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ARE THERE LONG-TERM EFFECTS ON WAGES WHEN GRADUATING IN A BAD ECONOMY IN TAIWAN?

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ABSTRACT

Entering labor market during a bad economy can be intuitively connected to worse working experience at the beginning of one's career, and moreover, the effect would persist for many years to come. We empirically estimate the long-term effect of graduating in a bad economy on wages in Taiwan. The estimation results do show significant evidences of negative long-term effect on wages. Besides, the long-term effects vary across genders and education groups.

Keywords: Wages, Labor market, Career effects, Recession, Taiwan.

JEL Classification: J24, J31.

Contribution/Originality

The paper's primary contribution is finding that there are significant evidences of negative long-term effect on wages of graduating in a bad economy in Taiwan. Besides, the long-term effects vary across genders and education groups.

1. INTRODUCTION

Generally, by intuition, it is easy to imagine that when a college graduate enters labor market for the first time and economic conditions are bad at that time, he/she would face difficulties in finding an appropriate job or gaining reasonable wages. Obviously, this may negatively influence the unlucky person's income in the short-run. However, whether this impact would persist through the individual's whole career is an important and serious issue. If the harm caused by the labour market condition at the time of entry can not be eliminated even after years, an unlucky young worker would probably lose a great fortune and lead a harder life compared to those who enter the labour market when economic conditions are favorable. As the recent global recession has hurt many countries including Taiwan, and high youth unemployment rate has become a serious

problem. Therefore, the long-term effect of starting a career under weak economic conditions on one's wage earnings over an entire lifespan needs to be discussed and investigated in depth. The main purpose of this paper is to estimate the long-term effect of the initial entry into labor market under weak economic conditions on wages in Taiwan, across genders and education levels.

If the economic condition of the initial labor market significantly affects one's wage in the short-run and persist in future, the results of this research would provide useful policy implications to the society. First, for young people, it seems that they should be more careful when choosing the timing to enter the labor market and their first jobs. Second, as the time of entry in the labor market is usually not completely decided by individuals themselves, the government should try to formulate appropriate policies to mitigate such exogenous impact. For example, providing employment counseling to graduates and subsidizing enterprises employing young people during a recession are possible policies with which the government can help the young overcome the misfortune. Third, as the negative effect of the job mismatch at the beginning of one's career would possibly persist through one's lifetime, avoiding initial job mismatching seems to be quite important. This suggests that young workers should search longer and harder for their first jobs, in order to get a job that matches their abilities and potential. This implies that the government should also provide better unemployment benefits to support youth searching for a good job, which would possibly enable them to find a better job market match.

In this research we use Taiwanese data to conduct empirical analysis, and employ various regression models to estimate the effect of graduating under bad economic conditions on an individual's wages. Results of our research are consistent with those reported in existing literature, providing significant evidence of negative long-term effect on wages for those initially entering labor market during a bad economy. However, the magnitude and how long it takes to overcome the effect vary across genders and education attainments.

This paper is organized as follows. Section II is literature review, introducing some theories about job search and previous literature related to the issue. Section III introduces the empirical model and the data used in the analysis. Section IV describes the estimation results. Finally, Section V summarizes the estimation results, connects them to the theories, and also provides some discussion and what can be improved in future research.

2. LITERATURE REVIEWS

Intuitively, entering labor market during a recession can result in bad working experience, compared to experience of those who enter labor markets when the economic environment is relatively prosperous. A bad economy may make it difficult for individuals to find jobs and many may suffer job mismatching, underemployment or unemployment, since inevitably labor demand decreases. The occurrence of weak job matching during recessionary periods has been verified. Bowlus (1995) used National Longitudinal Survey of Youth (NLSY) data to analyze the influence of bad economic conditions (at the time of entry in the labor market) on the quality of jobs. Using job tenure as an indicator of the quality of job matching and national unemployment rate as the

index of economic condition, bad economy is found to increase the propensity of job terminations. These results indicate that job mismatching does occur during recession. However, the question that remains is whether the impact persists through the lifespan of the unfortunate job seekers.

Different theories provide different predictions and explanations about career progress. Kahn (2010) states two possible expectations for the long-term effect of a bad economy at the time the individual graduated from school on his/her future career path. One is related to the job changing theory. This theory considers that job shopping is beneficial for earning higher wages, and it implies that one can keep switching to better jobs to get higher wages. According to this theory, the one initially entering labor market under poor economic conditions may aggressively change jobs more often than others in order to overcome the negative effect of the bad starting. Due to this job changing behavior, it would make no difference to wages of the luckier counterparts in the long run.

The other theory emphasizing the importance of investment and accumulation of human capital is extended to have the opposite prediction for the long-term effect. It is obvious that human capital investment and accumulation are beneficial for people with better job matches. Becker (1965) focused on the early human capital investment; such investment and accumulation are considered beneficial for the individual over a long period of time. Therefore, if one graduating and then entering the labor market suffers weak job match due to bad economic conditions, the initial bad economy impact may be severe and persistent. Thus, such unlucky individuals may fail to accumulate beneficial human capital through the right job training or working experience at the beginning of their career, which might make them less productive than others. As good productivity constitutes the source of promotion and wage adjustment through one's career, without good human capital accumulation, the initial harm turns out to be indelible.

Though various theories have reported varying results, negative and persistent effects of initial bad economic conditions have been found in many researches. Kahn (2010) using data from NLSY79, points out that white males graduating from colleges in a worse economy have suffered large, negative and persistent effects on their career outcomes. Both national and state unemployment rate are used as indicators of economic conditions. By using instrumental variables to solve the possible endogenous problems (i.e. timing of entering labor markets), the negative effect of initial bad economy on one's hourly wage has been found to last up to fifteen years after graduation. Besides, other consequences include weeks worked per year, average tenure in current job and occupation prestige scores are also affected in the long-term. Persistent negative effect on occupation prestige score is found significant, though there are only slight negative effects on number of working weeks per year and tenure at the current job.

Focusing on male college graduates, Oreopoulos *et al.* (2012) also try to estimate the magnitude of the short and long-term effects of graduating during recession on one's earnings. They investigate the mechanism of the catch-up process for initial earnings losses by using Canadian longitudinal university-employer-employee database. Besides, another contribution is the discussion of unequal initial labor market effects on more advantaged and less advantaged

individuals among college graduates. Estimation results of the effect of initial bad economy are negative, which is consistent with Kahn (2010). However, the magnitude of the effect is comparatively smaller, and it dissolves more quickly than in the case of American college graduates. The negative effect lasts only ten years.

Moreover, after controlling the individual's first employer by the initial firm's characteristics, the magnitude reduces even more, which implies parts of the earning loss are related to the initial employer. Additionally, negative effects for different quintiles of predicted annual earnings are found to be varying. Since individuals with higher predicted earnings may be those who are more advantaged, and vice versa, estimation results found that more advantaged graduates suffer less than the less advantaged ones. Both short and long-term effects for the top quintile of predicted earnings group are smaller than the bottom quintile. That is because more advantaged graduates are able to switch to better firms quickly but those less advantaged are not.

As the two previous researches have analyzed effects only on highly educated male college graduates, other researchers investigate the initial labor market effect on different demographic groups. Kondo (2007) focused on comparing the differences in effects across genders and race. According to economic theories, low-skilled and disadvantaged workers are predicted to be less influenced by the bad economy at the beginning of their careers since they suffer less from weaker working experience compared to the advantaged ones in general. The initial economic impact also might not persist for a long time for them. By using data from NLSY79 and controlling for years of education, the negative initial labor market effect on hourly wage of blacks is found to be stronger than whites' in the first few years, but they recover faster as time passes. On the other hand, white females are found to have only insignificant short- and long-term effects, while black females have patterns similar to black males.

About long-term influence on females, Hershbein (2012) conducts analysis of high school women's and men's labor supply decisions and the subsequent consequences, using NLSY79 data with family background fixed effects controlled in the model. This research compares the different behaviors of males and females responses to the initial bad labor market condition. The estimation results point out that short-term impact on women's wage is smaller than on men's. Moreover, the magnitude of the short-term effect of graduating in a bad economy on high-school graduates' wages is smaller than college graduates', and it does not persist too long. Besides, the research finds labor supply of high school women significantly decreases in the short run while labor supply of men is not influenced. Also, short-term effects of the initial impact of a bad economy in terms of college enrollment are significant for males but not for females. As the possible choices for women after graduating from high school are joining labor market, forming family and getting higher education, the above results suggest a most possible flow for high school females, that is, instead of entering labor market or attending college during a recession, high school graduated women seemingly tend to opt for becoming housewives. The significant negative effect on college enrollment over a period of five to eight years since graduation is probably because they have to

take care of their young children. Therefore, it is reasonable to observe insignificant impact of initial economic condition on wage for high school women.

Other than detecting various effects across race and gender, one research discusses long-term effects in different countries. Genda *et al.* (2010) compares the difference between effects of weak initial labor market on subsequent wages for Japanese and American males. Such difference might stem from Japan's unique job matching mechanism for high school graduates, as the school is the major medium of directly providing matched qualified graduates to the employers. Besides, regular employees are protected by the law that employers are asked to avoid dismissing regular workers. Employers in Japan are not able to cut regular workers' wages during a recession, but the opportunity to get a regular job for the disadvantaged graduates also declines in a bad economy.

Therefore, this might result in a persistent negative effect on Japanese high school male graduates compared to Americans without such a job matching system and law. Using data from Special Survey of the Labor Force and the Detailed Supplement to the Labor Force Survey for the Japanese group, and March supplement to CPS for the American group, estimation results are apparently distinct. While American high school males recover quickly, within twelve years after graduation, high school Japanese males suffer more serious impact at the beginning and bear the harm over more than twelve years, with only a slight recovery. For the group of college graduates, the patterns of fading away are similar in Japan and America, though the magnitude is stronger in case of the Japanese. This research reveals the differential effects of graduating in bad economy across countries and societies that need to be discussed.

In this paper, we use Taiwanese data to conduct the analysis similar to previous researches and try to provide some complementary findings. The main contribution of this paper is that it analyses both males and females samples, and compares the different effects across genders in an Asia country. Also, we try to investigate various effects on different education groups. In the estimation we control for all available personal characters and employment status that might relate to the wage in the model, ensuring the effects are not misestimated due to absence of important explanatory variables.

2. EMPIRICAL MODELS AND DATA

As the purpose of this paper is to identify the effect of entering labor market in bad economic conditions on one's earnings, the empirical strategy instinctively regresses the current wage on the economic indicator in the year of initial entry into labor markets. We consider the following model:

$$\log wage_i = \alpha + \beta_0 Index_i * Exp\_d_{0i} + \beta_1 Index_i * Exp\_d_{1i} + ... + \beta_k Index_i * Exp\_d_{Ki}$$

$$+ \lambda_1 Exp_i + \lambda_2 Exp_i^2 + x_i'\gamma + Year_i'\delta + \varepsilon_i, \; I = 1...N \qquad ...(1)$$

where $wage_i$ is the monthly income of individual i, and $Index_i$ is the economic indicator of the year in which individual i first entered labor markets. Exp_d_{ki} are dummies fordifferent

potential experience years, with $k = 0,...,K$. If individual i has k years of potential experience, then Exp_d_{ki} =1, otherwise Exp_d_{ki} =0. Exp_i is the number of potential experience in years for individual i, which is calculated as years after one's graduation from the highest education attainment. Exp_i^2 is the quadratic term of potential experience in years. x_i is a vector of other personal characteristics of individual i. $Year_i$ is a set of dummy variables of the survey years, in order to control for unobservable effect of length of observation period and different price levels in each survey year. ε_i is the remaining unobservable disturbance. Finally, N is the number of observations.

The ideal of the model is to let the estimated coefficient of initial labor market effect vary with experience. By setting dummy variables for each specific length of experience, one can create the interaction terms of the economic indicators and the year of first with dummies for potential experience. These interaction terms allow the model to capture different levels of initial labor market effect across different lengths of potential experience. That is, in this model we can observe how the effect would change as years went by after graduating.

The range of potential experience is from 0 to k years. Thus, we set $k+1$ dummies to identify each potential experience year (Exp_d_{ki}). Then, we let the index of economic condition interact with the dummies of potential experience. These interaction terms enable the model to capture various effects of initial bad economic conditions across individuals with different potential experiences. Thus, $\beta_0.....\beta_k$ are the coefficients of the initial labor market effect in the j_{th} year after the individual first entered labor markets.

Some previous researches mentioned that the above regression models might have potential endogeneity problems. One of the potential sources of endogeneity is that individuals with great ambition or high ability probably would tend to choose which year to graduate, in order to avoid entering labor market during a recession. Thus, the choice of timing to enter labor market probably could be made by individuals themselves, and that would cause endogeneity in estimation. However, since this paper uses Taiwanese data, this kind of endogeneity problems might not be that serious. Almost all students in Taiwan spend 4 years in colleges and 3 years in high schools. They always graduate from schools on time. As a result, the potential sources of endogeneity mentioned in previous researches might be not that severe in our analysis.

The set of other explanatory variables includes individual's personal characteristics like job tenure, years of education, and marital status. Besides, considering the possible effect caused by some properties of jobs, the model controls related variables, including occupation, industry,

workplace, class of worker and firm size. Current regional unemployment rate is also controlled in the model. In addition, since cohort effect might relate to some influence which might directly or indirectly affect individual's wage, the model also tries to control it. The main influence is the density of labor market. Because higher birth rate increases the supply of labor force with the same age and then causes this cohort to suffer aggressive competition in job seeking. Here we use the Dragon Year and the Tiger year of Chinese lunar calendar to control the cohort effect. Finally, the number of graduate students in the specific level of education during the year of individual's first entry is included in each regression.

The data used in this study are from Manpower Utilization Survey, accompanied with Manpower Survey and provided by Directorate-General of Budget, Accounting and Statistics, Executive Yuan, R.O.C (Taiwan). Manpower Survey is a sampling survey which has been conducted once a month since 1978, interviewing civilians aged 15 and above drawn from the national population, providing plenty of comprehensive personal background information, such as age, education, industry and occupation, etc., for the purpose of understanding the quality of Taiwanese civilian manpower and employment status of labor force. Moreover, Manpower Utilization Survey, attached to Manpower Survey, is conducted in every May, which continues interviews for different branches of labor force status and provides more detailed information about status of employment, such as monthly payments, human resource migration, and so on. These two vast databases enable this study to analyze the variation of individuals' monthly incomes when other personal characteristics are controlled for. This paper uses 8 years of data from 2003 to 2010 (the latest dataset available), with 472,282 observations in total as raw data.

An important part of this study is determination of the year of initial entry to the labor market for each individual, since the restriction that the questionnaire does not provide information about the exact year in which the individual graduated from his or her highest education attainment. Thus, the year of individual's first entry to the labor market could only be approximately traced back by the year of birth plus 6 years plus years of education, which could be regarded as the individual's predicted year of initial entry to labor market. Some previous researches Genda *et al.* (2010) have also used a similar way to estimate an individual's first entry-year.

The following steps were taken to estimate the year of entry. First, year of birth equals to the survey year minus the individual's age. Second, the number of years of education is according to the level of education, with 0 year for those who never attended normal school, 6 years for primary school attainment, 9 years for junior high attainment, 12 years for senior high or vocational high school attainment, 14 years for junior college attainment, 16 years for college degree, 18 years for master degree and 23 years for doctor degree. Yet, for estimating the predicted year of entry to labor market by males, two extra years are added since most males have to serve in the military for two years in Taiwan. So far, lack of information for the exact year of graduation could be regarded as one of the main drawbacks in this paper. However, although measurement errors due to prediction of the year of individual's first entry to labor market by the above method may inevitably cause biases in estimations, the biases might not be so serious. Since normally the

predicted year should be close to the exact year, and economic conditions of adjacent years usually might be similar.

The critical variable of interest in this study is indicators of economic environment of the year in which the individual first entered the labor market. This paper tries to use unemployment rate as the measurement of economic condition, which are also provided by Directorate-General of Budget, Accounting and Statistics, Executive Yuan, R.O.C. (Taiwan). The unemployment rate (average in year) measures the percentage of labor force that is unemployed. The reason to use unemployment rate as a suitable indicator is that because of the inevitable decline in labor demand during a recession, number of unemployed labor force would increase. In addition, most previous research works have used unemployment rate as an indicator of fluctuations in business cycles. Therefore, combining the functions of measuring both labor market intensity and economic conditions, here we use unemployment rate to measure economic conditions, as a higher unemployment rate represents worse economic environment. Moreover, the administrative data provide not only national unemployment rate, but also unemployment rate grouped by age, sexuality and education, which enable this study to undertake detailed analysis of the long-term effect across different demographical groups.

About the analysis data set, first we drop 244,560 individuals who had no monthly income from the raw data; they did not have jobs with payment. This reduction is able to exclude students, unemployed labor force and unpaid family workers from target samples. Second, we drop 22,300 individuals whose working hours were zero during the week before the survey since this paper only concerns individuals having full-time jobs. In addition, in order to avoid biases caused by outliers, we drop individuals whose monthly income was either negative or over 1 million New Taiwan Dollars (about $33,000 USD); since there were only 350 individuals excluded from the dataset on this account, this reduction would not cause serious influence on estimation. Finally, since the unemployment rate provided by the official data only starts from 1978 (before then the unemployment rate was estimated from other surveys, and possibly would cause data resource inconsistency problems), so here we drop individuals whose initial labor year is earlier than 1978, leaving the dataset with 160,146 observations in the full sample.

Table 1 shows the descriptive statistics of selected variables for male and female in the analysis data set, which includes all observations having potential experience of 0 to 32 years. Table 2 shows the comparison of the mean of log wage, years of education and tenure by high-unemployment rate and low-unemployment groups (i.e. higher or lower than median of unemployment rate within each group). From the table, we can observe that both for males and females, the average log wage is lower while entering labor market in a bad economy. Also the average tenure of the current job is quite shorter if the individuals are in the high-unemployment group. Since higher unemployment rate mostly occurs in recent years, the tenure for individuals who graduated recently would reasonably be lower and they shall have lower wages. Also, the younger average age in higher unemployment-rate group provides the information that could explain shorter tenure and lower wage.

Besides the monthly incomes and personal characteristic variables, we also take a look at the variation of unemployment rates by year. Figure 1 sketches the variation of annual unemployment rates of the sample, males and females. It can be observed that on the whole there is a slightly increasing trend in unemployment rate as time went by, and the variation of unemployment rates in the recent decade are more violent than in the past. Besides, there can be found a small hill on the series in the time period 1982-1986, and the rate also suddenly rises up to a higher level from 1997 to 2000. After then, other peaks appear in 2000-2003 and 2008-2010.

In addition, Figure 1 shows some differences between males' unemployment rate and females'. In the early time period, roughly before 1995, unemployment rate of females is similar to males and even a little bit higher than males in some years, but as time passes, unemployment rate of females has gradually become lower and the gap between them has increased, especially during economic recession. It could be observed that the gap between male and female unemployment rates was small when the economy was stable but became apparently larger in bad economic conditions.

Figure 2 depicts the variation of annual unemployment rate from 1978 to 2010 grouped by different education levels. From the figure we can observe that most education groups have similar patterns, consistent with the overall annual unemployment rate, though the average rates among groups are different. Only for the group of college and above, the unemployment rate is comparatively lower before 1990 but it keeps increasing from 2000 to 2010, except a little decrease in 2003 and 2010. This might imply that in the most recent decade, the main factors influencing unemployment rate of college and above graduates are not only macroeconomic conditions but also some other factors. For other education groups, junior high and below is found to have the lowest unemployment rate in most years. The levels of unemployment rate of senior high, vocational high and junior college are similar at the beginning, but spread wider in recent years. While the rate in junior college becomes lower, the rate in vocational high keeps leading the highest level. As a whole, the differences between unemployment rates of different education groups are wider and almost fixed in early period, but in recent years, the gaps have become comparatively smaller.

4. ESTIMATION RESULTS

The empirical model (i.e. equation (1)) shows how such effects vary across potential experience. Table 3 has the Ordinary Least Squares regression estimation results for males and females, separately. The initial impact of entering labor market during a recession on males is significantly 1.5% lower in terms of monthly income as the unemployment rate of males increases by 1% of the time. The magnitude is smaller than in other countries, which might be because the worker's ability is not controlled for in the model. As Mansour (2009) pointed out, without controlling AFQT score in analysis of American workers, the magnitude and persistence of the effect would be weakened. For females, the initial effect is a little larger than males and also significant in statistics. This is consistent with the previous explanation in the long-term effect that females might have lower pay at the beginning during a recession.

While there is some difference between the initial impact in case of males and females, the speed of recovery is somehow similar. Figures 3 and Figure 4 show the estimated effects on monthly wage across potential experience years for males and females, respectively. From the pattern we can observe that after 6 years of working in labor market, the negative effect is no longer significant for males, which is consistent with some previous researches in that the effect is eliminated within 10 years. For females, the effect becomes insignificant a little earlier, which is probably because females get married and leave labor force due to worse working experience.

However, the effect becomes negative and significant again on females from 12 to 20 years after first entry to labor market. This late negative effect might come from those who quit jobs to get married early and focus on family due to recession at the time of initial entry, now appear to re-enter the labor force. While re-entering labor market makes it difficult for females to find good jobs, the results of lower pay would make the effect of initial bad economic condition be significant again.

The other finding in this model is that the effects surprisingly turn positive in significance after 28 years, for both males and females. It is probably because for those who entered labor market in a good economy could have better human capital accumulation and got higher pay that enabled accumulation of fortune more quickly. Thus, they are able to retire early. As most of these luckier individuals leave labor force, the rest of people with initial luck but still have to work are considered to have weaker ability, which may in reference to lower income. Also, for those who enter labor market during a recession, after so many years if they are not knocked out from labor force, it probably reveals that they become competent over the years. Therefore, after many years have passed, the effect of entering labor market in a bad economy turns out to be positive.

Since the observations are restricted to individuals with full-time jobs, those who entered labor market during recession and resulted in bad working experience may not be included in the sample. For example, unemployed and part-time workers, who might account for a great part of the group with bad initial labor market condition, are excluded from estimation. Thus, for those graduating in bad economic conditions, since only individuals with full-time jobs can be observed and that might imply they have superior working ability. Thus, this is probably the reasons that we observe the estimated effect of initial bad economic conditions effects turns positive after 28 years,.

The various effects across potential experience years and education groups on males and females are estimated. Figure 5 shows the estimated effect on males' monthly wage across education and potential experience. The pattern shows that the short-term effects of initial bad economy are negative across education, and the more education a male has the larger the effect is, except in the case of male college graduates. This shows more educated males are influenced more by initial bad economic conditions. For the positive effect in case of male college graduates, this might be due to bias caused by the small sample size. Also, it is probably because high education has become universal in recent years in Taiwan and the quality of college graduates is widely distinct. Thus, the excess supply of college graduates, especially during a recession, helps employers find workers with really good talent. As the wage observed here is the one who has

already got a job, the employed condition reveals the one may possess a good working ability. Overall, the negative effect on each education group decreases as the number of potential experience years increases.

Figure 6 shows the estimated effect on females' monthly wage across education and potential experience years. From the figure we can find the negative short-term effect of initial bad economy is larger in low-education groups, which is different from males. This corresponds to the fact that gender discrimination is more prevalent in low-skill workers. It can also be seen that the pattern of the effect is not so consistent across education groups like males. The effects seem to have quadratic form over time, and distinct in different groups. Except vocational high and college graduates, the negative effect fades away at 12 years after graduation but becomes negative again and keeps going down as time goes by. However for female college graduates, the effect is positive at the beginning and becomes negative after 8 to 20 years. After that, the negative effects gradually fade away and turn apparently positive, as in the case male college graduates.

5. CONCLUSION

Conducting analysis with Taiwanese data, we find that the negative effect of entering labor market during a bad economy on an individual's wage would persist even after working for more than ten years. Such negative long-term effects are found significant in case of both males and females in the model. The negative effect on females is larger than males, which is probably due to the prevalent gender discrimination in eastern societies. Besides, the long-term effects across education groups are found varying. Nevertheless, the significant negative long-term effect on females graduating from college, junior high and below junior high reveals that highly educated and the lowest-educated females suffer larger effect of the initial bad luck.

The main limitations of this paper are the inaccurate predicted time of initial entry to labor market, and the small sample size for the sub-sample analysis. The predicted time of initial entry to labor market may cause the estimated effect to be biased. Also, the small sample size makes the estimated effects across education groups insignificant and inconsistent. Therefore, for future researches, getting information for the exact year of graduation and expanding the sample size would make the estimation results more reliable and consistent.

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Table-1. Descriptive Statistics of Selected Variables

	Male	**Female**
No. of individuals	95,064	65,082
Variables		
Wage	39365.51	29995.59
	(23948.21)	(14977.17)
Log wage	10.47	10.22
	(0.44)	(0.41)
Years of education	12.84	13.32
	(2.74)	(2.50)
Years of potential experience	15.32	13.80
	(8.22)	(8.26)
Tenure	6.71	5.18
	(6.29)	(5.38)

Note:

1. Standard deviations are in parentheses.
2. Monthly wage is used.

Table-2. Mean of Selected Variables (by Gender and Unemployment Rate)

			Mean			
	Unemployment rate group	**No. of individuals**	**log wage**	**Years of education**	**Tenure**	**Age**
Male	High	46,336	10.41	13.32	4.82	32.25
	low	48,728	10.53	12.37	8.51	39.87
Female	High	35,739	10.20	13.84	3.80	29.48
	low	29,343	10.25	12.69	6.86	37.56

Table-3. The Effects of Unemployment Rate at the First Entry Year on Monthly Wage

Dependent variable: log monthly wage	**Model (2)**	
	Male	**Female**
The effects of unemployment rate at the first entry year on monthly income across potential experience year: Effects on selected year		
Experience year=0	-0.0150***	-0.0239***
	(0.0036)	(0.0065)
Experience year=1	-0.0082***	-0.0160***
	(0.0030)	(0.0053)
Experience year=2	-0.0079***	-0.0100**
	(0.0027)	(0.0048)
Experience year=4	-0.0052**	-0.0032
	(0.0020)	(0.0036)
Experience year=6	-0.0019	-0.0033
	(0.0018)	(0.0030)
Experience year=8	-0.0004	-0.0052
	(0.0019)	(0.0034)
Experience year=10	-0.0070**	-0.0067
	(0.0028)	(0.0041)
Experience year=12	-0.0034	-0.0129**
	(0.0036)	(0.0051)
Experience year=14	-0.0057	-0.0109**
	(0.0046)	(0.0060)
Experience year=16	-0.0075	-0.0161**
	(0.0050)	(0.0066)
Experience year=18	-0.0058	-0.0112**
	(0.0039)	(0.0057)
Experience year=20	-0.0029	-0.0126**
	(0.0035)	(0.0050)
Experience year=22	0.0009	-0.0020
	(0.0035)	(0.0047)
Experience year=24	-0.0003	-0.0016
	(0.0039)	(0.0054)
Experience year=26	0.0082*	0.0093
	(0.0057)	(0.0074)
Experience year=28	0.0237***	0.0175***
	(0.0092)	(0.0117)
Experience year=30	0.0330***	0.0483***
	(0.0140)	(0.0175)
Experience year=32	0.0582***	0.0794***
	(0.0181)	(0.0214)
Other explanatory variables		
The Dragon year	0.0042	0.0009
	(0.0038)	(0.0042)
The Tiger year	-0.0058	0.0089**
	(0.0038)	(0.0043)
Number of observations	95,064	65,082
R-square	0.5161	0.5518

Notes:

1. Estimated standard errors are in parentheses. * Significance at 10% level; ** significance at 5% level; *** significance at 1% level.

2. The regressions also control individual's tenure, years of education, marriage, numbers of graduates in the year of graduation, current regional unemployment rate, occupation, industry, workplace, class of worker, firm size and the year of survey with dummy variables.

Figure-1. Annual Unemployment Rate from 1978 to 2010(by nation, male and female)

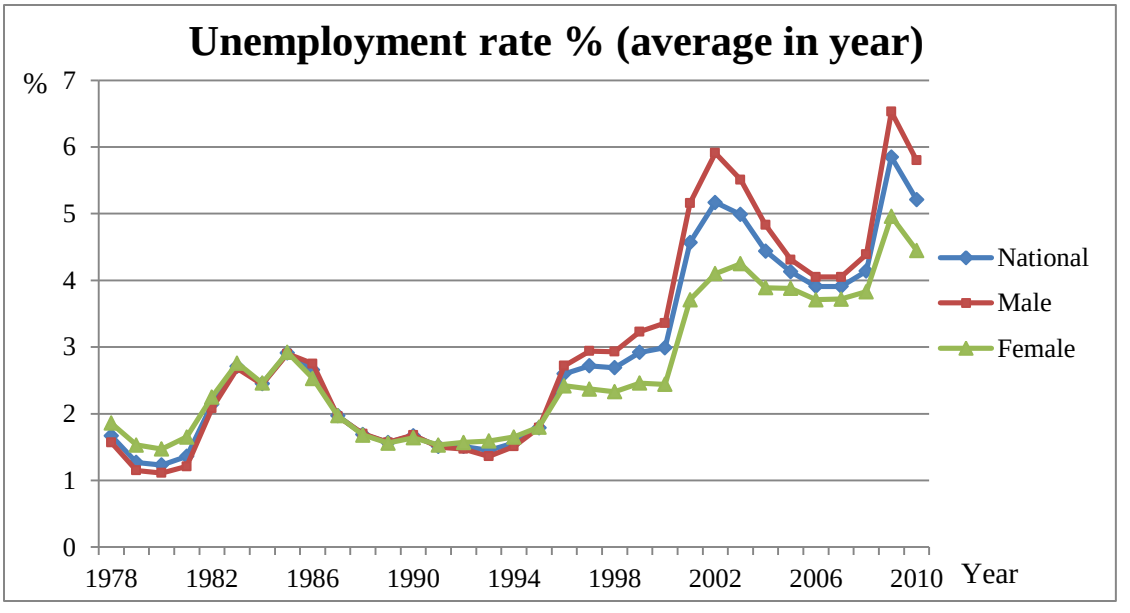


Figure-2. Annual Unemployment Rate from 1978 to 2010(by education level)

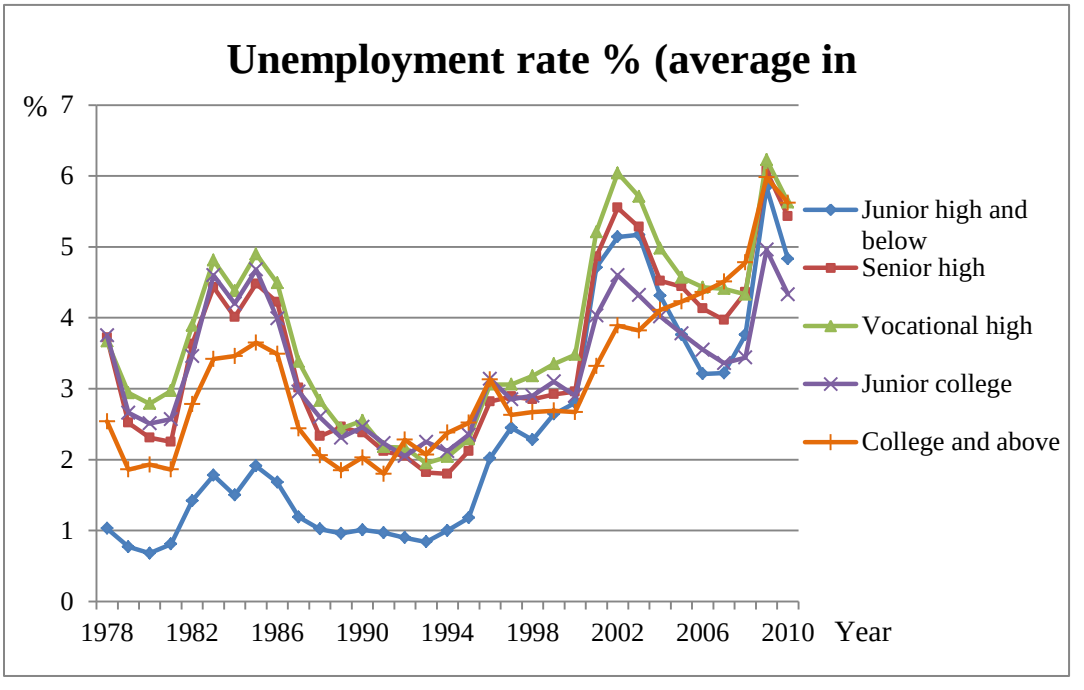
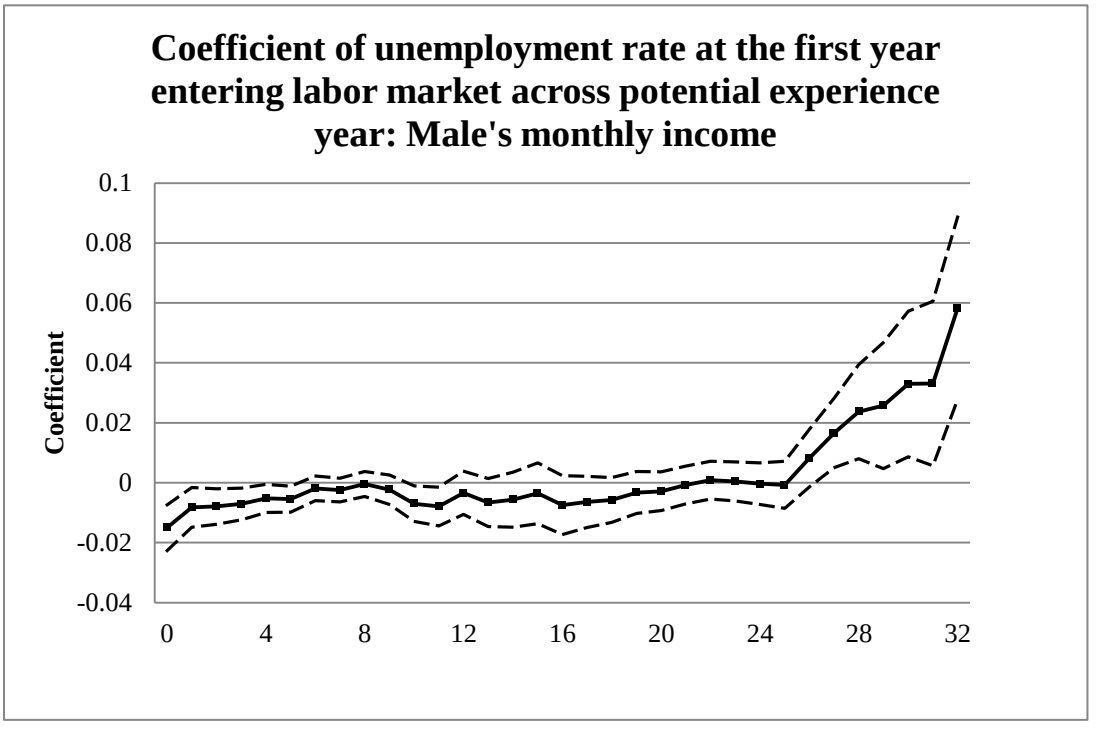
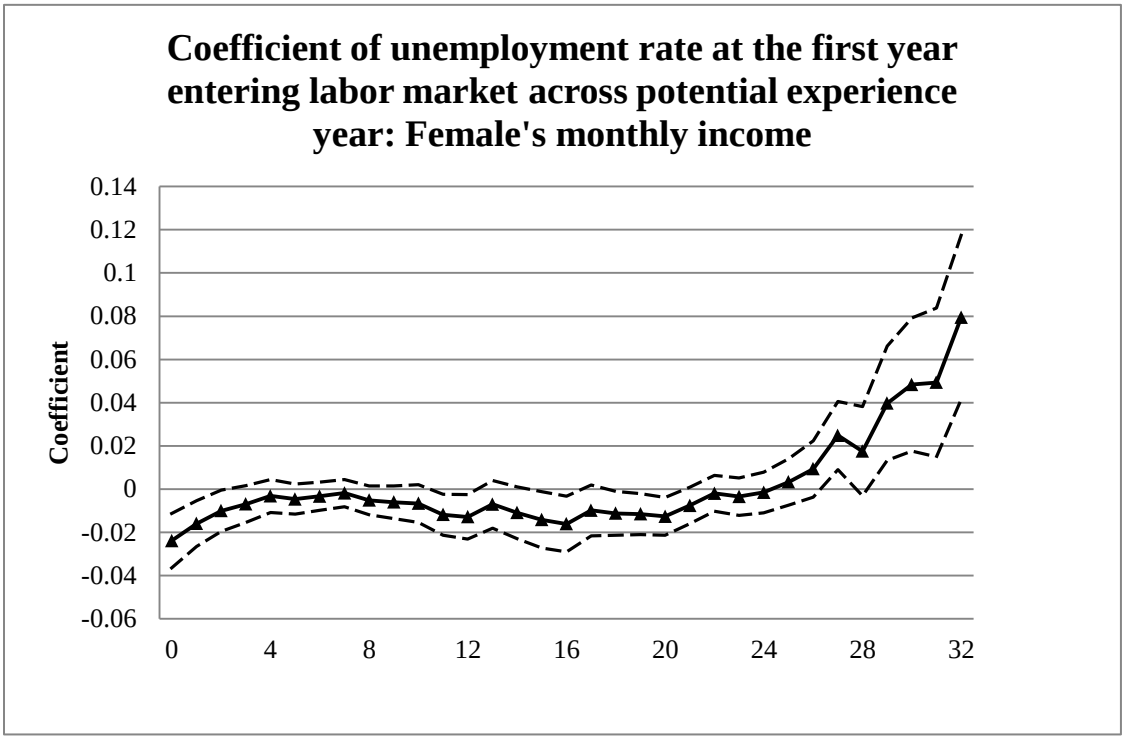


Figure-3. The Estimated Effect on Male's Monthly Wage(by potential experience year)



Note: The dotted lines construct the 95% confidence interval of the estimated coefficients.

Figure-4. The Estimated Effect on Female's Monthly Wage(by potential experience year)



Note: The dotted lines construct the 95% confidence interval of the estimated coefficients.

Figure-5. The Estimated Effect on Male's Monthly Wage (by education and potential experience year)

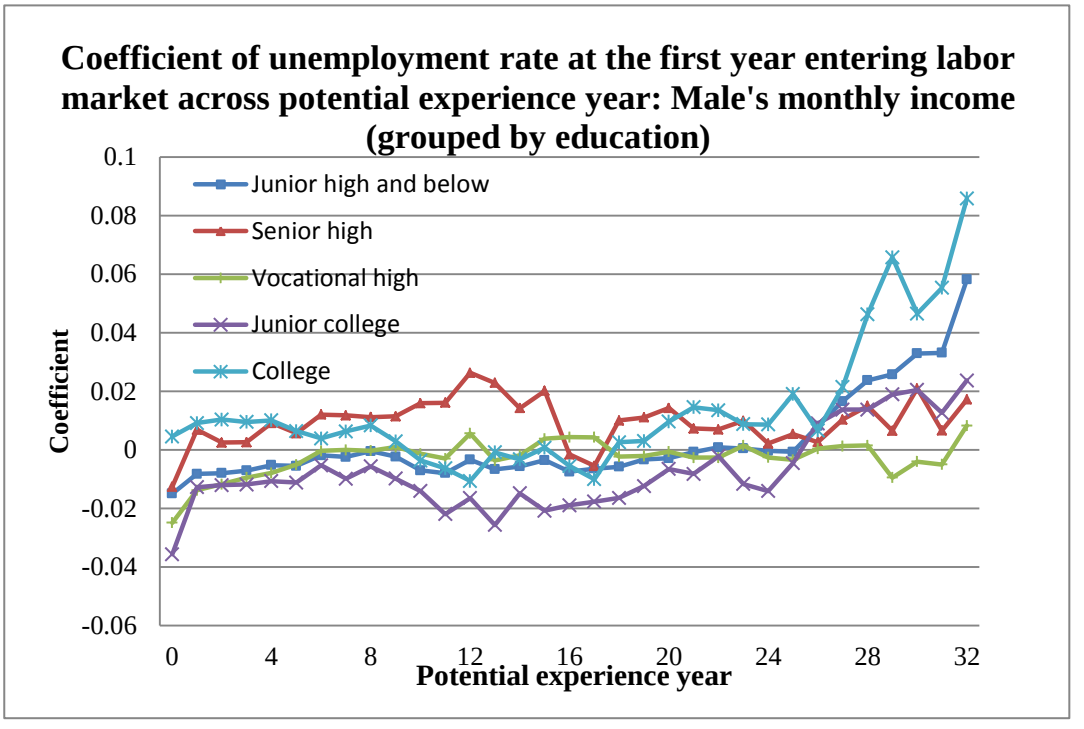


Figure-6. The Estimated Effect on Female's Monthly Wage (by education and potential experience year)