

Employment Status Persistence in the Japanese Labor Market

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Abstract

The growth of Japan's dual labor market, consisting of a primary sector of stable *regular* employment and a secondary sector of unstable *non-standard* employment, has become a cause for concern for policymakers trying to balance low unemployment with job security. This paper uses the *Keio Household Panel Survey*, an individual-level panel dataset, to investigate the effects on future employment opportunities of workers in Japan's non-standard employment and regular employment sectors. I find strong evidence of persistence within the dual labor market, suggesting that past employment experience has a significant impact on future labor market outcomes.

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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 1 and 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 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.

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, which has come to be referred to as *non-standard workers*, has been growing steadily over the last 30 years and by the mid-2000s comprised one third of the country's labor force. The trend has

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."

been particularly evident for women as 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 two sectors. The first case would imply a high level of persistence within the two 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 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 his 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 whichever employment sector they currently find themselves.

The paper is organized as follows: In section 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 3 describes the data used in this study. The description draws largely on a more detailed exploration of the data that I performed in Diamond (2011). I focus on variables relating to on-the-job and off-the-job training and summarize the variables of interest for the estimation.

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

Section 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 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 6 presents the results of the estimation and section 7 discusses the results. Finally, section 8 concludes.

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 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 *non-standard* sector, 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 has shifted to one centered on the differences in employment within the firm as Japan's industrial structure has shifted from one based heavily on manufacturing to one in which services play a more prominent role and the small business sector has shrunk.

Broadly speaking, one can consider the effects of a dual labor market from the perspective of the firm or from the perspective of the individual worker. A dual labor market allows firms the flexibility of being able to adjust their workforces in the face of unexpected shocks through the secondary labor market. As Bentolila and Saint-Paul (1991) show, the dual labor market flexibility provides firms with the incentive to ex-

pand employment during expansions more than they would if flexible contracts were not available as they know that they can quickly reduce their workforces in the event of a negative shock. This increases employment during expansions and reduces it during contractions more than would be the case without flexible employment contracts. There is a growing body of empirical research, including Ariga and Okazawa (2011) and Caballero et al. (2008), 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.

What determines the employment structure within the firm? Kandel and Pearson (2001) show that if firms have access to a secondary sector of flexible labor, they will adjust the composition of their workforce between permanent and flexible workers in response to demand. Specifically, firms will increase the proportion of permanent workers in response to higher expected growth in demand and will lower that proportion in response to an increase in the variability of demand. Houseman and Abraham (1993) show that women, who are far more concentrated in the non-standard employment sector, exhibit a larger elasticity of employment to output and take this as evidence of their role as a buffer to male workers, who are more concentrated in the regular employment sector.

Considering the significant firing costs involved in the regular employment sector, what advantages do they offer to firms? Firstly, there are ways in which firms may be able to economize on labor costs through using permanent workers. Contract theory suggests that there might exist an insurance mechanism by which risk-averse workers would be willing to accept lower wages in return for greater employment stability. Furthermore, from the perspective of the Shapiro and Stiglitz (1984) model of efficiency wages, the monitoring costs and efficiency wages should be higher for flexible workers than for

permanent workers as their costs for dismissal are lower.

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 line of thought focuses on individual workers and 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 Diamond (2011) 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 capital than non-standard employees. While not conclusive in any way, MHLW (2007) shows that the group of firms who suffered the largest decrease in revenues and profits 2 years earlier contained the largest percentage of firms that had reduced regular employment and smallest percentage of firms that increased regular employment over the last 3 years. On the other hand, the group of firms that showed the greatest increase in profits and revenues 2 years earlier contained the largest percentage of firms that increased and smallest percentage of firms that decreased regular employment over the past 3 years.

There are certainly supply-side factors driving the growth in non-standard employment. One possibility is that workers choose non-standard employment over regular

³For a more detailed explanation of the relationship between lifetime employment and human capital accumulation, please refer to Diamond (2011).

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?

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 composi-

⁴For a more detailed description of the dataset, please refer to Diamond (2011).

tion 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 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 and 3 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 two 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 3 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 4 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 5 presents the results for women.

For men, the 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, 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 6 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 the 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).

Table 1, reproduced from Diamond (2011), investigates 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 women⁵. 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 Diamond (2011) 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, 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

⁵Health is a measure that an individual assigns to his own health ranging from 1 (best) to 5 (worst).

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 4 and 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 but are less numerous in the regular sector, there is a large degree of overlap between the two 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 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.

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 7 presents the average proportion of regular workers in each of the groups over their first ten years in the labor market. Figure 8 does the same for the average proportion of non-standard workers. Table 7 indicates which cohorts were included in which group in forming these series.

Figure 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 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:

$$y_{it}^r = 1(y_{it}^{r*} = \beta y_{i0}^r + \gamma exp_{it} + \delta_t + \phi_{i0} + \epsilon_{it} > 0) \quad (1)$$

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, those in family businesses and those with side jobs. 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 ratio⁶.

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 point 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 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 8. 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 college graduates than high school 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) and interact

⁶Local 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) make a similar assumption and show that it is a reasonable approximation.

the regular employment in initial period dummy variable, y_{i0}^r , with a dummy variable indicating the number of 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 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:

$$\begin{aligned}
y_{it}^r = & 1(y_{i,t}^{r*} = \beta_{0-5}y_{i0}^r * exp_{it}^{0-5} + \beta_{5-10}y_{i0}^r * exp_{it}^{5-10} \\
& + \beta_{10-15}y_{i0}^r * exp_{it}^{10-15} + \beta_{15-20}y_{i0}^r * exp_{it}^{15-20} + \beta_{20+}y_{i0}^r * exp_{it}^{20+} \\
& + \gamma exp_{it} + \delta_t + \phi_{i0} + \epsilon_{it} > 0)
\end{aligned} \tag{2}$$

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 8. 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 not being able to secure a regular job and thus missing out on vital investment in training are greater for the more educated.

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 9. 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:

$$P(y_{it} = 1 | y_{i,t-1}, \dots, y_{i0}, \mathbf{z}_i, \alpha_i) = G(\rho y_{i,t-1} + \mathbf{z}_{it} \boldsymbol{\delta} + \alpha_i) \quad (3)$$

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

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 \mathbf{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. Firstly, I obtain the joint distribution of (y_{i1}, \dots, y_{iT}) conditional on (y_{i0}, \mathbf{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 (\mathbf{z}_i, α_i) . Once this is done, I can use standard maximum likelihood methods simply conditioning on y_{i0} as well as \mathbf{z}_i .

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

To this end, I follow the approach taken by Chamberlain (1982). I relax the assumption that α_i is independent of \mathbf{z}_{it} and make the parametric assumption that $\alpha_i = \psi + \xi_0 y_{i0} + \bar{\mathbf{w}}_i \boldsymbol{\xi} + a_i$, where $\mathbf{w}_i \subseteq \mathbf{z}_i$ and $a_i \sim N(0, \sigma_a)$ and is independent of (y_{i0}, \mathbf{z}_i) . In this case, equation 10 can be written as

$$y_{it} = 1[\psi + \rho y_{i,t-1} + \mathbf{z}_{it} \boldsymbol{\delta} + \xi_0 y_{i0} + \bar{\mathbf{w}}_i \boldsymbol{\xi} + a_i + e_{it} > 0] \quad (4)$$

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

$$f(y_1, \dots, y_T | \mathbf{z}_i; \boldsymbol{\theta}) = \int_{-\infty}^{\infty} \left[\prod_{t=1}^T f(y_t | 1, \mathbf{z}_{it}, y_{i,t-1}, y_{i0}, \mathbf{z}_i, a; \rho, \boldsymbol{\delta}) \right] \frac{1}{\sigma_a} \phi\left(\frac{a}{\sigma_a}\right) da \quad (5)$$

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

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 $\bar{\mathbf{w}}_i$ in equation 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 4 is estimated using the panel data covering 1963-2003 and the results for selected variables are presented separately in table 10 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 11. 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 ($1/0.12$) 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 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 in non-standard employment 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:

$$\begin{aligned}
y_{it} = & 1(\psi + \rho_{ns}^{63-72} D_{it}^{63-72} y_{i,t-1}^{ns} + \rho_{ns}^{73-84} D_{it}^{73-84} y_{i,t-1}^{ns} + \dots + \rho_{ns}^{98-03} D_{it}^{98-03} y_{i,t-1}^{ns} \\
& + \rho_{reg}^{63-72} D_{it}^{63-72} y_{i,t-1}^{reg} + \rho_{reg}^{73-84} D_{it}^{73-84} y_{i,t-1}^{reg} + \dots + \rho_{reg}^{98-03} D_{it}^{98-03} y_{i,t-1}^{reg} \\
& + \gamma_{63-72} D_{it}^{63-72} + \dots + \gamma_{98-03} D_{it}^{98-03} \\
& + \mathbf{z}_{it} \boldsymbol{\delta} + \xi_0 y_{i0} + \bar{\mathbf{w}}_i \boldsymbol{\xi} + a_i + e_{it} > 0)
\end{aligned} \tag{6}$$

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 12. They suggest that persistence in the non-standard sector has gradually decreased over time for high school graduates. For college graduates it decreased 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 13. 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.

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 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 they 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 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 that 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) 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.

8 Conclusion

I used the *Keio Household Panel Survey*, an individual-level dataset, to investigate differences in Japan's regular and non-standard employment sectors. I limited my study to men and found that workers differ in key respects, such as education and training,

between the two sectors. I also found that the two 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 then used 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 found 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 found 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 challenge for future research.

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9 Figures

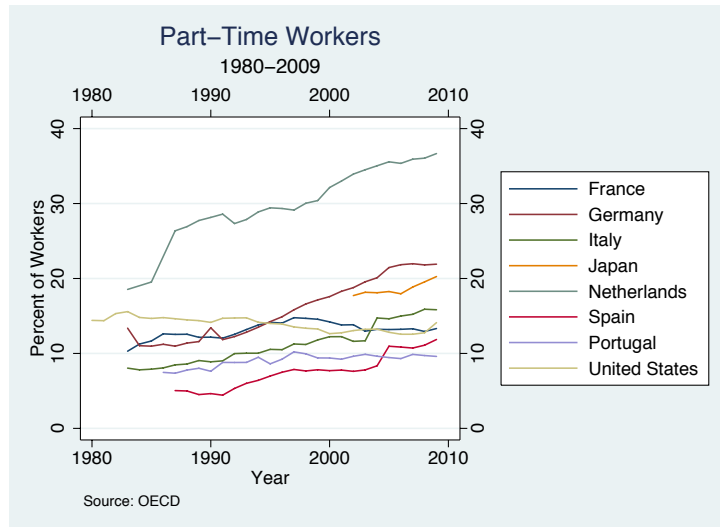


Figure 1: Percentage of Part-Time Workers: 1980-2009

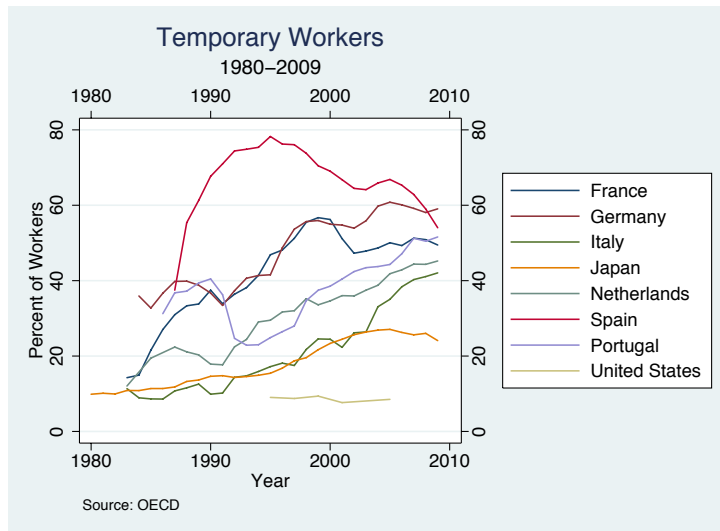


Figure 2: Percentage of Temporary Workers: 1980-2009

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 3: Retrospective Panel Questionnaire

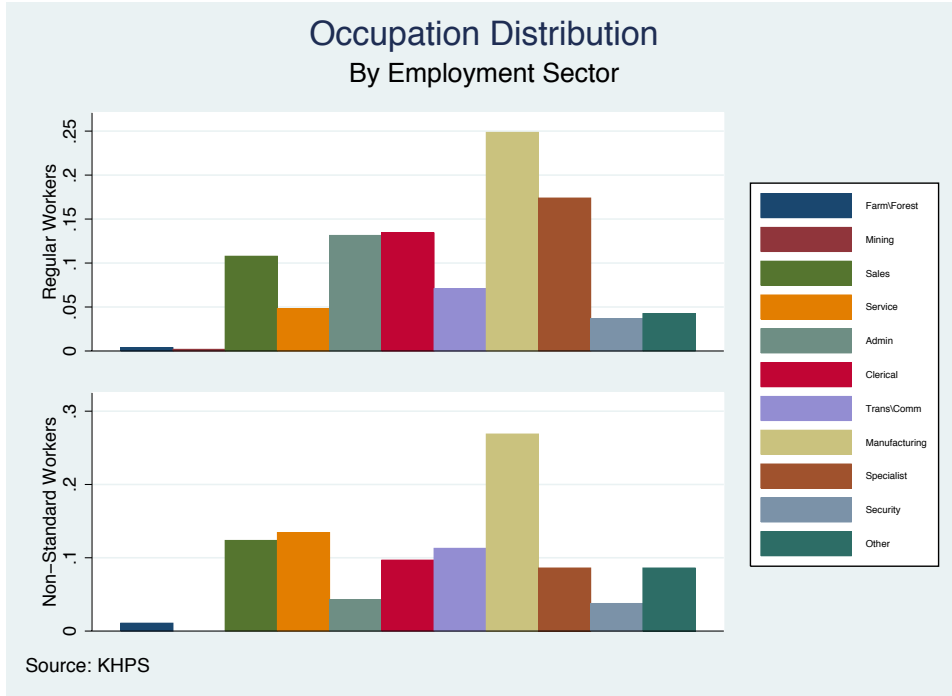


Figure 4: Occupation Distribution of Workers

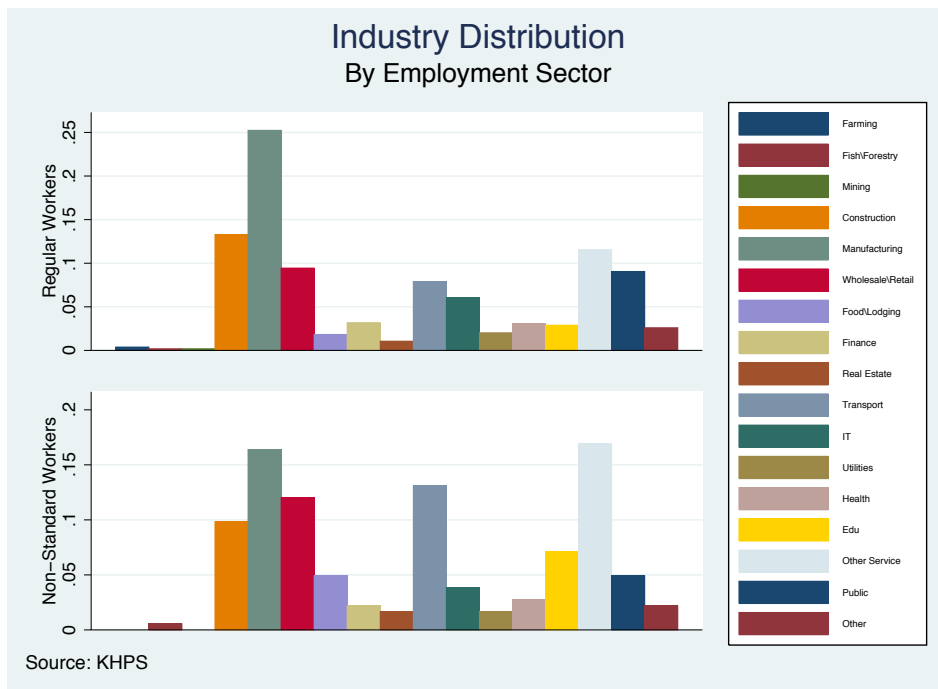


Figure 5: Industry Distribution of Workers

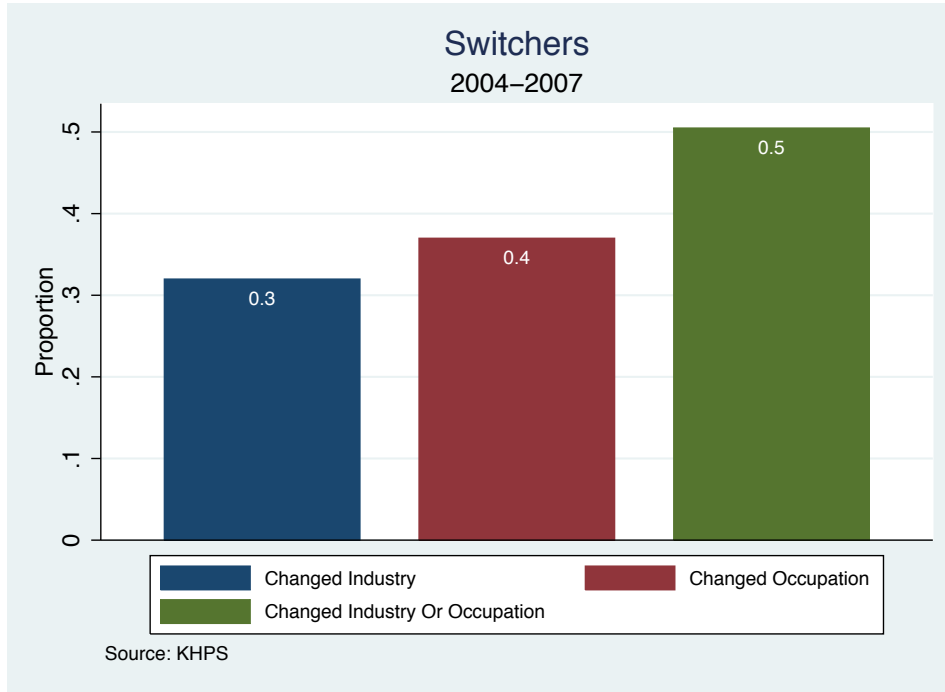


Figure 6: Switches Among Industries and Occupations

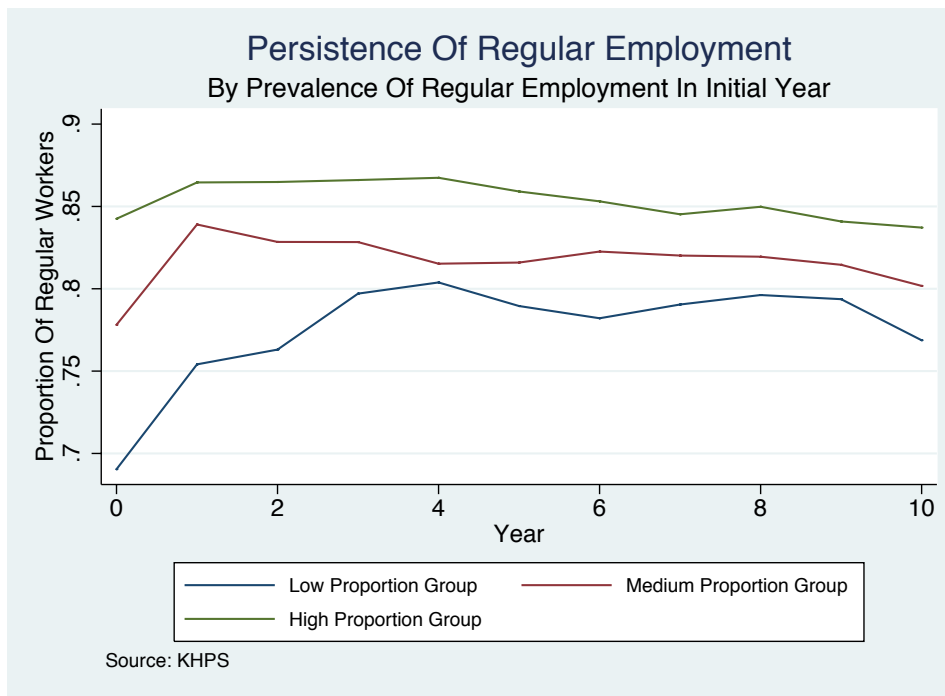


Figure 7: Proportion Of Workers In Regular Employment

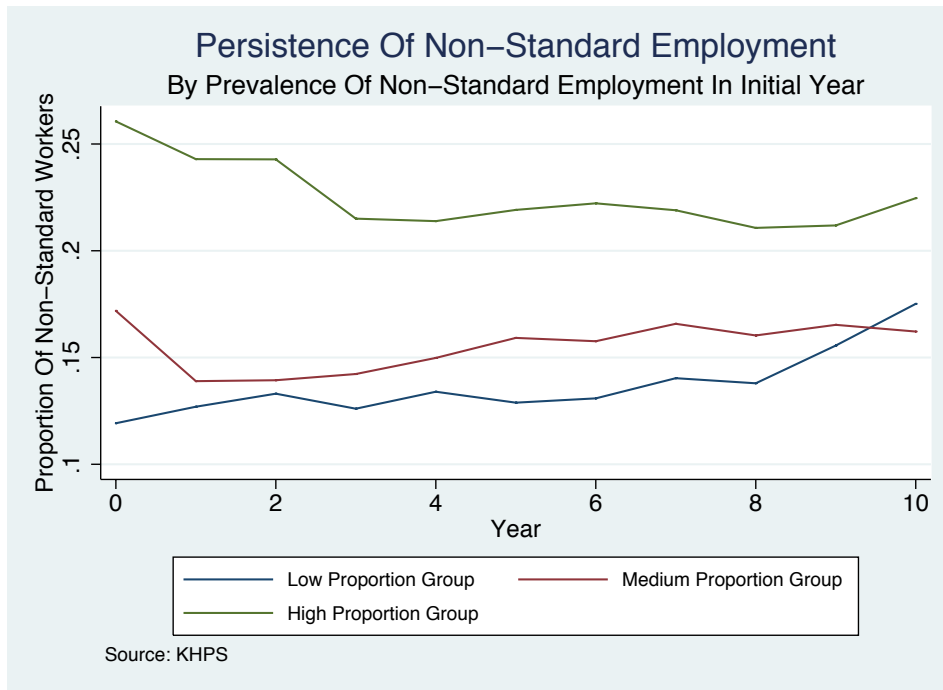


Figure 8: Proportion Of Workers In Non-Standard Employment

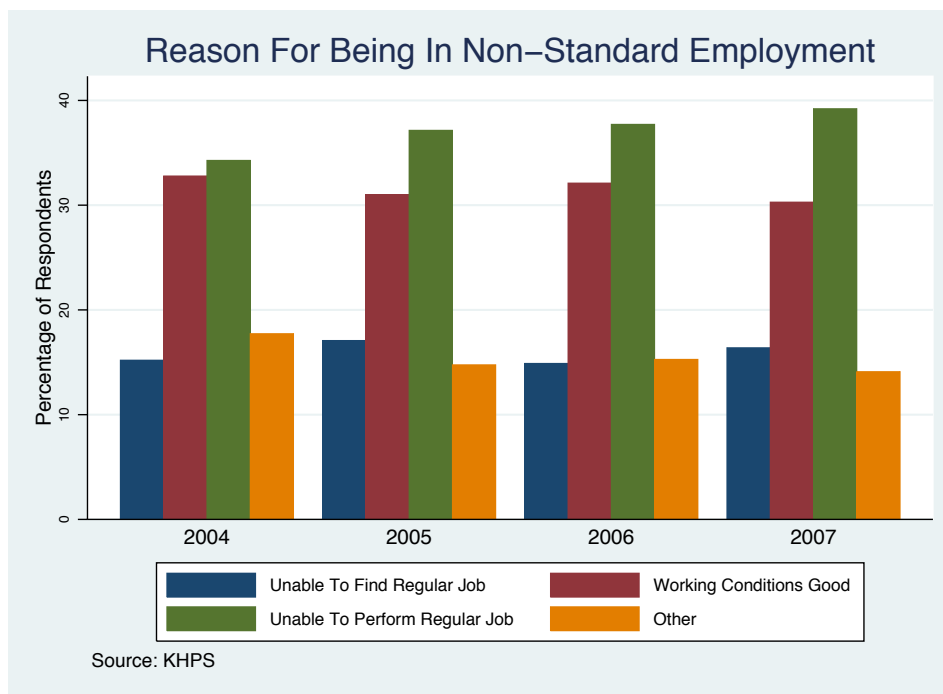


Figure 9: Reason For Being In Non-Standard Employment

10 Tables

Table 1: 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 2: 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 3: 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 4: Stationary Distribution - Men

	Actual Distribution In		Stationary Distribution Using	
	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 5: Stationary Distribution - Women

	Actual Distribution In		Stationary Distribution Using	
	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 6: 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 7: 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 8: Probability Of Being In Regular Employment (IV Estimation)

	(1) High School	(2) College	(3) High School	(4) College
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 9: Arellano-Bond Estimation

	Non-Standard Employment		Regular Employment	
	High School (1)	College (2)	High School (3)	College (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 10: 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 11: 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 12: Persistence Over Time

	Non-Standard Employment		Regular Employment	
	High School	College	High School	College
	(1)	(2)	(3)	(4)
<hr/> Probit Coefficients <hr/>				
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)**
<hr/> Average Marginal Effects <hr/>				
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 13: 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)**	
Age 25-29	3.050 (.113)**	3.245 (.180)**	2.793 (.085)**	2.695 (.130)**	.108 (.005)**	.090 (.006)**	.117 (.004)**	
Age 30-34	3.047 (.110)**	3.305 (.228)**	2.957 (.092)**	2.981 (.139)**	.108 (.004)**	.092 (.007)**	.124 (.004)**	
Age 35-39	3.328 (.142)**	3.139 (.201)**	3.310 (.112)**	2.967 (.145)**	.118 (.006)**	.088 (.006)**	.138 (.005)**	
Age 40-44	3.526 (.163)**	3.292 (.263)**	3.274 (.117)**	3.329 (.186)**	.125 (.006)**	.092 (.008)**	.137 (.005)**	
Age 45-49	3.780 (.193)**	3.406 (.291)**	3.610 (.140)**	3.303 (.207)**	.133 (.007)**	.095 (.009)**	.151 (.006)**	
Age 50-54	3.839 (.211)**	3.374 (.275)**	3.742 (.158)**	3.351 (.241)**	.136 (.008)**	.094 (.008)**	.156 (.007)**	
Age 55-60	4.279 (.288)**	3.625 (.349)**	3.485 (.165)**	3.481 (.278)**	.151 (.011)**	.101 (.010)**	.146 (.007)**	
Obs.	22265	11486	22265	11486	22265	11486	22265	
Percent Correctly Predicted	97.97	98.42	97.52	98.13	97.97	98.42	97.52	

**p < 0.01

*p < 0.05

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 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 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 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 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 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.