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YUJI GENDA

INSTITUTE OF SOCIAL SCIENCE  
UNIVERSITY OF TOKYO

AYAKO KONDO

GRADUATE FELLOW, ISERP  
DEPARTMENT OF ECONOMICS  
COLUMBIA UNIVERSITY

SOUICHI OHTA

DEPARTMENT OF ECONOMICS  
KEIO UNIVERSITY



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# LONG-TERM EFFECTS OF A RECESSION AT LABOR MARKET ENTRY IN JAPAN AND THE UNITED STATES

**Yuji Genda**<sup>1</sup>

Institute of Social Science  
University of Tokyo

**Ayako Kondo**<sup>2</sup>

Graduate Fellow, ISERP  
Department of Economics  
Columbia University

**Souichi Ohta**<sup>3</sup>

Department of Economics  
Keio University

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<sup>1</sup> Institute of Social Science, University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo, Japan. Tel/Fax: +81-3-5841-4954, Email: [genda@iss.u-tokyo.ac.jp](mailto:genda@iss.u-tokyo.ac.jp)

<sup>2</sup> Columbia University in the City of New York, 420 West 118th Street, 8<sup>th</sup> Floor, Mail Code 3355, New York, NY, 10027, USA. Tel: 212-854-6713, Fax: 212-854-7998, Email: [ak2258@columbia.edu](mailto:ak2258@columbia.edu).

<sup>3</sup> Department of Economics, Keio University, 2-15-45, Mita, Minato-ku, Tokyo, Japan. Tel: +81-3-5427-1923, Fax: +81-5427-1578, E-mail: [ohta@econ.keio.ac.jp](mailto:ohta@econ.keio.ac.jp).

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## Abstract

We examine effects of entering the labor market during a recession on subsequent earnings and employment for Japanese and American men, using comparable household labor force surveys. Previous analyses focus on search theoretic and implicit-contract arguments, which have their strongest effects on more educated workers. We argue that, in a country like Japan which has a dual labor market, there is an additional mechanism that affects mainly less educated workers. Namely, these workers are more likely to be trapped in the secondary sector if they graduate during a recession. We find a persistent, strong negative effect on earnings for less educated Japanese men, in contrast to no long-term effect for less educated American men; also, a substantial part of the effect for less educated Japanese men is attributed to the decreased probability of regular employment. The effect for the more educated group is more or less similar in both countries.

**Key words:** labor market entry, recession, earnings

## | 1 | INTRODUCTION

There is increasing evidence that labor market conditions at graduation affect subsequent wages and employment prospects (Ohtake and Inoki, 1997, for Japan; Oreopoulos, von Wachter and Heisz, 2006, for Canada; Kahn, 2006, for the United States). These studies typically draw on a combination of search and contracting models to interpret the persistent negative effect of graduating during a recession. Probably because both search frictions and implicit contracts are thought to be more relevant to skilled workers with strong attachment to the labor force, they tend to focus on male college graduates or employees in relatively large establishments. However, if it is difficult to move up to regular jobs in the primary market from low-paying unstable jobs in the secondary market, a recession at graduation can have a permanent effect on less educated people by making it more likely that they will fall into the secondary market.

This paper sheds light on the effect of graduating during a recession for less educated men, who have been largely ignored in the existing studies, by cross comparison across the less and the more educated groups in Japan and the United States. As we elaborate in Section 3, the hiring market for new graduates in Japan is isolated from the rest of the labor market and a distinction between regular and provisional jobs is prominent. Hence, if a recession at entry traps some of the affected cohort in unstable employment in subsequent years, there will be considerable penalty of graduating during a recession for less educated men. On the other hand, the division between regular and provisional jobs is subtle in the United States, and the labor market is more like a continuum of different kind of jobs than two distinct markets with a clear boundary. Thus, American men can serve as the “control group” in a broad sense to identify the effect that comes from being trapped in unstable, non-regular employment.

We estimate the effects of labor market conditions (namely, the unemployment rate) at entry using two comparable cross-sectional household surveys: the Labor Force Survey in Japan and the Current Population Survey in the United States. With controls for year- and region-fixed effects and region specific linear trends, we find that a recession at entry has a strong and persistent negative effect on subsequent earnings for less educated Japanese men, a weaker but still substantial effect for more educated Japanese men, a modest, gradually fading effect for more educated American men and only a temporary effect for less educated American men. The contrasting patterns across groups with different educational background are striking. We also find a significant negative effect on employment status for less educated Japanese men. Further, inclusion of the ratio of regular workers in total population of the cohort narrows the difference in coefficients of the unemployment rate at entry between less and more educated Japanese men, and the loss of earnings is concentrated to the lower part of earnings distribution in Japan. These findings support our view that duality between regular and non-regular employment plays an important role in generating a persistent negative effect of high unemployment at labor market entry for less educated Japanese men.

To our knowledge, this is the first study to estimate the effect of labor market conditions at entry separately for less educated American men and compare it with that for the more educated group. Our finding of a less persistent penalty of graduating during a recession for less educated American men suggests that the market for less skilled worker is closer to a spot market, since they are known to be more sensitive to contemporaneous labor market

fluctuations, especially downturns (Cutler and Katz, 1991; Hines, Hoynes and Krueger 2001). At the same time, the strong, persistent effect for less educated Japanese men suggests that, when the labor market exhibits duality, less skilled workers in unlucky cohorts suffer from long-term loss of earnings. This could be also the case in other countries where regular workers are protected by dismissal regulation and provisional/temporary employment contracts exist as a loophole.<sup>1</sup>

An additional motivation for looking at less educated Japanese men is that the deteriorated employment situation of the young Japanese who entered the labor market during the prolonged recession of the mid-1990s through the early 2000s is a growing social concern. As highlighted by Genda (2001), the cost of this recession was born disproportionately by young people who were on the course of transition from school to full-time work, since cutting new hiring was much easier than firing incumbent workers. The fraction of the young labor force not in regular full-time employment has sharply increased since the 1990s. Repairing the employment prospects of these young people stranded out of the “regular” track has emerged as a pressing issue, under the growing fear of future expansion of the poverty group and an increasing burden of social security. To find an effective solution, we need to understand how labor market conditions at entry affect each individual’s subsequent outcomes, who is affected the most, and how persistent the effects will be.

On this point, we substantially improve on the existing studies that look at the Japanese labor market, including Ohtake and Inoki (1997), in terms of the methodology and data coverage. The most important improvement is that we control for unobserved year-specific components by exploiting regional variations in unemployment rates.<sup>2</sup> Second, we examine the persistence of the effect by allowing the effect to vary with the years since entry. Third, our dataset spans 1986 to 2005, allowing us to look at outcomes in several years after entry for those who entered the labor market in the late 1990s, after the long recession started. Lastly, the use of household surveys allows us to examine the effect on employment status as well, which was unfeasible with the establishment survey data used by the existing studies in Japan. Also, our finding of a negative effect of a recession at entry on the ratio of regular employment provides evidence that the individual-level effect of failing to obtain a regular job at entry shown by Sakai and Higuchi (2005) and Kondo (2007a) leads to decline in regular employment at the cohort level.

The rest of the paper is organized as follows. The next section reviews underlying mechanisms that make labor market conditions have persistent effects on subsequent earnings and employment. Section 3 describes the institutional features we think important, the hiring market for new graduates and duality between regular and non-regular jobs. Section 4 describes data and methodology and examines comparability of Japanese and American data. Empirical results are reported in Section 5. Section 6 concludes.

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<sup>1</sup>In fact, studies using Spanish data (Amuedo-Dorantes, 2000) and Italian data (Gagliarducci, 2005) report difficulty in transition to permanent jobs from repeated temporary jobs similar to what is observed in Japan.

<sup>2</sup>Most of the existing studies use the national unemployment rate and include a linear or quadratic trend term, probably because the regional rates prior to 1983 are not available.

## | 2 | UNDERLYING MECHANISMS

In this section, we review two different mechanisms that can produce a persistent effect of labor market conditions at graduation. The first line consists of the theories that explain how the advantage of obtaining a better job at entry lasts for several years, including implicit long-term contracts and search models. Since the advantage of obtaining a high-wage job at entry vanishes when the worker is dismissed, these factors are expected to affect more educated workers and regular employees, who are presumably less likely to be dismissed. On the other hand, the second half of this section argues that a recession at entry can keep some less educated people away from regular employment when there is a substantial discontinuity between regular jobs and non-regular jobs, which is the case in Japan. This sort of penalty of graduating during a recession through chronic unstable employment is expected to be stronger for less educated people, given that they are more likely to fail to obtain a regular full-time job due to lack of demand.

In the United States, Beaudry and DiNardo (1991) find that incumbent workers' wages rise during booms but do not fall during recessions as long as the workers remain employed, and they explain this by implicit long-term wage contracts with mobile workers. That is, firms cannot dismiss workers or cut their wages during a recession while they have to raise wages to keep workers from the better outside options. Hence, the benefit from obtaining a high-paying job upon graduation due to the tight labor market can last for years and it can take several years to catch up for those who graduate during a recession. Oreopoulos et al (2006) emphasize the role of time intensive search and the existence of (implicit or explicit) long-term wage contracts as the mechanisms underlying the persistent negative effect of graduating during a recession on subsequent wages in Canada. That it takes time to dissolve initial matches also means that turnover rates among those who enter the labor market during a recession stay high for several years after entry. Bowlus (1995) shows that a job that started during a recession tends to end sooner in the United States, implying deteriorated matching quality, and Oreopoulos et al (2006) find similar evidence on mobility with their Canadian data. Also, at least for large firms, there is evidence that external labor market conditions at entry to the firm affect long-term wage setting within the firm (Baker, Gibbs and Holmstrom, 1994).

Similarly, Ohtake and Inoki (1997) report a positive correlation between labor demand in the year of graduation and subsequent wages in Japan. Further, Ohta (1998) and Genda and Kurosawa (2001) find that the unemployment rate at graduation is positively correlated with the subsequent quitting rate, and Ariga, Brunello and Ohkusa (2000) report a within-firm cohort effect similar to Baker et al (1994) in a large Japanese firm. Given the lower turnover rate in Japan, the process of dissolving initial bad matches is expected to take a longer time in Japan; actually, Genda and Kurosawa (2001) find that, unlike Beaudry and DiNardo (1991), the best labor market conditions that the cohort ever experienced have no effect, implying that worker mobility is limited in Japan. Also, it has been said that Japanese firms invest more in training their employees than American firms (Mincer and Higuchi, 1988; Hashimoto and Raisian, 1985). These factors can enhance the advantage of obtaining a better job at entry in Japan. Nevertheless, if these factors were the only causes, the resulting penalty of graduating during a recession should be stronger for more educated men in both Japan and in the United States, since long-term regular employment is more relevant to

more educated workers.<sup>3</sup>

On the other hand, if the labor market is divided into two sectors, one for high-paying jobs with long-term employment and the other for unstable, provisional jobs, and a worker gets stuck with the market that he falls into upon graduation, labor market conditions at entry can have permanent effect on wages and employment prospects for those who are likely to fall into the secondary market under slack labor demand. At the individual level, there is evidence that failure to obtain a regular full-time job upon graduation lowers the likelihood of having a regular full-time job in subsequent years in Japan (Sakai and Higuchi, 2005; Kondo, 2007a). Kondo (2007a) argues that leaving school without obtaining a regular full-time job works as a bad signal, because those who couldn't obtain a job at graduation are adversely selected on average.

However, it is not obvious whether this adverse effect for each person who fails to obtain a regular job at entry leads to a negative effect of labor market conditions at entry at the cohort level. The average productivity of people who graduate without obtaining a regular job during a recession is higher than the average productivity of people who graduate without obtaining a regular job during a boom, because more people can obtain a regular job during a boom. Therefore, the increased number of new graduates who fail to obtain a regular job may be canceled out by the improved average productivity of these workers.

Nevertheless, it is possible that a recession at entry has a negative effect at the cohort level when the gap between regular full-time jobs and non-regular jobs is substantial. More specifically, suppose: (1) more productive workers are matched with better (in some sense) jobs in the hiring market for regular jobs for new graduates, (2) a worker's employment history is observable without costs, while firms have to incur some screening costs to observe actual productivity, and (3) provisional jobs that a worker has experienced have little information about his productivity because the market for provisional workers is a spot market. The third assumption means that many people are bunched into a group of "those not in regular employment." That is, the firms cannot distinguish people at the margin (almost as productive as workers in the lowest ranked regular job) from those at the very bottom unless they incur the screening costs. Hence, there is a gap in the expected productivity between those in the lowest ranked regular full-time job and those without a regular full-time job. If a firm interviews an applicant without experience in regular employment, there is a good chance that they will find that he is not productive enough for the job after incurring the screening costs. Thus, even if the firm knows that some of the people who graduate without obtaining a regular job in years with low labor demand are more productive than people who obtain the lowest ranked regular job in years with high labor demand, it may well prefer an applicant who got the lowest ranked regular job in a year with high labor demand to one who graduated without obtaining a regular job in a year with low labor demand.

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<sup>3</sup>Ohtake and Inoki (1997) estimate the cohort-specific component of wages separately by education, and its correlation with the unemployment rate at entry is actually slightly more negative for high school graduates than for college graduates. Although they do not go into this point further, we think their results capture a part of the effect through the decline in regular employment, which this paper focuses on, even though their sample is limited to those who are employed (including those on fixed-term contracts of longer than a month) by the surveyed establishments.

In reality, firms might not take the difference across cohorts fully into account, and negative perceptions against young people who are not settled in stable employment could also worsen the subjective expectation. In any case, firms do not recruit their regular employees from the pool of non-regular workers and unemployed people regardless of the labor market conditions at their entry to the market. The loss of work experience on the regular employment track may also lower the average productivity of the cohort in the long-run and aggravate the loss of earnings, but this is more like a consequence than a cause.<sup>4</sup>

The discontinuity in expected productivity between regular and non-regular workers is essential to produce a cohort-level decline in regular employment. Screening costs exist and assortative matching is observed, and the market for unskilled workers is closer to a spot market than the market for skilled workers both in the United States and in Japan. However, as the next section explains in detail, the discontinuity between the markets for regular and non-regular jobs is prominent only in Japan; the U.S. labor market is more like a continuum of markets with different degree of sorting on skills. In the absence of a discrepancy between regular and non-regular jobs, the effect of a recession at entry on earnings is likely to be less persistent for the less educated group, who are presumably more likely to be dismissed, because the advantage of obtaining a high-wage job at entry vanishes when the worker is dismissed. Hence, we expect the effect of a recession at entry for the less educated group compared to that for the more educated group will be stronger for Japanese men.

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<sup>4</sup>Jacobson, LaLonde and Sullivan (1993) find that the earning losses due to displacement is not permanent but gradually fades away in five years in the United States, and Kletzer and Fairlie (2003) confirm this using a sample of young workers only. Further, von Wachter and Bender (2006) show that a large part of the persistent earning losses due to early job loss for young Germans is attributable to the difference in employer characteristics, and once employer characteristics is controlled for the losses become temporary like in the United States.



### | 3 | INSTITUTIONAL BACKGROUND

Japan's employment system is characterized by long-term employment beginning right after the completion of education and lasting until mandatory retirement. An obvious consequence of this so-called "life-time" employment system is long job tenure and high job-retention rates for prime-aged male workers.<sup>5</sup> Another important consequence of the life-time employment system is two-tier structure within an employer. To keep their regular employees during recessions, many Japanese firms also hire workers on fixed term contracts or part-time basis as a buffer. Although there is no explicit legal definition, regular full-time workers (called *seishain* in Japanese) and other provisional/part-time workers are clearly distinguished in practice. A *seishain*, or a regular employee, works full-time and is on an employment contract that does not specify the date of termination of the contract.<sup>6</sup> Non-regular workers are usually called "*arubaito*", a Japanese word meaning side workers or just-in-time workers, or a "part-timer" regardless of how many hours she actually works. Termination of fixed term contracts is relatively easy, in contrast to the tight dismissal protection on the regular workers under the so-called just cause case law (*kaikoken ranyou houri*).<sup>7</sup> Moreover, the case law requires employers to make every effort to avoid dismissal of regular workers, including termination of temporary and part-time workers and suspending new hiring; this shows that not only employers but also authorities regard non-regular workers as a buffer that protects employment of regular workers.

In addition to the different degree of employment protection, the hiring market for the regular full-time workers and that for the non-regular provisional workers work quite differently. Schools play an important roll in matching students with their prospective employers, especially for high school students, in the market for regular jobs. Consequently, the hiring market for new graduates is isolated from the rest of the labor market, which allows firms to discriminate between those who have not entered the labor market and those who have failed to obtain a regular job. Also, the resulting matching is highly assortative. In contrast, new graduates and other young applicants are treated in the same way in the market for provisional jobs, which is more or less a spot market. Hence, the labor market for Japanese youth fits the situation considered in the previous section, where a recession at entry leads to a decline in regular employment at the cohort level.

The school-based hiring system, a matching system between the senior students in high school and regular full-time jobs based on long-term relationships between high schools and firms, is the major way for high school students to find a job after their graduation. Local public Employment Service Agencies (*kokyo shokugyo antei-jo*) also provide a separate list of

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<sup>5</sup>For instance, the average tenure of men at age 30-34 in 2000 is about 8.5 years in Japan, while it is about 5 years in the United States. Note that the difference in turnover rates between more and less educated Japanese workers is similar to that of American workers: in both countries, the turnover rate of high school educated workers is higher than that of college educated workers.

<sup>6</sup>In some occasions, even if an employee satisfies the two conditions, she is not considered as a "regular" employee. Thus, many surveys including the Labor Force Survey directly ask how the respondent is called by the employer to classify regular and non-regular workers.

<sup>7</sup>Although there had been no statutory law until the 2004 reform of the Labor Standard Law, *kaikoken ranyou houri* had made the dismissal of regular workers for economic reasons practically very difficult. See, for example, Passet (2003) for details.

vacancies explicitly for new high school graduates to support schools and students. As Ariga (2005) emphasizes, long-term relationships with schools and intervention by the Employment Service Agency effectively makes the employers treat new graduates and other job applicants differently. Consequently, the market for new high school graduates is isolated from the rest of the labor market.<sup>8</sup>

Unlike high schools, colleges usually do not directly mediate their students and potential employers, except for some specialists in the engineering and science majors. A number of large private placement-service agencies play a central role in the job market for college graduates, instead of public Employment Service Agencies. Nevertheless, the hiring market for new college graduates is also separated from the rest of the labor market to some extent, because many vacancies for regular full-time jobs explicitly target senior students in college. The private placement-service agencies also distinguish new graduates from other job seekers, though not as strictly as the public Agencies. A typical recruiting process starts more than a year prior to graduation and takes several months, also posing difficulties to unemployed people with credit constraints.

The likelihood that a new graduate obtains a full-time regular job is pro-cyclical and on a declining trend. Yet, the proportion of new graduates who immediately obtain a full-time regular job was still as high as 79.8 % for high school graduates and 90.9% for four-year college graduates in 1997, according to the Survey of Young Employees. Also, the Survey shows that 68.1 % of male regular employees at age 25-29 in 1997 had never changed their employer. Moreover, Kato (2001) shows that neither the job-retention rate nor the average tenure of regular employees, with controls for the age composition, has declined since the 1980s. Regular full-time workers remain in long-term employment as before, despite the decreasing number of new entrants to regular full-time jobs.

In contrast, transition from education to stable employment in the United States is gradual and often takes several years. Schools do not intervene in the matching process between new graduates and jobs; at least, there is nothing like the Japanese school-based hiring system for high school students. Also, young workers change jobs very frequently. Topel and Ward (1992) report that two-thirds of all new jobs among young workers end in the first year. Neal (1999) shows that many job changes among young workers involve changes in industry and occupations, emphasizing the importance of searching for well matched career. He also shows less educated workers tend to change industry and occupation more frequently. Lynch (1999) presents the relatively high employment rate among young Americans still in school as another side of gradual transition from school to work in the United States. This gradual transition makes it difficult for firms to tell who “failed” at entry to the labor market in the United States.

Probably due to the weak restrictions on dismissals in general, the distinction between fixed-term and indefinite employment contracts is relatively unimportant in the United States. Also, though governmental surveys such as the Current Population Surveys distinguish part-time workers from full-time workers based on hours of work, there is no discontinuity in

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<sup>8</sup>However, many troubles with the system have arisen since the mid-1990s as both the demand for and the supply of high school graduates have declined. Ariga (2005) provides detailed description of the system and what went wrong in the 1990s.

earnings at any particular hours of work per week.<sup>9</sup> Thus, a commonly recognized dichotomous classification of workers similar to regular and non-regular workers in Japan does not exist in the United States. Of course there are substantial differences between high-paying skilled jobs and low-paying unskilled jobs in the United States, but the distribution of jobs seems to be continuous.

To summarize, there are two notable differences between Japan and the United States. First, the discrepancy between regular and non-regular workers is prominent in Japan, while this kind of distinction is subtle in the United States. Second, the hiring market for new graduates in Japan is isolated from the rest of the labor market and majority of Japanese new graduates move on full-time regular jobs right after graduation, while transition to stable employment in the United States takes several years around graduation.

Compared to the other OECD countries, Japan and the United States are at the opposite extremes as to the prevalence of job shopping among young workers. According to Table 4.7 of OECD (1996), the average number of employers per year held by young persons after leaving school is 0.86 for American men and 0.17 for Japanese men, the highest and the lowest among Germany, Japan, Norway, Great Britain and the United States. Other factors reported in OECD (1996), such as the employment to population rate among 20-24 year olds and the proportion of the youth in total labor force, are similar and not very different from the OECD average. Fixed-term contracts and other “non-standard” employment in some European countries bear similarities to Japanese non-regular workers in the sense that they provide a loophole in strict dismissal regulations and these workers receive lower training opportunities and lower wages than regular workers.

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<sup>9</sup>We have confirmed this by plotting annual earnings over hours worked using the March CPS.

## | 4 | DATA AND METHODOLOGY

### 4.1 Defining a Cohort and the Earnings Equation

Our sample consists of Japanese men and American white men who completed their education in 1983 or later and have potential experience in the range of one to twelve years. We restrict our sample to men in order to avoid additional complications from the labor supply behavior of married women, which is quite different in the United States and Japan. We also drop non-whites from the sample of American men to keep away from issues related to racial disparities.<sup>10</sup>

Our primary sources of data for Japanese men are the Special Survey of the Labour Force Survey (*Roudouryoku Chousa Tokubetsu Chousa*; 1986-2001) and the Detailed Supplement to the Labour Force Survey (*Roudouryoku Chousa Tokutei Chosahyo*; 2002-2005), both conducted by the Statistics Bureau. The Special Survey was conducted annually in February until 2001, and each year's sample consists of about 90,000 individuals older than 15 in about 40,000 randomly drawn households. In 2002, the annual Special Survey was replaced with the monthly detailed supplement with a sample size of 23,000 individuals; to avoid seasonality bias, we use February samples only. Both surveys are cross sectional and include the same questions on annual earnings, detailed employment status and employer characteristics, and basic demographic characteristics.

We use the March Supplement to the Current Population Survey, conducted by the Census Bureau and the Bureau of Labor Statistics, to do the same exercise for American men. The March supplement to the Current Population Survey is also cross sectional, consists of a random sample of households and contains most of the key variables in a comparable form. The sample size varies from about 100,000 in the 1980s to 200,000 individuals in the 2000s.

The primary dependent variable is log real annual earnings. This is total income from salary and wages (excluding self employed persons in incorporated business) of the person in the last year, deflated by the consumer price index. Note that income from other sources is not included. Construction of the variable is described in Appendix. Most of the other dependent variables including employment status, weekly hours and part-time status are directly taken from the survey questionnaires and measured in the reference week of each survey. The measure of regional labor market conditions for Japan is the unemployment rates for 10 regions based on the monthly Labour Force Survey, which are available since 1983. For the United States, we use the state unemployment rates issued by the Bureau of Labor Statistics as the Local Area Unemployment Statistics. The Japanese regions are on average one-fifth the size of the average American state, while having twice the average population.

We define a cohort as a group of people who entered the labor market in the same year and region or state, and then assign each person a vector of past and current regional unemployment rates based on his cohort. Since both the Labour Force Survey and the Current Population Survey are cross sectional datasets lacking detailed employment history,

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<sup>10</sup>Though limited to Americans, Kondo (2007b) examines how the effect of graduating during a recession differs across race and gender.

we have to compute the year of graduation from the year of birth and educational background. Students in Japan typically receive job offers by the autumn of their last year of enrollment, while they graduate in March of the following year. Thus, we define entry-year  $y$  for the Japanese sample as follows:  $year\ of\ birth + 6 + schooling$  for those born in April-December, and  $year\ of\ birth + 5 + schooling$  for those born in January-March.<sup>11</sup> For the U.S. sample, we compute year of graduation  $y$  as year of survey -- age + 6 + the highest grade attended. This corresponds to the year of graduation for a person who entered elementary school at age 6 and went straight to the highest grade. Also, we have to use the region/state of current residence as the best available proxy for the region/state of residence at entry. The next section examines the adequacy of this definition and discusses reservations that come from measurement errors.

We estimate the effects of the unemployment rate at entry to the labor market on current earnings and various employment outcomes net of region-fixed components and year-fixed components. It is also necessary to control for temporary macro shocks at the time of the survey because unemployment rates may be auto-correlated, and the effect of the contemporaneous unemployment rate is itself worth estimating. Thus, the basic form of the earnings equation to be estimated is written as follows:

$$\log I_{ityr} = \beta_{(t-y)}u_{yr} + \gamma_{(t-y)}u_{tr} + \delta\mathbf{X}_{it} + \varphi_t + \eta_r + \theta_r t + \mu_y + \varepsilon_{ityr} \dots (1)$$

where  $I_{ityr}$  is annual earnings of individual  $i$  who left school in year  $y$  and in region  $r$  observed in year  $t$ ,  $u_{yr}$  and  $u_{tr}$  are the unemployment rates at entry and at present, and  $\mathbf{X}_{it}$  is other control variables including educational background and potential experience in year  $t$ .  $\varphi_t$  is a survey-year fixed effect,  $\eta_r$  is a region fixed effect,  $\theta_r$  is the coefficient of linear trend, which varies with region, and  $\mu_y$  is an entry-year fixed effect. The remaining errors are denoted by  $\varepsilon_{ityr}$ . Estimated standard errors are clustered for year and region of entry, i.e.  $\varepsilon_{ityr}$  is assumed to be the sum of a cohort-specific random shock  $\bar{\varepsilon}_{yr}$  and an individual shock  $\tilde{\varepsilon}_i$ .

We allow the coefficients of the unemployment rates,  $\beta$  and  $\gamma$ , to vary with the years since entry to see the persistence of the effect. Ideally, we would like to estimate separate  $\beta$  and  $\gamma$  by every single year of potential experience. However, in consideration of the sample size of each cohort, we choose a more parsimonious specification with separate  $\beta$ s and  $\gamma$ s for four ranges of potential experience (1-3, 4-6, 7-9 and 10-12 years). To estimate the effect on employment status, we modify equation (1) into the probit model.

## 4.2 Are Japanese and American Data Comparable?

Since the comparison of patterns across the less and the more educated groups between Japan and the United States is a kind of differences-in-differences in a very broad sense, we

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<sup>11</sup>The Japanese Labor Force Survey does not ask years of education, but asks the school attended. Thus, we define years of education as follows: 9 for jr. high school graduates, 12 for high school graduates, 14 for jr/tech college graduates, 16 for college graduates and more.

need to check the comparability of Japanese and American data before the main analyses.

First, let us compare summary statistics of the micro datasets shown in Table 1. American men are on average more educated, and the earnings gap between the more educated group and the less educated group is larger for American men. Nevertheless, within each group by educational background, the two datasets look fairly similar except that the employment rate is slightly higher for Japanese men. The average sample size per cohort (defined by region/state and year of graduation) is 222 for Japanese men and 135 for American men.

On the other hand, the unemployment rates in Japan and the United States have moved quite differently. Figure 1 plots the national average unemployment rates and the minimum and the maximum of region/state unemployment rates over time for Japan and the United States in 1983-2003. Obviously, both the level of the average unemployment rate and the variation across states are much greater for the United States than Japan. Therefore, 1% rise in the unemployment rate could have a greater impact in Japan than in the United States, just because of the differences in the average level. Also, the overall trend is upward in Japan and downward in the United States, suggesting the importance of controlling for year effects.

Further, Table 2 shows summary statistics of the regional unemployment rates, both raw levels and net of the year- and the region/state- fixed effects and the region/state specific linear trend. Variation net of these fixed effects and trend terms is essential for identification. Admittedly, a large part of the variation in the raw rates is absorbed by the fixed effects; especially,  $R^2$  for the Japanese regional rates is as high as 0.96, while that for the American state rates is 0.84. This could be partly because the Japanese data has fewer data points and the fixed effects are over fitted. Yet, studies on the wage curve in Japan show that regional unemployment rates have significant impacts on contemporaneous wages even with controls for region fixed effects and time dummies (Montgomery 1994, Poot and Doi 2005). Thus, we believe that we can identify the effect of the unemployment rate at entry net of region and year dummies as well.

Since we use the region of current residence as a proxy for the region of residence at entry, measurement errors due to migration across regions attenuate the estimated effect of the unemployment rate at entry. The five-year migration rate across regions of Japanese men of relevant ages is about 10% or less, while the five year migration rate across states of American men is 15-20%.<sup>12</sup> Thus, attenuation bias due to measurement errors will be greater for Americans. However, the relative gap in migration rates between college educated and not college educated is fairly similar in Japan and the United States. Although the 5-year migration rate across regions in Japan by age and education is unavailable, the migration rate across prefectures by age and education is available. Under an ad hoc assumption that the share of the migration across prefectures within a region in the total across-prefecture migration is the same across groups with different educational background, the 5-year migration rate across region for 25-34 year-old Japanese men without college education would be about 6%, and that for 25-34 year-old with college education would be about 14%. The across-state 5-year migration rate of 25-39 year-old Americans with college education is

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<sup>12</sup>The five year migration rate across regions in Japan is 13.3% for 20-24 years old men, 10.0% for 25-29 years old men and 8.2% for 30-34 years old men. The migration rate across states is 18.5% for 20-24 years old American men (including blacks), 19.7% for 25-29 years old and 15.3% for 30-34 years old. Calculated from the Population Census in 2000 of each country.

26.0% and that of without college education is 13.5%, according to the cross tabulation from Census 2000 by Franklin (2003).<sup>13</sup>

Another source of attenuation bias is errors in the year of graduation. Errors in the graduation year for Japanese high school graduates are negligible, and those for college graduates are mostly within 1 or 2 years. Admittedly, our definition of the year of graduation is noisier for American men: about 2% of 20-year-old white men in the CPS are still enrolled in high schools, and 16% of 24-year-old white men are enrolled in colleges.<sup>14</sup>

Business cycles may affect schooling choice. First, let us check the effect on the completed education. Panel (A) of Table 3 shows the effect of unemployment rates around high school completion on the likelihood of college education among adult men. The dependent variable is an indicator of college education, and the control variables are dummies for year of birth and region of residence. The sample consists of 25 year-old or older men born after 1966, and the standard errors are clustered for region-birth year groups. The estimated effect for Japanese men is not statistically significant and varies in sign. Although the effect of unemployment rate at age 19 looks substantial, the standard error is huge and also contradicts the result of no effect on college enrolment in Panel (C). On the other hand, a recession at high school completion slightly increases the likelihood of having college education among American men.

Next, Panels (B) and (C) of Table 3 show the effect of the contemporaneous local unemployment rate on enrollment for a subsample of a specific age (e.g. 18 years old), following Card and Lemieux (2000). The sample contains all men in the relevant ages, and the table shows coefficients from probit model with year and region/state dummies in the right hand side. High school enrolment in Japan is not correlated with business cycles.<sup>15</sup> Also, the correlation between the college enrolment rate and the unemployment rate suggests that a recession may make some people to stay in college for another year but does not affect the decision upon high school graduation in Japan.<sup>16</sup> Note that the deferred graduation is not

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<sup>13</sup>This tabulation includes non-whites and women.

<sup>14</sup>Since many Americans graduate schools in one year later than the predicted entry, we have tried an alternative definition: the birth year + 7 + schooling. It does not change the results much.

<sup>15</sup>The number of observation who are not enrolled among 16-18 years old is too small to run separate regression by single age, and the number of observations enrolled to high school and older than 20 is too small to run regressions.

<sup>16</sup>This result might sound contradicting to the existing studies in Japan that show that worse labor market opportunities for high school graduates are associated to higher college enrolment rates. In fact, according to the School Census, the ratio of high school graduates proceeding to college started to rise around 1992, coinciding with the upturn of the unemployment rate. However, as Ariga (2005) emphasizes, this rise is largely attributed to the expansion of college capacity relative to the number of high school graduates. On one side, the number of colleges started to increase in the end of 1980s thanks to deregulation; on the other side, the number of high school graduates started to decrease around in the early 1990s after the second baby boomers (born in 1971-1974) finished high school. Since the most of the existing studies that find significant correlation between business cycle and college enrolment rate employ linear or quadratic trend and do not control for more flexible year fixed effects, chances are that they are picking up the spurious correlation in the early 1990s. Incidentally, the ratio of high school graduates proceeding to college stopped rising as the decrease of 18-year-old population slowed down around 2000, while the unemployment rate kept rising until 2002.

captured in the Japanese Labor Force Survey since it asks the diploma/degree obtained by the respondent, instead of years of schooling. On the other hand, a recession increases high school enrollment of 18-year-old American men, consistent with Card and Lemieux (2000), and it also increases college enrollment of 19- and 21- year-old American men slightly. However, the effect on college enrollment is small, and there is no significant effect of unemployment rate in the previous year on 20- and 22-year old men suggesting that a substantial part of the increased college entrants quit in a year.<sup>17</sup> Overall, the effect of business cycle on schooling choice is small.

Further, to assess whether people who proceed to colleges during a recession are differently selected from those who proceed to colleges during a boom, we estimate the correlation between the unemployment rate at age 18 and future wages for college graduates. The unemployment rate at age 18 is unlikely to have any direct effect on earnings after graduation from college. Thus, if there is a significant correlation, it is likely to be due to sorting on unobserved ability. Table 4 reports the result. Although the unemployment rate at age 18 is slightly positively correlated with earnings after graduating from college, the four coefficients are jointly insignificant and most of the individual coefficients are also insignificant in both countries. At least, there is no evidence that selection of students proceeding to college during a recession goes in an opposite direction in Japan than in the United States.

To summarize, both the attenuation bias and the size of average unemployment rate will make the estimates for American men smaller than those for Japanese men. However, the difference between more and less educated Japanese men and that between more and less educated American men will be comparable.

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<sup>17</sup>Card and Lemieux (2000) also conclude the effect of local labor market condition on college enrollment is weak. Their result suggests the effect of cohort size on the college enrollment rate is substantial in the United States, too.



### 5.1 Effects of the Unemployment Rate at Entry

Table 5 reports the estimated coefficients of the unemployment rate at entry and the contemporaneous unemployment rate on log real annual earnings. The estimated equations are exactly the same as equation (1); the coefficient of the unemployment rate at entry to the labor market corresponds to  $\beta$ , which is allowed to vary with experience by taking interactions with dummy indicators for 3-year potential experience categories. Figure 2 plots the estimated effect of the unemployment rate at entry on current earnings over potential experience. A high unemployment rate at entry has a very persistent negative effect for Japanese men, especially for the less educated group. 1% rise in the unemployment rate at entry leads to 7-5% earning losses for over 12 years for the group without college education. The effect is smaller and gradually fading, although still fairly persistent, for the more educated group; the initial loss is 4.6% and the gap gradually fades up to 2.3%. Turning to American men, the unemployment rate at entry has only a temporary effect for the less educated group, in a sharp contrast to the almost permanent effect for their Japanese counterpart. The effect for more educated Americans is gradually fading in about 10 years and fairly close to the estimates by existing studies using the data of college graduates in North America from other sources (Kahn 2006, Oreopoulos et al 2006). The difference in relative pattern across the less and the more educated groups is striking.

Provided that the less educated workers are less geographically mobile, the potential attenuation biases described in the previous section affect college graduates more than high school graduates. Nevertheless, all the difference between less educated and more educated Japanese men is not likely to be attributed to such biases. First of all, we observe the opposite pattern for the American men, which should be subject to the same kind of biases. Also, Ohtake and Inoki (1997) report that high school graduates who enter the labor market when the *national* unemployment rate is high earn lower wages, while the correlation for college graduates is smaller and statistically insignificant. We have confirmed the same result by regressions without fixed effects.<sup>18</sup>

Lastly, the effect of the contemporaneous unemployment rate on earnings among less educated groups shows an interesting contrast between Japan and the United States. In Japan, high school graduates become less sensitive to contemporaneous business cycles as they get

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<sup>18</sup>Though not reported, we have tried various specification checks including adding interaction of unemployment rates and indicators for business cycle upturns, restricting the sample to older cohorts that graduated before 1996 and different combination of region- and year- fixed effects. The effect of unemployment doesn't seem to vary between upturns and downturns, and the results for older cohorts are quite similar to that for the entire sample reported in this paper. Except that the difference between the less and the more educated groups in Japan tend to be over estimated without controls for survey year and region-specific trend, the inclusion of the fixed effects does not change the estimates substantially either. We have also tried expanding the American sample back to the cohorts who graduated in 1976; the effect of a recession at entry becomes more negative and persistent for the less educated group (perhaps because the recession in 1982 that affected the blue-collar intensive industries more) and the difference between the more and the less educated groups becomes subtle, but the relative pattern is not reversed.

older. The reason is not very clear to us; the prevailing long-term contracts alone cannot explain this well because earnings of college graduates are somewhat sensitive to the contemporaneous unemployment rate. Perhaps bonuses may increase more for more educated workers during booms. It is true that less educated workers are more likely to lose jobs; however, it is hard to think that they are more likely to stay unemployed and report zero earnings for the entire year than compromise on lower paying jobs and report low but positive earnings; in fact, the effect of unemployment at entry on the likelihood of reporting zero earnings is statistically insignificant (see Appendix). On the other hand, earnings of the less educated group are more sensitive to business cycles in the United States. This is consistent with existing evidence for costs of a recession born disproportionately by less skilled workers (e.g. Hines, Hoynes and Krueger 2001). This contrast implies that the labor markets for low skilled workers may work in a quite different manner in Japan and in the U.S.

Table 6 shows the effect of 1% rise in the unemployment rate at entry on the likelihood of being employed in the reference week of the survey. The unemployment rate at entry has a persistent negative effect for less educated Japanese men, like the effect on earnings. The effect for less educated American men is negative and marginally significant, but the size of the effect is small. The effect is almost zero and statistically insignificant for the more educated groups both in Japan and in the United States, consistent with the existence evidence for negligible effect on employment for college graduates by Oreopoulos et al (2006) and Kahn (2006).

To look at the effect on hours worked, we have to restrict the sample to those employed in the reference week because the data on hours worked is not available for those who are not employed. Since the unemployment rate at entry has a negative effect on the likelihood of being employed only for less educated Japanese men, the estimated effect on hours worked conditional on being employed may be biased upward for this group. Nevertheless, the upper panel of Table 7 shows that the estimated effect of the unemployment rate at entry to hours worked for Japanese high school graduates is negative and jointly significant, while the effect on college graduates is not statistically distinct from zero. Also, there is no statistically significant effect for Americans, either in the less educated and the more educated groups. In any case, the effect on hours worked is very small compared to the effect on earnings; a 1 % rise in the unemployment rate would change weekly hours by less than one hour. It suggests that the negative effect on earnings comes from fall in wages per hour and/or decline in employment.

Even though the overall effect on average hours is small, there can be a significant effect on full-time/part-time status. The lower panel of Table 7 shows the effect on the likelihood of being full-time.<sup>19</sup> The effect is negative and persistent for less educated Japanese men, and weaker and marginally significant for less educated American men. There is no statistically significant negative effect for the more educated groups and the overall pattern across the four groups is similar to the effect on employment and hours of work.

To summarize: we find persistent negative effects of graduating during a recession on subsequent earnings and employment for less educated Japanese men. On the other hand,

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<sup>19</sup>Fulltime worker is those who worked 35 hours or more in the reference week, both in the CPS and the Japanese Labor Force Survey.

the effect on earnings for less educated American men is only temporary and the effect on employment for them is only marginally significant. The effect on earnings is significantly negative for more educated Japanese and American men, but weaker compared to the effect for less educated Japanese men. Also, there is no effect on employment, hours worked and full-time/part-time status for the more educated groups.

## 5.2 Further Evidence for Chronic Unstable Employment

The persistent negative effect on employment for less educated Japanese men suggests that a part of the negative effect on earnings comes from unstable employment among them. In this section, we try to go into the relationship between the chronic unstable employment we argued in Section 2 and the loss of earnings observed in Table 5, although unavailability of information about the first job allows us to show only some suggestive evidence.

First, if a recession at entry lowers the likelihood of having a regular job and it really affects the earnings, adding employment status in the right hand side of equation (1) should weaken the effect of the unemployment rates at entry. We can test these hypothesis directly because the Japanese Labor Force Survey asks each employed person (excluding self-employed) whether he/she is employed as a “regular” employee.<sup>20</sup> Since more productive people tend to sorted into stable employment in general, we take an average over cells defined by region, year of entry and survey year so that sorting within cohort is canceled out:

$$\log \bar{I}_{\text{tyr}} = \alpha \bar{R}_{\text{tyr}} + \beta_{(t-y)} u_{\text{yr}} + \gamma_{(t-y)} u_{\text{tr}} + \delta \bar{\mathbf{X}}_{\text{tyr}} + \varphi_t + \eta_r + \theta_r t + \mu_y + \bar{\varepsilon}_{\text{yrt}} \dots (2)$$

$R$  is the ratio of regular employee in the population, and the bars above variables indicate the average of each cohort.

Table 8 reports the estimated effect of a recession at entry at the cohort level. First, column 1 confirms that worse labor market conditions at entry lower the ratio of regular employees among less educated Japanese men. Also, the effect is weaker and statistically insignificant for the more educated group. This is not surprising given that the effect on employment reported in Table 6 is persistently negative only for the less educated group. Column 2 reports the estimated effect of the ratio of regular employees on the average log annual earnings, implying that a substantial part of the effect of unemployment rate at entry for less educated Japanese men can be attributed to the reduced share of regular employment. Compared to Table 5, the negative effect of the unemployment rate at entry is reduced by 3% for the less educated group with experience less than 7 years, but the reduction is modest for the more educated group. The coefficient of being an *seishain* decreases with experience, perhaps because what really matters is the status at entry while the dummy variable refers to the contemporaneous employment status.

<sup>20</sup>This classification is based on how their employers call them. The exact Japanese word corresponding to “regular” here is “*seiki-no*”. There is another definition of “regular employees”, which means those whose employment contracts do not specify termination date. Although the two classifications are determined independently from each other, the latter category based on the length of contract includes almost everyone classified as “regular” based on how they are called. We decide to use the classification based on how they are called because the classification based on the length of contract includes a significant number of part-time workers, who are not usually considered as *seishain*.

Second, if the loss of earnings is actually born mainly by people who are kept out of regular employment, the effect of the unemployment rate at entry on earnings should be stronger in the lower part of the earnings distribution because provisional workers and unemployed people are concentrated to that part. To see this, we estimated the effect at 25 percentile and 75 percentile by quantile regression: 25 percentile roughly corresponds to the border between regular and provisional employees, while most people around 75 percentile have a regular job. The estimated coefficients reported in Table 9 show that the negative effect of a recession at entry operates stronger at 25 percentile than 75 percentile in Japan, while the difference between the two percentiles are negligible or even opposite in the United States.<sup>21</sup> Also, among Japanese, the difference between the two percentiles is greater and statistically more significant for the less educated group. The negative effect of a recession at entry is strongest for people who are the most likely to fall into unstable employment due to the recession in Japan.

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<sup>21</sup>Further examination of heterogeneous effects among Canadian college graduates by Oreopoulos et al (2006) show a complicated pattern: on one hand, the effect is stronger for workers who entered better paying firms at entry, on the other hand, the effect is stronger for workers scores with lower predicted earnings based on the characteristics of college programs they attended. These two factors should be canceling out each other in our cross sectional sample.

## | 7 | CONCLUDING REMARKS

Entering the labor market during a recession has a persistent negative effect on earnings for young Japanese men. The effect is stronger and more persistent for the less educated group, especially those in the lower part of earnings distribution. Moreover, a recession at entry not only lowers the annual earnings, but also raises the likelihood of non-employment and part-time employment for them, and a considerable part of the negative effect on earnings is the effect through the lower likelihood of regular, stable employment. In contrast, the negative impact of graduating from high school during a recession on earnings is temporary for less educated American men, while we observe a modestly persistent negative effect for more educated American men, consistent with the existing studies that focus on college graduates.

The existing studies that focus on college graduates draw on the theory of search frictions and implicit long-term contracts to explain the persistent but fading negative effect of a recession at entry. Following their logic, the effect of a recession at entry is expected to fade faster for less educated workers because they are more likely to be laid off and lose the advantage of obtaining a good first job, and our result for American white men confirm it. In contrast, we show theoretical possibility that the adverse selection of non-regular workers and unemployed people may produce a negative effect of entering the labor market in a recession at the cohort level. Our empirical results provide some suggestive evidence that the stronger effect for less educated Japanese men comes from chronic non-regular, unstable employment caused by the isolated hiring market for new graduates and duality between regular and non-regular employees in Japan, both of which do not exist in the United States.

That the cost of a recession at entry is born disproportionately by relatively disadvantaged people raises a serious concern: the cohorts that suffer from the loss of earnings on average also experience greater earnings inequality between less and more educated people, since the effect of a recession at entry is weaker for the more educated group. Furthermore, poverty concentrated to particular cohorts might severely weigh down the social security system and cause social unrest. Although coming up with specific policy recommendation is beyond the scope of this paper, it is worth bearing in mind that a persistent penalty for the disadvantaged could have quite different consequences for them than for more advantaged people.

## APPENDIX: EARNINGS DATA

The Japanese Labour Force Survey asks “Earnings from employed work (including not incorporated self-employment)”. The respondent chooses one of the following categories: 0, < 50, 50-99, 100-149, 150-199, 200-299, 300-399, 400-499, 500-699, 700-999, 1000-1499, 1500- for 1996-2005; 0, < 100, 100-199, 200-299, 300-399, 400-499, 500-699, 700-999, 1000-1499, 1500- for 1986-1995 (in 10,000 yen). We define the nominal earnings as the middle value of each earnings category. For the top category, we set 2,100 following the convention of dealing with the CPS top coding (in any case, very few observations are in this category). Then, we divide the nominal earnings with the regional Consumer Price Index normalized so that the national average takes 1 in 2000.

For the March CPS, we use “PEARINVAL - total persons earnings” as the nominal annual earnings. This is the sum of wage and salary income and income from self-employment (including farm). Although this is in principle a continuous variable, 62% of the observations with positive earnings are bunched at every \$1,000 and about 23% are even bunched at every \$5,000. Thus it is more or less similar to the category data in the Japanese survey. Negative earnings are replaced with zero. We divide the nominal earnings by the national Consumer Price Index normalized to take 1 in 2000.

Table A1 summarizes the fraction with zero or missing earnings. Table B2 reports the effect of the unemployment rate at entry on the likelihood of reporting zero earnings or missing earnings. The unemployment rate at entry slightly raises the probability of lacking valid earnings data for the less educated groups, probably due to non-employment. Assuming that those with lower potential wages are more likely to lack valid earnings due to non-employment, the potential bias will, if it is not negligible, work against our argument for Japanese men.

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**Table 1: Summary Statistics**

	Japanese men, high school or less	Japanese men, jr. college or more	American men, S ≤12	American men, S > 12
Sample size	53,557	39,592	63,611	76,699
exp = 1-3	17,833	11,417	19,849	17,643
exp = 4-6	14,759	12,229	17,297	21,982
exp = 7-9	12,083	9,399	14,753	19,994
exp = 10-12	8,882	6,547	11,712	17,080
Educational background	without high school diploma: 6,745, high school diploma: 46,812	Jr/tech college (2 year): 11,383, 4 year college or more: 28,209	Average years of schooling: 11.6; S = 12: 49,798	Average years of schooling: 15.4; S < 16: 35,216
Log real earnings	(10,000yen in 2000)		(100 dollars in 2000)	
exp = 1-3	5.10	5.50	4.44	5.12
exp = 4-6	5.41	5.79	4.88	5.48
exp = 7-9	5.60	5.99	5.16	5.70
exp = 10-12	5.73	6.15	5.31	5.86
Employed				
exp = 1-3	76.5%	92.2%	73.9%	88.8%
exp = 4-6	88.5%	94.7%	81.6%	90.6%
exp = 7-9	90.5%	95.5%	84.8%	92.4%
exp = 10-12	90.5%	96.2%	86.6%	93.8%

Figure 1: Unemployment rate in Japan and the United States: 1983-2003

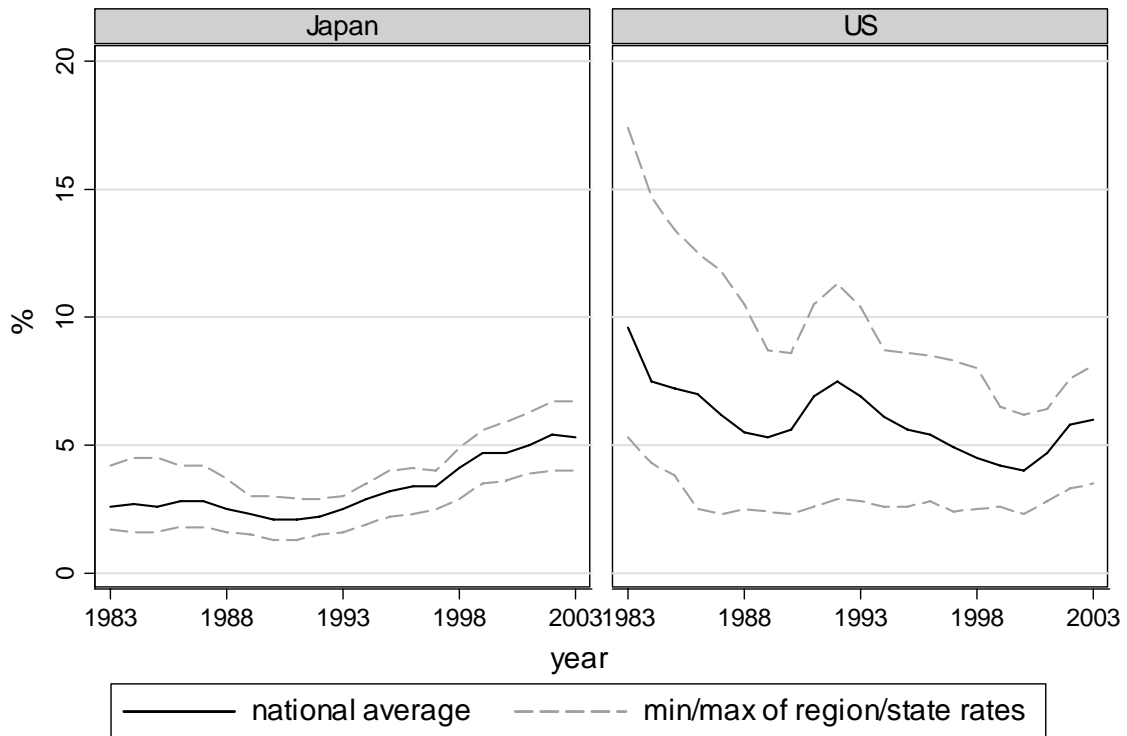


Table 2: Summary Statistics of the Region/State Unemployment Rates 1983-2003

	Obs	Mean	Std. deviation	Min	Max
Japanese regions (net of region FE, year FE & region specific linear trend)	210	3.21 (0.00)	1.23 (0.22)	1.3 (-0.60)	6.7 (0.89)
American states (net of state FE, year FE & state specific linear trend )	1071	5.74 (0.00)	1.95 (0.75)	2.3 (-2.07)	17.4 (3.27)

\* Residuals from a regression of raw rates on year dummies and region/state dummies.

**Table 3: The Effect of the Local Unemployment Rate on the Enrollment Rates**

(A) Unemployment rate around completion of high school on Pr( schooling &gt; 12 years)

	Japanese		American	
U. rate at	age 18	age 19	age 18	age 19
marginal effect	0.2%	-1.1%	0.5%	0.3%
coefficient	0.004	-0.027	0.013	0.007
S.E.	(0.004)	(0.021)	(0.005)	(0.005)

(B) Contemporaneous unemployment rate on high school enrolment rates

	Japanese		American	
Age	current	last	current	Last
16	-0.004	0.008	0.001	0.000
	(0.011)	(0.010)	(0.002)	(0.002)
17	* age	* age	0.000	0.003
	16-18	16-18	(0.002)	(0.002)
18	pooled	pooled	0.009	0.008
			(0.004)	(0.004)
19	0.002	-0.004	0.000	-0.002
	(0.018)	(0.018)	(0.003)	(0.003)
20	N/A	N/A	-0.001	0.000
			(0.002)	(0.002)

(C) Contemporaneous unemployment rate on college enrolment rates

	Japanese		American	
Age	current	last	current	Last
18	0.005	0.004	-0.001	0.002
	(0.007)	(0.007)	(0.004)	(0.003)
19	0.018	0.020	0.012	0.013
	(0.038)	(0.038)	(0.005)	(0.005)
20	0.000	-0.011	0.003	0.006
	(0.036)	(0.036)	(0.005)	(0.005)
21	0.062	0.086	0.004	0.010
	(0.039)	(0.039)	(0.005)	(0.004)
22	-0.029	0.040	-0.002	-0.002
	(0.038)	(0.039)	(0.004)	(0.004)
23	0.068	0.062	0.001	0.008
	(0.029)	(0.029)	(0.004)	(0.004)
24	0.027	0.029	0	0.003
	(0.023)	(0.022)	(0.003)	(0.003)

Note: Coefficients from probit regressions, with birth-year dummies and region/state dummies as covariates. Standard errors are clustered for birth-year and region/state. See the text for details.

**Table 4: The Effect of Unemployment Rates at Age 18 on Future Wages for College Graduates**

	Japanese		American	
	4-yr college grads only	incl. jr/tech college	Schooling ≥16 yrs	Schooling ≥ 13 yrs
<hr/>				
U at age18				
×experience 1-3 years	0.018 (0.033)	0.034 (0.018)	0.012 (0.007)	0.005 (0.005)
×experience 4-6 years	-0.005 (0.027)	0.014 (0.015)	0.009 (0.005)	0.011 (0.004)
×experience 7-9 years	-0.003 (0.024)	0.026 (0.016)	0.009 (0.005)	0.004 (0.004)
×experience 10-12 years	0.000 (0.023)	0.017 (0.019)	0.000 (0.005)	-0.001 (0.004)
<hr/>				
Contemporaneous U				
×experience 1-3 years	-0.064 (0.021)	-0.064 (0.018)	-0.014 (0.011)	-0.011 (0.008)
×experience 4-6 years	-0.034 (0.020)	-0.040 (0.017)	-0.031 (0.009)	-0.024 (0.007)
×experience 7-9 years	-0.023 (0.021)	-0.024 (0.017)	-0.024 (0.012)	-0.018 (0.008)
×experience 10-12 years	-0.019 (0.021)	-0.014 (0.018)	-0.016 (0.013)	-0.010 (0.009)
<hr/>				
Observations	18,053	27,577	38,769	72,226
R2	0.22	0.25	0.14	0.16

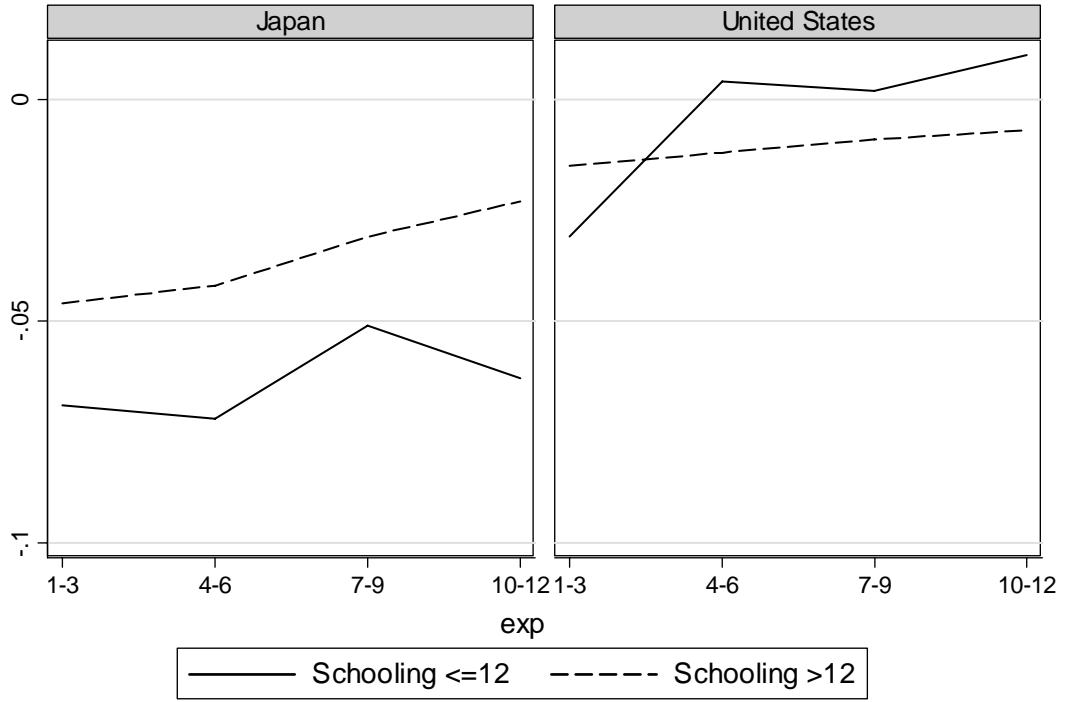
Note: Cohort-clustered robust standard errors in parenthesis. Other controls included are potential experience, education (dummies for the Japanese sample, years of schooling for the American sample), birth year dummies, region dummies, survey year dummies and region-specific linear trends.

**Table 5: The Effect of the Unemployment Rate at Entry and the Contemporaneous Unemployment Rate on Log Real Annual Earnings**

	Japanese		Americans	
	High school	College	S≤12	S>12
U at entry to the market				
×experience 1-3 years	-0.069 (0.026)	-0.046 (0.017)	-0.031 (0.008)	-0.015 (0.007)
×experience 4-6 years	-0.072 (0.021)	-0.042 (0.014)	0.004 (0.007)	-0.012 (0.006)
×experience 7-9 years	-0.051 (0.018)	-0.031 (0.014)	0.002 (0.006)	-0.009 (0.006)
×experience 10-12 years	-0.063 (0.017)	-0.023 (0.015)	0.010 (0.007)	-0.007 (0.005)
Contemporaneous U				
×experience 1-3 years	-0.050 (0.019)	-0.050 (0.017)	-0.042 (0.008)	-0.013 (0.008)
×experience 4-6 years	-0.016 (0.015)	-0.038 (0.015)	-0.043 (0.009)	-0.022 (0.007)
×experience 7-9 years	-0.010 (0.016)	-0.032 (0.014)	-0.036 (0.010)	-0.020 (0.007)
×experience 10-12 years	0.012 (0.018)	-0.024 (0.014)	-0.033 (0.011)	-0.012 (0.008)
Observations	47,469	38,017	57,635	72,226
R2	0.23	0.27	0.17	0.16

Note: Cohort-clustered robust standard errors in parenthesis. Other controls included are potential experience, education (dummies for the Japanese sample, years of schooling for the American sample), graduation year dummies, region dummies, survey year dummies and region-specific linear trends.

Figure 2: The effect of 1% rise of the unemployment rate at entry on log real annual earnings



**Table 6: The Effect of the Unemployment Rate at Entry on Employment Status**

	Japanese		Americans	
	High school	College	High school	College
Marginal effects				
U at entry				
×experience 1–3 years	-3.26%	-0.51%	-0.67%	-0.20%
×experience 4–6 years	-3.12%	-0.08%	-0.30%	-0.12%
×experience 7–9 years	-3.75%	0.62%	-0.30%	-0.13%
×experience 10–12 years	-3.93%	-0.01%	-0.55%	-0.37%
Contemporaneous U				
×experience 1–3 years	-3.97%	0.25%	-2.53%	-0.64%
×experience 4–6 years	-3.71%	0.29%	-2.20%	-0.76%
×experience 7–9 years	-3.08%	0.70%	-1.82%	-0.72%
×experience 10–12 years	-2.26%	0.50%	-1.76%	-0.66%
Probit Coefficients				
U at entry				
×experience 1–3 years	-0.170 (0.055)	-0.061 (0.068)	-0.007 (0.003)	-0.002 (0.002)
×experience 4–6 years	-0.162 (0.049)	-0.009 (0.058)	-0.003 (0.003)	-0.001 (0.002)
×experience 7–9 years	-0.195 (0.045)	0.076 (0.068)	-0.003 (0.003)	-0.001 (0.002)
×experience 10–12 years	-0.204 (0.042)	-0.001 (0.066)	-0.005 (0.003)	-0.004 (0.002)
Contemporaneous U				
×experience 1–3 years	-0.207 (0.048)	0.030 (0.068)	-0.025 (0.003)	-0.006 (0.002)
×experience 4–6 years	-0.193 (0.042)	0.035 (0.053)	-0.022 (0.003)	-0.008 (0.002)
×experience 7–9 years	-0.160 (0.043)	0.084 (0.054)	-0.018 (0.004)	-0.007 (0.002)
×experience 10–12 years	-0.118 (0.047)	0.061 (0.060)	-0.018 (0.005)	-0.007 (0.003)
Sample size	53,513	39,562	63,611	76,699
Pseudo R2	0.098	0.051	0.059	0.026
LR test statistics (H0: all =0)	28.02	3.86	7.83	4.52
(p-value)	(0.00)	(0.43)	(0.10)	(0.34)

Note: Cohort-clustered robust standard errors in parenthesis. Other controls included are potential experience, education (dummies for the Japanese sample, years of schooling for the American sample), graduation year dummies, region dummies, survey year dummies and region-specific linear trends. The null hypothesis for the LR test is that all coefficients of unemployment rates at entry interacted with potential experience are zero.



**Table 7: The Effect of the Unemployment Rate at Entry on Hours Worked, Conditional on Being Employed**

(1) Hours worked in last week

	Japanese		Americans	
	High school	College	S<=12	S>12
OLS Coefficients				
×experience 1–3 years	-0.609 (0.520)	0.587 (0.474)	0.047 (0.102)	-0.051 (0.094)
×experience 4–6 years	-0.356 (0.407)	0.551 (0.396)	0.018 (0.086)	0.022 (0.077)
×experience 7–9 years	-0.933 (0.398)	0.324 (0.426)	0.035 (0.089)	0.101 (0.080)
×experience 10–12 years	-0.838 (0.353)	0.570 (0.398)	0.031 (0.088)	0.029 (0.073)
Observations	46,169	37,660	50,250	68,430
Pseudo R2	0.022	0.012	0.04	0.03
F test statistics (H0: all =0)	2.65	0.77	0.08	0.61
(p-value)	(0.034)	(0.546)	(0.987)	(0.658)

(2) Pr( full-time | employed)

	Japanese		Americans	
	High school	College	S<=12	S>12
Marginal effects				
×experience 1–3 years	-2.4%	0.5%	-0.5%	-0.4%
×experience 4–6 years	-1.7%	0.4%	-0.3%	-0.4%
×experience 7–9 years	-2.2%	0.1%	0.2%	-0.4%
×experience 10–12 years	-1.6%	1.4%	-0.6%	-0.2%
Probit Coefficients				
×experience 1–3 years	-0.161 (0.065)	0.053 (0.070)	-0.005 (0.003)	-0.004 (0.002)
×experience 4–6 years	-0.119 (0.050)	0.041 (0.058)	-0.003 (0.003)	-0.004 (0.002)
×experience 7–9 years	-0.152 (0.050)	0.012 (0.059)	0.002 (0.003)	-0.004 (0.002)
×experience 10–12 years	-0.109 (0.048)	0.145 (0.071)	-0.006 (0.003)	-0.002 (0.002)
Observations	46,169	37,660	51,435	70,087
Pseudo R2	0.031	0.019	0.032	0.022
LR test statistics (H0: all =0)	9.93	5.24	6.91	5.20
(p-value)	(0.042)	(0.053)	(0.141)	(0.268)

Note: Cohort-clustered robust standard errors in parenthesis. Other controls included are the unemployment rate in survey year, potential experience, education (dummies for the Japanese sample, years of schooling for the American sample), graduation year dummies, region dummies, survey year dummies and region-specific linear trends. The null hypothesis for the F/LR tests is that all coefficients of unemployment rates at entry interacted with potential experience are zero.

**Table 8: The Effect through Employment Status (*seishain*) on Earnings in Japan**

Dependent variable:	(1) ratio of <i>seishain</i>		(2) average log real annual earnings	
	High school	College	High school	College
<hr/>				
U at entry to the market				
×experience 1-3 years	-0.062 (0.017)	-0.027 (0.015)	-0.033 (0.023)	-0.030 (0.017)
×experience 4-6 years	-0.048 (0.014)	-0.011 (0.013)	-0.042 (0.018)	-0.037 (0.015)
×experience 7-9 years	-0.031 (0.013)	0.003 (0.012)	-0.026 (0.017)	-0.032 (0.014)
×experience 10-12 years	-0.022 (0.012)	0.000 (0.012)	-0.041 (0.016)	-0.025 (0.015)
<hr/>				
Contemporaneous U				
×experience 1-3 years	-0.046 (0.014)	-0.011 (0.012)	-0.007 (0.019)	-0.043 (0.015)
×experience 4-6 years	-0.039 (0.012)	-0.008 (0.010)	0.011 (0.015)	-0.034 (0.013)
×experience 7-9 years	-0.036 (0.012)	0.002 (0.010)	0.006 (0.015)	-0.035 (0.013)
×experience 10-12 years	-0.021 (0.013)	-0.002 (0.011)	0.018 (0.016)	-0.025 (0.014)
<hr/>				
Ratio of <i>seishain</i>				
×experience 1-3 years			0.651 (0.059)	0.566 (0.058)
×experience 4-6 years			0.563 (0.057)	0.520 (0.059)
×experience 7-9 years			0.451 (0.069)	0.396 (0.068)
×experience 10-12 years			0.417 (0.084)	0.388 (0.083)
<hr/>				
Sample size	1,836	1,831	1,836	1,831
R2	0.6	0.32	0.87	0.87

Note: Robust standard errors in parenthesis. Each cohort is weighted by the number of observations in the original dataset. Other controls included are potential experience, education (ratio of high school drop outs or jr. college graduates), graduation year dummies, region dummies, survey year dummies and region-specific linear trends.

**Table 9: Coefficients of Unemployment Rate at Entry at 25-percentile and 75-percentile**

	25 percentile	75 percentile	F stats for (p-value) for test H0: 25% = 75%
U at entry		Japanese men, high school or less	
×experience 1-3 years	-0.103 (0.019)	-0.011 (0.015)	15.56 (0.000)
×experience 4-6 years	-0.114 (0.020)	-0.029 (0.017)	8.59 (0.003)
×experience 7-9 years	-0.079 (0.016)	-0.021 (0.018)	6.99 (0.008)
×experience 10-12 years	-0.073 (0.017)	-0.024 (0.014)	5.38 (0.020)
U at entry		Japanese men, college or more	
×experience 1-3 years	-0.043 (0.020)	-0.005 (0.013)	3.26 (0.071)
×experience 4-6 years	-0.057 (0.022)	-0.021 (0.010)	2.22 (0.136)
×experience 7-9 years	-0.029 (0.018)	-0.014 (0.016)	0.53 (0.467)
×experience 10-12 years	-0.043 (0.022)	-0.003 (0.010)	3.46 (0.063)
U at entry		American men, S≤12	
×experience 1-3 years	-0.034 (0.010)	-0.024 (0.006)	0.69 (0.406)
×experience 4-6 years	0.010 (0.010)	-0.003 (0.005)	1.78 (0.183)
×experience 7-9 years	0.004 (0.010)	-0.003 (0.004)	0.63 (0.426)
×experience 10-12 years	0.014 (0.008)	0.005 (0.005)	1.40 (0.236)
U at entry		American men, S>12	
×experience 1-3 years	-0.013 (0.010)	-0.016 (0.004)	0.13 (0.718)
×experience 4-6 years	-0.008 (0.008)	-0.009 (0.004)	0.01 (0.911)
×experience 7-9 years	-0.006 (0.005)	-0.001 (0.004)	1.94 (0.163)
×experience 10-12 years	-0.006 (0.006)	-0.002 (0.004)	0.30 (0.586)

Note: Standard errors computed by bootstrapping are in parenthesis. Other controls included are potential experience, education (dummies for Japanese sample, years of schooling for American sample), graduation year dummies, region dummies, survey year dummies and region-specific linear trends.

**Table A1: Fraction with Zero/Missing Earnings**

	Japanese men, high school or less	Japanese men, jr. college or more	American white men, S ≤12	American white men, S > 12
exp = 1-3	19.1%	5.5%	13.8%	6.2%
exp = 4-6	8.1%	3.7%	7.9%	5.4%
exp = 7-9	6.9%	3.4%	7.2%	5.4%
exp = 10-12	7.2%	2.7%	6.8%	6.6%

**Table A2: The Effect of the Unemployment Rates on the Likelihood of Zero/Missing Earnings Probit Coefficients**

	Japanese		Americans	
	High school	College	S≤12	S>12
U at entry to the market				
×experience 1–3 years	0.068 (0.054)	0.027 (0.054)	0.036 (0.013)	0.023 (0.015)
×experience 4–6 years	0.060 (0.041)	0.123 (0.047)	0.024 (0.012)	0.005 (0.013)
×experience 7–9 years	0.036 (0.036)	0.035 (0.050)	0.015 (0.013)	-0.008 (0.013)
×experience 10–12 years	0.033 (0.033)	0.010 (0.053)	0.021 (0.013)	0.001 (0.013)
Contemporaneous U				
×experience 1–3 years	0.052 (0.041)	0.020 (0.054)	0.052 (0.015)	-0.015 (0.015)
×experience 4–6 years	0.059 (0.031)	-0.013 (0.045)	0.032 (0.015)	0.003 (0.015)
×experience 7–9 years	0.036 (0.032)	0.001 (0.044)	0.046 (0.016)	-0.002 (0.016)
×experience 10–12 years	0.017 (0.035)	0.041 (0.051)	0.027 (0.022)	-0.005 (0.019)
Observations	52,342	39,000	63,611	76,699
Pseudo R2	0.186	0.180	0.077	0.026

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Institute for Social and Economic Research and Policy  
Columbia University in the City of New York  
420 West 118th Street  
8th Floor, Mail Code 3355  
New York, NY 10027  
Tel: 212-854-3081  
Fax: 212-854-8925  
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