The Japanese Economic Review
The Journal of the Japanese Economic Association

The Japanese Economic Review
Vol. 69, No. 1, March 2018

doi: 10.1111/jere.12148

EMPLOYMENT STATUS PERSISTENCE IN THE JAPANESE LABOUR MARKET

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The growth of non-standard employment has become a cause for concern for policy-makers trying to boost output and keep unemployment low while also maintaining job security. This paper estimates a dynamic unobserved effects model using the *Keio Household Panel Survey*, an individual-level panel data set, to investigate the effects on future employment opportunities of employment in Japan's non-standard employment and regular employment sectors. I find strong evidence of persistence within the labour market, suggesting that past employment experience has a significant impact on future labour market outcomes.
JEL Classification Numbers: C33, J62.

1. Introduction

In an attempt to balance the tasks of protecting their citizens from the harsh uncertainties of the business cycle and harnessing the productive possibilities of workers, countries around the world have been experimenting with labour market regulation with varying degrees of success. In many of these countries there has been a segmentation of the labour market into a primary sector of stable long-term employment (or "regular" employment) and a much less stable secondary sector of "non-standard" workers. These non-standard workers consist largely of part-time workers and workers on temporary employment contracts.

Although differences in the definition of non-standard employment make cross-country comparisons difficult, Figure 1 uses common definitions to compare the growth of part-time and temporary employment across a group of OECD countries.[1] The figure shows 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 labour market for most countries and in some cases exceed 20%. The picture for temporary employment is even starker. Temporary employment accounts for more than 40% of all employment in almost all the countries in Figure 1.

Studies on the transition from non-standard employment to regular employment have produced mixed conclusions. On the one hand, Booth *et al.* (2002) study the case of Britain and conclude that fixed-term contracts generally do serve as a stepping stone to permanent employment. Similarly, Casquel and Cunyat (2004) use data for Spain to conclude that for highly educated workers temporary contracts serve as stepping stones to permanent employment, although for young workers, women and less-educated workers, they appear to be a dead-end. Using panel data from Holland, de Graaf-Zijl *et al.* (2011) show that time in temporary employment increases the transition rate into regular employment and they interpret this as evidence of a stepping stone effect.

[1] The 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".

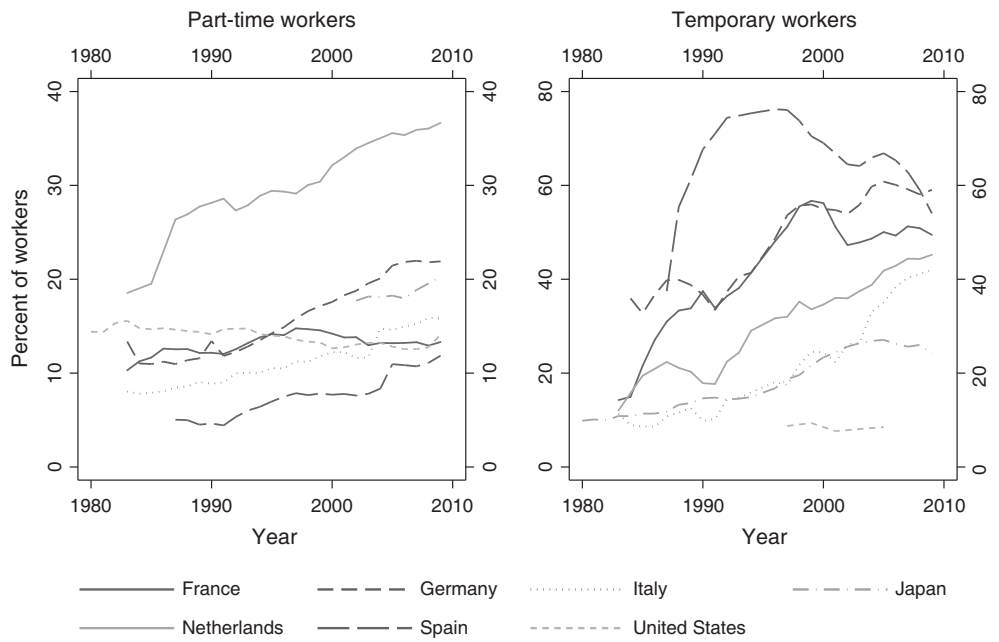

FIGURE 1. Growth of non-standard employment in the OECD: 1980–2009

On the other hand, research on Germany by Kvasnicka (2009) suggests that temporary help work for unemployed job seekers does not increase the probability of entry into regular employment over a 4-year period, but neither does it increase the risk of future unemployment. More pessimistically, Autor and Houseman (2010) use data from Detroit's welfare-to-work programme to show that the probability of ongoing employment for workers gaining employment through temporary help agencies is approximately half of that of workers who are hired directly and that such temporary help placements do not facilitate transitions to direct-hire jobs.

This study focuses on the particular case of Japan, where the labour market has been experiencing a dramatic transformation since at least the 1970s, characterized by a segmentation of the labour market into a sector of highly stable *regular* employment in medium and large firms with employment security up until the age of mandatory retirement (usually 60) and, in contrast, a much less stable secondary sector of part-time workers, temporary contract workers and workers in small firms. This latter group of *non-standard workers* has been growing steadily over the past 30 years and currently comprises 37.9% of the country's labour force. The trend has 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 employment (according to the 2012 Employment Status Survey (*Shugyo Kozo Kihon Chosa*)).

An important question to ask is how the growth of non-standard employment might affect the productivity and earnings of workers. 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 or she is engaged. The same amount of time spent on a menial task rather than a task exposing the worker to new and advanced skills with which he or she is unfamiliar should result in different amounts of human capital being accumulated. This line of thought has a specific implication for Japan because regular workers often rotate through multiple departments at a firm (gaining exposure to multiple skills) and are usually granted lifetime employment.

If it is indeed true that such an employment system leads regular workers to 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. Using training data, Diamond (2011) reports evidence supporting the idea that regular employees do, indeed, receive greater investment in their human capital than non-standard employees.

While not directly investigating the role of human capital development on future employment opportunities, Esteban-Pretel *et al.* (2011) use simulations based on a structural estimation of Japanese data to conclude that having a non-standard job as one's first job reduces the probability of transition into regular employment compared even with the initially unemployed and that the effect lasts for approximately 20 years. These results are supported by Ariga *et al.* (2012), who focus their analysis on high school graduates and find that the effect of initial regular employment on future regular employment lasts at least 10 years. Even more pessimistically, Kondo (2007) finds that starting one's career in non-standard employment reduces the probability of getting a regular job in the future by 50%. However, applying Kondo's approach to a large sample of women, Hamaaki *et al.* (2013) find the effect for women to be closer to 22%. Nevertheless, they also find that the effect of the initial job lasts for as long as 10 years.

Genda *et al.* (2010) expand on these studies by investigating how the effects of labour market conditions upon entry into the labour market differ not only between men in Japan and the United States, but also between high-educated and low-educated male workers within each country. They find that the effects are larger and more persistent for low-educated workers than for highly educated workers, and that low-educated men in Japan are particularly at the mercy of labour market conditions at the time of graduation.

This study proposes to add to the debate in a number of ways. First, this study uses a micro-level panel data set that, to this author's knowledge, has not previously been used to investigate the question of employment persistence in Japan. The details of this data set will be discussed in the following section, but one significant advantage is that it contains a retrospective employment history for each individual, allowing for an analysis over a long period of time. In fact, the earliest observations used in the analysis are from 1963 and the long time-series is used to investigate the behaviour of employment status persistence in the Japanese economy over time.

Second, this study departs from the fundamental approach taken by the studies on Japan cited above. While those papers investigated the long-term effects of *initial* employment, this study investigates employment status persistence over the much shorter time period of a single year and does not restrict its attention to the initial job. Although not performed in this study, this framework allows one to investigate topics such as the future career prospects of mid-career changes in employment status or the impact on future employment opportunities of switching between regular and non-standard employment.

Third, the differences in employment status persistence among age groups are investigated. The aim of this exercise is to contribute to the debate on which age groups of Japanese society bear the brunt of employment adjustment, ignited by Genda (2003) and

expanded in Genda *et al.* (2010). During the 1990s much attention focused on the diminishing job security of middle-aged and older workers, but Genda (2003) asks who really lost jobs in Japan during the 1990s and argues that the decline in labour demand fell largely on the young. With this in mind, the question of persistence in the labour market takes on added importance. What are the implications for individuals in a labour 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?

My investigation uses a dynamic unobserved effects model on an individual-level retrospective panel data set to estimate the probability that a worker in a particular sector of the labour market (i.e. the regular employee sector or the non-standard employee sector) will continue to be in that same sector a year later. The model attempts to separate the effect of unobserved individual heterogeneity from that of true state dependence and suggests that there is a large degree of state dependence so that people are likely to remain in whichever employment sector they currently find themselves.

The paper is organized as follows. Section 2 provides an overview of Japan's labour market and highlights some of the relevant literature in this area while Section 3 describes the data used in this study. Section 4 introduces the dynamic model to estimate the degree of employment status persistence in Japan's labour market, Section 5 presents the results of the estimation and Section 6 provides robustness checks of these results. Section 7 extends the basic model in order to estimate the level of employment status persistence across age groups and over time and Section 8 discusses the results. Finally, Section 9 concludes the study. Explanations of how the variables used in the estimation were constructed are included in Appendix I.

2. Japan's labour market

Japan's labour market can be divided into a sector of regular employees, characterized by lifetime employment and seniority-based wages on the one hand, and a sector of non-standard employees, consisting of part-time workers, *arubaito* workers, temporary contract workers, dispatch workers and entrusted workers on the other hand.

Arubaito is similar to part-time employment, but usually refers to college or high school students. Dispatch workers are employees hired through a temporary employment agency. Regardless of where they work their employment contract is with the employment agency. Entrusted workers are usually workers retained by the firm after mandatory retirement on relatively long fixed-term contracts. However, as for temporary contract workers, the definition is fluid and differs from firm to firm.

Regular and non-standard workers display large differences in earnings. According to Ministry of Health, Labour and Welfare (2010), while more than 22% of regular employees earn a monthly base salary of more than ¥400,000, only 4% of non-standard workers earn a monthly base salary of more than that amount. Similarly, while only 14.5% of regular employees earn a monthly base salary of less than ¥200,000, more than 78% of non-standard workers earn a monthly base salary of less than that amount.[2] However, these figures do not control for differences in industry or occupation between regular and non-

[2] Using an exchange rate of US$1 = ¥120, ¥400,000 is equivalent to US$3,333. These figures do not include annual bonuses, which usually amount to 2–6 months' salary for regular workers. Non-standard employees typically do not receive bonuses.

standard workers. Using a survey of firms, Japanese Institute for Labour Policy and Training (2011b) reports that for jobs with similar duties, more than 76% of part-time workers and more than 62% of fixed-term employees earn less than their regular employee counterparts. Only 1.5% of part-time workers and 4.3% of fixed term employees earn more than regular employees with the same employment tasks.

Although many non-standard employees work fewer hours than their regular counterparts, this is not true across the board. According to Ministry of Health, Labour and Welfare (2010), while 74% of regular workers work more than 40 h a week, so do 27.7% of non-standard workers.[3] While a significant portion of the difference in working hours is due to workers choosing more convenient working hours, this is not the whole story. A 2006 survey by the Ministry of Health, Labour and Welfare (2006) showed that although 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, 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. This suggests that the demand side of the labour market is an important driver of the growth of non-standard employment.

Regular and non-standard employment differ in other key respects too. One such example is the tax code. As discussed in Houseman and Osawa (1995), employers are exempt from obligations to offer benefits to non-standard employees, while secondary household earners making less than ¥1.3 million a year are exempt from paying income tax and, by retaining their dependent status, are eligible for both health insurance under their spouse's plan as well as pension benefits from the government. These distortions created by the tax code can affect both the demand for and supply of non-standard employment. Abe and Ohtake (1995) show that 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 as evidence that women are choosing to work part-time in order to limit their work hours to avoid paying income tax while still being able to retain their "dependent" status.

Finally, the distinction that probably receives more attention than any other between regular and non-standard employees is the ability of firms to dismiss workers. As Schaede (2008) explains in detail, while regular workers are protected from dismissal by a strict interpretation of the *Labour Standards Law*, the Japanese legal system offers no such protection to non-standard workers.

3. The data

The data in this study come from the *Keio Household Panel Survey (KHPS)*, an annual micro-level panel survey following 4,005 households that was first conducted in 2004. The KHPS is modelled on the Panel Study of Income Dynamics in the United States and the European Community Household Panel. It is designed to sample from the entire Japanese population aged 20–69 in 2004 and this offers significant advantages over other existing household panel surveys which focus on particular segments of the population. The survey sample was selected using a two-stage stratified random sampling

[3] There is considerable variation in weekly working hours within non-standard employment. For example, 53.2% of contract workers work more than 40 h a week, but only 13.9% of part-time workers do.

method and the response rate for the initial year was 29.8%. Kimura (2004) examined the KHPS to determine if the underlying sample does indeed represent its target population and concluded that there are no significant distributional differences between the KHPS and surveys that cover the entire Japanese population, such as the Population Census and the Labour Force Survey.

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 and his or her income, expenditures, assets and housing. In the survey's first year (2004), 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, employed in regular employment, employed in non-standard employment, self-employed, worked in a family business or had a side job. Unfortunately, non-standard employment is not broken down into its constituent parts, making it impossible to determine if the time spent in non-standard employment was spent in part-time employment, on a fixed-term contract, as a dispatch worker or as an entrusted worker. A graphical representation of the actual questionnaire that was used for the retrospective panel is provided in Figure 2. Using these employment data along with data on education, I constructed an unbalanced panel of individuals' employment and educational histories up until 2003.

To summarize one of the main features of the retrospective data, Table 1 shows the distribution of transitions among employment sectors using the pooled data. For this exercise and the remainder of this study I have restricted the sample to workers below the age of 60 to avoid the effects of mandatory retirement on employment status. I treat men and women separately because the labour supply decisions of women are generally

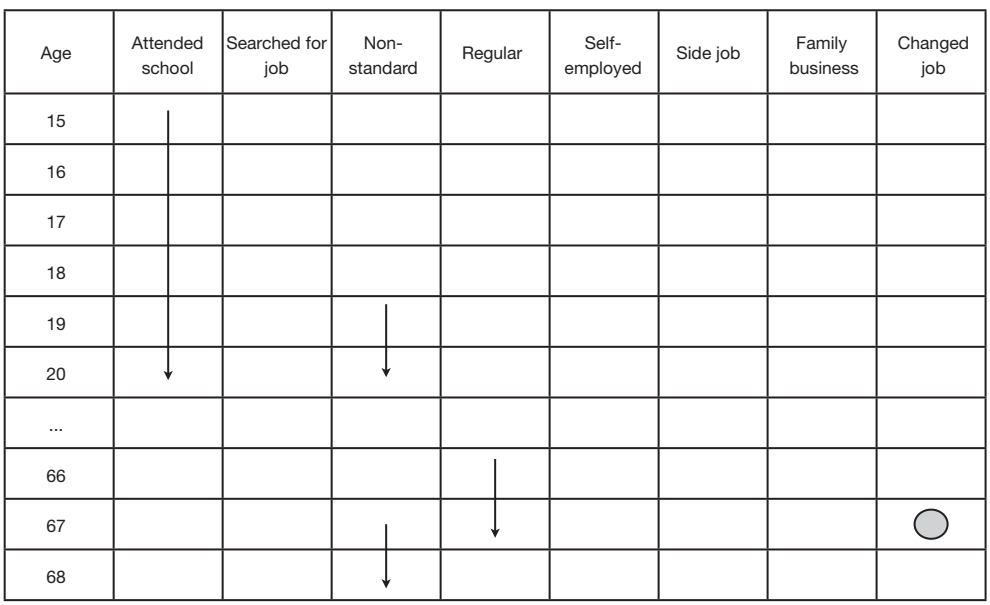

FIGURE 2. Retrospective panel questionnaire

more complex than those of men and thus warrant separate consideration. The transition matrices suggest a high degree of persistence within employment sectors. Focusing on regular and non-standard employment, the tables suggest a smaller difference between the persistence of regular and non-standard employment for women than for men. Table 1 also shows a larger incidence of being out of the labour 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 following both a year of unemployment and a year of being out of the labour 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. Using the data from the retrospective panel, Table 2 presents the actual distribution across employment sectors in 1970 and 2003, as well as the stationary distribution across employment sectors using all the available data and also using data only from 1990 onwards.

For men, the stationary distribution implies that regular employment may or may not have overshot 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 overshot 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 labour 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 3 provides a description of some general patterns and includes only those working at the time of the survey. In the rest of the paper I will include the self-employed and family-business workers among non-standard workers. While these workers differ in important ways, they face similar

TABLE 1
Employment sector transitions

	Date t				
Date $t-1$	Regular employment	Non-standard employment	Unemployed	Out of labour force	Other employment
Men					
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 labour force	16.96	2.41	2.24	76.56	1.83
Other employment	1.33	0.34	0.06	0.4	97.87
Women					
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 labour force	5.39	3.78	0.6	88.17	2.06
Other employment	1.02	1.64	0.1	1.96	95.28

Notes: Observations: 53,655. Unemployed are defined as those who searched for a job but did not work for the entire year. Data limitations prevent identification of spells of unemployment between jobs during a year.

TABLE 2
Stationary distribution

	Actual distribution in		Stationary distribution using	
	1970	2003	All data	Data since 1990
Men				
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 labour force	24.26	10.10	3.42	4.83
Other employment	11.80	17.75	29.22	29.83
Women				
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 labour force	45.22	31.38	28.14	30.07
Other employment	17.36	15.18	24.16	17.61

incentives for investment in human capital and similar employment uncertainty. Thus, I include them in non-standard employment. "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. "Non-standard employment" is similarly defined. In the sample, 71% of men were in regular employment, meaning that 29% were in non-standard employment. If one excludes the self-employed and family business workers, then the share of *non-standard* employment falls to 8%. For women, 33% were in regular employment and 44% were in non-standard employment excluding the self-employed and family-business workers. "Regular employment experience" reports the mean and standard deviation of years of regular employment experience in the sample and "Non-standard employment experience" does the same for non-standard employment experience. "Ever been in non-standard employment" is a dummy variable that takes the value 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

TABLE 3
Employment history summary statistics

	Men	Women
In regular employment	0.71	0.33
	(0.45)	(0.47)
In non-standard employment (narrow definition)	0.08	0.44
	(0.27)	(0.50)
Regular employment experience	16.76	9.25
	(11.38)	(8.22)
Non-standard employment experience	4.34	7.70
	(8.59)	(8.89)
Ever been in non-standard employment	0.38	0.72
	(0.49)	(0.45)
Conditional non-standard experience	11.75	10.62
	(10.63)	(8.83)
Observations	1,341	977

who have spent any time at all in non-standard employment. The results show that 38% of men have spent some time in non-standard employment in their lives while almost three-quarters of women have. Although men have spent an average of 4.34 years in non-standard employment in their lives (7.7 years for women), men that have ever been in non-standard employment have spent an average of 11.75 years in non-standard employment (the number for women is 10.62 years).

Table 4 presents the individual characteristics of workers in different types of employment. Focusing on the columns for regular and non-standard workers, the table shows that male regular workers are slightly older than male non-standard workers, but the opposite is true for women. For both men and women, regular workers are more highly educated and more likely to have had a regular job within 1 year of graduation. Furthermore, regular employees receive higher monthly wages and much higher annual bonuses than non-standard employees. 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.

Diamond (2011) summarizes the data on on-the-job and off-the-job training and concludes that the evidence supports 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

TABLE 4
Table of means of selected variables

	Men			Women		
	Regular (1)	Non-standard (2)	Unemployed (3)	Regular (4)	Non-standard (5)	Unemployed (6)
Age	41.30	40.52	42.16	38.24	41.44	39.57
	(10.12)	(11.73)	(14.09)	(10.94)	(10.71)	(10.89)
College	0.42	0.28	0.14	0.19	0.11	0.05
	(0.49)	(0.45)	(0.35)	(0.39)	(0.32)	(0.22)
Dropout	0.05	0.10	0.08	0.02	0.02	0.03
	(0.22)	(0.30)	(0.28)	(0.12)	(0.15)	(0.16)
Married	0.77	0.60	0.44	0.50	0.71	0.63
	(0.42)	(0.49)	(0.50)	(0.50)	(0.45)	(0.49)
Household members	3.82	3.80	3.83	3.81	4.07	3.70
	(1.48)	(1.66)	(1.54)	(1.69)	(1.49)	(1.36)
Regular employee after graduation	0.84	0.58	0.73	0.86	0.75	0.78
	(0.36)	(0.49)	(0.45)	(0.34)	(0.43)	(0.42)
Monthly wage (¥1,000)	369.73	320.86		239.69	117.64	
	(199.70)	(289.12)		(101.13)	(102.26)	
Annual bonus (¥10,000)	97.01	7.45		60.77	5.56	
	(85.33)	(22.85)		(51.65)	(17.37)	
Hours per week	51.19	45.6		44.84	25.66	
	(14.19)	(23.54)		(12.19)	(17.65)	
Manufacturing	0.25	0.12		0.15	0.14	
	(0.43)	(0.32)		(0.36)	(0.35)	
Transport and communication	0.14	0.08		0.03	0.04	
	(0.34)	(0.27)		(0.16)	(0.20)	
Retail, wholesale, lodging and food	0.11	0.26		0.12	0.32	
	(0.31)	(0.44)		(0.33)	(0.47)	
Observations	955	386	29	304	592	37

on Ability Development (Ministry of Health, Labour and Welfare, 2008), Japan's Ministry of Health, Labour and Welfare showed that approximately 76% of establishments provided off-the-job training to regular employees, but only 35% provided such training to their non-standard workers. The favourable 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. If this is the case, then those workers who are included in the group of regular workers 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 simply be due to differences in industry or occupation. Figures 3 and 4 display the distributions of regular and non-standard workers across occupations and industries. 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

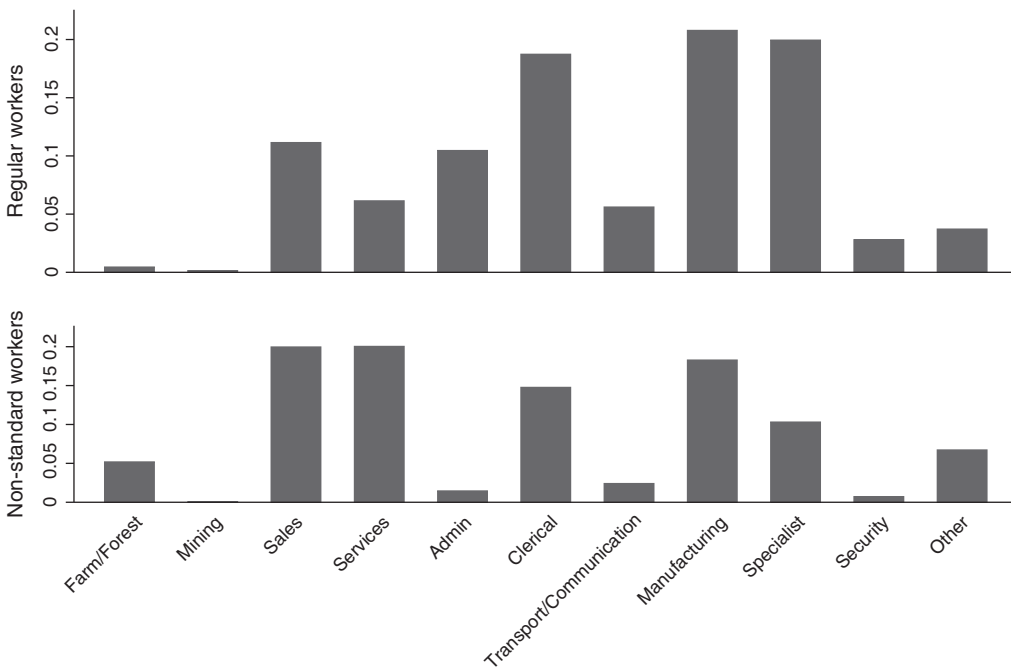

FIGURE 3. Occupation distribution of workers by employment sector
Source: KHPS.

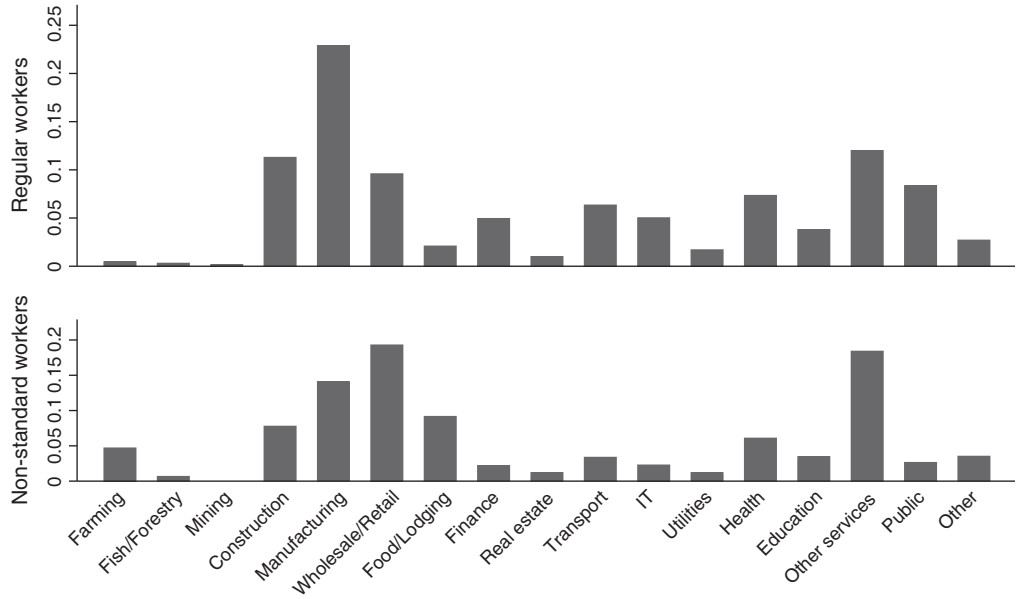

FIGURE 4. Industry distribution of workers by employement sector
Source: KHPS.

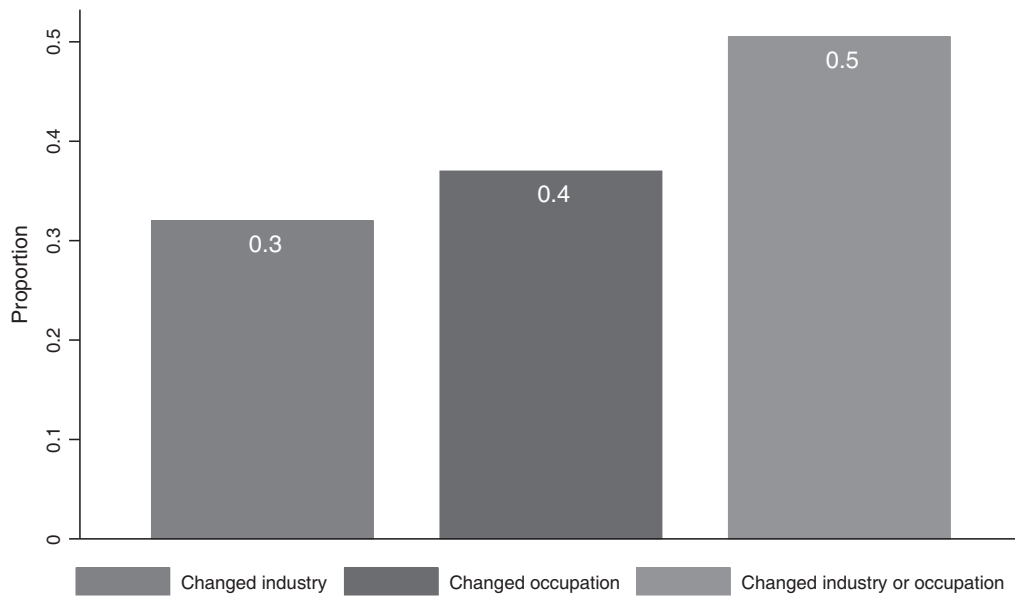

FIGURE 5. Switches among industries and occupations, 2004–2007
Source: KHPS.

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 to 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 5. 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 in a dynamic unobserved effects model

Because 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 nonlinearities 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. I would like to estimate the following dynamic unobserved effects model:

$$P(y_{it} = 1 | y_{i,t-1}, \ldots, y_{i0}, \boldsymbol{z}_i, \alpha_i) = G(\rho y_{i,t-1} + \boldsymbol{z_{it}\delta} + \alpha_i), \tag{1}$$

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

The inclusion of the lagged dependent variable allows me to test for the presence of state dependence after controlling for unobserved heterogeneity. However, in specifying the model in this way, there are two central obstacles to consistently estimating the coefficients of interests. First, the presence of the lagged employment status dummy variable means that strict exogeneity is no longer satisfied (although the $\boldsymbol{z}_{it}$ do satisfy a strict exogeneity assumption conditional on α_i). Second, I need to control for the unobserved individual heterogeneity, which may be correlated with an individual's job upon entry into the labour 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 more likely to find a job in the regular employment sector and are also more highly educated. Such a relationship would generate positive correlation between the observable explanatory variable (education) and the error term if ability were not accounted for and bias the estimated ρ and $\boldsymbol{\delta}$. 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 effect of the unobserved ability and biases the estimated coefficient upwards. For this reason, a traditional random effects approach is not suitable.

To control for state dependence, after controlling for unobserved individual heterogeneity, I follow Wooldridge (2005), whose approach uses distributional assumptions to transform a fixed effects model into a random effects model. As pointed out by Honoré and Tamer (2006), one great advantage of this method is that it leads to convenient functional forms for the likelihood function. Although Honoré and Kyriazidou (2000) propose a semiparametric method of estimating an unobserved effects logit model with

a lagged dependent variable and strictly exogenous explanatory variables (in other words, a model just like that described in (1)), time dummy variables cannot be included as explanatory variables and average marginal effects cannot be estimated. This drawback leads me to favour Wooldridge's method for the present analysis, where it is reasonable to suspect that macroeconomic fluctuations play a significant role in employment mobility and a discussion of the phenomenon requires a measure of the overall persistence in the labour market.

Wooldridge's approach works in the following way. First, I obtain the joint distribution of $(y_{i1}, \ldots, y_{iT})$ conditional on $(y_{i0}, \boldsymbol{z}_i)$. 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 $(\boldsymbol{z}_i, \alpha_i)$. Once this is done, I can use standard maximum likelihood methods simply conditioning on y_{i0} as well as $\boldsymbol{z}_i$.

To obtain the joint distribution $f(y_1, \ldots, y_T|y_{i0}, \boldsymbol{z_i})$, I first need to propose a density for α_i given $(y_{i0}, \boldsymbol{z}_i)$. To this end, I follow the approach taken by Chamberlain (1984). I relax the assumption that α_i is independent of $\boldsymbol{z}_{it}$ and make the parametric assumption that $\alpha_i = \psi + \xi_0 y_{i0} + \overline{\boldsymbol{w}}_{\boldsymbol{i}}\boldsymbol{\xi} + a_i$, where $\boldsymbol{w_i} \subseteq \boldsymbol{z_i}$, $\overline{\boldsymbol{w}}_{\boldsymbol{i}}$ is the average over time of $\boldsymbol{w_i}$ and $a_i \sim N(0, \sigma_a)$ is independent of $(y_{i0}, \mathbf{z}_i)$. Making parametric assumptions on the nature of the relationship between the unobserved heterogeneity, α_i, and observables, $\boldsymbol{z}_i$, is certainly a weakness of this approach. However, it is useful to the extent that it allows for some dependence between α_i and $\boldsymbol{z}_i$. Another advantage is that these assumptions imply that Equation (1) can be written as

$$y_{it} = 1[\psi + \rho y_{i,t-1} + \boldsymbol{z}_{it}\boldsymbol{\delta} + \xi_0 y_{i0} + \overline{\boldsymbol{w}}_{\boldsymbol{i}}\boldsymbol{\xi} + a_i + e_{it} > 0], \tag{2}$$

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

$$f(y_1, \ldots, y_T|\boldsymbol{z}_i; \theta) = \int_{-\infty}^{\infty} [\prod_{t=1}^{T} f(y_t|1, \boldsymbol{z}_{it}, y_{i,t-1}, y_{i0}, \boldsymbol{z}_i, a; \rho, \boldsymbol{\delta})] \frac{1}{\sigma_a}\phi\left(\frac{a}{\sigma_a}\right) da', \tag{3}$$

where ϕ is the pdf of a normal $(0, \sigma_a)$ distribution. The takeaway is that one can estimate ψ, ρ, $\boldsymbol{\delta}$, ξ_0, $\boldsymbol{\xi}$ and σ_a using a random effects probit by simply including y_{i0} and $\overline{\boldsymbol{w}}_{\boldsymbol{i}}$ as explanatory variables in each time period.

5. Estimation of the dynamic model

The dependent variable is a dummy variable that takes the value of one if the individual was in a given employment sector (regular or non-standard) in a particular year. As exogenous explanatory variables (corresponding to $\boldsymbol{z_{it}}$ in (1)), I include age and a dummy variable for whether or not the individual graduated from college. While it may appear strange to use age to capture the effect of past employment experience, age is highly correlated with both work experience and tenure and is strictly exogenous.

I determine the first year of participation in the labour 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. I also include the local job-seekers ratio to control for local labour market conditions and both year and cohort dummy variables to control for macroeconomic conditions, with each individual's cohort defined by his or her year of entry into the labour market.

Because the level of education does not change for any individual over time, w_i contains the level of education (indicated by the college dummy variable) and the average of age over time. A more detailed explanation of these and other variables is included in Appendix I.

Because I control for both the individual's cohort and level of education when estimating the model in Equation (1), the average age variable essentially pins down the individual's age of entry into the labour market. The reason why average age might be correlated with unobserved heterogeneity and should be included in the w_i term of Equation (1) is due to the institutional peculiarities of Japan's labour market for new hires. In Japan's primary and secondary education systems, students can neither jump ahead nor be left behind based on performance. Thus, students are of the same age when they graduate from high school. Most high school graduates already have jobs upon graduation, but some do not. If one assumes that it is generally those of lower ability that must search for employment after graduation, then we will find that those high school graduates who are older when they enter the labour market are of lower ability.

Similarly, high school students who are unable to gain admission into their university of choice often choose to spend another year or longer studying to retake the following year's university entrance exam. Such students are known as *ronin* in Japanese. In addition, as discussed in Genda and Kurosawa (2001) and Ariga (2005), university students are conscious of the importance of one's initial job and sometimes delay graduation for a year if they are unable to secure desirable jobs before their scheduled graduation. This would suggest that lower ability students delay their entry into the labour market, implying a negative correlation between unobservable individual ability and the average age variable in Equation (1).

The implication for the model in Equation (1) is that one should observe a positive coefficient on the average age term when estimating the model for non-standard employment and a negative coefficient when estimating the model for regular employment.

The model in Equation (1) is estimated separately for men and women using the panel data covering 1963–2003; the results are presented for non-standard and regular employment in Table 4. For consistency of the estimates I use only data of the 1,264 individuals who have a 25-year employment history, so that I have a balanced panel. Only individuals who graduated from high school or college and are observed in the labour market continuously for 25 years are included in the sample. Those who graduated from junior college or vocational school are included among high school graduates because treating them separately does not change the results in any material way. Individuals who leave and then return to the labour market are, therefore, not included in the sample used for estimation.

While restricting the data does not present a problem for the male sample, it greatly reduces the number of women whose data can be included in the estimation. It is also questionable as to whether or not the estimated coefficients describe the employment status dynamics of most women as a great many of them are very likely to leave the labour force temporarily at some point and, thus, the sample of women who remain in the labour force continuously for 25 years may not be very representative of the population. While the male sample used in the estimation includes 49% of the available

individuals, the female sample includes only 27% of the available individuals. I return to this issue later in the paper when addressing the robustness of these results, but this point should be kept in mind when interpreting the results that follow.

Table 5 presents the results of estimating Equation (1). They show clear evidence of state dependence in both sectors, even after controlling for unobserved heterogeneity. In other words, even after taking 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 to be in non-standard employment again next year. In fact, a male employee is, on average, 82.3% 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 74.2% more likely on average to be in regular employment in the following year if he is in regular employment in the present year.

A female employee is, on average, 93.5% more likely to be in non-standard employment in the following year if she is in non-standard employment in the present year and is 92.5% more likely to be in regular employment in the following year if she is in regular employment in the present year. In all four cases presented in Table 4 the estimated effect of the lagged dependent variable (i.e. employment status in the previous period) is statistically significant at the 1% level.

A number of interesting patterns are suggested by the results in Table 5. First, persistence appears to be greater in the non-standard employment sector than in the regular employment sector, even though the regular employment sector is associated with lifetime employment.

TABLE 5
Dynamic probit model: Average marginal effects (25-year balanced panel)

	Men		Women	
	Non-standard (1)	Regular (2)	Non-standard (3)	Regular (4)
Lagged non-standard employment	0.823		0.935	
	(0.033)***		(0.005)***	
Lagged regular employment		0.742		0.925
		(0.037)***		(0.006)***
Age	−0.001	0.003	−0.004	0.005
	(0.002)	(0.003)	(0.002)**	(0.002)**
Local job-seekers ratio	−0.001	0.002	0.001	−0.004
	(0.004)	(0.004)	(0.004)	(0.005)
College	−0.021	0.025	−0.017	0.024
	(0.012)***	(0.016)	(0.017)	(0.020)
Average age	0.004	−0.008	0.006	−0.008
	(0.004)	(0.005)	(0.005)	(0.006)
Initial job non-standard	0.051		0.003	
	(0.014)***		(0.006)	
Initial job regular		0.061		0.012
		(0.013)***		(0.006)
Year dummies	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes
Observations	18,437	18,437	10,010	10,010
Percentage correctly predicted	98.42	98.13	97.10	96.91

Notes: ***$P < 0.01$; **$P < 0.05$.

Second, a college degree makes it less likely that an individual will be in non-standard employment and more likely that they will be in regular employment. Furthermore, the size of the effect is similar for men and women, although the estimated coefficient is statistically significant only for men in non-standard employment.

Third, even after controlling for education, the previous period's employment status and age, the employment status of an individual's initial job still has a statistically significant effect on the following period's employment status for men. Furthermore, the size of the effect is large. Having started one's career in non-standard employment increases the probability that one will be in non-standard employment during the following year by 5.1%, while starting one's career in regular employment increases the probability that one will be in regular employment during the following year by 6.1%. Interestingly, the effect for women is much smaller and not statistically significant.

The individual-specific component (w_i in Equation 1) is captured by the college and average age variables. While the estimated coefficient on the college dummy variable behaves in the manner one would expect if education were correlated with unobserved individual ability, the estimated coefficient is statistically significant only for men in non-standard employment. The signs on the estimated coefficients for the average age term are also consistent with the explanation above and suggest that lower ability individuals are more likely to enter into non-standard employment while higher ability individuals are more likely to be in regular employment. Nevertheless, the estimated coefficients are not statistically significant.

Table 6 estimates the same model as that estimated in Table 5 separately for college and high school graduates. The results suggest that, for men, the difference in employment status persistence between high school and college graduates is modest, while for women it is large. Persistence is far greater for female high school graduates than it is for female college graduates. The results also suggest that persistence is generally higher in non-standard employment than it is in regular employment. The one exception to this appears to be female high school graduates.

6. Robustness

There are disadvantages to restricting estimation to a balanced panel. First, we are not using potentially useful information. This is particularly important for the female sample because college graduates account for only 447 of the observations in Table 6. Because the data must be rectangular, one faces a trade-off between using more individuals or more time periods. Using more individuals (and fewer times periods) means that we cannot observe what happens to older workers late in their careers. However, using fewer individuals (and more time periods) means that we cannot observe what happens to younger employees in more recent years. Table 7 shows the results of using a balanced panel of 10 years rather than the 25 years used for Table 5.

While the point estimates change, the signs and relative relationships of the estimates are very similar to those of Table 5. In particular, there is greater persistence in non-standard employment than in regular employment and persistence is greater for women than for men. The fact that the estimated coefficients on the lagged dependent variables have changed suggests that these parameters may be time-dependent or age-dependent. I shall return to this point later.

TABLE 6
Dynamic probit models: Average marginal effects (25-year balanced panel)

	Men				Women			
	Non-standard		Regular		Non-standard		Regular	
	High school (1)	College (2)	High school (3)	College (4)	High school (5)	College (6)	High school (7)	College (8)
Lagged non-standard employment	0.815 (0.039)***	0.841 (0.065)***			0.937 (0.005)***	0.783 (0.061)***		
Lagged regular employment			0.759 (0.040)***	0.757 (0.079)***			0.927 (0.006)***	0.747 (0.056)***
Age	−0.004 (0.003)	0.004 (0.004)	0.006 (0.004)	−0.003 (0.006)	−0.005 (0.002)**	0.046 (0.067)	0.006 (0.002)***	−0.034 (0.065)
Local job-seekers ratio	−0.0005 (0.005)	−0.004 (0.007)	−0.00006 (0.005)	0.007 (0.009)	−0.001 (0.004)	−0.017 (0.044)	−0.001 (0.005)	0.049 (0.045)
Average age	0.011 (0.007)	−0.008 (0.010)	−0.018 (0.009)**	0.010 (0.015)	0.010 (0.005)	−0.110 (0.190)	−0.013 (0.006)**	0.077 (0.188)
Initial job non-standard	0.067 (0.020)***	0.032 (0.021)			0.004 (0.006)	0.033 (0.033)		
Initial job regular			0.072 (0.017)***	0.039 (0.021)			0.013 (0.006)**	0.021 (0.030)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,817	5,249	12,817	5,249	9,465	447	9,465	447
Percentage correctly predicted	98.20	98.82	98.10	98.34	97.15	95.53	96.95	95.13

Notes: ***$P < 0.01$; **$P < 0.05$.

In addition, in contrast to the results of Table 5, the estimated coefficients on the college dummy variable and on average age are statistically significant for women. While not statistically significant for men at the 95% level, the coefficients on the average age and college dummy variables share the same sign as those for the female sample.

Another interesting observation is that the size of the coefficient on the initial job dummy variables has increased, suggesting an increase in the impact of the initial job for the sample that includes younger workers.

Similarly to Table 6, Table 8 estimates the model separately for high school and college graduates using a balanced panel of 10 years rather than 25 years. The most striking difference when compared to Table 6 is how much smaller the estimated coefficient on the lagged dependent variables has become for male college graduates. Similarly, the size of the coefficient on the initial job dummy variables has increased dramatically, suggesting that the employment status of male college graduates has become particularly sensitive to their initial jobs.

One might like to control for employment history by including variables related to the individual's employment history, such as years of tenure in regular or non-standard employment, to allow for the possibility that human capital accumulated through on-the-job training (OJT) is general in nature and can be used by other firms. This would mean that, given two identical individuals, the one with more work experience would be more attractive to potential employers and would find it easier to transition to a regular job.

There are, however, two problems with including variables related to the individual's employment history as explanatory variables. The first is technical. Variables of this type violate the strict exogeneity assumption of Equation (1) and will bias the estimated coefficient on the lagged dependent variable, the primary variable of interest. The

TABLE 7
Dynamic probit model (10-year balanced panel)

	Men		Women	
	Non-standard (1)	Regular (2)	Non-standard (3)	Regular (4)
Lagged non-standard employment	0.779		0.889	
	(0.038)***		(0.007)***	
Lagged regular employment		0.627		0.837
		(0.042)***		(0.011)***
Age	−0.001	0.004	−0.006	0.008
	(0.002)	(0.003)	(0.002)***	(0.003)***
Local job-seekers ratio	−0.001	0.0006	0.003	0.0003
	(0.004)	(0.005)	(0.005)	(0.006)
College	−0.020	0.030	−0.077	0.098
	(0.013)	(0.017)	(0.020)***	(0.025)***
Average age	0.003	−0.007	0.026	−0.033
	(0.004)	(0.006)	(0.006)***	(0.008)***
Initial job non-standard	0.061		−0.002	
	(0.017)***		(0.007)	
Initial job regular		0.099		0.025
		(0.017)***		(0.009)***
Year dummies	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes
Observations	11,216	11,216	9,191	9,191
Percentage correctly predicted	97.43	96.42	95.28	94.45

Notes: ***$P < 0.01$; **$P < 0.05$.

TABLE 8
Dynamic probit models: Average marginal effects (10-year balanced panel)

	Men				Women			
	Non-standard		Regular		Non-standard		Regular	
	High school (1)	College (2)	High school (3)	College (4)	High school (5)	College (6)	High school (7)	College (8)
Lagged non-standard employment	0.816	0.566			0.888	0.835		
	(0.036)***	(0.112)***			(0.007)***	(0.042)***		
Lagged regular employment			0.717	0.429			0.838	0.783
			(0.041)***	(0.084)***			(0.011)***	(0.045)***
Age	−0.002	0.0007	0.005	0.002	−0.007	−0.006	0.008	−0.023
	(0.003)	(0.006)	(0.004)	(0.008)	(0.002)***	(0.038)	(0.003)***	(0.038)
Local job-seekers ratio	−0.004	0.005	0.002	0.0008	−0.00005	0.086	0.003	−0.066
	(0.005)	(0.008)	(0.006)	(0.010)	(0.005)	(0.034)**	(0.006)	(0.035)
Average age	0.002	−0.002	−0.009	−0.006	0.025	0.015	−0.032	0.005
	(0.007)	(0.012)	(0.009)	(0.016)	(0.007)***	(0.070)	(0.008)***	(0.069)
Initial job non-standard	0.056	0.127			0.004	−0.019		
	(0.020)***	(0.057)**			(0.008)	(0.024)		
Initial job regular			0.084	0.157			0.027	0.008
			(0.020)***	(0.046)***			(0.010)***	(0.026)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,254	3,619	7,254	3,656	8,397	736	8,397	736
Percentage correctly predicted	98.20	98.82	98.10	98.34	97.15	95.53	96.95	95.13

Notes: ***$P < 0.01$; **$P < 0.05$.

second problem is that the number of years of regular or non-standard employment tenure is simply a combination of the dependent variable in earlier years. In other words, adding such variables would be similar to including more lags of the dependent variable. So, while it would be most interesting to see the effect of employment experience or tenure on the probability of being in regular or non-standard employment during the following year, the framework used in this study prevents one from doing so.

Nevertheless, one can investigate whether more than one lag of the dependent variable is necessary to describe the dynamics of employment status persistence. Table 9 reports the results of estimating Equation (1) on the 25-year balanced panel (as in Table 6) using three lags of the dependent variable rather than just one. The estimated coefficients on the dependent variable at two and three lags are small and generally not statistically significant. This suggests that the employment status process is well described using only the previous year's employment status. Male high school graduates are the one group where the second and third lags of the dependent variable are statistically significant. Although the estimated coefficients are economically small, the results suggest that, at least for this demographic group, explaining the evolution of an individual's employment status requires more complicated dynamics, even though using a single lag remains a satisfactory and parsimonious description of the stochastic process.

7. Extensions

To investigate the possibility that persistence in the labour market has changed over time, I create four time-period dummy variables, indicating if a given observation was in the period 1973–1984 (growth slowdown period), 1985–1991 (bubble period), 1992–1997 (post-bubble period) or 1998–2003 (post-financial crisis period). This leaves the pre-1973 period as the base time period. 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:

$$\begin{aligned} y_{it} = 1(&\psi + \rho_{ns}^{73-84} D_{it}^{73-84} y_{i,t-1}^{ns} + \ldots + \rho_{ns}^{98-03} D_{it}^{98-03} y_{i,t-1}^{ns} \\ &+ \rho_{reg}^{73-84} D_{it}^{73-84} y_{i,t-1}^{reg} + \ldots + \rho_{reg}^{98-03} D_{it}^{98-03} y_{i,t-1}^{reg} \\ &+ \gamma_{73-84} D_{it}^{73-84} + \ldots + \gamma_{98-03} D_{it}^{98-03} \\ &+ \boldsymbol{z}_{it}\boldsymbol{\delta} + \xi_0 y_{i0} + \overline{\boldsymbol{w}}_{\boldsymbol{i}}\boldsymbol{\xi} + a_i + e_{it} > 0), \end{aligned} \tag{4}$$

where y_{it}^{s} $s \in (reg, ns)$ is a dummy variable that takes the value 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 the value one if the given observation for individual i occurs in time period r (i.e. $t = r$) and zero otherwise. The remaining variables are as defined above.

If the length of the time dimension of the panel is increased then the observations of recent years are excluded from the sample as one cannot be young in recent years and have a long employment history. Therefore, to focus on the behaviour of persistence over time, I limit the time dimension of the panel to 15 years. The disadvantage of this approach is that I exclude the observations of older workers. This exercise should,

TABLE 9
Dynamic probit models robustness check: Average marginal effects

	Men				Women			
	Non-standard		Regular		Non-standard		Regular	
	High school (1)	College (2)	High school (3)	College (4)	High school (5)	College (6)	High school (7)	College (8)
Dependent variable$_{t-1}$	0.920	0.939	0.856	0.896	0.925	0.770	0.920	0.794
	(0.023)***	(0.034)***	(0.034)***	(0.043)***	(0.015)***	(0.124)***	(0.016)***	(0.117)***
Dependent variable$_{t-2}$	−0.010	−0.004	−0.003	0.003	0.007	0.026	−0.0001	0.021
	(0.004)**	(0.008)	(0.007)	(0.012)	(0.017)	(0.069)	(0.014)	(0.063)
Dependent variable$_{t-3}$	0.040	0.032	0.041	0.044	0.006	0.026	0.017	0.019
	(0.015)***	(0.025)	(0.015)***	(0.030)	(0.013)	(0.047)	(0.014)	(0.042)
Age	−0.002	0.001	0.003	−0.001	−0.004	0.087	0.005	−0.088
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)**	(0.042)**	(0.002)**	(0.042)**
Local job-seekers ratio	−0.003	−0.007	0.003	0.007	−0.002	0.006	0.0007	−0.006
	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.040)	(0.005)	(0.039)
Average age	0.006	−0.002	−0.008	0.005	0.011	−0.137	−0.013	0.136
	(0.004)	(0.005)	(0.004)**	(0.005)	(0.006)	(0.089)	(0.006)**	(0.089)
Initial job dependent variable	0.011	−0.001	0.015	−0.004	0.001	0.027	0.004	0.027
	(0.008)	(0.004)	(0.008)**	(0.004)	(0.006)	(0.031)	(0.006)	(0.030)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,915	4,834	11,915	4,834	8,729	556	8,729	556
Percentage correctly predicted	98.23	98.99	98.23	98.90	93.78	96.22	96.00	96.21

Notes: ***$P < 0.01$; **$P < 0.05$.

therefore, be interpreted as an attempt to estimate how persistence within the labour market has changed over time for workers below the age of 40. The results are reported in Table 10 and are plotted graphically in Figure 6.

The employment persistence for men in regular employment displays a downward trend throughout the period 1973–2003. For men in non-standard employment the pattern is more complex. For high school graduates in non-standard employment one can observe stability in persistence over the period 1973–1997, followed by an increase in persistence. For male college graduates, persistence in the non-standard employment sector declined during the period 1973–1991, but then increased during the 1992–1997 post-bubble period of economic slowdown.

For women, the patterns are more varied. Employment status persistence for high school graduates decreased sharply during the 1973–1991 period, followed by a slight decline until 2003 for both regular and non-standard employment. In contrast, female college graduates saw persistence in non-standard employment increase during the 1973–1997 period and persistence in regular employment increase during the 1973–1991 period and decrease subsequently during the 1992–1997 post-bubble period. The small sample size, however, demands that one uses caution when considering the results of female college graduates.

Comparing men and women, one finds that persistence for high school graduates in regular employment displays similar patterns but that the patterns for all other groups differ significantly between men and women.

Finally, the model can be used to investigate how persistence differs across age groups. Genda (2003) argues that during the 1990s it was young workers who suffered disproportionately from the weak labour market. The model developed in this section provides a framework for analysing one possible channel through which labour demand fluctuations may affect young and old workers differently; namely, through differences in employment status persistence across age groups. The results for this estimation, performed on the 25-year balanced panel, are reported in Table 11. As in the previous example, I plot the results graphically in Figure 7. One can think of these graphs as persistence-age profiles.

The profiles for male college graduates in both non-standard and regular employment are fairly flat, while that for male high school graduates in non-standard employment is erratic until age 25–29 and fairly flat thereafter. Finally, the profile for male high school graduates in regular employment is concave, reaching a maximum at age group 35–39.

Female high school graduates in both regular and non-standard employment display an upward sloping profile until age 35–39. After that persistence declines. Because of the small sample size, estimating profiles for female college graduates is difficult, but the estimation results suggest that although persistence in non-standard employment declines with age, persistence in regular employment follows a more complicated pattern, with persistence declining until age 29 and then increasing until age 35–39. After that, persistence appears to decline again.

Comparing persistence across employment sectors for individuals with the same level of education, one can observe that persistence levels are generally similar for regular and non-standard employment for male college graduates and female high school graduates, but significantly different for the other groups.

A comparison of age-persistence profiles across levels of education for individuals in the same employment sector reveals that persistence is higher for high school graduates than it is for college graduates.

TABLE 10
Persistence over time: Average marginal effects

	Men				Women			
	Non-standard		Regular		Non-standard		Regular	
	High school (1)	College (2)	High school (3)	College (4)	High school (5)	College (6)	High school (7)	College (8)
Non-standard employment								
1973–1984	0.338	0.647			0.629	0.599		
	(0.044)***	(0.088)***			(0.013)***	(0.052)***		
1985–1991	0.329	0.441			0.567	0.668		
	(0.051)***	(0.103)***			(0.017)***	(0.041)***		
1992–1997	0.321	0.462			0.570	0.682		
	(0.063)***	(0.136)***			(0.018)***	(0.019)***		
1998–2003	0.437				0.556			
	(0.120)***				(0.022)***			
Regular employment								
1973–1984			0.205	0.271			0.512	0.364
			(0.017)***	(0.037)***			(0.013)***	(0.045)***
1985–1991			0.161	0.204			0.433	0.574
			(0.013)***	(0.027)***			(0.014)***	(0.029)***
1992–1997			0.149	0.167			0.415	0.362
			(0.013)***	(0.025)***			(0.012)***	(0.054)***
1998–2003			0.136	0.142			0.394	
			(0.012)***	(0.019)***			(0.016)***	
Age	−0.003	0.004	0.007	−0.003	−0.008	0.066	0.006	−0.043
	(0.005)	(0.006)	(0.006)	(0.007)	(0.006)	(0.039)	(0.006)	(0.045)
Local job-seekers ratio	0.003	−0.003	−0.011	−0.0008	−0.003	0.010	−0.009	−0.046
	(0.007)	(0.007)	(0.008)	(0.008)	(0.010)	(0.032)	(0.010)	(0.041)
Average age	0.004	−0.013	−0.021	0.009	0.025	−0.093	−0.026	0.024
	(0.013)	(0.013)	(0.016)	(0.016)	(0.017)	(0.072)	(0.018)	(0.085)
Initial job dependent variable	0.467	0.178	0.323	0.148	0.273	−0.006	0.194	0.051
	(0.061)***	(0.058)***	(0.042)***	(0.040)***	(0.036)***	(0.025)	(0.026)***	(0.035)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,259	5,193	10,259	5,193	10,078	796	10,078	796
Percentage correctly predicted	88.87	95.95	89.74	95.51	90.37	95.10	89.54	93.76

Notes: ***$P < 0.01$; **$P < 0.05$.

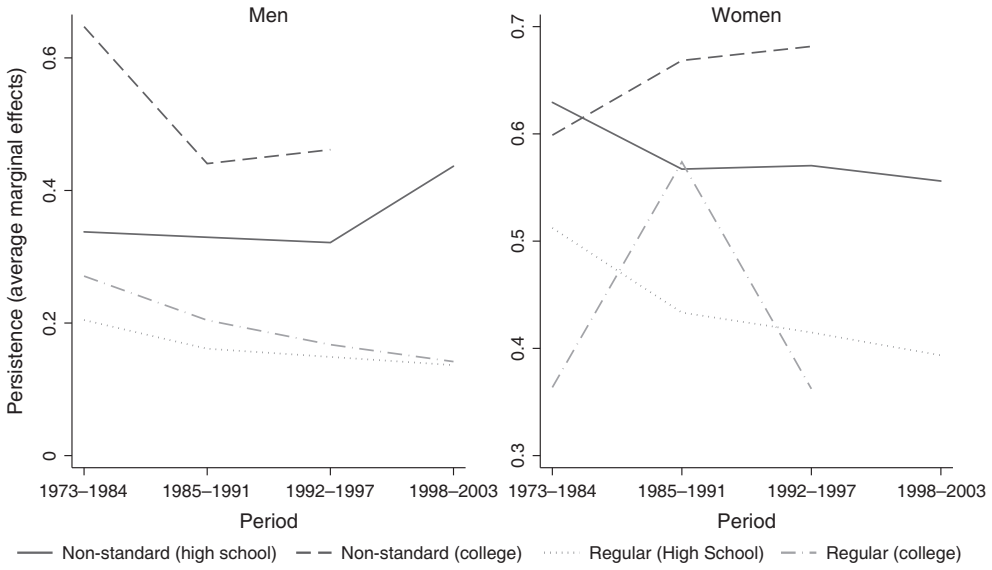

FIGURE 6. Employment status persistence over time
Source: KHPS.

The pattern of persistence across age is interesting when one considers that young workers are believed to have lower job attachment. It is also 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. Both of these factors may be driving the patterns observed in Figure 7.

8. Discussion

While this study is fundamentally interested in the same question asked by Kondo (2007) and Hamaaki *et al.* (2013) namely, what is the effect on future employment opportunities of early career employment — the approach used here differs from these earlier studies in a number of ways. First, whereas the earlier studies employed an instrumental variables approach, this study uses a panel data approach. Doing so allows one to avoid the difficult problem of finding valid instruments. It also allows one to exploit the time-series dimension of the data by following individuals from year to year and to try to control for individual specific effects.

Second, the focus of this study is on the nature of short-term employment status persistence rather than on the long-term effects of an individual's initial job. Although I have not done so here, this framework allows one to investigate related issues, such as the effects of mid-career job changes on future employment opportunities.

TABLE 11
Persistence across age groups: Average marginal effects

	Men				Women			
	Non-standard		Regular		Non-standard		Regular	
	High school (1)	College (2)	High school (3)	College (4)	High school (5)	College (6)	High school (7)	College (8)
Dependent variable ×								
Age 15–19	0.690		0.202		0.383		0.516	
	(0.065)***		(0.007)***		(0.045)***		(0.021)***	
Age 20–24	0.607	0.106	0.285	0.158	0.444	0.382	0.549	0.267
	(0.045)***	(0.021)***	(0.011)***	(0.034)***	(0.011)***	(0.072)***	(0.016)***	(0.051)***
Age 25–29	0.729	0.101	0.310	0.139	0.529	0.327	0.532	0.222
	(0.034)***	(0.015)***	(0.013)***	(0.020)***	(0.004)***	(0.040)***	(0.012)***	(0.026)***
Age 30–34	0.704	0.114	0.322	0.147	0.563	0.305	0.573	0.241
	(0.042)***	(0.015)***	(0.013)***	(0.018)***	(0.004)***	(0.032)***	(0.007)***	(0.028)***
Age 35–39	0.746	0.100	0.327	0.138	0.576	0.302	0.607	0.326
	(0.037)***	(0.012)***	(0.013)***	(0.014)***	(0.003)***	(0.035)***	(0.004)***	(0.044)***
Age 40–44	0.740	0.118	0.279	0.154	0.559		0.605	0.293
	(0.039)***	(0.014)***	(0.011)***	(0.016)***	(0.003)***		(0.003)***	(0.040)***
Age 45–49		0.147	0.196	0.150	0.498		0.561	
		(0.025)***	(0.008)***	(0.016)***	(0.003)***		(0.004)***	
Age	−0.004	0.002	0.0003	−0.0007	−0.003	0.032	−0.0003	−0.027
	(0.003)	(0.005)	(0.003)	(0.007)	(0.002)	(0.018)	(0.002)	(0.015)
Local job-seekers ratio	−0.0005	−0.002	0.0004	0.006	−0.0007	0.062	−0.002	−0.033
	(0.004)	(0.006)	(0.005)	(0.009)	(0.004)	(0.040)	(0.004)	(0.034)
Average age	0.004	−0.0004	0.0005	0.0006	−0.001	0.003	0.002	−0.005
	(0.002)	(0.004)	(0.003)	(0.007)	(0.0007)	(0.008)	(0.0008)***	(0.007)
Initial job dependent variable	0.057	0.022	0.063	0.034	0.009	−0.007	0.017	0.019
	(0.019)***	(0.013)	(0.017)***	(0.017)**	(0.006)	(0.030)	(0.006)***	(0.024)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,812	5,235	12,812	5,235	9,404	707	9,404	707
Percentage correctly predicted	98.23	98.76	98.10	98.38	97.08	95.18	96.93	95.62

Notes: ***$P < 0.01$; **$P < 0.05$.

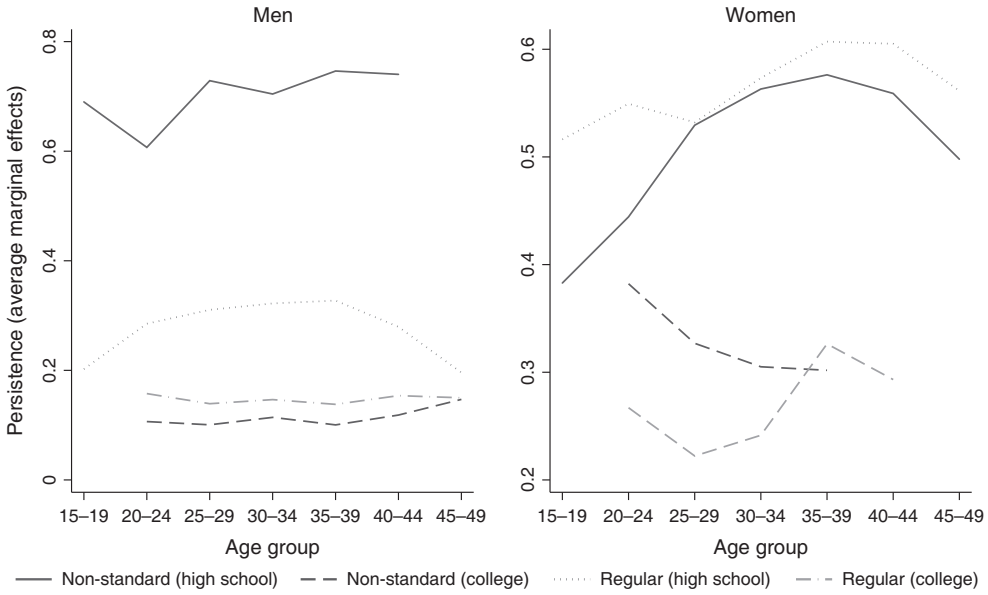

FIGURE 7. Employment status persistence across age
Source: KHPS.

While these two studies, as well as others mentioned earlier, showed that one's initial job can have long-lasting implications for one's future employment opportunities, the results presented in this study extend those results by showing that, *even after controlling for the initial job* one's current employment status has a large effect on one's future employment status. While the initial job is certainly very important, so is one's subsequent employment history. This suggests that shocks which change a worker's employment status can have long-lasting implications.

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 labour 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 four options they are given are: (i) I want to work in regular employment, but no company will hire me; (ii) the wages and working conditions are good; (iii) I am unable to fulfill the requirements of a regular job for personal reasons; and (iv) other reasons. Figure 8 presents data from this question for each year in the survey. It shows that approximately 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 and household responsibilities such as childcare or nursing) rather than personal preference as the primary reason for their being in non-standard employment.

A similar pattern was reported in Japanese Institute for Labour Policy and Training (2011a). The survey found that while only 16.4% of regular employees wanted to

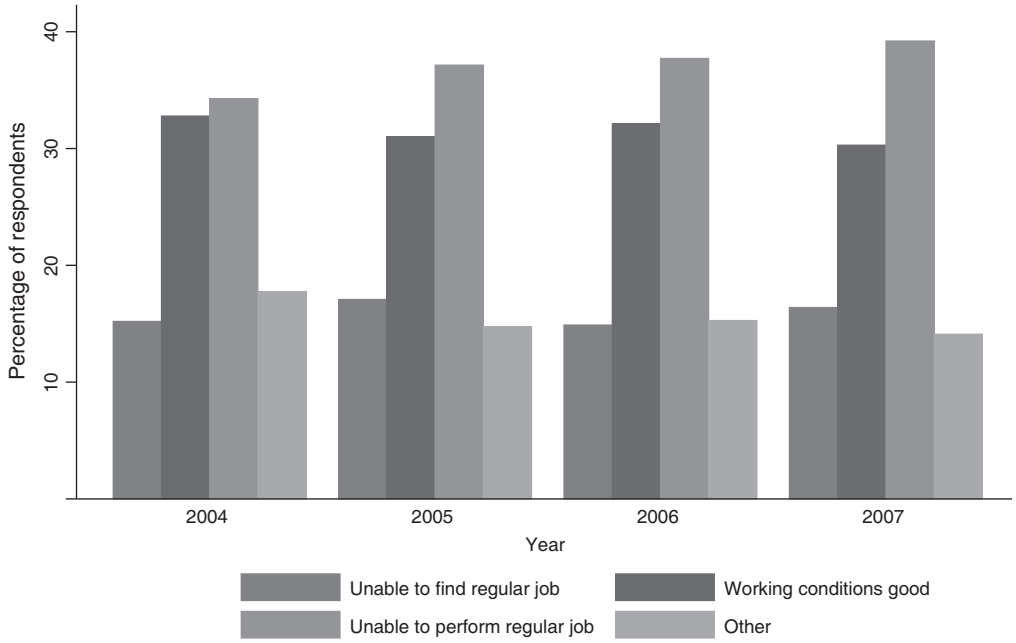

FIGURE 8. Reason for being in non-standard employment
Source: KHPS.

change their job type, 30.1% of non-standard workers did. The survey found large variation in responses by job type. For example, only 24.7% of part-time workers wanted to change job type, while 47.6% of dispatch workers wanted to do so. The survey also reported that 40.8% of regular workers reported being "satisfied" or "slightly satisfied" with their careers, while 15.6% said that they were "unsatisfied" or "slightly unsatisfied". The figures for non-standard employees were 31.2 and 22.1%, respectively. These results suggest that while many non-standard workers do, indeed, choose non-standard employment of their own accord, there are many who would prefer to be engaged in some other type of employment.

The results above suggest that there is, indeed, a significant amount of state dependence in Japan's labour market, but that the level of persistence has been on a declining trend (at least until 2003, the most recent year with data available). 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 growth of non-standard employment 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 a labour market structure 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 adopted 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 was 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 were distinct from the firm, then the firm may prefer to hire outside workers.

The pace of 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 or she 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 of today's Japan is more accurate. 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. In contrast, the returns to more general work experience and education would have increased. This view would be consistent with the results presented above. As the original rationale for lifetime employment has become increasingly irrelevant, one would expect employment status persistence to have diminished over time.

While not answering this question directly, the findings of studies on Japan's wage-tenure profiles point in the same direction. While Hashimoto and Raisian (1985) found that Japan was much closer to a system of lifetime employment than the United States, Clark and Ogawa (1992) argued that the findings of Hashimoto and Raisian (1985) were the result of performing their analysis at a point in time that obscured the longer-term trend of declining returns to tenure in Japan over time. This conclusion was later supported by Ohtake (1998), who found that the earnings-tenure profiles between Japan and the United States converged during the 1980s. The 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 the economic rationale for lifetime employment has weakened over time.

However, another possibility is that the institutions and economic conditions that made lifetime employment an effective employment arrangement might have changed so as to reduce 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 to what it was during the post World War II high-growth era. 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. However, 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, labour 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. Such a view would also be consistent with declining persistence in employment status as the economy becomes more flexible.

Furthermore, other structural changes to Japan's labour market over the period investigated in this study (1963–2003) are also likely to have affected the level of employment status persistence. One example is changes in Japan's labour laws, such as the introduction of the *Worker Dispatch Law* in 1985, which deregulated the market for dispatch workers. Before the law was enacted, it was (with certain exceptions) illegal to hire workers temporarily through an agency. Okudaira *et al.* (2013) investigated the effect of being a dispatch employee on the probability of entering regular employment and concluded that employment through a dispatch agency is not a stepping stone to regular employment. Although not investigated in their study, this leaves open the possibility that introduction of the law may have increased the amount of non-standard employment in Japan. Similarly, it may also have had an effect on the persistence of both regular and non-standard employment.

9. Conclusion

This paper used the *Keio Household Panel Survey*, an individual-level data set, to investigate the effects on future employment of being in regular or non-standard employment in Japan.

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 whichever employment sector they currently find themselves. The pattern of employment status persistence over age groups differs across demographic groups with some, such as high school graduates in regular employment and female high school graduates in non-standard employment, displaying concave profiles and others, such as male college graduates in both sectors of the labour market, displaying flat profiles. In tracking the level of persistence over time, I found that for college graduates in

both the regular and non-standard employment sectors, persistence generally decreased for younger workers during 1973–2003. In contrast, persistence appears to have trended upwards for male high school graduates in non-standard employment and female college students in non-standard employment.

From these results and the broader literature on the subject emerges an image of a labour market whose institutions have slowly been changing over time. Discovering the underlying source of state dependence within Japan's labour market and what changes will allow Japan's labour market to better adapt to its changed and changing economy is a challenge for future research.

Acknowledgements

I thank three anonymous referees, Takeo Hoshi, Yuji Genda, Daiji Kawaguchi, Ryo Kambayashi, Gordon Dahl, Fumio Ohtake and Yukinobu Kitamura for their comments in writing this paper. I also thank participants of the NBER Japan Project for their help. The data were kindly provided by the Global COE Program at Keio University and Kyoto University.

Appendix I
Construction of variables

Employment status and lagged employment status

Regular Employment and Non-Standard Employment (and their lagged terms) are dummy variables that take the value 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, and zero otherwise.

Education dummy variables

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. Using this information and the retrospective panel, one can calculate when an individual entered the labour force and what their level of education at the time was. Returning to school after working for a few years is not common in Japan and I exclude from the sample those who do so. I also exclude those whose highest level of education was lower than high school.

Besides middle school, high school, college and graduate school, respondents could also select junior college (*tanki daigaku*) or technical college (*kousen*) as their highest level of education. The market for new job-seekers in Japan tends to view those at junior college or technical college as more similar to high school graduates than to college graduates. Thus, I include junior college and technical college graduates in the high school group.

Job offers to job-seekers ratio (*kyujin bairitsu*)

Published by the Ministry of Health, Labour and Welfare, these data are collected at Public Employment Security Offices (*koukyou shukugyou anteijou*). The index comes in two 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 workers excluding part-time workers. In the statistical analyses, I use the annual average of the effective ratio including part-time workers at the regional level. The KHPS divides respondents' geographical location into eight regions: Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku, Kyushu (including Okinawa) and Shikoku. This segmentation matches the segmentation of the job-seekers ratio, except that the job-seekers ratio data separates Kanto into North-Kanto and South-Kanto and Chubu into Hokuriku and Tokai. In these cases I use the simple average of the two areas' ratios to create a job-seekers' ratio for the combined region in the KHPS.

Final version accepted 10 February 2017.

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