Session II

The 26th Pacific Economic Community Seminar

Examining the Mid- and Long-Term Structural Unemployment in Asia-Pacific

Structural Unemployment in Japan*

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Summary

This paper investigated factors behind the transition from the low and stable unemployment rate in and before the 1980's to the persistently high unemployment rate in and after the 1990's in Japan, mainly by reviewing the literature. The role of specific mismatch or reallocation factor is limited, as shown by various mismatch indicators. Instead, the response of unemployment rate to business cycles has become larger and long-lasting. Possible factors behind this change include (1) deflation and rigidity of nominal wages, (2) decline in discouraged-worker effect, (3) increase in non-regular employment, (4) long-term scars of youth unemployment. More efforts are needed to strengthen the safety net, including social insurance coverage, for non-regular workers and to promote the conversion of temporary jobs to more stable ones.

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1. Introduction

This paper investigates structural factors behind the transition from low and stable unemployment rate in and before the 1980's to persistently high unemployment rate in the 1990's and after [1].

For the good performance of the Japanese labor market in the 1980's, several reasons were pointed out. Nominal wages were flexible to economic shocks, partly due to harmonious industrial relation. Employment adjustment speed was slow, because of high fixed costs due to long-term employment and accumulated firm-specific skills though intensive OJT. Discouraged-worker effect among women contributed to reduce labor supply during recessions. Smooth transition from school to work was ensured through placement by school, which provided youth with stable jobs at the start of their careers.

Nonetheless, during the "Lost Decade", the unemployment rate soared to 5 % and over and it sticks to the high level and did not fall to the initial low level, even if the economy recovered. What are the factors behind this change?

"Structural" unemployment is frequently measured using the Beverage Curve. But such method has problems, especially for the extraction of the "structural factors" of the changes in unemployment rate during the long recessions, because "structural factors" and "demand-deficient factors" are considered to affect unemployment interdependently.

On the other hand, the Japanese labor market has experienced structural changes such as aging of the labor force, increase in non-regular workers, and increase in female employment, industrial/occupational changes in employment, increase in long-term unemployment etc.

Thus, this paper investigates structural factors behind the changes in unemployment rate between before the Bubble Burst and after, by surveying the literature using alternative methods such as analysis of mismatch indicators, macro-economic time series analysis, gross flow analysis, as well as analysis on specific possible factors.

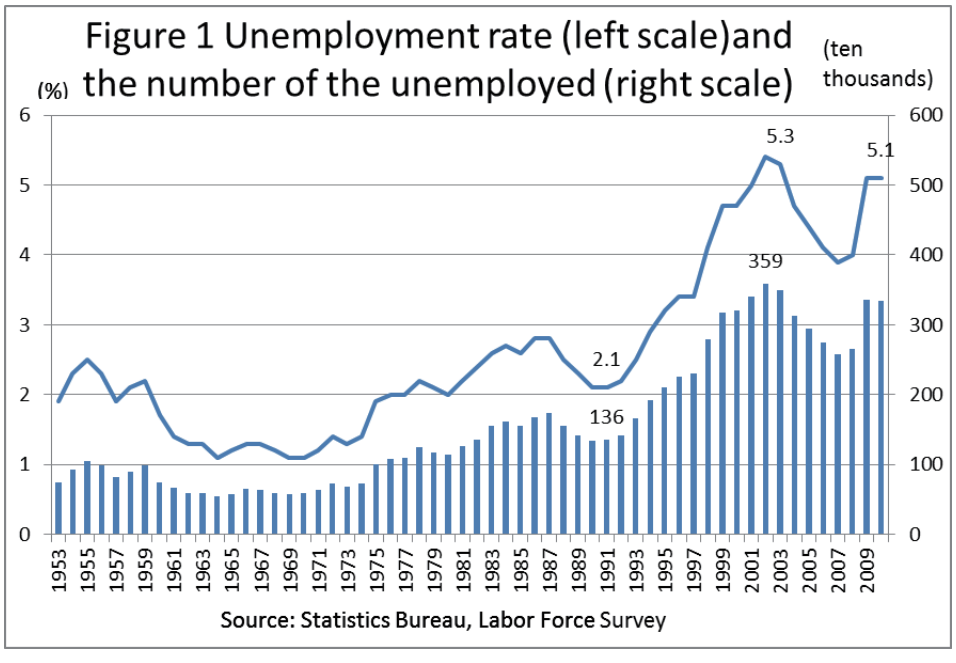
The structure of the paper is as follows. Section 2 examines long-term trends in unemployment rate in Japan. Section 3 discusses the measurement issues about "structural" unemployment by the Beverage Curve. Section 4 examines trends in several mismatch indicators to show whether mismatch unemployment has increased. Section 5 refers to the results of a recent study on time series analysis of unemployment.

1 There are excellent surveys on unemployment after the Bubble Burst in Japan, such as Ohta et al. (2008), Yamamoto (2010) and Nishikawa (2010). This paper owes much to these papers.

Section 6 examines gross flows of labor market. Section 7 discusses possible factors behind the changes in unemployment rate, namely (1) deflation and nominal wage rigidities, (2) employment adjustment speed, (3) discouraged-worker effect, (4) non-regular workers and unemployment, (5) long-term negative effects of youth unemployment.

2. Long-term trends in unemployment rate

Figure 1 shows the long-term trend in unemployment rate from the beginning of the 1950's onwards in Japan. Unemployment rate decreased from over 2% in early 1950's to the level of 1% in the 1960's and rose again to over 2% in a gentle U-shape. The number of the unemployed remained below 1 million in the 1960's and until the mid-1970. After the 1st Oil Price Shock in 1974, it began to increase gradually and in the 1980's it moved around 1.5 million. In this period, unemployment rate was not so sensitive to business cycles and remained below 3% even in the recessions. Thus, the Japanese labor market in this period is characterized by "low and stable unemployment rate".



Nonetheless, after the Bubble Burst in the early 1990's unemployment rate rose sharply from 2.1% in 1991 to 5.3% in 2002. The number of the unemployed increased from 1.36 million in 1991 to 3.59 million in 2002. Unemployment rate began to fall in 2003 but only to 3.9% in 2007 and jumped up again to 5.1%

in 2009 after the Lehman Shock in 2008. Thus, in this period, the Japanese labor market is characterized by "persistently high unemployment rate". Since unemployment rate has not declined so much during the upturns of the business cycles, it is argued that the persistency of high unemployment rate may be due to some structural factors in the labor market.

3. Measuring Structural Unemployment

The persistent rise of the unemployment rate during the 1990's has provoked the concern about the quantitative and qualitative evaluation of structural factors behind this trend.

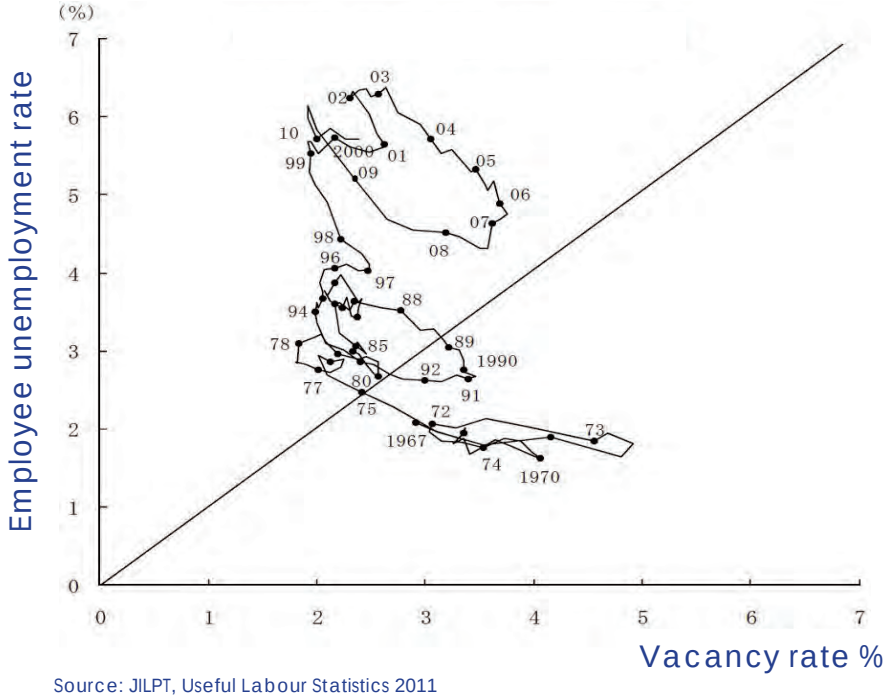
Most of the researches on the quantitative aspect have attempted to measure structural unemployment by the use of the UV analysis. This method is often used by MHLW (Ministry of Health, Labour and Welfare), White Paper on the Labour Economy as well as the Cabinet Office, Annual Report on Japanese Economy and Public Finance.

Structural unemployment is estimated by the UV analysis as follows. As unemployment rate u, "employee unemployment rate" is usually used. Employee unemployment rate is defined as $U/(E+U)$, where U is the number of the unemployed and E is the number of wage earners and salaried employees. The vacancy v is defined as $(V-E)/(V-H+E)$ where V is the number of effective job openings and H is the number of job openings filled by job applicants. The relationship between u and v is usually negative. The curve of this relationship drawn in the u-v plane is called as Beverage Curve or UV Curve (Figure 2). In this method, the quantity of the structural unemployment is measured by the unemployment rate u which corresponds to the crossing point of the Beverage curve and 45^{o} line, where $u = v$ holds. The difference between actual unemployment and structural unemployment is considered as "demand-deficit unemployment". Structural unemployment thus defined is often called as "structural/frictional unemployment", since it includes also the part of unemployment due to the frictions such as imperfect information in the labor market. There are many estimations of structural unemployment rate by this method such as JILPT (2011), Ohtake and Ohta (2002), etc.

Nonetheless, the structural unemployment measured by UV analysis has several problems. First, when "demand-deficient factors" disappear, unemployment rate will not necessarily converse to the unemployment rate at which the relationship $u = v$ holds. Recent search theory (Mortensen-Pissarides model) suggests that the relationship $u = v$ has no meaning as equilibrium. According to the model, there is no distinction between structural/frictional unemployment and demand-deficient unemployment.

Second, it is difficult to distinguish empirically between structural/frictional unemployment and demand-deficient unemployment. Not only structural factors but also cyclical factors may shift the Beverage curve. For example, the increase in vacancies during the upturn of the economy may induce firms to hire the workers who did not sufficient qualities to meet the firms' requirements during the downturn of the economy. Then it can be said that the increase in labor demand has reduced structural unemployment. In other words, "structural factors" and "demand-deficient factors" dot not affect unemployment independently but with mutual inference.

Figure 2 UV Curve (1967 I - 2010 IV, sesonally adjusted)



Source: JILPT, Useful Labour Statistics 2011

4. Mismatch indicators

It is considered that "structural" unemployment occurs through various "mismatches" between demand and supply in the labor market. The requirements of job openings may not match with the qualities of job applicants. For example, the firms would like to hire an IT engineer with sufficient knowledge about modern IT technology. Nonetheless the job seekers may not be sufficiently qualified or skilled for such jobs. There are several mismatch indicators which allow us to gage the extent to which the mismatch in the labor market is widened. We would like to investigate whether unemployment has increased by the

widening of mismatch in the labor market in the 1990's.

The mismatch indicator developed by Jackman and Roper (1987) is widely used. The labor market is divided into several sectors by the factor such as region, age, or occupation etc., which we focus to analyze the mismatch. Suppose that there are N sectors. u_n and v_n designate the number of the unemployed and that of vacancies in the nth sector, respectively $U \equiv \sum_{n=1}^{N} U_n$, $V \equiv \sum_{n=1}^{N} V_n$. Then Jackman and Roper mismatch indicator is defined as follows.

$$\frac{1}{2}\sum_{n=1}^{N}\left|\frac{U_n}{U}-\frac{V_n}{V}\right|$$

This indicator shows the ratio of the number of the unemployed workers to be reallocated across sectors to maximize the number of the hired under a given matching function to the number of the unemployed. It is postulated that "structural unemployment" is the unemployment which can be reduced by the reallocation of the unemployed workers across sectors.

Figures 3 to 5 show trends in the Jackman-Roper mismatch indicators calculated from the statistics on the numbers of job openings and job applicants at the Public Employment Security Office of the Ministry of Health, Labour and Welfare (MHLW). Figure 3 shows the mismatch indicator with eleven age groups of the interval of five years old. It rose until 1997 but declined thereafter. As shown earlier, it was during the deep recession from 1997 to 2002 that unemployment rate accelerated to rise. Thus we cannot contend that the mismatch across age group has contributed to the rise in the unemployment rate during this period. Figure 4 shows the Jackman-Roper mismatch indicator with seven sectors of occupations (classification of the 1 digit level). This indicator shows a downward trend from early 1990's until mid-2000's with a rise in the late 2000's. Figure 5 shows the Jackman-Roper mismatch indicator with 47 sectors of regions (prefectures). This indicator also tended to decline from 1990 to 2003 with some rebound from 2004 to 2008.

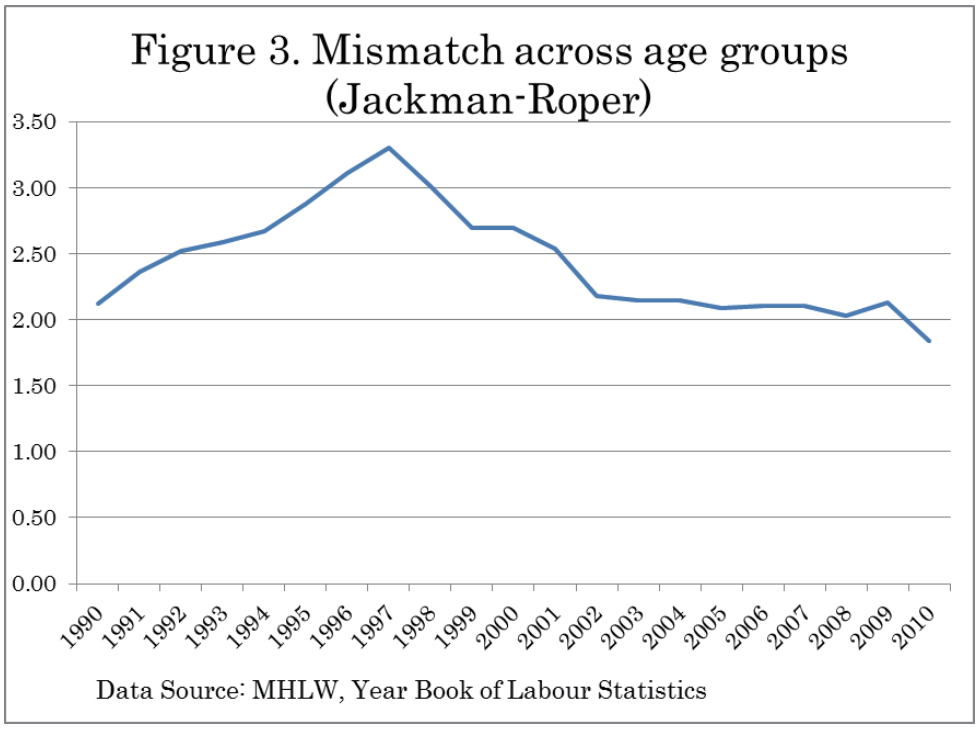


Figure 3. Mismatch across age groups (Jackman-Roper)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Data Source: MHLW, Year Book of Labour Statistics

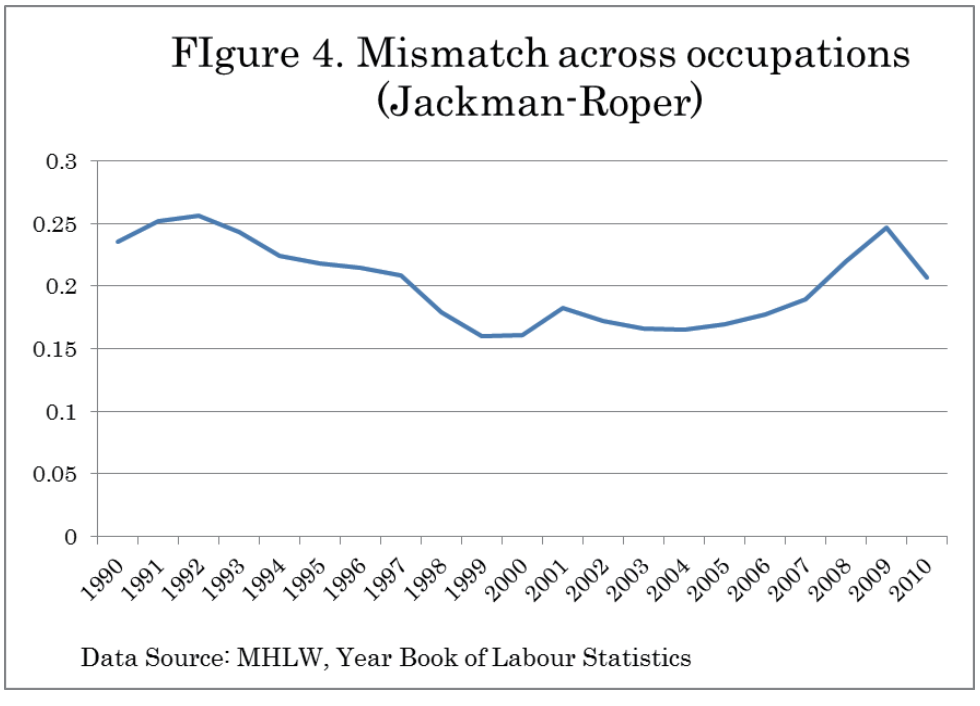
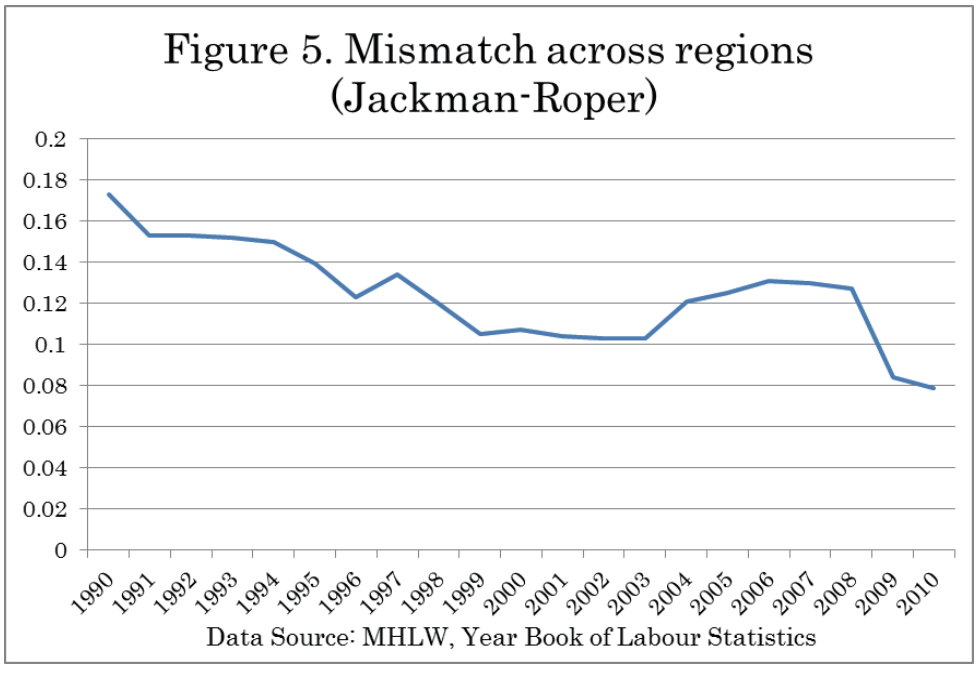


FIgure 4. Mismatch across occupations (Jackman-Roper)
0.3
0.25
0.2
0.15
0.1
0.05
0
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Data Source: MHLW, Year Book of Labour Statistics



In sum, during the 1990's, especially in the late 1990's, the indicators do not show any strong sign of increase in mismatch. Rather they tended to decline, suggesting reduction in mismatch in the Japanese labor market during this period. These results are consistent with preceding literature (Ohta et al. (2008) etc.).

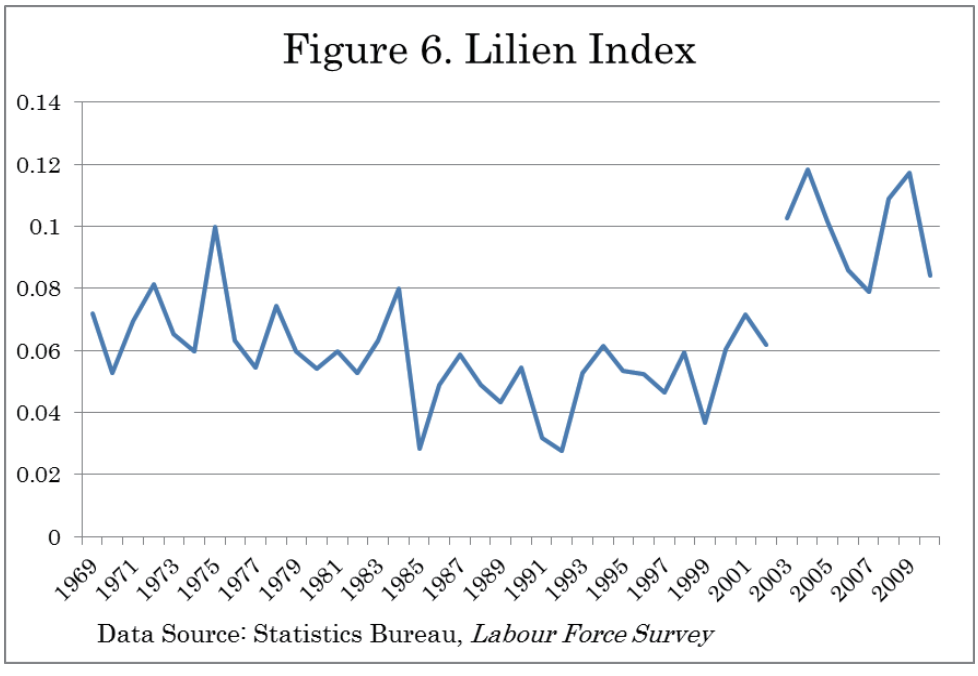
Other than age, occupation and region, mismatch may occur across industrial sectors. However, since there is few statistics which provides information on both job openings and job applicants, it is difficult to calculate mismatch indicators as above. Instead, Lilien indicator is often used to measure the extent to which the reallocation of labor across industries affects the unemployment. The standard deviation of the changes in employment across industries indicates the amount of the variance of sectorial shock in each industry which is heterogeneous economic shock across industries (Lilien (1982)). Lilien indicator is usually calculated as follows. Let e_n be the number of employees in industry n . And let $E = \sum_{n=1}^{N} e_n$ be the number of employees in all industries. Then Lilien indicator is defined as

$$\sum_{n=1}^{N} \left[\frac{e_n}{E} \left(\Delta \ln e_n - \Delta \ln E \right)^2 \right]^{1/2}.$$

If sectorial shock is different across industrial sectors, then it is reflected in changes in employment across industries. If it takes time for workers to move across industries due to industry-specific skills etc.,

then unemployment will occur. Thus, the relationship between unemployment rate and Lilien indicator may shed light to the role which labor reallocations across industries play with regard to the changes in unemployment rate. Previous researches have tended to find weak relationship between the unemployment rate and the Lilien indicators.

Figure 6 shows Lilien indicator made from the number of employees by 1-digit industrial classification in the Labour Force Survey [2]. There seems no sharp rise in this indicator during the period between mid-1990's to early 2000's, when there was a rapid rise in the unemployment rate.



It is noteworthy that a recent literature has revealed that most of the labor movement occurs within individual industries and that the labor market seems to be divided by industrial sector (Abe and Ohta (2001)). This implies that the labor reallocation within individual industries is more important to the variations of unemployment rate than the labor reallocation between industries.

2 There is a gap between 2002 and 2003 due to the change in the Japanese Standard Industrial Classification.

5. Macro-economic Analysis

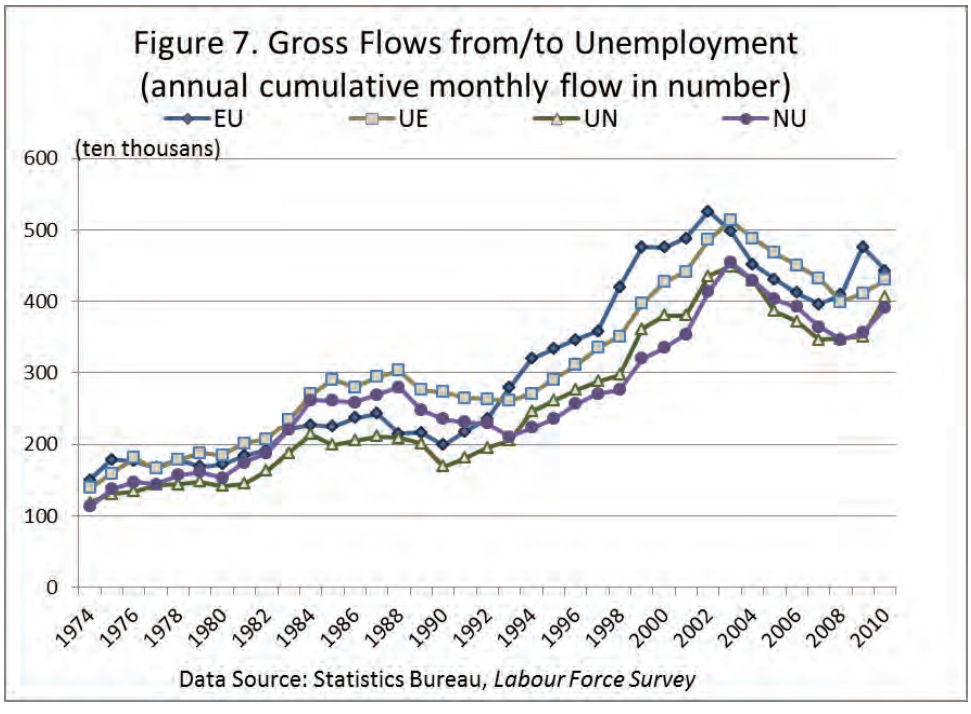
Ohta et al. (2008) conducted a macro-economic time-series analysis by VAR model with two variable vectors of unemployment rate and output and investigated the effects of "macro shock" (overall shock on both aggregate demand and aggregate supply) and "reallocation shock" (structural shock). They found that the persistent increase in unemployment rate in and after the 1990's is due to the increase in the degree of the response of unemployment rate to economic shocks rather than the increase in the size of shocks. In particular, the effect of "macro shock" has increased so much that it dominates the variance in unemployment rate for a long period, while the effect of "reallocation shock" on unemployment rate has not increased. This is a reason why low and stable unemployment rate started to rise.

The result that there seems no increase in the effect of the "reallocation shock" on the variance of unemployment rate during "the high unemployment period" is consistent with the fact that there is no evidence that the contributions of mismatch factors have increased during the 1990's.

6. Gross Flow Analysis

Gross flow analysis would shed some light on how unemployment rate has become so persistently high after the 1990's. The gross flow is defined as the number of workers who changed their labor force status from the previous month to the current month. The figure 7 shows annual cumulative gross flows from/to unemployment. EU , UE , NU and UN designate annual cumulative gross flow from employment to unemployment, that from unemployment to employment, that from not in the labor force to unemployment and that from unemployment to not in the labor force, respectively. Apparently, there is a sharp difference between before the Bubble Burst in the early 1990's and after that. Until 1980's, the gross flow EU was less than 2 million and half and rather stable. The gross flow UE was almost the same until mid-1980's but it was larger than the flow EU , resulting net flow from unemployment to employment was around 500-900 thousands. This was balanced by the almost the same amount of the net flow from not in the labor force to unemployment. Thus, unemployment was rather low and stable. By contract, in the 1990's and early 2000s., the gross flow EU increased much more rapidly than the UE flow, resulting in the steady net flow of about 450 thousands on average from employment to unemployment from 1993 to 2002, while the gross flows between unemployment and not in the labor force were almost the same. Thus this excess flow from

employment to unemployment ***(EU-UE)*** has mainly contributed to the steady increase in unemployment during this period.



If we translate this gross flow data into transition probabilities, we can investigate transitions of the individual workers more profoundly. Transition probability is calculated as the probability from one labor status to another from the gross flow data. For example, in general the transition probability from employment to unemployment is defined as $eu=EU/E_{-1}$, where EU is the number of monthly gross flow from employment to unemployment and E_{-1} the number of employment in the previous month[3]. Figure 8 shows the average transition probabilities from/to unemployment. Before the Bubble Burst, eu was relatively stable, while ue tend to rise. Although nu rose during the recession after the second Oil Price Shock in early 1980's, nu and un were rather stable thereafter until late 1980's. By contrast, after the Bubble Burst in early 1990's, ue declined sharply, while eu rose steadily until early 2000's. Moreover, nu rose steeply until 2002, while un declined slightly in the 1990's and remained stable thereafter. By gender, we observe that eu rose more steeply for women than men and that for men nu rose mainly in the 1990's and the early 2000's, but for women it rose also in the 1980's (Figures 9-10). We could summarize the findings as follows.

3 The method used here is somewhat different, since we took into consideration the transitions whose duration of the previous labor force status is less than one month.

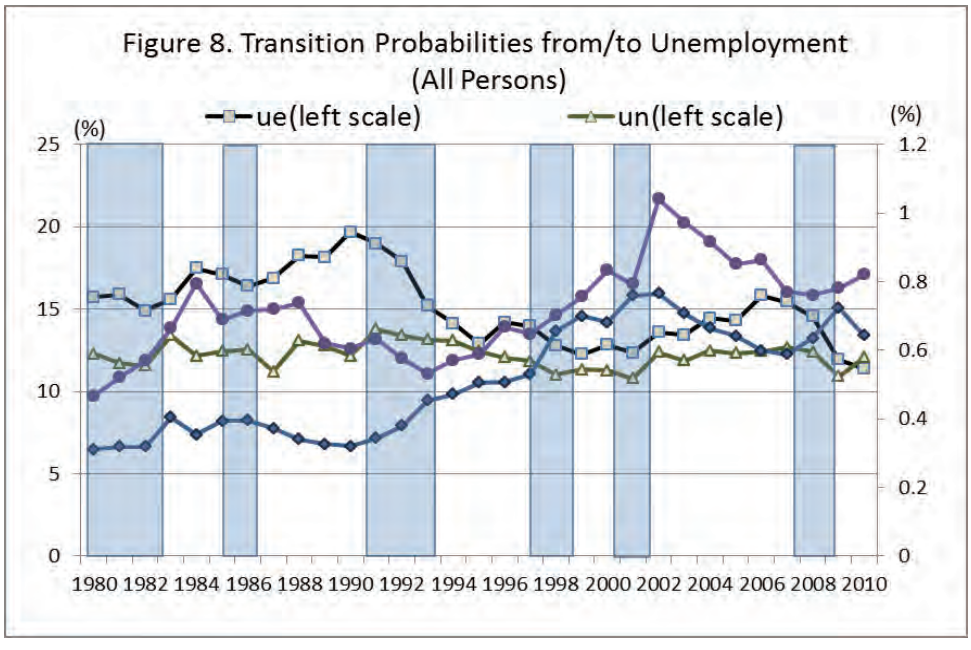


Figure 8. Transition Probabilities from/to Unemployment
(All Persons)
ue(left scale)
un(left scale)
(%)
(%)
25
20
15
10
5
0
1.2
1
0.8
0.6
0.4
0.2
0
1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010

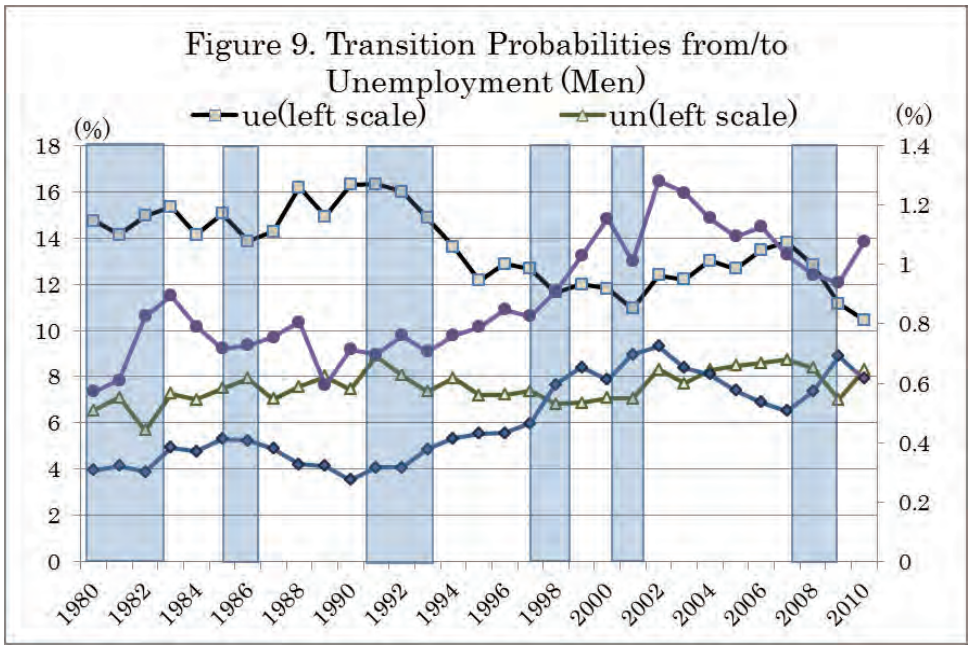
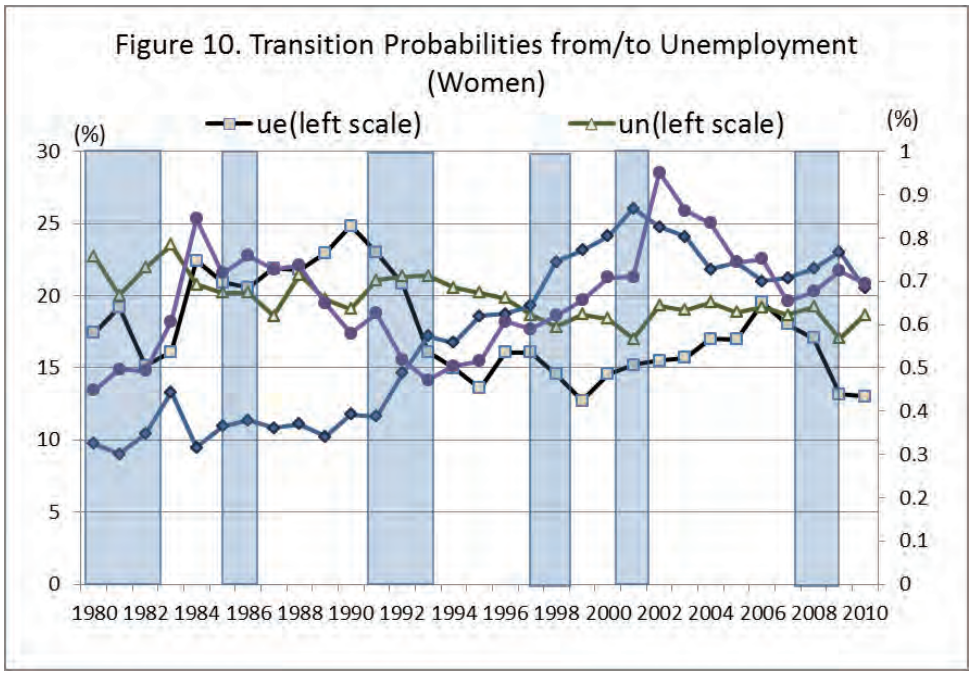


Figure 9. Transition Probabilities from/to
Unemployment (Men)
ue(left scale)
un(left scale)
(%)
(%)
18
16
14
12
10
8
6
4
2
0
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010



First, the unemployment rate rose in the 1990's, mainly due to the rise in ***eu*** . As shown in Figures 8, ***eu*** rose sharply in the 1990's. Previous literatures have found the contribution of the rise in the transition probability ***eu*** to the increase in unemployment rate in the 1990's was the highest (Kuroda (2002), Ohta (2005) and Ohta et al. (2008)).

Second, we could observe "discouraged-worker effects" for women in the 1980's or before, but after the 1990's and onwards they have almost disappeared. In the 1980's, ***un*** rose during recessions, while ***nu*** declined. In total, these contributed to lower the unemployment rate during recessions. However, in the late 1990's and after, ***un*** did not rise during recessions, while ***nu*** rose. These movements did not seem to contribute to lower the unemployment rate. These changes in labor supply behavior of female workers stem from deferred marriage and the stagnating income of husbands due to recessions (Higuchi (2001)).

Third, the rise in ***nu*** in the latter half of the 1990's and after seems to correspond to the increase in new school leavers who could not find their first jobs, reflecting the degradation of the youth labor market, together with added-worker effect discussed below. In effect the rise in ***nu*** is observed for both genders. In addition, the gross flow ***nu*** contributed significantly to the rise in youth unemployment rate, according to the results of the decomposition of the rise in the unemployment rate by age (Ohta (2005)).

Ohta et al. (2008) analyzed the impact of "macro shock" and "matching shock" on the four gross flows from/to unemployment by VAR models. They have found that the role played by "matching shock" or "structural factors" in the variation of unemployment rate in the 1990's was limited. By contrast, "macro

shock" lengthened the impulse responses of all gross flows examined. More precisely, "macro-shock" increased the flow ***eu*** and in turn it increased the other flows from/to unemployment over a long period.

7. Factors behind persistently high unemployment

It has been revealed so far that the change from persistently low unemployment rate until the 1980's to persistently high unemployment rate in and after the 1990's was not induced by specific "structural factors" but rather by demand shock and its subsequent effects on unemployment. We would like to investigate the factors behind these changes in unemployment more deeply by the micro-economic analysis of firms and workers.

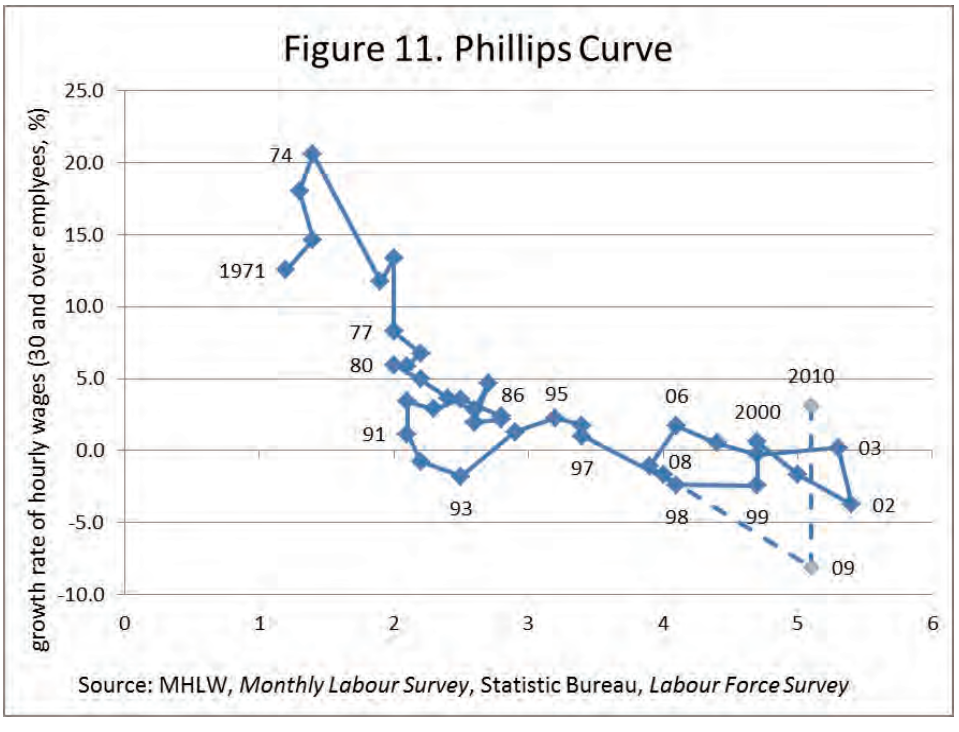
Yamamoto (2010) analyzed the factors behind the flattening of the Phillips Curve from the 1980's to the 1990's and after by the use of recent New Keynesian macro model. He pointed out as possible factors behind this phenomenon (1) deflation and nominal wage rigidity, (2) the increase in the labor supply elasticity (Frisch elasticity), (3) the increase in the employment adjustment costs, (4) the decline in discouraged-worker effects, (5) union's bargaining powers, (6) the extension of UI benefits, etc. As pointed out by Yamamoto (2010), (2), (5) and (6) are not plausible. According to the estimation of Kuroda and Yamamoto (2006), the labor supply elasticity (Frisch elasticity) in Japan declined during the 1990's. On the other hand, the unionization rate shows a long term decline over decades. Moreover, the reform of the Employment Insurance in 2001 has tightened the entitlement of UI benefits, contrary to the assumption (OECD (2010)). Kohara (2004) points out that the number of the long-term unemployed decreased because of this reform of EI. We would like to exclude these factors and add some others such as the increase in non-regular workers, the persistent scars of the recession on youth and long-term unemployment as possible factors.

7-1. Deflation and Nominal Wage Rigidity

If the adjustment of wages during the downturn of the economy is large and quick enough, the increase in unemployment will be mitigated. Literature has revealed that in Japan nominal wages are flexible partly due to cooperative industrial relations and the existence of relatively large bonus. This is considered one of the reasons why the unemployment rate was so persistently low in and before the 1980's.

Nonetheless, it is also shown that the adjustment of real wages is rigid in Japan. Ohtake (1988) estimated the speed of the convergence of both real wages and employment to the stable point in several OECD counties and shown that the adjustment speeds for both real wages and employment are slower in Japan than other countries. This finding is supported by Nakamura (1995) who estimated a macro economic model for Japan and US.

Since mid-1990's, Japan has been experiencing persistent deflation triggered by the Bubble Burst and accumulated bad loan[4] . This implies that if nominal wages are rigid toward downward, then the adjustment to the macro shock will be done through the reduction of employment. In effect, the slope of Phillips Curve has flattened between in and before the 1980's and thereafter (Figure 11). Apparently, the nominal wages tend to be rigid toward downward. In and after the 1990's, the growth rate of nominal hourly wages stagnated around 0% and did not decline to less than -3.8%, except for 2009 when it declined exceptionally to -8.1% because of the Lehman Shock[5] . The rigidity of nominal wages was examined in details and it is shown that there existed the rigidity in and after the 1990's. After the Bubble Burst, the downward rigidity of nominal wages appeared and it contributed to raise the unemployment rate in and after the 1990's (Kuroda and Yamamoto (2006)).



4 For example, the average annual growth rate of CPI was -0.1% for the period from 1995 to 2010.
5 The growth rate of nominal hourly wages rebounded to +3.1% in 2010. Thus, if we combine 2009 and 2010 together, the average annual rate was -2.5%.

7-2. Employment Adjustment Speed

Employment adjustment is the firm's behavior to adjust the employment to shocks to output demand or prices. In Japan, the speed of employment adjustment is often analyzed by the use of the following partial employment adjustment function.

$$\ln N_t - \ln N_{t-1} = \lambda \left(\ln N_t^* - \ln N_{t-1} \right)$$

N_t denotes the actual number of employment at period t and N_t^* denotes the optimal number of employment corresponding to the (expected) output at period t which maximizes the profit under the assumption that there is no adjustment cost. There may be discrepancies between the realized number of employment and the optimal number of employment because of the existence of adjustment costs such as hiring/firing costs and training costs etc. Thus, the gap between the optimal number and the actual number at period t-1 is partially adjusted. In the model λ is considered to measure the extent to which the gap is adjusted during one period and it is, therefore, called as "employment adjustment speed".

The partial employment adjustment function is transformed to the following model which is in reality used to estimate the employment adjustment speed.

$$\ln N_t = (1-\lambda) \ln N_{t-1} + \beta X + \varepsilon$$

X is a vector of the variables which determine the optimal level of employment, including (expected) output level and labor cost.

The slow employment adjustment speed is often considered as one of the factors for persistently low unemployment rate in and before the 1980's. Employment adjustment speed is determined by the adjustment costs such as hiring/firing costs, training costs etc., so-called quasi-fixed costs (Oi (1962)). The larger the adjustment costs are, the slower the employment adjustment speed is. The Japanese large firms tend to make relatively more firm specific investment on the human capital of their workforce. Thus, employment adjustment speed is supposed to be slower. Researches in this period find that employment adjustment speed is slower than the USA and it is similar to Germany and the UK if employment is measured as the number of employment, but if employment is measured as the man-hour (the number multiplied by hours worked), then there is no difference among these countries (Shinotsuka (1989)) . Thus, it implies that the adjustment by the number of workers is slower but that by the hours worked is rapid in Japan. Nonetheless, it is also pointed out that the employment adjustment behaviors among small and

medium firms are different, reflecting two-tier structure of the economy (Muramatsu (1995)). Moreover, the employment adjustment is not necessarily continuous for individual firms. The labor shedding is typically conducted when the business conditions are so bad that the profit is negative for consecutive two financial years (Koike (1983), Suruga (1997)). It must be also noted that the slow speed of employment adjustment do not necessarily induce low unemployment rate, because slow employment adjustment speed implies low transition probability from unemployment to employment as well as low transition probability from employment to unemployment.

The question is whether employment adjustment speed has become more rapid in and after 1990's. The results are somewhat dispersed. Higuchi (2001) contends that employment adjustment speed has become more rapid over a long period, by estimating the employment adjustment speeds for three periods of 1960-73, 1974-1984, 1985-2000. On the contrary, other researchers contends that there is no significant change in the employment adjustment speed of regular workers, because employers tend to use other form of adjustment such as working hours and employment of non-regular workers (Nakata and Takehiro (2001), Miyamoto and Nakata (2002)).

The changes in the governance structure of Japanese firms may have affected the employment adjustment speed. Employment adjustment speed tends to be slower in the firms with higher proportion of the main bank's share or with managers being internally promoted (Urasaka and Noda (2001), Toyama (2001)).

In sum, the effects of the changes in employment adjustment speed on unemployment rate are not so clear-cut. First, it is not so clear that employment adjustment speed has changed or not. Second, large dismissal around 2000 may have happened even if employment practice has not changed, because employment adjustment behavior used to be discontinuous and large dismissal tended to take place even in the 1980's, if profit was negative for two consecutive financial years. Third, the effect of the employment adjustment speed on unemployment rate is not clear. The slow speed of employment adjustment do not necessarily induce low unemployment rate.

7-3. Discouraged-Worker Effect

During the persistently low unemployment rate period, discouraged-worker effect is considered to have played an important role. During the downturn of the business cycle, wages go down and

employment opportunities become scarcer. Then job-seekers tend to abandon their job search and those who are not in the labor force and want to work may stop to enter into the labor force, since the costs of job search may surpass the expected income from the future work. This effect is called as discouraged-worker effect and it works in the direction to lower the labor force participation rate. On the other hand, during the downturn of the business cycle, the earnings of bread-winners tend to decrease or the risk for them to lose their jobs may increase. In consequence, the other members of the family who are not in the labor force tend to enter into the labor force in order to supplement the family income loss. This effect is called as added-worker effect and it works in the direction to raise the labor force participation rate. During the upturn of the business cycle, vice versa. These two effects work in the opposite direction each other, but we do not know a priori which effect dominates the other. The net effect of the business cycle on the labor force participation rate is known only through empirical observation. In and before the 1980's, discouraged-worker effect dominated added-worker effect and this pro-cyclical effect on the labor force participation rate contributed to stabilize the fluctuation of unemployment rate. Especially, during the downturn of the business cycle, the labor force participation rate of married women fell, contributing to mitigate the rise in unemployment rate.

How discouraged-worker effect has changed in and after the 1990's? Figure 10 show that transition probability from unemployment to not in the labor force rose $\nearrow$ rose and that from not in the labor force to unemployment $\searrow$ fell during the downturn just after the Bubble Burst (1991-1993) and the recession after the second Oil Price Shock (1980-1982). This confirms well the dominance of discouraged-worker effect over the added-worker effect. However, we cannot observe such dominance of discouraged-worker effect during the recessions from the latter half of the 1990's onwards. This observation is consistent with previous researches.

Regarding the factors behind these changes in the labor supply behavior of women, it is pointed out that (1) due to the reduction of husbands' permanent income during the prolonged recessions, added-worker effect has become more dominant, (2) the deferred marriage of women contributed to reduce the discouraged-worker effect, since discouraged-worker effect is found only for married women.

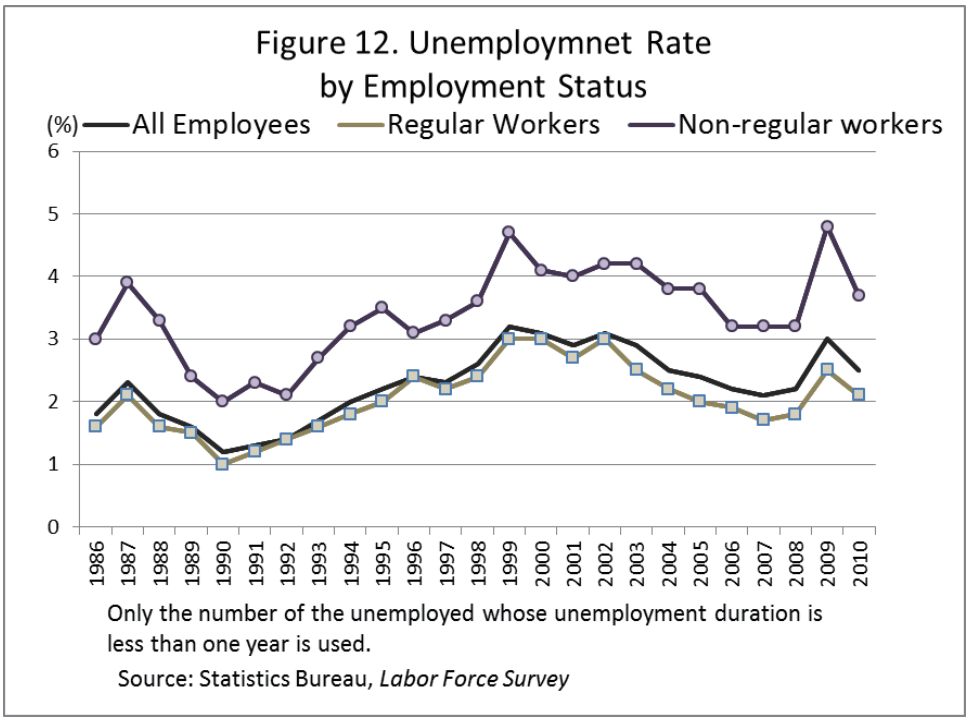
7-4. Non-regular workers and unemployment

One of the salient features of the recent Japanese labor market is the increase in the proportion of non-regular workers among employees. Non-regular workers consists of par-time workers (67.9%), dispatched workers from temporary labor agency (5.5%), contract employees and entrusted employees (18.8%), others (7.8%)[6] . The proportion of non-regular workers among employees excluding executives of company or corporation was 34.4% for all persons, 18.9% for men and 53.8% for women in 2010. Behind the recent growth of non-regular employment, it is considered that there are structural changes such as globalization of the economy and technological changes like ICT etc. as well as the tertiary industrialization.

The job tenures of non-regular workers tend to be shorter than regular workers. For example, according to MHLW Basic Survey on Wage Structure, the average tenure of full-time regular workers is 12.6 years for both sexes, whereas that of part-time workers only 5.1 years. This reflects the fact that non-regular employment is unstable employment. Most non-regular employment is temporary employment usually with term of one year or less. When the term expires, non-regular workers must search next jobs. They are unemployed until they find jobs.

Figure 12 shows unemployment rate by employment status. The unemployment rate of non-regular workers is much higher than that of regular workers. Thus, the increase in the proportion of non-regular workers raises unemployment rate, unless the use of non-regular workers expands employment to offset[7] . In addition, according to a survey[8] of MHLW, about 20% of non-regular workers want to be employed in regular employment. Thus, this means non-negligible number of under-employment.

6 The number in the parenthesis indicates the proportion of each category in percentage for all persons in 2010 based on Statistics Bureau, Labor Force Survey.
7 Ohta et al.(2008) showed that the increase in non-regular workers do not contribute to lower unemployment rate, by econometric analysis using regional data of Labor Force Survey.
8 MHLW General Survey on the Diversification of Employment Status 2007.



Moreover, the training opportunities for non-regular workers are much limited, compared with regular workers. In the long run, it implies the accumulation of low skilled workers in the labor market and the increase in structural unemployment.

7-5. Long-term scars of youth unemployment

The sharp deterioration of youth labor market is also one of the salient features of the Japanese labor market after the Bubble Burst. In and before the 1980's, most new school leavers could find full-time jobs on their graduation, through placement by school or job search during at school. There used to be no serious youth employment problem. However, after the Bubble Burst, especially after the latter half of the 1990's, employers suspended largely new hiring as it is a cheaper way of employment adjustment than the dismissal of incumbent employees. During the long period of recessions (the Lost Decade), the damage on the youth labor market was so large and left a long-lasting scar.

Recent researches have revealed that young workers who graduated in recessions tend to suffer from lower wages and fewer employment opportunities for a long time (Kondo (2007), Genda et al. (2008) etc.). This state-dependency is often called as “generational effect” in Japan. According to the results of econometric estimation of Genda et al. (2008), the unemployment rate at the time of graduation has a long-

lasting negative effect on earnings and employment opportunities, especially for low educated workers. For low educated workers (high school graduates or lower), the 1% higher unemployment rate at the time of graduation reduces the real earnings of that generation by 5-7% over 12 years. Similarly, for low educated workers, the 1% higher unemployment rate at the time of graduation reduces significantly the employment rate (3-4%) as well as the probability of getting full-time employment (about 2%) over 12 years. They conducted the same estimation for the United States. But for high-school graduates, the effect of the higher unemployment rate at the time of graduation on real annual earnings disappeared in three years. This difference suggests that the Japanese youth labor market is quite different from that of the United States. In Japan, the employment opportunities of good quality are concentrated at the labor market of new school-leavers, leaving few good employment opportunities for mid-career external labor market. This particular structure of the labor market is closely related to employment practices of the Japanese firms, which tend to recruit new school leavers and to invest intensively on their human capital by OJT. In this sense, it may be possible to interpret the current difficulties of youth as a consequence of the deterioration of long-term perspectives of the Japanese firms, under the Japanese employment practices.

8. Concluding Remarks

This paper investigated the factors behind the transition from low and stable unemployment rate in and before the 1980's to persistently high unemployment rate in and after the 1990's in Japan, mainly by reviewing the literature. The role of specific mismatch or structural factor is limited, as shown by various mismatch indicators. Rather, the response of unemployment rate to business cycles has become larger and long-lasting. The possible factors behind this change include (1) deflation and rigidity of nominal wages, (2) decline in discouraged-worker effect, (3) increase in non-regular employment, (4) long-term scars of youth unemployment.

Policy Implications are as follows.

First, adequate macro-economic policies are needed to get rid of the deflation. Mild inflation would allow more adjustment through changes in nominal wages to lower unemployment rate, since nominal wages are flexible in Japan.

Second, growth strategies are necessary to provide employers with future long-term perspectives, which encourage them to hire more young workers to invest on their human capital.

Third, it is needed to strengthen the safety net, including social insurance coverage, for non-regular workers and to promote the conversion of temporary jobs to more stable ones, thereby reducing labor market duality.

Fourth, it is also necessary to strengthen the measures to assist smooth transition from school to work, including the measure to ease too much concentration of job offers at the time of graduation as well as comprehensive assistance to disadvantaged young workers.

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USC DEPARTMENT OF ECONOMICS

The U.S. Employment Situation

Where is the Unemployment Rate Going?

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1.Introduction.

The U.S. unemployment rate is currently stuck at 9.1 percent (as of August 2011), three years after the onset of the recession in Fall 2008 and more than two years after the start of the recovery in the summer of 2009. The U.S. unemployment situation has not been this poor since the early 1980s, when then Chairman Paul Volker engineered a recession to combat the high inflation rate. Now in the U.S., what to do about the high unemployment rate is the largest economic and public policy problem facing the country.

Responding to the latest employment numbers and the weak economy in general, in early September 2011, President Obama unveiled a stimulative "jobs plan." The plan calls for nearly $450 billion of spending and tax cuts. Specifically, the plan calls for a cut in payroll taxes —or taxes used to fund retirement social security—from 12.4 percent to 6.2 percent (for employers and employees combined) in 2012, infrastructure investment, and an extension of unemployment insurance and new programs for the jobless. While it is likely that the payroll cuts will be extended, other aspects of his plan are likely to face stiff opposition from the Congressional Republicans. Economists expect that if the Obama "jobs plan" is enacted in its entirety, GDP growth in the U.S. will increase by about another 1.4 percent in 2012.

A new feature of the latest "jobs plan" is that it includes provisions to cut payroll taxes for employers. The previous jobs plan included only payroll tax cuts for employees. The new Obama plan would halve the employer's share of the payroll tax temporarily in 2012 to 3.1 percent from 6.2 percent on the first $5 million of a firm's payroll. About 98 percent of firms have payrolls of $5 million or less. This plan is expected to stimulate small business hiring.

Small businesses are normally the drivers of U.S. employment growth. However, small businesses have been slow to recover since the recession officially ended in June 2009. Small businesses are suffering from slow sales, while large corporations have been exporting more, earning more revenue from overseas, and stockpiling cash.

Reflecting the weakening economy, economists are now predicting that the economy will grow by only 1.7 percent in 2011, down from the May prediction of 2.8 percent. For 2012, economists are forecasting growth of 2.3 percent, compared to an earlier May forecast of 3.2 percent growth. The weakening outlook reflects an economy that has struggled this year with a rise in gasoline prices, supply disruptions arising from Japan's earthquake, a worsening of Europe's debt problems, and the political rancor over the U.S. debt problem. With this slackening growth, economists do not see much scope for a decrease in the unemployment rate. Economists are forecasting that for all of 2011, the unemployment rate will average 9.0 percent, and will average 8.7 percent in 2012.

The objective of this paper is to examine the U.S. employment situation at the macroeconomic level in some detail. A key issue we will examine is to see if the current 9.1 percent (as of end-August 2011) unemployment is a cyclical or structural phenomenon. As we will see below, the long-run "natural" rate of unemployment in the U.S. before the onset of the current recession—in mid-2008-- was 5.0 percent. If that is the case, then the current unemployment rate should over time decline to the "natural" rate of unemployment. However, it may be the case that the "natural" rate itself may have risen—if the natural rate has risen close to the current rate of unemployment of 9.1 percent, then there is no way to reduce the current rate of unemployment much lower unless it is accompanied by a huge burst of inflation.

The "natural" rate of unemployment rises when there is a fundamental change in the structure of the economy. For example, suppose that previously many construction jobs were available because of the housing boom of 2001-2007. A collapse in the housing sector would eliminate many of these construction jobs. Suppose in turn that the U.S. demand for workers switched to Chinese speaking software engineers. Unless many of these construction workers learn Chinese and computer programming, they would not be able to switch to these newly available jobs. That is, there is "supply-demand" mismatch in jobs arising from the change in the structure of the U.S. economy. An increase in demand stimulated by more active government fiscal and monetary policy will not lower the unemployment rate in this case. Only by retraining the construction workers, so that they can speak Chinese and know how to computer program will the "supply-demand" mismatch problem be alleviated, and the unemployment rate will go down.

Our conclusion is that while the current unemployment rate is indeed high, there is not much evidence that the "mismatch" problem is any more severe in this recession than in previous recessions. The "natural" rate of unemployment probably increased, but slightly, from 5 percent to around 6 percent at most.

2.Key U.S. Labor Market Data.

The U.S. Unemployment Rate.

As mentioned, as of Fall 2011, the U.S. unemployment rate seems stuck at about 9.0 percent. The unemployment rate is defined as total unemployment divided by the total labor force. This rate of 9.0 percent represents a decline from 10.1 percent at the worst of the recession, in the Spring of 2009. During the latest recession, the unemployment rate started to worsen from the Fall of 2006, rapidly deteriorating until the Spring of 2009, then recovering somewhat. The puzzle is why the unemployment rate has been so slow to decline during this latest recession's recovery phase. Since the recovery started, it has been two years and the unemployment rate has hardly budged downwards.

From Chart 1, we can see how quickly the unemployment rate has adjusted downwards after previous recessions. During the recession in the early 2000s, the unemployment rate declined from around 6.5 percent to around 4.5 percent in about three years. During the recession in the early 1990s, the unemployment rate declined from around 8 percent to 5.5 percent in about two years. During the recession in the early 1980s, the unemployment rate declined from 10.5 percent to 7 percent in one year, and then to 4.5 percent in another 3 years. During the mid-1970s recession, the unemployment rate declined from 9 percent to 5.5 percent in four years. During the early 1970s recession, the unemployment rate declined from 6 percent to 4 percent in 3 years. Thus, compared to earlier recessions, the decline in the unemployment rate during this current recession is more gradual.

The U.S. Labor Force Participation Rate.

Another important labor force statistic examined by U.S. policy makers is the labor force participation rate (Chart 2). The labor force participation rate is defined as the total labor force divided by the adult population. Policymakers are particularly concerned with the sharp decline in the labor force

participation rate since 2007. The decline in the labor force participation rate is indicative of workers leaving the labor force entirely, most likely because they are discouraged from ever finding a job. These former workers leave the labor force, many never to return, many consigned to a life of poverty.

The historical patterns in the U.S. labor force participation rates are notable. The U.S. labor force participation rate increased sharply from 1970 to 1995, as large numbers of women and baby boomers born between 1957 and 1966 entered the labor force. The labor force participation rate stabilized between 1995 and 2007, declining sharply thereafter. What is peculiar about the latest recession is the sharp decline in the labor force participation rate. During previous recessions, the labor force participation rate hardly declined at all. It appears that the decline in the participation rate during the current recession is related to an increase in workers becoming discouraged about their labor market prospects and exiting from the labor force.

The U.S. Output Gap.

The U.S. output gap is depicted in Chart 3. The output gap measures how much the current level of output departs from the potential level of output. When the output gap is positive, the economy is above the full employment level of output; that is, the economy is booming. When the output gap is negative, the economy is below its full employment level of output; that is, the economy is in a recession.

During the last recession, the output gap went all the way down to minus 8 percent, lower than the minus 7.8 percent achieved in the last large recession of the early 1980s. While during the early 1980s, the output gap recovered rapidly and turned positive in a few quarters, the output gap during the latest recession is still hovering around minus 8 percent. This slow recovery in the output gap—like the slow recovery in the unemployment rate—signals that recovery from the current recession is unusually slow and far from complete.

The Natural Rate of Unemployment.

Finally, Chart 4 depicts the "natural" rate of unemployment, which essentially is the rate of unemployment that corresponds to the level of unemployment when output is at its potential level, when the output gap is zero. It is the average level of unemployment around which the average level of unemployment fluctuates.When unemployment is above its "natural" rate, then there is likely to be a

recession. When unemployment is below its natural rate, then there is likely to be a boom.

The natural rate of unemployment should be relatively immune to business cycle fluctuations. A change in the natural rate of unemployment reflects underlying structural changes in the economy. For example, from the mid-1960s to the early 1980s, there was a sharp increase in the natural rate of unemployment, driven by the influx of women and baby boomers into the U.S. labor force. As these workers became assimilated into the labor force, the natural rate of unemployment started to decline. The natural rate of unemployment stabilized in the 2000s, but then started to rise during the latest recession. The important question is: Does the recent rise in natural rate of unemployment reflect a structural shift in the economy? That is, has the structure of the U.S. economy changed so that even at full employment, more people are unemployed?

The natural rate of unemployment is also sometimes called the "Non-accelerating Inflation Rate of Unemployment." This is because when the actual unemployment rate is equal to the natural rate, the inflation rate will remain what it is currently. It can be shown that when, say, the Federal Reserve tries to push the unemployment rate below the natural rate, the inflation rate will accelerate. Thus, it is said that the Federal Reserve must not try to push the actual unemployment rate below the natural rate, since then there will be a danger that the inflation rate will become uncontrollable.

The natural rate of unemployment depicted in Chart 4 was constructed by the U.S. Congressional Budget Office (CBO). The CBO estimates the "natural" rate of unemployment from an econometric estimate of a Phillips curve, which is an equation that relates the change in inflation to the unemployment rate and other variables, including changes in productivity trends, oil price shocks, and wage and price controls in effect in the early 1970s. Recall that when the actual unemployment rate is equal to the natural rate of unemployment, the inflation rate is stable. Thus, by econometrically examining the relation between the actual unemployment rate and the actual inflation rate, the "natural" rate of unemployment can be teased out from the data.

Specifically, CBO estimates the natural rate of unemployment for married men--a group with very high and stable labor force attachment during the normal working years and with a low average unemployment rate. It then estimates the natural rate of unemployment for specific age/sex groups on the basis of the observed relationship between each group's unemployment rate and that of married men. The overall natural rate of unemployment is derived from the group-specific rates, so demographic shifts are directly factored into the CBO's estimates.

According to Chart 4, the natural rate of unemployment as estimated by the CBO rose from 5.5 in 1965 to 6.2 percent in 1979. This increase is often attributed to the difficulty of assimilating the large numbers of women and young baby boomers into the labor force during the 1970s. Since the early 1980s, the natural rate rapidly declined to 5.0 percent in 2000. Since the onset of the Great Recession in 2008, the natural rate has ticked upwards to 5.2 percent.

The natural rate estimated by the CBO cannot take into account, large scale structural changes in the economy. While it takes into account demographic shifts such as the entry of women or of young workers into the labor force, the CBO measure cannot take into account shifts that are relatively independent of demographics, but are strongly determined by changes in the economy's industrial structure. For example, it cannot take into account the structural shift in demand from construction workers to computer science engineers, if that demand shift is independent of the workers' age or gender. If because of structural changes in the economy, the real "natural" rate today is now 8 percent instead of the CBO estimated 5.2 percent, then if the Federal Reserve is too aggressive in expanding the money supply to lower the current unemployment rate from 9.0 percent to 8.0 percent, there is the risk that the inflation rate will accelerate. To give further perspective into whether the current high unemployment rate is structural or cyclical, we next turn to an examination of the "Beveridge Curve."

3.The Beveridge Curve and the Mismatch of Workers and Jobs.

Labor markets in the U.S. are characterized by huge flows of labor across different sectors and countries. This is because U.S. workers are highly mobile. American capitalism also entails high degrees of success and failures of firms and many jobs are created and destructed in the process. From a macroeconomic viewpoint, the U.S. labor market is highly efficient in matching workers with jobs, but that matching process takes time, which means that at any point in time, there is a coexistence of vacancies and workers looking for jobs. This relationship between job vacancies and the unemployment rate at a point in time expressed graphically is called the Beveridge curve.

The Beveridge curve is a scatter plot of unemployment rates versus vacancy rates. Chart 5 displays an empirical Beveridge curve, a plot of the civilian unemployment rate (total unemployment divided by the total labor force) and the non-farm vacancy rate, monthly from 2000 to July 2011. The position

on the curve is indicative of where the economy is in the business cycle: Recessions are a time of high unemployment and low vacancies, and booms are a time of low unemployment and high vacancies.

Movements along this curve represent different points in the business cycle. When the economy moves into a recession, vacancies go down and unemployment goes up, causing the equilibrium in the labor market to move down along the curve. On the other hand, as the economy expands, firms hire more workers to expand production, resulting in a decrease in the unemployed.

In addition, to telling us what the unemployment and vacancy rates are in times of recessions and crisis, the location of the Beveridge curve in relation to the origin indicates the overall level of economic efficiency. That is, the location of the Beveridge curve can be interpreted as the intensity of the "reallocation"—the movement of workers from one job to the next, often from one sector to another in the economy. When the Beveridge curve shifts out from the origin, that means that compared to before, a high number of vacancies co-exist with a high number of unemployed. That is, somehow, there is a greater mismatch between those that are unemployed and the jobs that are available.

In perfectly functioning markets, the fact that workers are looking for jobs at the same time as firms are looking for jobs would seem to be an anomaly. Economists attribute this apparent anomaly to frictions in the labor market that prevent the labor market from appropriately allocating workers to firms. These frictions may be geographical mismatches, skill-job mismatches, and industrial mismatches. For example, there may be lots of construction workers looking for jobs, but firms may be looking for nurses. In addition, workers may be spending more time to search for a job, as they are being picky. Such frictions are normal, and we can observe some level of vacancies and unemployment, even in well-functioning labor markets.

Economists are also interested in shifts in the Beveridge curve as a measure of changes in the efficiency of the labor market. Shifts in the Beveridge curve indicates shifts in the changes in the efficiency in the labor market in matching workers to jobs. Changes in the structure of the economy in particular may shift the Beveridge curve. An example may be technological change that creates a gap between the skills needed for a particular job and the skill set of the unemployed. If there is greater mismatch between the skills needed in the economy and the skills that the unemployed can offer, the Beveridge curve will shift outwards.

Going back to Chart 5, there is a visible swing back in the Beveridge curve starting in the first quarter of 2010. That is, both vacancies and the unemployment rate are higher, suggesting that the Beveridge curve may be starting to shift outwards, implying less efficient matching between workers and jobs.

To more formally test whether the Beveridge curve has shifted outwards, we regress the vacancy rate on the unemployment rate, to see if the coefficients have changed during the first quarter of 2010. A regression of the vacancy rate on the unemployment rate yields a statistically significant coefficient of -0.23 on the unemployment rate. Thus, on average during the sample period from 2000 to 2011, the vacancy rate and unemployment rate have a negative relationship.

We performed a Chow test to see if there has been a change in the relationship during the early part of 2010. The Chow test decisively rejects the hypothesis that the coefficients are the same before and after March 2010 or April 2010. Statistically, there appears to have been a definite shift in the Beveridge curve after early 2010.

Part of the shift in the Beveridge curve in early 2010 was due to the increase in vacancies caused by the recruitment of Census workers by the Federal government. We can see that the level of government employment spiked up in April and May of 2010 and pushed the rate of government job openings from 1.8 percent in March to 2.5 percent in May. The Census effect is larger when we take into account the recent reduction in state and local government job openings, as state and local governments cut back their hiring. In any event, a swing back in the Beveridge curve such as that after the first quarter of 2010 is common during the recovery phase of business cycles. As the economy starts recovering, there is a delay in lowering unemployment, even when vacancies expand quickly.

That is, during and after typical U.S. business cycles in the post-war period, the Beveridge curve has tended to shift outwards. One reason may be that although some workers may start filling the job openings, workers that have left the labor force (the so-called 'discouraged' workers) might start looking for a job, thereby belatedly keeping the unemployment rate high even after the recovery.

More on the Mismatch Hypothesis

As mentioned, a more structural reason that the Beveridge curve may have shifted out is the increased mismatch between employers and workers. This hypothesis relies on imbalances in labor supply and demand across industry sectors, geographic areas, or skill groups. Daly, Hobijin, and Valletta (2011) evaluate whether the mismatch hypothesis can explain the shift outward in the Beveridge curve and the high current level of unemployment. The examine labor supply and demand imbalances across industry sectors, states and occupations.[1]

1 Daly, M., B. Hobijin, and R. Valletta (2011), "The Recent Evolution of the Natural Rate of Unemployment," working paper, Federal Reserve Bank of San Francisco.

Employment mismatches will occur with uneven job growth, with some sectors growing and other sectors shrinking. The actual amount of job reallocation can be calculated by the difference in job growth across different sectors. Daly, Hobijn, and Valletta show that:

...the dispersion in employment gains and losses spiked in the most recent recession as a result of severe and unevenly distributed job declines. For example, construction employment declined nearly 25 percent from the start of the recession through the end of 2009 , while health and education jobs grew by 4 percent. Similar to past recessions, job losses were concentrated in cyclically sensitive sectors such as construction and manufacturing. ...As aggregate employment stabilized, the dispersion in employment gains and losses across industries and states returned to pre-recession levels, suggesting very little imbalance in the pace of employment growth in recent months (p. 14).

Thus, the authors argue that mismatch during this recession is no worse than in past recessions. As the economy recovers, the mismatch should decrease as in past recessions.

One unusual factor in the current recession is the sharp reduction in construction employment and the high and persistent level of unemployment, for the construction sector, resulting from the collapse of the housing bubble. The unemployment rate for construction workers is about 20 percent in recent months, compared to 7 to 8 percent between 2003 and 2007. This translates into about 1.25 million unemployed U.S. construction workers. If the construction sector never returns, then perhaps 600,000 to 700,000 construction workers are permanently unemployable. This would mean that structural employment would increase by about 0.4 to 0.5 percentage points, translating into an increase in the post-recession natural rate of unemployment to perhaps between 5.5 and 6.0 percent.

Chart 1: The U.S. Unemployment Rate

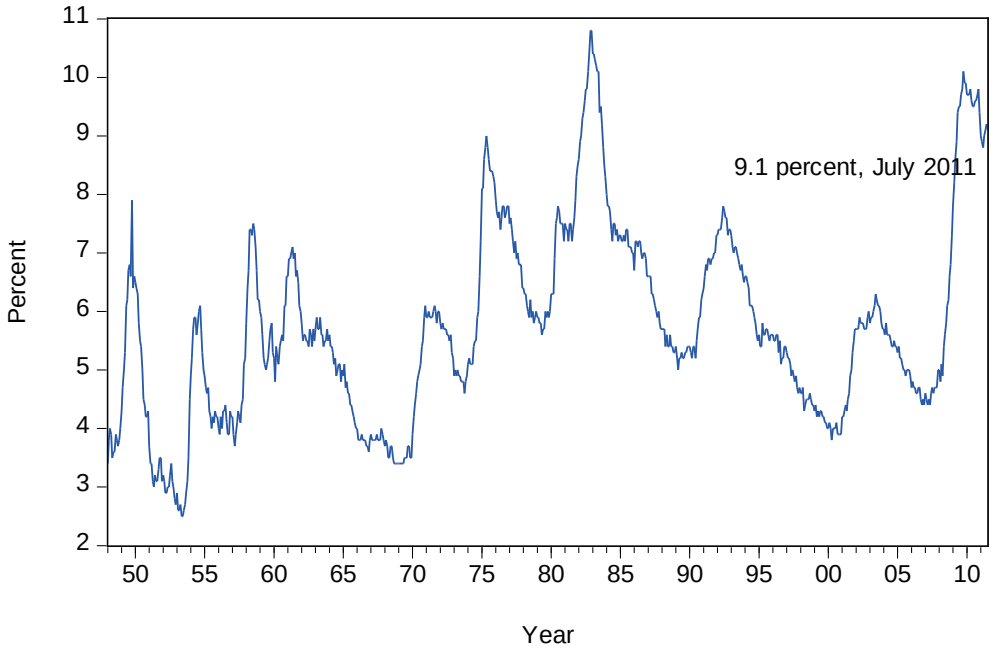

Chart 2: Labor Force Participation Rate

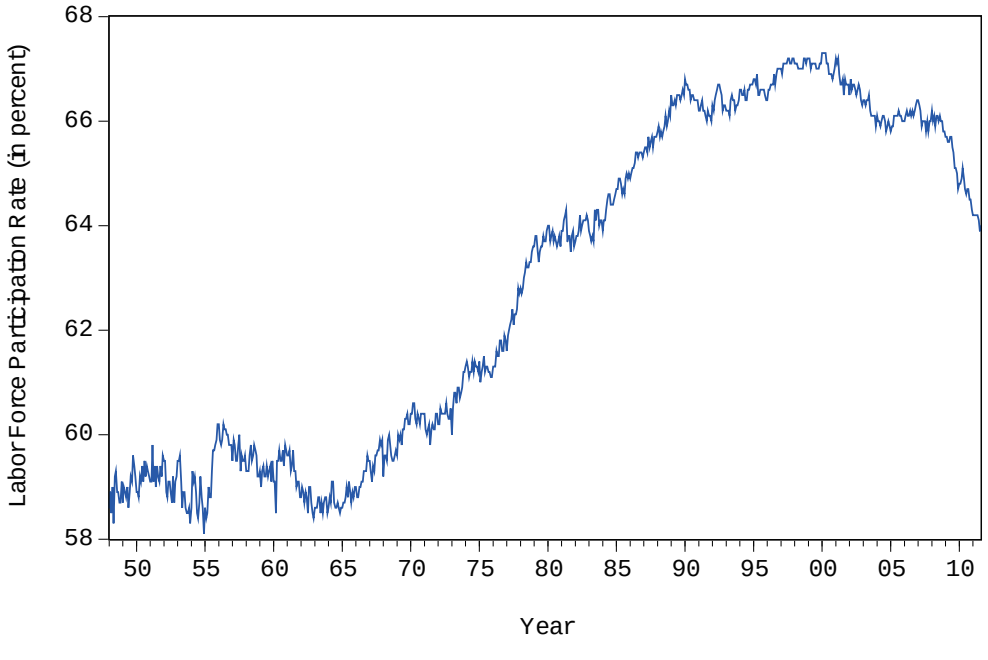

Chart 3: Output Gap

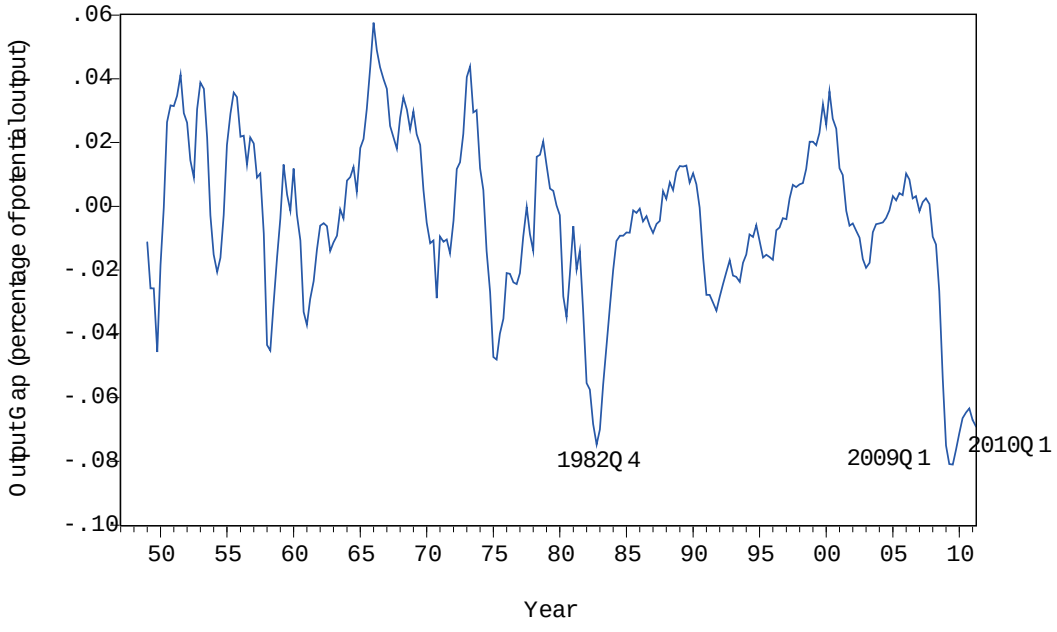

Chart 4: Natural Rate of Unemployment

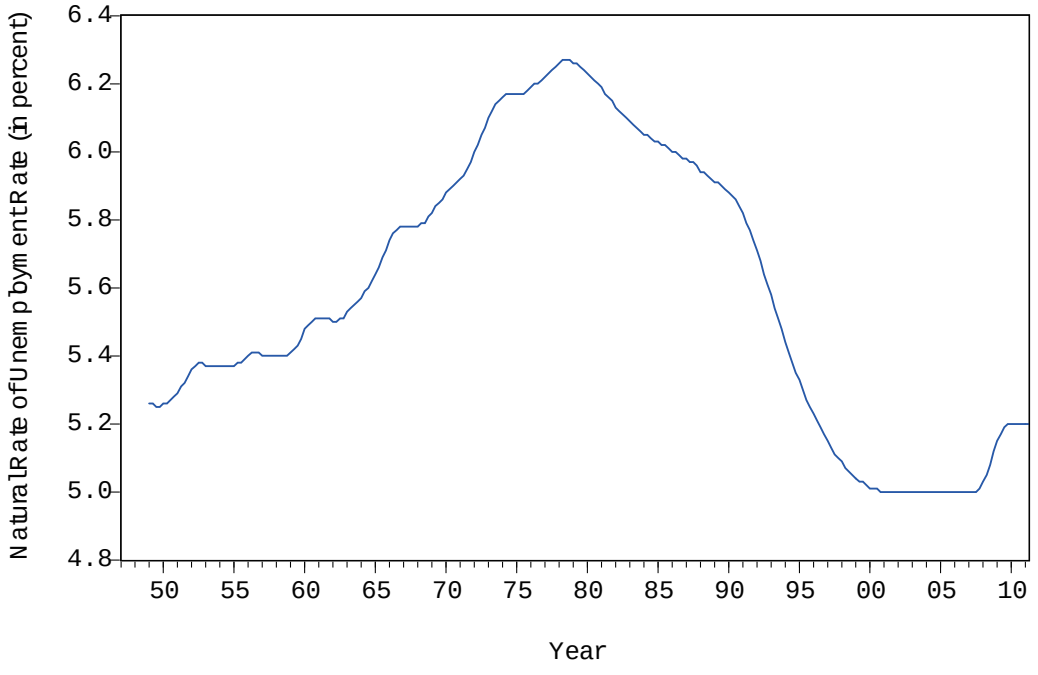

Chart 5: The Beveridge Curve