and firms' financial structure, I add Return On Assets (ROA, calculated as ordinary profits divided by total assets) to the list of control variables, which included the firm size and establishment year dummy variables introduced in the previous section. Firms with low ROAs may feel they are unable to support a policy of lifetime employment. For the analysis of the 2005 survey, a subjective rate of return index was constructed from the responses to a question regarding how firms viewed recent economic conditions. Such a question, however, was not included in the 2007 or 2009 surveys.

Table 3.11 reports the results of the probit regression models using the Supporting Lifetime Employment dummy as the dependent variable. I see that firms are less likely to respond that they intend to support lifetime employment the higher is the proportion of shares owned by foreign shareholders or individual shareholders. The firm is also less likely to support lifetime employment the younger it is. None of the other variables appear to have an effect on lifetime employment policy. The probability that a firm supports a system of lifetime employment increases if a firm anticipates that it will regard employees as important stakeholders in the future but decreases if employees will be influential in the future. The estimated coefficients, however, are not statistically significant. The estimated coefficient on ROA is positive, indicating that the better the firm's performance, the more likely it is to support a system of lifetime employment. This relationship again is not statistically significant.

Table 3.12 shows the results from a similar regression, but with the reconsidering lifetime employment dummy variable as the dependent variable. In this case, I see that older firms are more likely to reconsider their policies of lifetime employment, as are firms with lower ROA.

Workers at a firm that practices lifetime employment should stay employed by the firm longer than the workers at other firms. Tables 3.13 and 3.14 report the results of the exercise of correlating the ownership structure with the average length of services by the workers. The dependent variable is not a 0-1 dummy variable, so I estimate a standard regression equation using ordinary least squares (OLS).

Table 3.13 shows the results of the regression for the average length of employment of all regular employees. First, the greater the percentage of shares held by banks and the lower the percentage of shares held by foreign investors or individual investors, the longer the average length of employment. In the 2005 survey, the only statistically significant coefficient was that on the percentage of shares held by foreign investors, but in the 2009 data none of these coefficients are statistically significant. In addition, the larger the size of the firm, the greater the average years of employment. The estimated coefficient is, however, not statistically significant. There is also no evidence that whether or not employees have been regarded as important stakeholders in the past or whether or not employees have been influential up until the time of the survey has any influence on the average length of service. Finally, the higher the ROA in 2005 and the younger the firm, the smaller the average years of continuous employment. The estimated coefficients are statistically significant. This result may be a reflection of the ability of the firms with high ROA to hire newly graduated students, while those with low ROA had to suspend hiring.

Table 3.14 presents the results of a similar regression estimated using the average years of employment for regular male employees. The results are basically the same as those for the results for all regular employees. The higher the percentage of shares held by banks and the lower the percentage of shares held by foreign investors or individual investors, the longer the average length of continuous employment, although the estimated coefficients are not statistically significant. Also, the larger the firm, the greater the average length of employment. Finally, the lower the ROA or the older the firm, the longer the average years of continuous employment. These results are statistically significant.

The results of this section can be summarized as follows. Firstly, I cannot establish any statistically significant relationship between the financial structure of the firm and either the supporting lifetime employment dummy variable or the reconsidering lifetime employment dummy variable. The average length of employment (of all regular employees and male regular employees only) increases with firm size. Firms with a small percentage of its shares held by banks and firms with a large percentage of its shares held by foreign investors exhibit a shorter average length of continuous employment. Finally, there is a tendency for poorly performing companies and older companies to have longer years of service on average.

These results are basically similar to the results obtained from the 2005 survey data. There are, however, a few differences. For example, the relationship that was observed between the influence of employees and the average length of employment in the 2005 data is no longer observed in the 2009 data.

3.6 Corporate Governance and Employee Training

In addition to the lifetime employment system, another hallmark of Japanese personnel practice is found in the way employee education and training are conducted. In Question 16 of the 2009 survey, firms were asked about their employee education and training policies in the past and looking ahead to the future. In particular, they were asked three questions: (1) whether education and training should be the responsibility of the firm or the responsibility of the employee, (2) whether their education and training policy emphasizes on the job training (OJT) or off the job training (OFF-JT), and (3) whether the firm actively selected particular employees for training or applied their training policy uniformly to all employees. This question is exactly the same as Question 16 in the 2007 survey. Table 3.15 presents the distribution of responses to this question.

Regarding whether employee education and training is viewed as the responsibility of

the firm or the responsibility of the employee, approximately two thirds of firms responded that it had been more the responsibility of the firm up until the time of the survey. The outlook for the future is similar, with a slightly smaller percentage of firms responding that it would be the responsibility of the firm in the future. This result is slightly lower than that in the 2007 survey. In 2007, three quarters of firms responded that in the future the responsibility of employee education and training would be the responsibility of the firm.

On the subject of whether OJT or OFF-JT is considered more important, in both the 2007 and 2009 surveys more than 90 percent of firms responded that OJT was considered more important than OFF-JT. Looking ahead to the future, that percentage declined slightly, but still more than 80% of firms will continue to regard OJT as of primary importance.

Finally, compared with the survey from 2007, the proportion of firms that have applied employee education and training selectively in the past has increased. The number of firms that intend on doing so in the future is even greater, but not very different from the number that reported an intention to do so in the 2007 survey. This result shows that the shift from uniform application of employee education and training to all employees to a system of selective education and training has steadily progressed during the two years between the surveys.

I construct six dummy variables from the responses to Question 16.

- Firm's responsibility up until present: A dummy variable that takes a value of one if the policy until the present has been that education and training is the firm's responsibility or largely the firm's responsibility.
- Firm's responsibility in future: A dummy variable that takes a value of one if the policy in the future will be that education and training is the firm's responsibility or largely the firm's responsibility.
- OJT up until present: A dummy variable that takes a value of one if the policy until the present has been to emphasize OJT.
- OJT in future: A dummy variable that takes a value of one if the policy in the present will be to emphasize OJT.
- Selective up until present: A dummy variable that takes a value of one if the policy until the present has been to select employees for education and training.
- Selective in future: A dummy variable that takes a value of one if the policy in the future will be to select employees for education and training.

I consider the connection between firms' employee education and training systems on the one hand and their financial structure and corporate governance on the other by estimating probit models for these six dummy variables as the dependent variables. Table 3.16 explores which firms have considered employee education and training the firm's responsibility up until the present. Table 3.17 studies which firms consider employee education and training to be the firm's responsibility going forward. The tables show that in neither case does there appear to be a relationship between employee education and training and the firm's financial structure. Although a positive correlation was observed between firms that gave employees as among their most influential stakeholders and firms that believed employee education and training to be the responsibility of the firm in the 2005 survey, no such relationship is observed in the 2009 survey.

Tables 3.18 and 3.19 examine the relationship between whether or not OJT is emphasized in employee education and training and the firm's ownership structure. There does not appear to be a connection between the degree of emphasis on OJT and the ownership structure of the firm. In fact, none of the estimated coefficients on the variables of interest is statistically significant. But, focusing on the point estimates it can be observed that the younger the firm, the more OJT has been emphasized (table 3.18) and the more it will continue to be emphasized in the future (table 3.19).

To summarize the above results, the majority of firms believe that employee education and training has been the responsibility of the firm and will continue to be so in the future. Furthermore, employee education and training has emphasized OJT in the past and will continue to do so in the future. The shift from uniform application of education and training to all employees to a system of selection of employees for education and training that was observed in the 2007 survey has continued to be observed in the 2009 survey. But, no relationship between firm policy on employee education and training and corporate governance is observed. The one relationship that was observed in the 2005 data, a positive correlation between firms where employees exhibit greater influence and the belief that employee education and training is the responsibility of the firm, cannot be found in the 2009 data.

3.7 Conclusion

This paper used the Survey of Employment Systems and Personnel Strategy conducted by the Japan Institute of Labor Policy and Training (JILPT) in 2005, 2007 and 2009, to consider the connection between corporate governance and personnel strategies at large Japanese firms.

Most of the relationships that were discovered in the 2005 data were confirmed using the

2009 data. But, some were found not to be robust. Relationships between the financial structure and which stakeholders were regarded important or influential were confirmed in both sets of data. Similarly, a tendency for longer average lengths of service at firms with lower rates of profitability were observed in both 2005 and 2009.

Although the 2005 data revealed longer average lengths of employment at firms with higher ratios of borrowing and at firms where employees were influential, such relationships were not observed in the 2009 data. Furthermore, a trend of shorter average lengths of employment at firms with higher percentages of stock held by foreign investors and greater support for lifetime employment among larger firms were observed in 2005 but not 2009.

Although such relationships were not observed in 2005, the 2009 data suggest that negative relationships exist between the percentage of shares owned by foreign investors and support for lifetime employment, as well as between the percentage of shares owned by individual investors and support for lifetime employment.

The lack of a relationship between firms' systems of employee education and training and their corporate governance was common to both 2005 and 2009 surveys. At a majority of firms employee education and training are considered to be the responsibility of the firm even today, and OJT is emphasized in such training. Finally, a shift from a uniform supply of education and training to all employees to a system of selection among employees for education and training appears to be in progress.

3.8 Tables

Table 3.1: Stakeholders Viewed As Important Or Influential (Ranked Among Top 3)

	Stakeholder Viewed As Important						Stakeholder Is Influential					
	2009	2007	2005	2009	2007	2005	2009	2007	2005	2009	2007	2005
Sample Size	207	287	438	207	287	438	203	287	426	203	287	426
Customers (Consumers)	70.53%	79.1%	79.5%	69.08%	80.8%	80.1%	46.8%	56.0%	55.6%	47.3%	59.6%	57.5%
Employees	68.6%	65.5%	63.9%	70.5%	67.6%	58.4%	47.8%	44.4%	47.4%	46.3%	40.1%	39.7%
Individual Investors	20.8%	19.2%	24.9%	23.2%	26.5%	38.1%	20.2%	21.1%	20.0%	23.7%	29.6%	35.0%
Institutional Investors	30.0%	36.6%	34.2%	33.3%	44.9%	45.2%	39.9%	43.3%	38.5%	44.8%	58.9%	59.4%
Banks	22.7%	24.0%	26.7%	20.3%	16.0%	15.8%	39.9%	42.6%	42.0%	37.0%	33.8%	29.1%
Trading Partners (Firms)	44.4%	46.7%	40.2%	42.03%	39.0%	32.9%	43.8%	43.7%	37.6%	39.9%	35.5%	29.3%
Group Firms	15.0%	13.6%	13.0%	14.5%	10.8%	11.2%	21.2%	18.7%	17.6%	21.7%	16.0%	16.0%

Note: Figures represent percentage of firms ranking the relevant stakeholder among their three most important or influential stakeholders.

Table 3.2: Financial Structure And Importance Of Banks

	Banks Viewed As Important Up Until Survey				Banks Viewed As Important In The Future			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Borrowing/Total Assets	2.873 (.608)**		2.831 (.624)**		2.047 (.525)**		2.267 (.562)**	
Percentage of Shares Owned By Banks		-1.010 (.723)		-1.741 (1.060)		-1.345 (.767)		-1.947 (1.074)
Log(Total Assets)			-.168 (.062)**	-.052 (.073)			-.110 (.060)	-.023 (.072)
Established Before 1946			1.009 (.459)*	1.606 (.567)**			1.122 (.513)*	.959 (.460)*
Established 1946-1965			.500 (.460)	.895 (.553)			.974 (.519)	.538 (.446)
Established 1966-1985			.788 (.489)	1.214 (.563)*			1.032 (.546)	.556 (.476)
Const.	-1.267 (.156)**	-.483 (.198)*	-.110 (.706)	-.903 (.833)	-1.270 (.158)**	-.509 (.192)**	-1.064 (.788)	-.789 (.773)
Obs.	204	197	204	197	205	199	205	199

***p < 0.01, **p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-4) financial data from 2007 are used. For the models (5-8) financial data from 2009 are used.

Table 3.3: Financial Structure and Importance of Institutional Investors

	Institutional Investors Viewed As Important			
	Up Until Survey		In The Future	
	(1)	(2)	(3)	(4)
Percentage of Shares Owned By Foreign Shareholders	1.389 (.765)	2.216 (.961)*	2.092 (.780)**	4.372 (1.189)**
Log(Total Assets)		-.089 (.070)		-.211 (.077)**
Established Before 1946		-.122 (.370)		.270 (.364)
Established 1946-1965		-.350 (.366)		.100 (.354)
Established 1966-1985		-.219 (.405)		.301 (.397)
Const.	-.682 (.129)**	.445 (.734)	-.660 (.129)**	1.268 (.763)
Obs.	197	197	199	199

**p < 0.01, *p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-2) financial data from 2007 are used. For the models (3-4) financial data from 2009 are used.

Table 3.4: Financial Structure and Importance of Individual Investors

	Individual Investors Viewed As Important			
	Up Until Survey		In The Future	
	(1)	(2)	(3)	(4)
Percentage of Shares Owned By Individual Shareholders	1.851 (.556)**	1.876 (.664)**	1.898 (.528)**	1.601 (.644)*
Log(Total Assets)		-.051 (.071)		-.020 (.068)
Established Before 1946		-.964 (.445)*		-.835 (.364)*
Established 1946-1965		-.536 (.430)		-.450 (.349)
Established 1966-1985		-.536 (.460)		-.636 (.403)
Const.	-1.530 (.231)**	-.345 (.847)	-1.514 (.240)**	-.621 (.956)
Obs.	197	197	199	199

**p < 0.01, *p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-2) financial data from 2007 are used. For the models (3-4) financial data from 2009 are used.

Table 3.5: Financial Structure and Importance of Employees

	Employees Viewed As Important											
	Up Until Survey						In The Future					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Percentage of Shares Owned By Banks	1.813 (.684)**			1.558 (.969)			.757 (.681)			.542 (.966)		
Percentage of Shares Owned By Foreign Shareholders		.468 (.789)			-.580 (.979)			-.491 (.754)			-.905 (.993)	
Percentage of Shares Owned By Individual Shareholders			.178 (.506)			.062 (.599)			-.575 (.491)			-.322 (.601)
Log(Total Assets)				.004 (.066)	.089 (.067)	.069 (.060)				-.028 (.065)	.031 (.066)	-.023 (.060)
Established Before 1946				.442 (.394)	.685 (.365)	.675 (.390)				.779 (.361)*	.798 (.349)*	.811 (.350)*
Established 1946-1965				.858 (.376)*	1.018 (.364)**	1.005 (.392)*				1.048 (.347)**	1.055 (.346)**	1.048 (.349)**
Established 1966-1985				.636 (.401)	.747 (.402)	.710 (.413)				.724 (.383)	.708 (.384)	.690 (.386)
Const.	.075 (.187)	.462 (.125)**	.452 (.192)*	-.504 (.696)	-1.187 (.719)	-1.022 (.729)	.364 (.179)*	.589 (.126)**	.755 (.212)**	-.069 (.667)	-.516 (.692)	.113 (.872)
Obs.	197	197	197	197	197	197	199	199	199	199	199	199

***p < 0.01, *p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-6) financial data from 2007 are used. For the models (7-12) financial data from 2009 are used.

Table 3.6: Financial Structure and Influence of Banks

	Banks Have Been Influential In The Past			Banks Will Be Influential In The Future				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Borrowing/Total Assets	2.265 (.588)**		2.314 (.597)**		2.418 (.519)**		2.721 (.551)**	
Percentage of Shares Owned By Banks		-.539 (.645)		-.015 (.916)		-.634 (.664)		-.415 (.927)
Log(Total Assets)			-.140 (.053)**	-.123 (.065)			-.122 (.054)*	-.087 (.065)
Established Before 1946			.451 (.357)	.405 (.393)			1.048 (.408)*	.765 (.383)*
Established 1946-1965			.455 (.348)	.278 (.372)			1.086 (.408)**	.594 (.368)
Established 1966-1985			.100 (.399)	.058 (.409)			.971 (.450)*	.569 (.411)
Const.	-.612 (.133)**	-.068 (.185)	.594 (.613)	.916 (.685)	-.808 (.140)**	-.148 (.177)	-.460 (.676)	.172 (.678)
Obs.	200	193	200	193	201	195	201	195

**p < 0.01, *p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-4) financial data from 2007 are used. For the models (5-8) financial data from 2009 are used.

Table 3.7: Financial Structure and Influence of Institutional Investors

	Institutional Investors Influential Up Until Survey		In The Future	
	(1)	(2)	(3)	(4)
Percentage of Shares Owned By Foreign Shareholders	1.455 (.758)	1.392 (.951)	1.554 (.742)*	2.180 (.947)*
Log(Total Assets)		.006 (.065)		-.065 (.064)
Established Before 1946		.074 (.365)		.093 (.342)
Established 1946-1965		-.067 (.359)		-.175 (.334)
Established 1966-1985		-.004 (.407)		-.216 (.384)
Const.	-.401 (.124)**	-.466 (.700)	-.282 (.123)*	.451 (.672)
Obs.	193	193	195	195

**p < 0.01, *p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-2) financial data from 2007 are used. For the models (3-4) financial data from 2009 are used.

Table 3.8: Financial Structure and Influence of Individual Investors

	Individual Investors Influential Up Until Survey		In The Future	
	(1)	(2)	(3)	(4)
Percentage of Shares Owned By Individual Shareholders	1.377 (.564)*	.891 (.666)	.926 (.527)	.365 (.657)
Log(Total Assets)		-.095 (.072)		-.108 (.068)
Established Before 1946		.208 (.497)		-.165 (.377)
Established 1946-1965		.300 (.491)		.139 (.365)
Established 1966-1985		.361 (.520)		-.109 (.421)
Const.	-1.416 (.231)**	-.440 (.892)	-1.114 (.231)**	.312 (.976)
Obs.	193	193	195	195

**p < 0.01, *p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-2) financial data from 2007 are used. For the models (3-4) financial data from 2009 are used.

Table 3.9: Financial Structure and Influence of Employees

	Employees Influential In The Past				Employees Influential In The Future							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Percentage of Shares Owned By Banks	1.231 (.642)			1.302 (.908)			.351 (.648)			.245 (.910)		
Percentage of Shares Owned By Foreign Shareholders		-.300 (.766)			-1.160 (1.010)			-1.072 (.788)			-2.065 (1.098)	
Percentage of Shares Owned By Individual Shareholders			.402 (.489)			.350 (.573)			-.090 (.479)			.175 (.585)
Log(Total Assets)				-.030 (.064)	.069 (.065)	.039 (.058)				-.007 (.063)	.087 (.067)	.012 (.059)
Established Before 1946				.408 (.407)	.616 (.383)	.540 (.402)				.469 (.370)	.413 (.361)	.511 (.359)
Established 1946-1965				.577 (.387)	.730 (.377)	.643 (.397)				.587 (.353)	.562 (.353)	.620 (.354)
Established 1966-1985				.542 (.422)	.667 (.422)	.556 (.430)				.543 (.397)	.510 (.402)	.555 (.400)
Const.	-.344 (.186)	-.0006 (.121)	-.166 (.186)	-.484 (.686)	-1.314 (.715)	-1.134 (.724)	-.165 (.176)	.032 (.123)	-.050 (.202)	-.550 (.659)	-1.293 (.700)	-.805 (.858)
Obs.	193	193	193	193	193	193	195	195	195	195	195	195
**p < 0.01, *p < 0.05												

***p < 0.01, *p < 0.05

Note: Each cell contains the estimated coefficient from the probit model and its standard error. For the models (1-6) financial data from 2007 are used. For the models (7-12) financial data from 2009 are used.

Table 3.10: Answers to Question 14 (Question Concerning Lifetime Employment) 2009 (2007)

Answer	Number of Firms	Percentage
1. Will continue to support lifetime employment.	142 (191)	64.6% (65.6%)
2. Partial modification is inevitable.	49 (66)	22.3% (22.7%)
3. A fundamental reconsideration is needed.	6 (11)	2.7% (3.8%)
4. Do not have a system of lifetime employment.	23 (23)	10.5% (7.9%)
Total	220 (291)	100% (100%)

Note: The figures in parentheses represent the values obtained from the 2007 survey.

Table 3.11: Support of Lifetime Employment

	(1)	(2)
Will Regard Employees As Important In The Future	.074 (.220)	
Employees Will Be Influential In The Future		-.261 (.203)
Percentage of Shares Owned By Banks	1.154 (1.058)	1.420 (1.081)
Percentage of Shares Owned By Foreign Shareholders	-3.280 (1.188)**	-3.723 (1.239)**
Percentage of Shares Owned By Individual Shareholders	-3.005 (.713)**	-3.018 (.729)**
Log(Total Assets)	.008 (.082)	-.006 (.083)
ROA	.010 (.016)	.013 (.017)
Established Before 1946	-.418 (.405)	-.390 (.406)
Established 1946-1965	-.670 (.392)	-.586 (.387)
Established 1966-1985	-.938 (.432)*	-.961 (.441)*
Const.	1.973 (1.013)	2.235 (1.017)*
Obs.	199	195

**p < 0.01, *p < 0.05

Note: Dependent variable is a dummy taking a value of 1 if the firm responded that it will support a system of lifetime employment. Each cell contains the estimated coefficient from the probit model and its standard error.

Table 3.12: Reconsidering Lifetime Employment

	(3)
Employees Will Be Influential In The Future	.273 (.660)
Percentage of Shares Owned By Banks	-2.451 (4.000)
Percentage of Shares Owned By Foreign Shareholders	6.557 (4.937)
Percentage of Shares Owned By Individual Shareholders	3.805 (2.503)
Log(Total Assets)	-.254 (.286)
ROA	-.124 (.056)*
Established Before 1946	7.299 (1.333)**
Established 1946-1965	7.465 (1.306)**
Established 1966-1985	5.896
Const.	-8.505 (3.455)*
Obs.	195

Note: Dependent variable is a dummy taking a value of 1 if the firm responded that a reconsideration of lifetime employment is needed. Each cell contains the estimated coefficient from the probit model and its standard error. All firms that are reconsidering lifetime employment also anticipate that employees will be regarded as important stakeholders in the future, so model (1) cannot be estimated.

Table 3.13: Average Years of Continuous Service (All Regular Employees)

	(1)	(2)
Will Regard Employees As Important In The Future	.208 (.978)	
Employees Will Be Influential In The Future		.679 (.934)
Percentage of Shares Owned By Banks	4.506 (3.150)	3.439 (3.188)
Percentage of Shares Owned By Foreign Shareholders	-4.677 (3.518)	-3.895 (3.449)
Percentage of Shares Owned By Individual Shareholders	-2.680 (2.732)	-2.955 (2.754)
Log(Total Assets)	.597 (.355)	.638 (.360)
ROA	-.285 (.094)**	-.303 (.097)**
Established Before 1946	5.009 (2.360)*	5.055 (2.333)*
Established 1946-1965	3.001 (2.336)	2.980 (2.305)
Established 1966-1985	1.474 (2.499)	1.466 (2.528)
Const.	6.666 (5.054)	6.402 (5.161)
Obs.	184	180
Adjusted R ²	.236	.235

**p < 0.01, *p < 0.05

Note: Dependent variable is average years of continuous service of regular employees. Estimation is conducted using OLS with White Standard Errors. Each cell contains the estimated coefficient from the probit model and its standard error. The independent variables are taken from 2005.

Table 3.14: Average Length of Continuous Service (Regular Male Employees Only)

	(1)	(2)
Will Regard Employees As Important In The Future	.625 (1.080)	
Employees Will Be Influential In The Future		.784 (1.032)
Percentage of Shares Owned By Banks	4.856 (3.587)	4.091 (3.615)
Percentage of Shares Owned By Foreign Shareholders	-5.152 (3.579)	-4.346 (3.542)
Percentage of Shares Owned By Individual Shareholders	-3.146 (3.147)	-3.399 (3.169)
Log(Total Assets)	.470 (.394)	.510 (.394)
ROA	-.291 (.099)**	-.301 (.105)**
Established Before 1946	5.470 (2.584)*	5.543 (2.551)*
Established 1946-1965	3.734 (2.572)	3.837 (2.536)
Established 1966-1985	1.906 (2.754)	2.147 (2.779)
Const.	8.391 (5.646)	8.154 (5.716)
Obs.	177	173
Adjusted R ²	.195	.186

**p < 0.01, *p < 0.05

Note: Dependent variable is average years of continuous service of regular employees. Estimation is conducted using OLS with White Standard Errors. Each cell contains the estimated coefficient from the probit model and its standard error. The independent variables are taken from 2005.

Table 3.15: Distribution of Responses to Question 16

	A	Largely A	Largely B	B	Total
Up until now has it been the firms responsibility (A) or the employees responsibility (B)?	41 (19%) 70 (24%)	124 (57%) 149 (50%)	49 (22%) 67 (23%)	5 (2%) 6 (2%)	219 298
In the future, will it be the firms responsibility (A) or the employees responsibility (B)?	41 (19%) 78 (26%)	115 (53%) 152 (51%)	59 (27%) 59 (20%)	3 (1%) 3 (1%)	218 298
Up until now, OJT emphasized (A) or OFF-JT emphasized (B)?	66 (30%) 88 (30%)	138 (63%) 181 (61%)	12 (5%) 22 (7%)	3 (1%) 1 (0.3%)	219 298
In the future, OJT will be emphasized (A) or OFF-JT will be emphasized (B)?	50 (23%) 59 (20%)	140 (64%) 188 (63%)	29 (13%) 43 (14%)	0 (0%) 2 (1%)	219 298
Up until now, selected employees (A) or uniformly all employees (B)?	16 (7%) 24 (8%)	80 (36%) 88 (30%)	107 (49%) 142 (48%)	17 (8%) 37 (12%)	220 298
In the future, selected employees (A) or uniformly all employees (B)?	14 (6%) 23 (8%)	128 (58%) 169 (57%)	68 (31%) 80 (27%)	9 (4%) 19 (6%)	219 298

Note: All upper figures in cells represent 2009 values. All lower figures represent 2007 values. The figures in parentheses represent the figure as a percentage of all firms.

Table 3.16: Firm is Responsible for Employee Education and Training (Up Until Present)

	(1)	(2)
Up Until Present Emphasized Employees	-.026 (.221)	
Up Until Present Employees Have Been Influential		.172 (.201)
Percentage of Shares Owned By Banks	.515 (.970)	.466 (.971)
Percentage of Shares Owned By Foreign Shareholders	-.111 (1.110)	.061 (1.121)
Percentage of Shares Owned By Individual Shareholders	.329 (.614)	.314 (.620)
Log(Total Assets)	.014 (.082)	.007 (.082)
ROA	.034 (.026)	.030 (.026)
Established Before 1946	.534 (.431)	.483 (.429)
Established 1946-1965	.220 (.409)	.166 (.404)
Established 1966-1985	.705 (.442)	.603 (.445)
Const.	-.306 (.915)	-.263 (.912)
Obs.	197	193

Note: The dependent variable is a dummy variable that takes a value of 1 if, in response to question 16 (1), the firm responded that, up until the time of the survey, employee education and training had been the responsibility of the firm or largely the responsibility of the firm. Each cell contains the estimated coefficient from the probit model and its standard error. The independent variables are taken from 2005.

Table 3.17: Firm is Responsible for Employee Education and Training (In The Future)

	(1)	(2)
Up Until Present Emphasized Employees	.304 (.211)	
Up Until Present Employees Have Been Influential		-.031 (.195)
Percentage of Shares Owned By Banks	-.373 (.946)	-.338 (.950)
Percentage of Shares Owned By Foreign Shareholders	.270 (1.036)	.047 (1.057)
Percentage of Shares Owned By Individual Shareholders	1.157 (.651)	1.169 (.658)
Log(Total Assets)	.066 (.077)	.069 (.078)
ROA	.002 (.015)	.003 (.015)
Established Before 1946	.190 (.380)	.320 (.380)
Established 1946-1965	-.025 (.363)	.107 (.358)
Established 1966-1985	.330 (.411)	.332 (.412)
Const.	-.940 (.937)	-.846 (.930)
Obs.	199	195

**p < 0.01, *p < 0.05

Note: The dependent variable is a dummy variable that takes a value of 1 if, in response to question 16 (1), the firm responded that, in the future, employee education and training would be the responsibility of the firm or largely the responsibility of the firm. Each cell contains the estimated coefficient from the probit model and its standard error. The independent variables are taken from 2009.

Table 3.18: OJT Emphasized in Employee Education and Training (Up Until Present)

	(1)	(2)
Up Until Present Emphasized Employees	-.0004 (.042)	
Up Until Present Employees Have Been Influential		-.018 (.039)
Percentage of Shares Owned By Banks	-.250 (.189)	-.245 (.192)
Percentage of Shares Owned By Foreign Shareholders	.078 (.219)	.062 (.224)
Percentage of Shares Owned By Individual Shareholders	-.114 (.119)	-.119 (.122)
Log(Total Assets)	-.002 (.016)	-.002 (.016)
ROA	-.004 (.005)	-.004 (.005)
Established Before 1946	.106 (.086)	.108 (.087)
Established 1946-1965	.102 (.083)	.107 (.083)
Established 1966-1985	.160 (.086)	.164 (.088)
Const.	.963 (.177)**	.960 (.179)**
Obs.	197	193

**p < 0.01, *p < 0.05

Note: The dependent variable is a dummy variable that takes a value of 1 if, in response to question 16 (2), the firm responded that, up until the time of the survey, employee education and training had focused on OJT or largely on OJT. Each cell contains the estimated coefficient from the probit model and its standard error. The independent variables are taken from 2005.

Table 3.19: OJT Emphasized in Employee Education and Training (In The Future)

	(1)	(2)
Up Until Present Emphasized Employees	-.050 (.052)	
Up Until Present Employees Have Been Influential		.028 (.054)
Percentage of Shares Owned By Banks	-.059 (.236)	-.081 (.241)
Percentage of Shares Owned By Foreign Shareholders	.406 (.242)	.476 (.260)
Percentage of Shares Owned By Individual Shareholders	-.006 (.150)	.039 (.155)
Log(Total Assets)	-.015 (.019)	-.012 (.019)
ROA	-.002 (.003)	-.003 (.003)
Established Before 1946	.168 (.114)	.165 (.115)
Established 1946-1965	.172 (.116)	.151 (.116)
Established 1966-1985	.232 (.118)	.210 (.119)
Const.	.872 (.241)**	.792 (.242)**
Obs.	199	195

Note: The dependent variable is a dummy variable that takes a value of 1 if, in response to question 16 (2), the firm responded that, in the future, employee education and training would focus on OJT or largely on OJT. Each cell contains the estimated coefficient from the probit model and its standard error. The independent variables are taken from 2009.

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