

where Y_{ityr} is an indicator variable that takes one if employed, for person 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 X_{it} is other control variables including educational background and potential experience in year t . ϕ_t is a survey-year fixed effect, η_r is a region fixed effect, θ_r is the coefficient of linear trend, which varies with region, and v_y is an entry-year fixed effect. The remaining errors, ε_{ityr} include a random cohort-region effect and a random region-calendar year effect, which are likely to be autocorrelated. To account these aggregate random shocks, standard errors of coefficients are estimated by block bootstrap with clusters by region/state.¹⁶ Likewise, the basic form of the earnings equation to be estimated is written as follows:

$$(4) \quad \log I_{ityr} = \beta_{(t-y)}u_{yr} + \gamma_{(t-y)}u_{tr} + \delta'X_{it} + \phi_t + \eta_r + \theta_r t + v_y + \varepsilon_{ityr}$$

where I_{ityr} is annual earnings.

We allow the coefficients of the unemployment rates, β and γ , to vary with the years since entry to see the persistence of the effect. Ideally, we would like to estimate separate β and γ 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 β s and γ s for four ranges of potential experience (1–3, 4–6, 7–9, and 10–12 years).

Before going into the main analyses, let us check the comparability of Japanese and American data. The summary statistics of the micro data sets are 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 data sets 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, a one percentage point 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.

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-squared 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 have fewer data points and the fixed effects are

16. We use block bootstrap to cluster the standard errors by region, because the ordinary clustered sandwich estimator is likely to overestimate the standard errors given only ten regions in Japan. Even the block bootstrapping substantially boosts the standard errors compared to those estimated with clustering by region-year.

Table 1
Summary Statistics

	Japan, High School or Less	Japan, Junior College or more	United States, schooling ≤ 12	United States, schooling > 12
Observations	53,557	39,592	63,611	76,699
Experience = 1-3	17,833	11,417	19,849	17,643
Experience = 4-6	14,759	12,229	17,297	21,982
Experience = 7-9	12,083	9,399	14,753	19,994
Experience = 10-12	8,882	6,547	11,712	17,080
Educational background	Without high school diploma: 6,745, high school diploma: 46,812	Junior/tech college (two- year): 11,383, four-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	(10,000 yen in 2000)	(100 dollars in 2000)		
Experience = 1-3	5.10	5.50	4.44	5.12
Experience = 4-6	5.41	5.79	4.88	5.48
Experience = 7-9	5.60	5.99	5.16	5.70
Experience = 10-12	5.73	6.15	5.31	5.86
Employed				
Experience = 1-3	76.5%	92.2%	73.9%	88.8%
Experience = 4-6	88.5%	94.7%	81.6%	90.6%
Experience = 7-9	90.5%	95.5%	84.8%	92.4%
Experience = 10-12	90.5%	96.2%	86.6%	93.8%

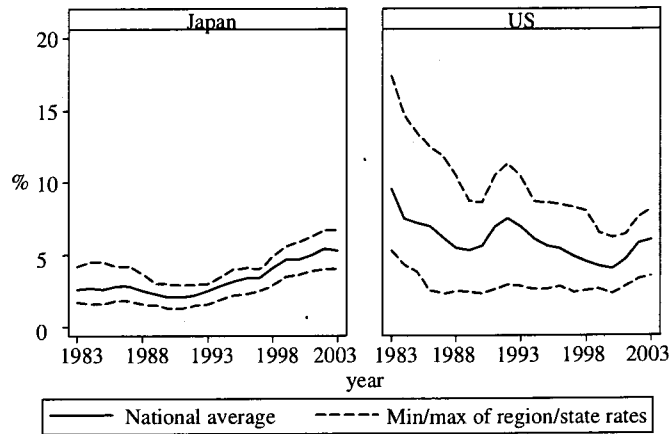


Figure 1
Unemployment rate in Japan and the United States: 1983–2003

Table 2
Summary Statistics of Region/State Unemployment Rates 1983–2003

	Observations	Mean	Standard Deviation	Minimum	Maximum
Regions in Japan	210	3.21	1.23	1.3	6.7
Net of region fixed effects, year fixed effects and region specific linear trend ^a		(0.00)	(0.22)	(-0.60)	(0.89)
States in the United States	1,071	5.74	1.95	2.3	17.4
Net of state fixed effects, year fixed effects and state- specific linear trend ^a		(0.00)	(0.75)	(-2.07)	(3.27)

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

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 1993; 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.

Note that entry to the labor market is, by definition, observed only once for each person. Therefore, even if we had a panel data set, we could not control for individual fixed effects. Also, as shown in Appendix, the effect of contemporaneous unemployment rate on the enrollment rate is weak, suggesting that endogeneity of entry is quantitatively negligible.¹⁷ A recession at graduation from high school does not significantly affect the selection of those who proceeds to college, either. Thus, the major limitation of cross-section data is that the year and place of graduation are measured less precisely than panel data. Given that the measurement errors in the year and region of graduation are larger for American men (see Appendix), 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 because more-educated men are more mobile in both countries.

V. Estimated Effects of a Recession at Entry

A. Effects on Employment Status

Table 3 shows the effect of a one percentage point rise in the unemployment rate at entry on the likelihood of being employed in the reference week of the survey. The estimated equations are exactly the same as Equation 3. The unemployment rate at entry has a persistent negative effect for less-educated Japanese men: A one percentage point rise in the unemployment rate at entry reduces the likelihood of employment by 3–4 percentage points for over twelve years. The effect for less-educated American men is also negative and marginally significant, but the size of the effect is small. The effect is almost zero and statistically insignificant for more-educated groups both in Japan and in the United States, consistent with the existence evidence for a negligible effect on employment for college graduates by Oreopoulos, von Wachter, and Heisz (2006).

The negative effect of a one percentage point rise in the unemployment rate is not necessarily the same magnitude as the positive effect of a one percentage point fall in the unemployment rate. To see if there is any asymmetry in the response to the unemployment rate between upturns and downturns, we take interactions of the unemployment rate at entry and an indicator variable for a declining unemployment rate (upturns).¹⁸ As shown in Table 4, the negative effect for Japanese less-educated

17. This is an important difference from the study of the effect of labor market condition at the beginning of job. On the one hand, each person can have multiple jobs over time. On the other hand, each worker is likely to have much more choice in the timing of starting a job than the timing of completing education. Thus, it is not surprising that Beaudry and DiNardo (1991) find different results from pooled regressions and fixed effect regressions exploiting multiple spells per worker.

18. This variable takes one if the unemployment rate of the year is lower than the previous year's rate, and zero otherwise.

Table 3
The Effect of the Unemployment Rate at Entry on Employment

	Japan		United States	
	High school	College	Schooling ≤ 12	Schooling > 12
Marginal effects				
Unemployment rate 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%
Probit Coefficients				
Unemployment rate at entry				
× experience 1–3 years	–0.170 (0.074)	–0.061 (0.056)	–0.026 (0.012)	–0.013 (0.013)
× experience 4–6 years	–0.162 (0.072)	–0.009 (0.064)	–0.011 (0.010)	–0.008 (0.014)
× experience 7–9 years	–0.195 (0.061)	0.076 (0.064)	–0.011 (0.011)	–0.008 (0.010)
× experience 10–12 years	–0.204 (0.058)	–0.001 (0.083)	–0.021 (0.011)	–0.025 (0.013)
Observations	53,513	39,562	63,611	76,699
Pseudo R ²	0.10	0.05	0.06	0.03

Note: Standard errors in parenthesis are calculated by bootstrapping (reps = 200) with clustering by state/region. 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.

men remains substantial and statistically significant while the difference in the estimated effect is small and statistically insignificant for all the other groups.

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 are not available for those who are not employed. Since the unemployment rate at entry has a negative effect on the likelihood of being employed for less-educated Japanese men, the estimated effect on hours worked conditional on being employed may be biased upward for this group. The upper panel of Table 5 shows that the estimated effect of the unemployment rate at entry on hours worked is not statistically significant for any groups. The size of the effect is also small; a one percentage point rise in the unemployment rate would change weekly hours by less than an hour. It suggests that, if there is a negative effect on earnings, it comes from a fall in wages per hour and/or a decline in employment.

Table 4
The Effect of the Unemployment Rate at Entry on Employment, Allowing Different Effect between Upturns and Downturns

	Japan		United States	
	High school	College	Schooling ≤ 12	Schooling > 12
Marginal effects				
Unemployment rate at entry during downturn				
× experience 1–3 years	–3.5%	–0.7%	–0.79%	–0.20%
× experience 4–6 years	–3.1%	–0.3%	–0.39%	–0.10%
× experience 7–9 years	–3.6%	0.5%	–0.45%	–0.15%
× experience 10–12 years	–4.3%	0.0%	–0.70%	–0.31%
Unemployment rate at entry during upturn				
× experience 1–3 years	–3.9%	–0.5%	–0.64%	–0.17%
× experience 4–6 years	–4.2%	–0.3%	–0.35%	–0.14%
× experience 7–9 years	–4.3%	0.7%	–0.29%	–0.02%
× experience 10–12 years	–4.9%	0.5%	–0.53%	–0.38%
Probit coefficients				
Unemployment rate at entry to the market				
× experience 1–3 years	–0.175 (0.093)	–0.079 (0.066)	–0.030 (0.014)	–0.014 (0.014)
× experience 4–6 years	–0.158 (0.084)	–0.030 (0.083)	–0.015 (0.012)	–0.006 (0.015)
× experience 7–9 years	–0.180 (0.068)	0.062 (0.072)	–0.017 (0.011)	–0.010 (0.013)
× experience 10–12 years	–0.215 (0.073)	–0.006 (0.090)	–0.027 (0.013)	–0.021 (0.015)
Unemployment rate at entry × upturn dummy				
× experience 1–3 years	–0.021 (0.029)	0.024 (0.041)	0.006 (0.008)	0.002 (0.009)
× experience 4–6 years	–0.054 (0.020)	–0.005 (0.055)	0.001 (0.008)	–0.003 (0.009)
× experience 7–9 years	–0.037 (0.027)	0.018 (0.049)	0.006 (0.008)	0.008 (0.009)
× experience 10–12 years	–0.033 (0.020)	0.067 (0.052)	0.006 (0.009)	–0.005 (0.008)

(continued)

Table 4 (continued)

Observations	49,336	36,668	63,611	76,699
Pseudo R ²	0.10	0.05	0.06	0.03

Note: Standard errors in parenthesis are calculated by bootstrapping (reps = 200) with clustering by region/state. Other controls included are the upturn dummy itself, the unemployment rate in survey year, potential experience, education dummies, graduation year dummies, region dummies, survey-year dummies, and region-specific linear trends.

Table 5

The effect of the unemployment rate at entry on fulltime status

(1) Hours worked in last week

	Japan		United States	
	High school	College	Schooling ≤ 12	Schooling > 12
OLS Coefficients				
× experience 1–3 years	–0.609 (0.949)	0.587 (0.322)	0.047 (0.102)	–0.051 (0.0106)
× experience 4–6 years	–0.356 (0.754)	0.551 (0.365)	0.018 (0.081)	–0.022 (0.078)
× experience 7–9 years	–0.933 (0.623)	0.324 (0.294)	0.035 (0.088)	0.101 (0.081)
× experience 10–12 years	–0.838 (0.718)	0.570 (0.361)	0.031 (0.078)	0.029 (0.072)
Observations	46,169	37,660	50,250	68,430
R ²	0.02	0.01	0.04	0.03

(continued)

Even though the overall effect on average hours is small, there can be a significant effect on fulltime/parttime status. The lower panel of Table 5 shows the effect on the likelihood of being fulltime.¹⁹ 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 more-educated groups, and the overall pattern across the four groups is similar to the effect on employment.

19. Fulltime workers are those who worked 35 hours or more in the reference week.

Table 5 (continued)

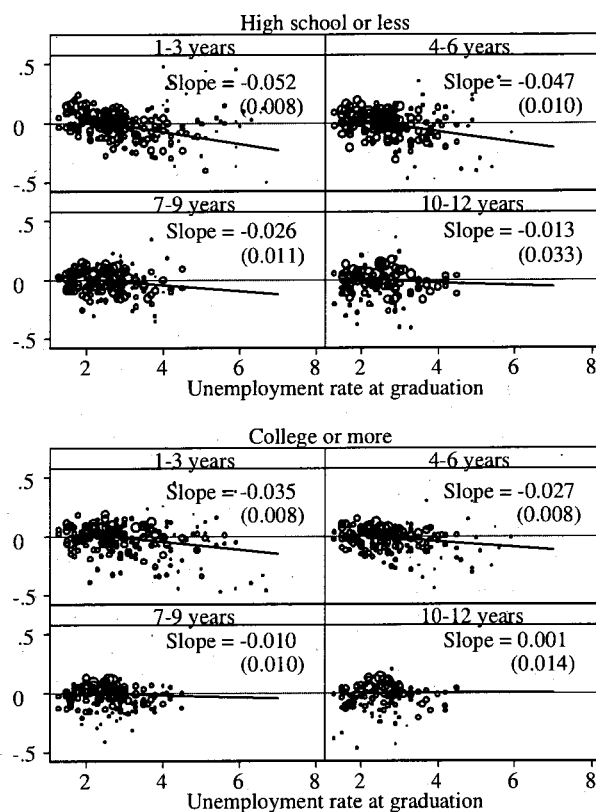
(2) Pr(fulltime | employed)

	Japan		United States	
	High school	College	Schooling ≤ 12	Schooling > 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 (0.075)	0.053 (0.059)	–0.019 (0.012)	–0.019 (0.013)
× experience 4–6 years	–0.119 (0.056)	0.041 (0.048)	–0.010 (0.012)	–0.019 (0.010)
× experience 7–9 years	–0.152 (0.052)	0.012 (0.055)	0.007 (0.014)	–0.019 (0.011)
× experience 10–12 years	–0.109 (0.054)	0.145 (0.101)	–0.022 (0.012)	–0.011 (0.012)
Observations	46,169	37,660	51,435	70,087
Pseudo R ²	0.03	0.02	0.03	0.02

Note: Standard errors in parenthesis are calculated by bootstrapping (reps=200) with clustering by state/region. 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.

B. Effect on Earnings

Figure 2 shows the correlation between each cohort's log annual earnings and its unemployment rate at entry *without* controls for year- or region- fixed effects. Specifically, we split the sample into 16 groups by country, educational background and experiences, and regress log annual earnings on the contemporaneous unemployment rate, years of schooling and experience by single year. Then we take the average of the residuals from this regression for each cohort and plot it over the unemployment rate at entry. Not surprisingly, the unemployment rate at entry is negatively correlated with earnings for groups within three years from entry regardless of country and educational background. However, the persistence of the correlation shows an interesting pattern: In Japan, the negative correlation is more persistent for the less-educated group, while the opposite seems to be the case in the United States.

**Figure 2a***Regional unemployment rates and log earnings (Japan)*

Note: "cohort" is defined by region and year of graduation. Each cohort is weighted by the number of individual observations that belong to the cohort. Log annual earnings are residuals net of the contemporaneous unemployment rate, years of schooling and experience by single year. Figures in parenthesis under the slopes are standard errors.

This pattern is robust to the inclusion of region- and graduation year-fixed effects. Table 6 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 4.²⁰ A high unemployment rate at entry

20. Appendix Table A7 presents estimates with controls for industry. It makes the estimated effect slightly weaker for Japanese men, but it does not change the relative pattern across groups with more and less education.

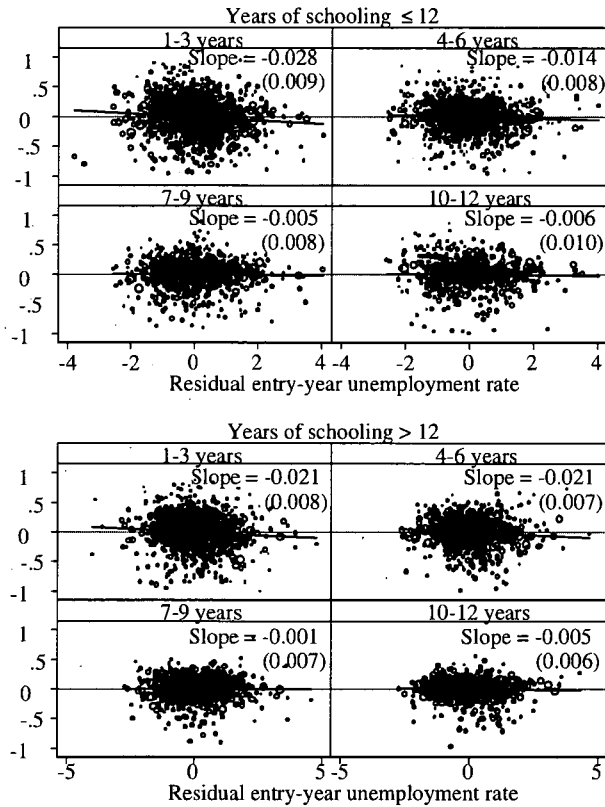


Figure 2b
State unemployment rates and log earnings (United States)

Note: "cohort" is defined by region and year of graduation. Each cohort is weighted by the number of individual observations that belong to the cohort. Log annual earnings are residuals net of the contemporaneous unemployment rate, years of schooling and experience by single year. Figures in parenthesis under the slopes are standard errors.

has a persistent negative effect for Japanese men. A one percentage point rise in the unemployment rate at entry leads to earning losses by 5–7 percent for over 12 years for the group without college education, although the large standard errors make the statistical significance marginal.²¹ The effect is smaller but more precisely estimated,

21. These large standard errors seem to be due to serial correlations within regions. If we ignored serial correlations and clustered standard errors by region-graduation year instead of region, the effect for less-educated Japanese would be significant at least at 5 percent level for all experience categories.

Table 6
The Effect of the Unemployment Rate at Entry and the Contemporaneous Unemployment Rate on Log Real Annual Earnings

	Japan		United States	
	High school	College	Schooling ≤ 12	Schooling > 12
Unemployment rate at entry to the market				
× experience 1–3 years	–0.069 (0.049)	–0.046 (0.017)	–0.031 (0.009)	–0.015 (0.008)
× experience 4–6 years	–0.072 (0.044)	–0.042 (0.017)	0.004 (0.006)	–0.012 (0.007)
× experience 7–9 years	–0.051 (0.036)	–0.031 (0.015)	0.002 (0.006)	–0.009 (0.005)
× experience 10–12 years	–0.063 (0.036)	–0.023 (0.018)	0.010 (0.010)	–0.007 (0.006)
Contemporaneous unemployment rate				
× experience 1–3 years	–0.050 (0.020)	–0.050 (0.025)	–0.042 (0.009)	–0.013 (0.011)
× experience 4–6 years	–0.016 (0.020)	–0.038 (0.025)	–0.043 (0.010)	–0.022 (0.007)
× experience 7–9 years	–0.010 (0.023)	–0.032 (0.019)	–0.036 (0.009)	–0.020 (0.010)
× experience 10–12 years	0.012 (0.023)	–0.024 (0.017)	–0.033 (0.013)	–0.012 (0.011)
Observations	47,469	38,017	57,635	72,226
R ²	0.23	0.27	0.17	0.16

Note: Standard errors in parenthesis are calculated by bootstrapping (reps = 200) with clustering by state/region. 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.

and still fairly persistent, for more-educated Japanese; the initial loss is 4.6 percent and the gap gradually fades up to 2.3 percent. 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 counterparts. The effect for more-educated Americans is gradually fading in about ten years and fairly close to the estimates by Oreopoulos, von Wachter, and Heisz (2006) for college graduates in Canada.

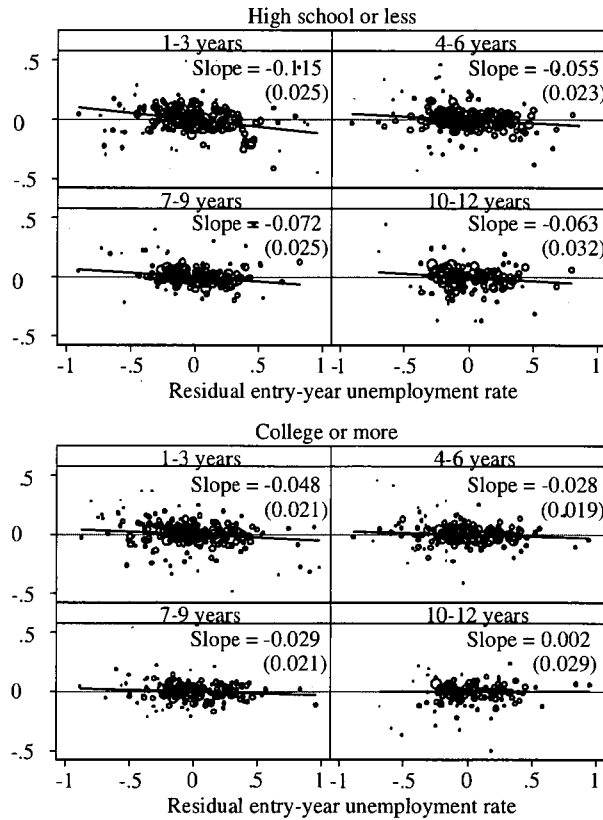


Figure 3a
Residual regional unemployment rates and residual log earnings (Japan)

Note: "cohort" is defined by region and year of graduation. Each cohort is weighted by the number of individual observations that belong to the cohort. See the text for variable definitions. Figures in parenthesis under the slopes are standard errors.

Figure 3 plots residual log earnings net of graduation year- and region/state- fixed effects over residual unemployment net of these fixed effects. The slopes are equivalent to β_s in Equation 4 except that the effect of contemporaneous unemployment rate is not allowed to vary with the years since graduation. The same observations hold: the largest and most persistent negative effect for less-educated Japanese, a weaker but still fairly persistent effect for more-educated Japanese, a modest effect for Americans. Although the relative pattern across the less- and the more-educated

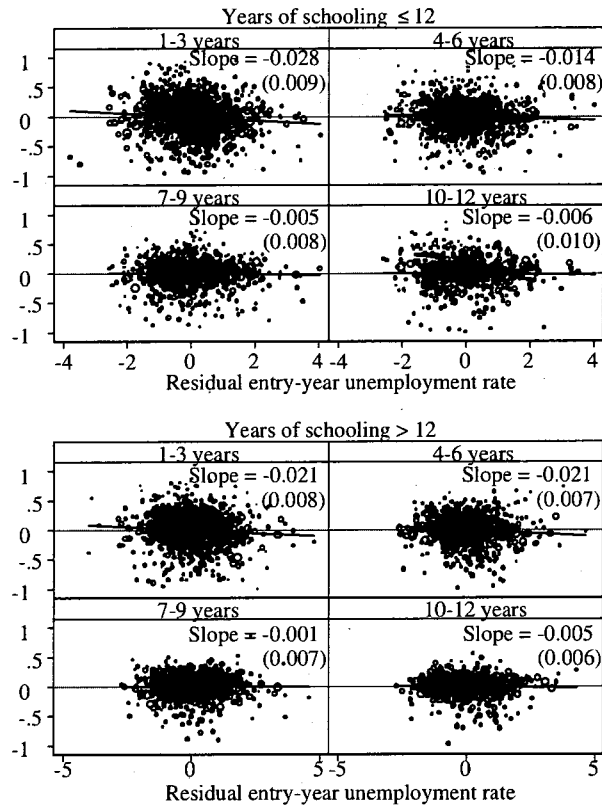


Figure 3b
Residual state unemployment rates and residual log earnings (United States)

Note: "cohort" is defined by state and year of graduation. Each cohort is weighted by the number of individual observations that belong to the cohort. See the text for variable definitions. Figures in parenthesis under the slopes are standard errors.

groups becomes subtle for American men, the difference in these patterns between Japan and the United States remains striking.²²

22. The effect of the contemporaneous unemployment rate on earnings among less-educated groups also 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 older. 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. 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 (Hines, Hoynes, and Krueger 2001).

Table 7
*The Effect of the Unemployment Rate at Entry on Log Real Annual Earnings,
 Allowing Different Effect between Upturns and Downturns*

	Japan		United States	
	High school	College	Schooling ≤ 12	Schooling > 12
Unemployment rate at entry to the market				
× experience 1–3 years	–0.079 (0.055)	–0.042 (0.016)	–0.034 (0.011)	–0.016 (0.009)
× experience 4–6 years	–0.080 (0.049)	–0.042 (0.018)	0.000 (0.008)	–0.016 (0.008)
× experience 7–9 years	–0.062 (0.040)	–0.028 (0.016)	–0.003 (0.007)	–0.011 (0.006)
× experience 10–12 years	–0.073 (0.039)	–0.022 (0.020)	0.007 (0.011)	–0.008 (0.007)
Unemployment rate at entry × upturn dummy				
× experience 1–3 years	0.010 (0.009)	0.003 (0.013)	0.003 (0.006)	0.001 (0.005)
× experience 4–6 years	0.006 (0.009)	0.008 (0.013)	0.004 (0.006)	0.006 (0.005)
× experience 7–9 years	0.012 (0.009)	0.002 (0.012)	0.008 (0.005)	0.003 (0.006)
× experience 10–12 years	0.009 (0.009)	0.006 (0.009)	0.004 (0.005)	0.000 (0.006)
Observations	43,574	35,190	57,635	72,226
R ²	0.22	0.27	0.17	0.16

Note: Standard errors in parenthesis are calculated by bootstrapping (reps = 200) with clustering by region/state. Other controls included are the upturn dummy itself, the unemployment rate in survey year, potential experience, education dummies, graduation year dummies, region dummies, survey-year dummies, and region-specific linear trends.

Table 7 allows the effect of unemployment rate at entry to vary between upturns and downturns; this is the same exercise as Table 4 for employment. Although the effect of the unemployment rate is slightly more negative during downturns for all groups, the differences are small and statistically insignificant.

Assuming that those who become unemployed due to a recession at entry would earn less than the average of the cohort they belong to, the negative effect of the unemployment rate at entry on employment biases the effect on earnings upward.

Since many of those unemployed in the reference week report some positive earnings, this bias seems to be small (see the appendixes for more discussion); in any case, if there is any bias, it should work against our findings that the negative effect on earnings is stronger for less-educated Japanese men, because the negative effect on employment is also stronger for them.

The persistent negative effects on employment and fulltime status for less-educated Japanese men suggest that a part of the negative effect on earnings comes from unstable employment among them. This is consistent with our argument that the school based hiring system in Japan leaves less-educated Japanese men who failed to obtain a regular job upon graduation in unstable employment for a long time. For more direct evidence, Panel 1 of Table 8 confirms that worse labor market conditions at entry lower the ratio of regular employees (*seishain*)²³ among less-educated Japanese men, and that this effect lasts up to ten years. Also, the effect is weaker and statistically insignificant for the more-educated group.

If a recession at entry lowers the likelihood of having a regular job and it really affects earnings, the estimated effect of the unemployment rate at entry should be smaller within the sample of who obtained regular job upon graduation than in the entire sample. Since the information on the first job is not available, we estimate Equation 4 using the sample of workers currently in regular jobs.²⁴ Panel 2 of Table 8 shows that, as expected, the negative effect of graduating from high school during a recession is much smaller for regular employees.²⁵ Moreover, the effect does not change much for college graduates, who are not affected by the school-based hiring system.

VI. Concluding Remarks

Entering the labor market during a recession has a persistent negative effect on earnings for young Japanese men. Moreover, a recession at entry not only lowers the annual earnings, but also raises the likelihood of nonemployment and parttime employment for less-educated Japanese, and a considerable part of the neg-

23. The Japanese Labor Force Survey asks each employed person (excluding self-employed) whether he/she is employed as a regular employee, based on how their employers call them. The exact Japanese word corresponding to "regular" here is "*seiki*." 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 also includes a significant number of part-time workers, who are not usually considered as "*seishain*" or "*seiki*."

24. It is difficult to estimate the effect within people who do not have a regular job, because a substantial number of them report zero-income and, at the same time, this group includes a nonnegligible number of high-earning free lancers. This complicates the effect of business cycle on the composition of this group and makes the direction of the potential bias ambiguous.

25. One might suspect that high school graduates who can obtain a regular job during a recession are likely to be positively selected and it biases the estimated effects upward. Though we cannot rule out it completely, we believe that this bias is small because the quantile regression including nonregular employees shows that the effect of the unemployment rate at entry on earnings is small for those at 75 percentile in the conditional distribution, who are very likely to be regular employees.

Table 8
The Effect through Declined Regular Employment (Seishain) on Earnings in Japan

(1) Ratio of *seishain* in the entire cohort (probit)

	Japan	
	High school	College
Marginal effects		
× experience 1–3 years	–4.6%	–1.9%
× experience 4–6 years	–4.0%	–0.9%
× experience 7–9 years	–2.3%	0.3%
× experience 10–12 years	–1.5%	0.2%
Probit coefficients		
× experience 1–3 years	–0.142 (0.052)	–0.090 (0.041)
× experience 4–6 years	–0.121 (0.060)	–0.041 (0.051)
× experience 7–9 years	–0.071 (0.037)	0.015 (0.048)
× experience 10–12 years	–0.046 (0.034)	0.009 (0.051)
Observations	53,441	39,521
Pseudo R ²	0.07	0.03

(2) Log real annual earnings, for *seishain* only (OLS)

	Japan	
	High school	College
OLS coefficients		
× experience 1–3 years	–0.007 (0.019)	–0.046 (0.012)
× experience 4–6 years	–0.015 (0.020)	–0.056 (0.014)
× experience 7–9 years	–0.013 (0.017)	–0.042 (0.012)

(continued)

Table 8 (continued)

× experience 10–12 years	–0.035 (0.019)	–0.027 (0.017)
Observations	38,281	33,778
R ²	0.26	0.35

Note: Standard errors in parenthesis are calculated by bootstrapping (reps = 200) with clustering by region. Other controls included are the unemployment rate in survey year, potential experience, education dummies, graduation year dummies, region dummies, survey-year dummies, and region-specific linear trends.

ative 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 in the United States. We find a modestly persistent negative effect of graduating from colleges, similar to the existing studies that focus on college graduates.

Existing studies have mainly focused on college graduates and found persistent but fading negative effect of a recession at entry. Their models implicitly or explicitly ignore the effect through employment stability, which may be negligible for more-educated workers but not ignorable for less-educated workers. If dismissals are considered, less skilled workers are more likely to be laid off and lose the advantage of obtaining a good first job. We confirm that the effect of the labor market condition at graduation quickly fades away for less-educated American men. On the other hand, legally or institutionally enforced employment protection may place excessive burdens on those left outside of the protection. Our empirical results provide suggestive evidence that the stronger effect for less-educated Japanese men comes from chronic nonregular, unstable employment among those stranded out of the school-based hiring system, which does not exist in the United States.

That the cost of a recession at entry is borne 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 institutions that were meant to protect inexperienced workers could weigh down those who dropped out of the system.

Appendix 1

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 one in 2000.

For the March CPS, we use "PEARNVAL—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 percent of the observations with positive earnings are bunched at every \$1,000 and about 23 percent 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 one in 2000.

Table A1 summarizes the fraction with zero or missing earnings. Table A2 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 nonemployment. Assuming that those with lower potential wages are more likely to lack valid earnings due to nonemployment, the potential bias will, if it is not negligible, work against our argument for Japanese men.

Table A1
Fraction with Zero or Missing Earnings

	Japan, High School or Less	Japan, Junior College or More	United States, Schooling ≤ 12	United States, Schooling > 12
Experience = 1-3	19.1%	5.5%	13.8%	6.2%
Experience = 4-6	8.1%	3.7%	7.9%	5.4%
Experience = 7-9	6.9%	3.4%	7.2%	5.4%
Experience = 10-12	7.2%	2.7%	6.8%	6.6%

Table A2
The Effect of the Unemployment rates on the Likelihood of Zero or Missing Earnings

Probit coefficients

	Japan		United States	
	High school	College	Schooling ≤ 12	Schooling > 12
Unemployment rate at entry to the market				
× experience 1–3 years	0.068 (0.055)	0.027 (0.037)	0.036 (0.014)	0.023 (0.016)
× experience 4–6 years	0.060 (0.054)	0.123 (0.043)	0.024 (0.013)	0.005 (0.013)
× experience 7–9 years	0.036 (0.040)	0.035 (0.041)	0.015 (0.011)	–0.008 (0.013)
× experience 10–12 years	0.033 (0.047)	0.010 (0.064)	0.021 (0.014)	0.001 (0.011)
Contemporaneous unemployment rate				
× experience 1–3 years	0.052 (0.045)	0.020 (0.043)	0.052 (0.014)	–0.015 (0.015)
× experience 4–6 years	0.059 (0.034)	–0.013 (0.036)	0.032 (0.019)	0.003 (0.018)
× experience 7–9 years	0.036 (0.033)	0.001 (0.036)	0.046 (0.016)	–0.002 (0.018)
× experience 10–12 years	0.017 (0.045)	0.041 (0.041)	0.027 (0.019)	–0.005 (0.016)
Observations	52,342	39,000	63,611	76,699
Pseudo R ²	0.186	0.180	0.077	0.026

Note: Standard errors in parenthesis are estimated by bootstrapping (reps=200) with clustering by region/state. 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.

Appendix 2

Measurement Errors Caused by Migration across Regions and Skipped/Repeated Grades

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 percent or less, while the five-year migration rate across states of American men is 15–20 percent.²⁶ 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 five-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 five-year migration rate across region for 25–34-year-old Japanese men without a college education would be about 6 percent, and that for 25–34-year-olds with a college education would be about 14 percent. The across-state five-year migration rate of 25–39-year-old Americans with a college education is 26.0 percent and that of those without a college education is 13.5 percent, according to the cross-tabulation from Census 2000 by Franklin (2003).²⁷

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 one or two years. Admittedly, our definition of the year of graduation is noisier for American men: About 2 percent of 20-year-old white men in the CPS are still enrolled in high school, and 16 percent of 24-year-old white men are enrolled in college.²⁸

Appendix 3

Business Cycles and Schooling Choice

First, let us check the effect on the completed education. Panel A of Table A3 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

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

27. This tabulation includes nonwhites and women.

28. Because many Americans graduate school 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.