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Unemployment and Labour Market Transitions in the Czech Republic: Evidence from Micro-data

by

Henrik Huitfeldt*

Abstract:

The Czech labour market performance in early 1990s has widely been regarded as a success story. In particular, the Czech unemployment rate has been one of the lowest in Europe. In this paper we provide a microperspective on the Czech labour market by using data from the Czech labour force survey. We use the panel features of the labour force survey to investigate the determinants of transitions between employment, unemployment, and non-participation. The paper consists of two parts. The first part examines the Czech labour market with respect to unemployment and unemployment duration. In the second part, we make an empirical analysis of the labour market transitions in the Czech Republic.

Keywords: labour market transitions, unemployment, unemployment duration, transition probabilities

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1. Introduction

The Czech labour market performance in the early 1990s has widely been regarded as a success story. In particular, the Czech unemployment rate has been one of the lowest in Europe. For the other countries in the region, Poland, Hungary and Slovakia, the unemployment rate is about ten percentage points higher. During this period, the structure of the Czech labour market has changed dramatically. In the beginning of 1990, employment in the private sector was negligible. Four years later, 1994, about 60 percent of the employed worked in private-owned firms. These changes have been maintained through both a large-scale ownership reform and labour market mobility. The number of employees who 1995 have worked less than five years at the current job is 58 percent of the total employment¹. In Sweden² and Great Britain³ these shares are 45 percent and 50 percent.

Several recent studies have analysed unemployment flows in Central Europe Boeri (1994) surveys labour market dynamics in Central and Eastern Europe. Burda and Lubyova (1995), Boeri and Burda (1995) and Svejnar and Terrell (1994) study differences in labour market dynamics between the Czech and Slovak Republics, using district data on unemployment from the labour offices.

Only a few studies have used micro-data to examine the Czech labour market. Gottwald, Pedersen and Simek (1994) use a sample of 460 unemployed persons in North Moravia. They estimate wage equations and models explaining the duration of unemployment spells and

¹ The Czech labour force survey, the first quarter 1995.

² Computed from the HUS-database (1993).

³ Gregg and Wadsworth (1995)

transitions from unemployment to a new job. Ham, Svejnar and Terrell (1995) use a dataset of unemployed men to analyse the effects of the unemployment compensation system on the duration of unemployment in the Czech and Slovak Republics. All these studies use data on registered unemployed from the local labour offices. A large part of the unemployed does not register in the Czech Republic, however. For international comparisons, data on registered unemployed are thus problematic. An alternative would be to use data from the labour force survey, where the ILO definition on unemployment is utilised.

The purpose of this paper is to examine labour market transitions in the Czech Republic. We have used individual data from the Czech Labour Force Survey, which contains rich information about the Czech labour market. The Czech labour force survey started in 1993 and it includes about 25 000 households every quarter. One-fifth of the sample is changed every quarter. We can thus follow an individual for five subsequent quarters.

The paper consists of two parts. In the first part we examine the Czech labour market with respect to unemployment and unemployment duration. Different data sources are compared and the Czech Republic is highlighted in an international perspective. In the second part, we present an empirical analysis of the labour market transitions in the Czech Republic. First, we compute transition probabilities between unemployment, employment and non-participation for different demographic groups. Differences in unemployment rates among these groups are then analysed in terms of the transition probabilities. We concentrate on differences in behaviour between men and women, and between individuals with different educational level. Second, we estimate multinomial logit equations for transitions out of unemployment, employment and non-participation. In this analysis, we examine the role of other factors which can explain

different transition probabilities between individuals, for example the local unemployment rate, unemployment insurance, elapsed unemployment duration and labour market policy.

2 Basic Facts

2.1. Unemployment Statistics

Two sources for unemployment statistics exist in the Czech Republic: data on registered unemployed from the Labour Offices and a Labour Force Survey. Data on registered unemployed are available from the beginning of the transformation in 1989. Under the former regime, unemployment was officially non-existent and the reported unemployment rate was below one percent until 1991 (see figure 1). The unemployment rate rose to 4 percent in 1991 and it has since then varied between 3 and 4 percent. The second quarter 1993, the Czech Statistical Office initiated a labour force survey. Since the start of the survey, the unemployment rate has been close to 4 percent. That is between 0.5 - 1.0 percentage point higher than the unemployment rate reported by the labour offices.

In 1992, the Czech unemployment insurance system was changed and became fairly restrictive. The potential duration of unemployment compensation is since then only six months. The replacement ratio is 60 percent of the previous wage for the first three months of unemployment and then 50 percent for the remaining three months. An unemployed who has worked a minimum of twelve months within the previous three years and has not received unemployment compensation in the previous six months is eligible for unemployment compensation. A previously unemployed person is re-eligible for unemployment compensation after six months of work. To be eligible for social welfare, when the unemployment insurance

has expired, an unemployed need to stay registered. Besides the unemployment compensation, other advantages are connected with registration at a labour office. A registered unemployed will be entitled to health insurance and he could receive consultation or other services. Labour offices have high demands on the unemployed to accept offered jobs. Every month about two percent of the unemployed loose their compensation from the labour offices because of not being co-operative, that is not accepting a job offer or not visit a labour office with a compulsory two week interval.⁴

The unemployment rate reported by a country's labour offices typically differs from survey statistics on unemployment. The reason is that according to the ILO definition of unemployment used in the labour force surveys, an unemployed has to search for a job and be available to start a job within 14 days. If he works one hour or more during the reference week, he is classified as employed. Not all registered unemployed fulfils these conditions. For example, registered unemployed may not search for a job. An opposite effect appears, when the eligibility to unemployment compensation is so restrictive that not all unemployed people have an incentive to register. The Czech labour force survey includes information if an individual is registered or not. Using these data, we can make a distinction between three different groups of "unemployed" people: **1.** Individuals unemployed according to *both* the survey and the labour offices, **2.** Individuals unemployed *only* in the survey and **3.** People registered as unemployed, but not unemployed according to the survey (and the ILO definition).

⁴ Terrell and Munich (1995)

The first quarter 1995, the unemployment rate for the Czech Republic in the survey was 3.87 percent of the labour force and the corresponding number for registered unemployed was 2.93 percent.⁵ In table 1 we display the relative size for the different subgroups of unemployment. The group of people which does not register, but are unemployed according to the ILO definition, is larger than the group of registered unemployed not searching. In other countries, for example Sweden and Hungary, survey and labour office statistics on unemployment are at the same level⁶.

Table 1. Descriptive statistics of three different groups of unemployed people

	Unemployed according to registration data and survey data.	Unemployed only according to registration data	Unemployed only according to survey data
SIZE (as a percentage of the labour force)	2.34	0.49	1.52
DURATION^a (months)	9.85	10.65	8.60
AGE^b	32.81	32.34	34.05
UI^c (Unemployment Insurance)	0.19	0.20	0
MEN	0.44	0.27	0.51
PRIMARY EDUCATION^c	0.35	0.33	0.27
VOCATIONAL TRAINING^c	0.44	0.42	0.47
SECONDARY EDUCATION^c	0.18	0.23	0.22
UNIVERSITY^c	0.03	0.02	0.09

Source: Calculations from the Czech labour force survey from the Czech Statistical Office.

a. This is the average duration of an incompleted unemployment spell. (The average time that has passed since an unemployed worker ended his last job. New entrants are thus not included in the computation of this measure on average duration.) See further discussion in Section 2.2.

b. Mean

c. Proportion of the total group

⁵ In the labour force survey a quarter is shifted one month backwards, i.e. the first quarter 1995 consists of December 94, January 95 and February 95.

⁶ Another country, with higher survey unemployment rate than registered unemployed is Russia. Russia has also a surprisingly low unemployment rate (OECD (1995b)).

Registered unemployed that do not fulfill the ILO definition of unemployment have a longer duration of unemployment than other unemployed. Studying a survey question why these individuals do not search actively, almost exclusively three reasons are mentioned. They are either sick, at home taking care of children, or they have already found a job, but they are waiting to start it. People unemployed according to survey data, but not registered at a labour office, have an average duration of unemployment that is relatively short. Individuals who loose their unemployment compensation seem to either stay registered without compensation or leave the labour force.

Two possible explanations why survey data show higher unemployment than labour office data could be mentioned. First, the Czech unemployment insurance system is not particularly generous. Unemployed workers could choose not to register, because they are either not eligible to any unemployment compensation or that they think that the compensation is so low, that it does not exceed the effort to register. Another explanation could be that the Czech Republic has a large share of short unemployment spells. Thus, many workers change employers and are unemployed for only a short interval between two employment periods. These workers do not turn up in labour office statistics, but they could be recorded as unemployed in survey statistics.

2.2. Unemployment Duration and Unemployment Inflow

In a steady state with constant unemployment, the unemployment rate can be decomposed into two components: the inflow to unemployment and the average duration of an unemployment

spell.⁷ This relationship is strictly valid only in a steady-state. The inflow must equal the outflow in each time period and the distribution of different unemployment durations must remain constant. Two countries with the same level of unemployment can thus have different levels of inflow to unemployment and different average durations of an unemployment spell. The measure on duration used in this decomposition of unemployment, is the duration of *completed* spells. We need the whole spell length and the inflow rate to calculate the unemployment rate. We can also measure average duration using *incompleted* spells at the time of a survey. That is, using the time the unemployed spent in unemployment, before the survey, as an estimate of average unemployment duration.⁸

In available data on unemployment spells, the "survival" rate⁹ generally increases with the length of a spell.¹⁰ Since the survival rate is calculated for all unemployed combined, they are influenced by the heterogeneity present among the unemployed in their individual chances of leaving unemployment. Persons with a high probability of leaving unemployment will experience a short spell and we will observe a low survival rate for short spell lengths. The opposite will be true for longer spell lengths. Another possible explanation is that individuals are experiencing a decreased likelihood of leaving unemployment over the unemployment spell. Their human capital can depreciate over the spell, or employers may use time in unemployment as a screening device when they employ people. In the last case, we have negative duration dependence of unemployment. In a homogeneous population and with a constant survival rate, the duration of completed and incompleted spells are equal. If the survival rate increases over

⁷ This relationship can be summarised as:

$$U \equiv F \cdot D$$

U is the stock of unemployed, F the inflow (or equivalently the outflow) into (from) unemployment during a particular time period and D the average duration of a spell (see Björklund (1981) for a derivation).

⁸ See Salant (1977) for a discussion of these two measures on unemployment duration.

⁹ The probability of remaining unemployed in a time period, given that he was unemployed last period.

the spell, then the average duration of an incompletd spell will be higher than the average duration of a completed spell.

In the Czech Republic, both data sources on unemployment can be used to compute average duration. From the labour offices, we have information on the inflow to registered unemployment every month. In a steady-state we can compute the average duration of a completed spell, $E(S)_{REG}$, from the decomposition of unemployment. $E(S)_{REG}$ is the number of unemployed in a month divided by the number of new spells starting in the month.

From the labour force survey, we can both get an estimate of the average duration of completed spells, $E(S)$, and the average duration of incompletd spells, $E(T)$. Survey participants answer a question about how long they actively have searched for employment. Using all persons who reported that they have searched for employment for a shorter period than one month, we can compute the inflow to unemployment last month and then derive $E(S)_{SUR}$. We can also compute the average duration of incompletd spells, $E(T)$, at the time of the survey using the same question.

We have three different estimators of average duration, $E(S)_{REG}$, $E(S)_{SUR}$ and $E(T)_{SUR}$. The average duration of unemployment for the different estimators is reported by years in table 2. Note that $E(S)_{REG}$ is shorter than $E(S)_{SUR}$, although registered people on average have a longer duration than those included in the survey. The reason is that persons with unemployment spells starting and ending within the month are not included in the computation of $E(S)_{SUR}$. In

¹⁰ For a study on Czech data, see Ham/Svejnar and Terrell (1995)

$E(S)_{REG}$ all spells starting in the month will be included, regardless if the spell end within the month or not.

Table 2. Average duration of incompletd and completed spells of unemployment
(months)

	$E(S)_{REG}$	$E(S)_{SUR}$	$E(T)_{SUR}$
1991	3.4	-	-
1992	5.1	-	-
1993	4.3	6.0	6.9
1994	5.5	7.1	7.5
1995	5.6	8.9	9.5

Source: Calculations from the Czech labour force survey from the Czech Statistical Office and labour office data from the Czech Ministry of Labour and Social affairs.

In an international comparison, the most reasonable approach is to use $E(S)_{SUR}$. This measure is available for many European countries. If the proportion of spells shorter than one month and the survival rate is the same everywhere, then countries are directly comparable. Labour market characteristics from a number of countries are displayed in table 3. The unemployment rate in the Czech Republic has the lowest unemployment rate among the displayed countries. In figure 2, we have labour markets with high inflow and low average duration, USA, Austria and Denmark in the right low corner. In the left high corner, we have countries with high average duration and low inflow, France, Netherlands and Italy. The Czech Republic is in the left middle together with Switzerland and Norway.

OECD (1995a) argues that the pace of restructuring the last five years in the Czech Republic has been high. Many workers have changed occupations. These large structural changes have not been associated with a high inflow to unemployment, however. How can this paradox be explained? Boeri (1994) introduces "transitional unemployment" as a concept on how the

labour market works in former communist countries. He reviews some stylised facts of labour market dynamics that is shared by most of the Central and Eastern European countries.

Table 3. Unemployment rate, inflow to unemployment, average duration and long-term unemployed (1993)

Country	Unemployment rate ^a	Inflow to unemployment ^b	Average duration of completed spells (months) ^c	Share of long-term unemployed ^d
Czech Republic^e	3.8	0.47	7.0	21.6
Switzerland	4.7	0.38	9.7	20.2
Austria	4.2	1.28	2.4	16.9
Germany	10.0	0.57	11.6	40.3
Norway	5.5	0.45	10.6	27.2
United States	6.2	2.06	2.6	11.7
Sweden	7.9	1.25	5.5	17.2
Netherlands	9.5	0.24	24.9	52.3
Italy	12.0	0.41	16.6	57.7
United Kingdom	9.3	0.67	12.3	42.5
Denmark	10.5	1.75	5.5	25.2
France	12.5	0.34	24.5	34.2
Hungary ^e	10.8	0.55	14.8	41.3
Slovakia ^e	13.7	0.70	16.6	41.6
Russia ^e	7.9	0.79	8.7	23.1
Poland ^e	14.4	0.78	15.3	40.2

Source: OECD (1994b) and the OECD-CCET Labour Market Database 1995/N.2.

a. Unemployment Statistics according to a Labour Force Survey.

b. As a per cent of the population aged 15-64 less the unemployed.

c. Computed as the unemployment rate divided by the inflow rate to unemployment.

d. Unemployed more than 12 months as a per cent of total unemployment.

e. 1994

”The issue is that labour market adjustment in these countries is happening without necessarily involving transition from employment to unemployment and *vice versa*. Most employment reduction in the state sector is accommodated by pushing workers out of the labour force rather than into unemployment. Moreover, the rapid expansion of private sector employment does not necessarily involve large outflows from unemployment, but direct job-to-job shifts and hiring of new entrants into the labour force. ”Transitional unemployment” has all

characteristics of a stagnant pool. The risk of becoming unemployed may not be as high as usually thought, but, once in the pool, it is very difficult to get out.’¹¹

In section three, we will look for evidence on large flows into and out of the labour force and direct flows between different jobs in the Czech Republic.

3. Labour Market Transitions

3.1 Transitions Between Labour Market States

To examine the Czech labour market, we use data from the Czech labour force survey. About 25 000 households have been questioned about their labour market status every quarter since spring 1993. The survey includes information about all individuals in a household. A household stays in the survey for five subsequent quarters. That makes it possible to study labour market transitions between three different labour market states: employment, unemployment and non-participation. Our data set consists of the first two quarters 1995 (Q1: Dec. 94, Jan. 95, Feb. 95, Q2: Mar. - May 95). Altogether about 36 000 individuals, 15 - 64 years, are present in both quarters.

An individual is included in the survey if his dwelling, his flat or house, is sampled. One problem associated with this type of sampling is that individuals moving from a flat or house will fall out of the survey. A study of migration can thus not be done with the Czech labour force survey. If unemployed persons move to a new locality (and maybe to a new employment), these transitions will not be recorded. In our dataset 662 individuals included in

¹¹ Boeri (1994)

the first survey fall out due to attrition, that is less than 2 percent. Unemployed are slightly overrepresented in the attrition, but this problem seems to be a minor one in this dataset.

Table 4. Demographic differences between individuals in different labour market states, first quarter 1995.

	Employment (in % of the population)	Unemployment (in % of the labour force)	Not in the labour force (in % of the population)
All	72.2	3.78	24.5
Sex:			
Men	77.6	3.40	18.7
15-24	58.3	7.31	37.1
25-54	92.5	2.61	4.96
55-64	47.7	2.48	51.1
Women	67.0	4.21	30.1
15-24	51.9	6.10	44.7
25-54	84.9	3.86	11.7
55-64	19.4	3.10	79.9
Education:			
Primary	41.9	8.98	53.8
25-54	75.5	7.72	18.1
Vocational training	80.3	3.66	16.0
25-54	89.4	3.18	7.63
Secondary	78.4	2.53	19.2
25-54	91.7	2.10	6.33
University	90.4	1.18	8.30
25-54	95.6	2.03	3.30

Source: Calculations from the Czech labour force survey from the Czech Statistical Office.

Using the labour force survey we can compute the main characteristics of individuals in the three labour market states (Table 4). The participation rate for all individuals was about 75 percent the first quarter 1995. That is high by EU standards, where the participation rate on average is below 70 percent¹². The main difference is for prime aged men and women. In comparison, Sweden had a non-participation rate for both men and women between 25 and 54 years of about 15 percent (1992). The Czech numbers are here 5.0 and 11.7 percent. The main

¹² OECD (1994b)

reason for not being in the labour force for prime aged individuals are: early retirement pension (50 percent), housekeeping or childcaring (28 percent) and health reasons (14 percent). The participation rate for the oldest age group differs between men and women. One reason for that is different entitlement ages for old-age pensions. The entitlement ages for old-age pensions were 54 for women and 60 for men, but now the whole pension system is under reconstruction.

In table 4, we note that a low proportion of persons with only primary education (8 or 9 years) is employed. This group consists of about 15 percent of the population between 25 and 54 years. The unemployment rate for youth between 20 and 24 years with only primary education is over 25 percent. Women have a higher unemployment rate than men, 4.21 percent compared to 3.40. This difference is even larger for prime-aged workers. Young individuals also have a relatively high unemployment rate.

Transitions between different labour market states can be presented by a transition matrix.

Labour force status in quarter t-1	Labour force status quarter t		
	E_t	U_t	N_t
E_{t-1}	EE	EU	EN
U_{t-1}	UE	UU	UN
N_{t-1}	NE	NU	NN

E is the number of employed, U is the number of unemployed and N is the number of non-participants. The symbols in the cells stand for the number of individuals who are in one labour market state in the quarter t-1 and move to another state in the quarter t or stay in the same state. The number of individuals changing state, divided with the number of persons in the origin state, can be interpreted as an estimate of a transition probability between different

states. These transition probabilities will in the following be denoted as P_{ue} ($=UE/U_{t-1}$), the probability that an individual who is unemployed at time $t-1$ is employed at time t , et cetera. Note that each individual is interviewed only once every quarter and that the labour market activity between the interviews is unknown. An individual that becomes unemployed and obtains a new job within a quarter, will be recorded as employed in both quarters.

In table 5, the transition probabilities are displayed by sex, age and education. A comparison with Swedish data gives that P_{ue} is at the same level in the two countries, but all other transition probabilities are lower in the Czech Republic¹³. We do not record large flows into and out of labour force in the Czech Republic. All four probabilities including non-participation are more than two times lower in the Czech Republic than in Sweden.

Making comparisons between transition probabilities of different demographic groups might expose differences in their labour market behaviour. Women have a higher unemployment rate than men. This could have two different sources: women could have a higher probability of becoming unemployed than men or have a longer average duration of an unemployment spell than men. In a steady state, average unemployment duration can be computed using the transition probabilities as: $D = 1/(P_{ue} + P_{un})$. This measure of average duration is overestimated, because transitions between the interviews are not recorded. Women have almost a 50 percent higher probability of becoming unemployed than men. Their estimated average duration of unemployment is shorter than for men, 2.8 quarters compared to 3.1 quarters. It seems as the reason for the higher female unemployment rate is their higher probability of becoming unemployed.

Table 5. Transition probabilities between the first and second quarter 1995 by sex, age and education for the Czech Republic.

	P_{eu}	P_{en}	P_{ue}	P_{un}	P_{ne}	P_{nu}
All	0.0057	0.0084	0.263	0.0763	0.0225	0.0033
<i>Age</i>						
15-24	0.0097	0.0059	0.264	0.0677	0.0183	0.0027
25-54	0.0049	0.0056	0.273	0.0775	0.0502	0.0086
55-64	0.0045	0.0448	0.130	0.111	0.0130	0.0011
<i>Sex:</i>						
Men	0.0046	0.0061	0.272	0.0535	0.0263	0.0033
15-24	0.0095	0.0059	0.279	0.0349	0.0197	0.0038
25-54	0.0034	0.0033	0.283	0.0609	0.0669	0.0056
55-64	0.0050	0.0307	0.143	0.0857	0.0187	0.0016
Women	0.0069	0.0109	0.255	0.0965	0.0201	0.0032
15-24	0.0100	0.0060	0.246	0.109	0.0172	0.0018
25-54	0.0064	0.0081	0.265	0.0893	0.0433	0.0099
55-64	0.0034	0.0741	0.105	0.158	0.0098	0.0009
<i>Education:</i>						
Primary:25-54	0.0069	0.0081	0.139	0.0509	0.0282	0.0066
Vocational training: 25-54	0.0054	0.0059	0.320	0.0567	0.0565	0.0105
Secondary: 25-54	0.0038	0.0054	0.385	0.169	0.0678	0.0073
University: 25-54	0.0036	0.0023	0.280	0.0800	0.0667	0.0133

Source: Calculations from the Czech labour force survey from the Czech Statistical Office.

This reasoning is only a simplification of how the transition probabilities influence the unemployment rate. For example, the inflow to unemployment influences the unemployment rate not only through the transition probabilities from employment and out of labour force, but also through the relative size of these two states, determined by all other transition probabilities.¹⁴ The unemployment rate can be expressed in terms of the transition probabilities as¹⁵

¹³ Calculations from the Swedish Labour Force Survey (AKU), average for the period: third quarter 1994 - second quarter 1995.

¹⁴ Marston (1976)

¹⁵ In steady state, inflow to employment and unemployment equals outflow and we get the following equations:

$$(i) \quad P_{ue}U + P_{ne}N = (P_{eu} + P_{en})E$$

$$(ii) \quad P_{eu}E + P_{nu}N = (P_{ue} + P_{un})U$$

$$u = \frac{P_{eu} + (1 - P_{ns})P_{en}}{P_{eu} + (1 - P_{ns})P_{en} + P_{ue} + P_{ns}P_{un}} \quad (1)$$

where

$$P_{ns} = \frac{P_{ne}}{P_{ne} + P_{nu}}$$

P_{ns} is the probability of a successful labour market entry. The differences between two group's unemployment rates due to different transition probabilities can be derived by a differentiation of (1).

$$u^{FEMALE} - u^{MALE} = \sum_i \frac{\partial u}{\partial P_i} (P_i^{FEMALE} - P_i^{MALE}), \quad i = en, eu, un, ue, ns^{16} \quad (2)$$

$$\frac{\partial u}{\partial P_{eu}} \text{ and } \frac{\partial u}{\partial P_{en}} > 0, \quad \frac{\partial u}{\partial P_{ue}}, \frac{\partial u}{\partial P_{un}} \text{ and } \frac{\partial u}{\partial P_{ns}} < 0$$

The partial derivatives with respect to P_{eu} and P_{en} have positive signs and the derivatives with respect to P_{ue} , P_{un} and P_{ns} have negative signs. In table 6, the partial differences in unemployment rates due to the five transition probabilities in equation 2 are displayed by sex, age and education. They are reported in percent of the difference in the unemployment rate.

Eliminating N and defining the unemployment rate as, $u = U/(U+E)$ we get equation (1).

¹⁶ Marston (1976) calculates the partial derivatives $\partial u / \partial P_i$ as the weighted sum of the partial derivatives for the

$$\text{two different groups. } \frac{\partial u}{\partial P_i} = \frac{1}{2} \frac{\partial u}{\partial P_i^{FEMALE}} + \frac{1}{2} \frac{\partial u}{\partial P_i^{MALE}}.$$

Table 6. Partial differences in unemployment rates attributable to transition probabilities between states on the labour market by age, sex and education (percent of total difference).

	P_{eu}	P_{en}	P_{ue}	P_{un}	P_{ns}	Total
15-24 minus 25-54	93.4	0.8	4.3	4.1	-2.6	100
Females minus Males	69.9	14.7	7.1	-9.6	17.9	100
Education: Primary minus higher than primary (25-54)	19.9	4.3	61.5	10.0	4.2	100

Source: Calculations from the Czech labour force survey from the Czech Statistical Office.

The comparison between women and men indicates that most of the difference in the unemployment rate is due to women's higher probability of losing employment. Women have also a lower probability of obtaining a job when they enter, perhaps re-enter, the labour market. Women have a lower probability of getting a job once unemployed than men, but this is not a main factor explaining women's higher unemployment rate.

The youngest age group has a higher unemployment rate than prime-aged workers. This difference is mainly due to a higher probability of becoming unemployed for younger workers. Prime-aged persons with low education have a high unemployment rate. The main factor explaining this difference is that they have a low probability of obtaining a job. Two problem-groups on the labour market, young workers and unskilled workers, thus have different reasons for their high unemployment rate.

3.2 The Determinants of Labour Market Transitions

In order to determine which factors are the most important in explaining transitions between labour market states we have estimated multinomiallogit models. In studying the effects of the explanatory variables on specific transitions, we will make use of the logistic probability function. In this framework, the logarithm of the odds that a transition occurs, is a linear

function of the characteristics of the individual. Consider the case of the transitions out of unemployment. The model is then given by:

$$\ln\left(\frac{P_{ue}^i}{P_{uu}^i}\right) = const. + \sum_{j=1}^n \beta_j X_j^i$$

$$\ln\left(\frac{P_{un}^i}{P_{uu}^i}\right) = const. + \sum_{j=1}^n \gamma_j X_j^i$$

where the X_j^i are the j th characteristic for the i th individual and the β s and the γ s measure the effect of the characteristics on the odds of a transition relative to remaining unemployed.

Similar models can be derived for transitions out of employment and into the labour force. The β -and γ - coefficients can be used to derive an estimate of the derivative of a given probability with respect to the individual characteristics, the *marginal effects*. The formula for P_{ue} , for example, is

$$\frac{\partial P_{ue}}{\partial X_j} = P_{ue} (\beta_j - P_{ue} \beta_j - P_{un} \gamma_j)$$

Transitions from unemployment

In a search theoretical framework, the probability of leaving unemployment will be a function of: (i) variables that affect the individual's chances of finding a vacancy (ii) variables that affect the individual's chances of being offered the job and (iii) variables that affect the individual's probability of accepting the job offer. In section 2.2, we noticed that unemployed workers not

registered at a labour office have a shorter average duration. This could perhaps be explained by these group's use of more successful methods of search. In our regression model, we include a dummy variable that takes the value 1 if the unemployed use active methods of search: writing advertisements, visiting companies or use other methods of contact. To account for differences in demand between districts, we use the local unemployment rate. The Czech Republic is divided into 76 different districts, *okres*, and the unemployment rate in December 1994 varied from 0.3 percent in Prague to over 7 percent in some districts in North Moravia. The emphasis on labour market policy differs widely across the republic. To study the effect by labour market policy on the probability of leaving unemployment, we include a variable that measures the number of persons in a district that has a place in a labour market program relative to the size of the labour force in the district.

The probability of leaving unemployment could increase or decrease over the unemployment spell. If the unemployed becomes discouraged and start to search less or if employers use unemployment duration as a screening method, then the probability will decrease. If the unemployed's probability of accepting an offer increases over time, the probability of leaving unemployment will increase. To study this duration dependence, we include a linear duration variable or a set of dummy variables, where we allow the relationship between the transition probabilities and duration to be non-linear. Other included variables are different education levels, age groups and marital status. For a more detailed variable specification, see table A1.

The multinomiallogit results of transitions from unemployment are presented in table A2. In equation U1 and U2, the whole sample are used and U3 and U4 are equations estimated separately for women and men. The most striking result is the strong duration dependence. An unemployed's probability of obtaining a job diminishes fast over the unemployment spell.

These result can be due to negative duration dependence, but also to unobserved heterogeneity among the unemployed. If an unemployed fail to find a job, then he seems to keep on searching. We do not see a large number of discouraged workers leaving unemployment.

Gottwald et al (1994) estimated a probit regression model for transitions from unemployment to a new job for their North Moravian sample. They found that men and younger workers have a higher probability of obtaining a job and that education has a positive effect on transition to employment. Our result do not indicate any significant differences between men and women or between different age groups. The education effect is strong in our sample too, at least for vocational training and secondary school. Gottwald et al use a dummy variable to control for the unemployed's use of other search channels than the local labour offices. They got a positive but insignificant effect for people using other search methods. Our search variable gives a strong result for men, but it is insignificant for women. Men improve their chances of obtaining a job with almost 10 percentage points if they use active methods of search.

Boeri and Burda (1995) examine the effect of active labour market policies on outflow to jobs using a matching function approach. They use district data on expenditures and the number of persons in a labour market program. Both measures of labour market policy have a positive significant effect on flows from unemployment to jobs. Our regression results do not suggest any positive relationship between the number of persons that locally participates in a labour market program and exits to employment. Instead, emphasis on active labour market policy seems to increase flows out of the labour force. In districts with high unemployment, the probability of obtaining a job is lower, but unemployed workers in these districts do not seem to leave the labour force at a higher rate than other unemployed.

A variable that could affect an unemployed's willingness to accept a job offer is the unemployment income. Ham et al (1995) estimates a hazard function for the Czech Republic using a micro-dataset of unemployed men. Their aim is to identify a benefit and an entitlement effect from the unemployment insurance system. The potential duration of benefits in the Czech Republic is six months. They estimate a small negative effect of increasing benefits on unemployment outflows, but their attempt to estimate the effect of changing entitlement is complicated because of the small variation in their data. Their estimated new job hazard rate for male recipients though increases until the unemployment insurance expired and then shifts down to a much lower level.

In our dataset, we have information if an unemployed has unemployment insurance, UI, or not. It is possible to estimate if the probability of obtaining a job changes over the entitlement period. The behaviour close to the end of the entitlement period is particularly interesting. A couple of different specifications is estimated and they are presented in table A3. The fact that not all benefit recipients get unemployment insurance from the first day in unemployment complicates the interpretation of the results. Benefits are delayed because persons with severance pay are not entitled to benefits and other reasons. Interesting enough, we see a strong increase in the exit rate to employment, for persons with unemployment insurance and an unemployment duration in the interval between 7 and 12 months (see U6-8). This is the period when most of the benefit recipients probably will end their entitlement period. In our dataset, the benefit recipients with duration between 7 and 12 months that had not obtained a job, about 75 percent are not recipients in the second quarter, thus their unemployment insurance has expired.

Transitions from employment

Economic theory would suggest that the risk of becoming unemployed will be higher for less skilled workers and for those who have been in their jobs only a short time.¹⁷ The risk of losing employment also increases when demand conditions on the labour market are tighter. The results for the Czech Republic are displayed in table A4. E1 uses the whole sample and E2 and E3 are equations estimated separately for women and men. Job tenure explains a large part of the transitions between employment and unemployment for both men and women. A worker employed longer than one year has an exit probability that is three times lower than a worker employed less than three months. These effects are almost the same for both men and women.

Workers with low education have a higher risk of losing their job. This effect is stronger for men than women. Women leave the labour force at a higher rate early in their labour market career. This is probably the explanation for the strong effect of job tenure for women on the probability of leaving the labour force. The unemployment rate has a strong impact on transitions into unemployment, but not on transitions into non-participation. The latter suggests that labour force exits are not driven by labour market reasons. Persons with only temporary employment are more likely to lose their job and when they leave their job they are also likely to leave the labour force.

A large number of workers have changed occupation or employer in the Czech Republic. Information on workers employed in both quarters in the labour force survey, but with a job tenure at the same employer shorter than three months in the second quarter, can be used to

¹⁷ Stern (1983)

estimate transitions between different jobs. In table 7, we display the transition probabilities for different demographic groups. Job-to-job mobility is almost two times the mobility from employment to unemployment and out of the labour force. Young workers have a higher mobility than older workers and the mobility rate is higher for less educated workers.

Table 7. Transition probabilities for job-to-job mobility

	All	<i>Age: 15-24</i>	<i>Age: 25-54</i>	<i>Age: 55-64</i>	Men	Women
P_{ee}'	0.0241	0.0387	0.0210	0.0235	0.0257	0.0223

	Primary education	Vocational Training	Secondary education	University
P_{ee}'	0.0241	0.0264	0.0225	0.0180

Source: Calculations from the Czech labour force survey, first and second quarters 1995.

We have also estimated a multinomiallogit equation with exits to a new job included (see E4 in table A4). Job tenure explains most of the differences between workers who move between different jobs. The effect of age and education on job-to-job mobility have the same sign as above but the differences are only significant for workers with university education.

Transitions from non-participation

Only few individuals move into and out of the labour force by labour market reasons in the Czech Republic. Most of the flows out of the labour force consist of retirement or individuals leaving the labour force for family or health reasons.¹⁸ Individuals entering the labour force consist of new-graduates and women who re-enter the labour force after a maternity leave. In

the analysis of transitions into the labour force, we exclude old-age pensioners and individuals that already have a job, but are waiting for starting it. Due to the small number of recorded transitions between non-participation and unemployment, these results should be interpreted carefully. The results are displayed in table A5. Persons with low education have a lower probability of obtaining employment. An interesting result is the negative effect from the unemployment rate on the probability of leaving non-participation for employment. Bad labour market conditions do not force people out of the labour force, but it prevents them to re-enter.

4. Conclusions

The objective of this paper has been to examine labour market transitions in the Czech Republic. The main results can be summarised as follows.

- (i) The unemployment rate reported by the labour force survey and labour office statistics differ. The group of unemployed only included in the survey has a lower average duration in unemployment.
- (ii) In an international comparison, the Czech Republic has a low inflow to unemployment and a fairly low average duration of an unemployment spell. The low inflow rate to unemployment does not necessarily imply that the mobility at the Czech labour market is low. Large flows between different jobs, with perhaps a short unemployment period in-between, could change the conclusion.

¹⁸ The Czech labour force survey the second quarter 1995.

(iii) Women are experiencing a higher unemployment rate than men in the Czech Republic.

This is mainly explained by the higher probability for women of losing a job. Persons with low education have a high unemployment rate. This is not due to a high inflow rate. Instead, they have severe problems of getting a job once unemployed.

(iv) The Czech Republic has a labour market, where few people stay unemployed for a long period. But, if an unemployed fail to find a job in the first months after entering unemployment, then the prospect of obtaining a job will deteriorate quickly. The unemployment insurance system seems to have incentive effects on the unemployed.

(v) A large fraction of the employed changes employer. The same groups of workers that experience unemployment move between jobs, that is less educated people and workers with short job tenure. One interpretation of this observation could be that movement between different employers is often made involuntarily.

(vi) Only small flows are recorded including non-participation. Transitions from employment to non-participation are not a major issue in understanding the low Czech unemployment rate.

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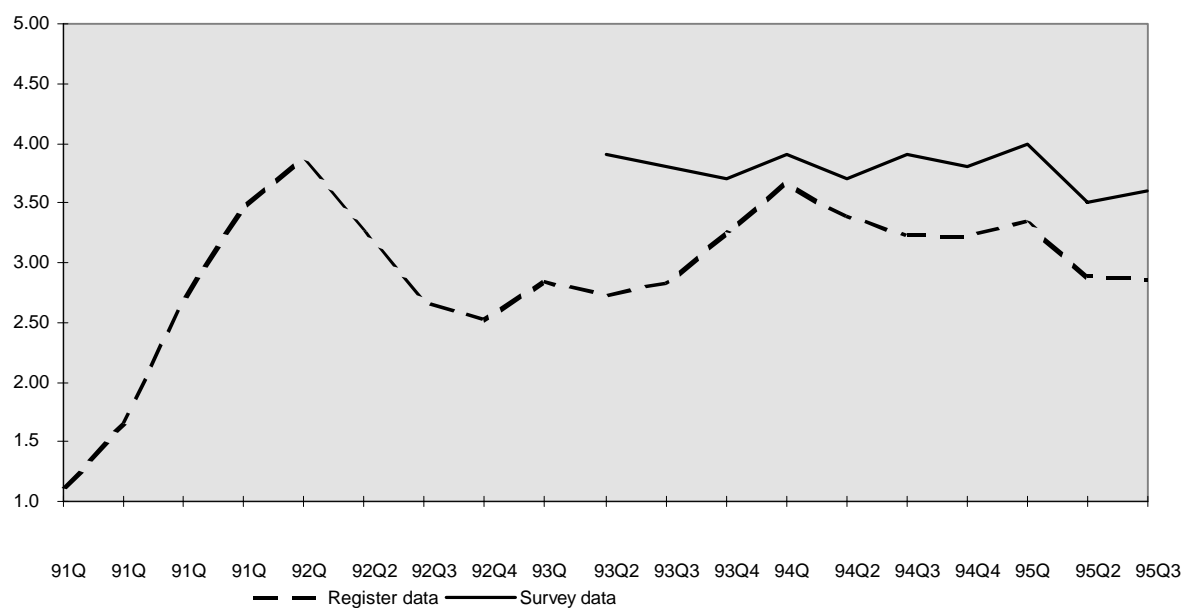
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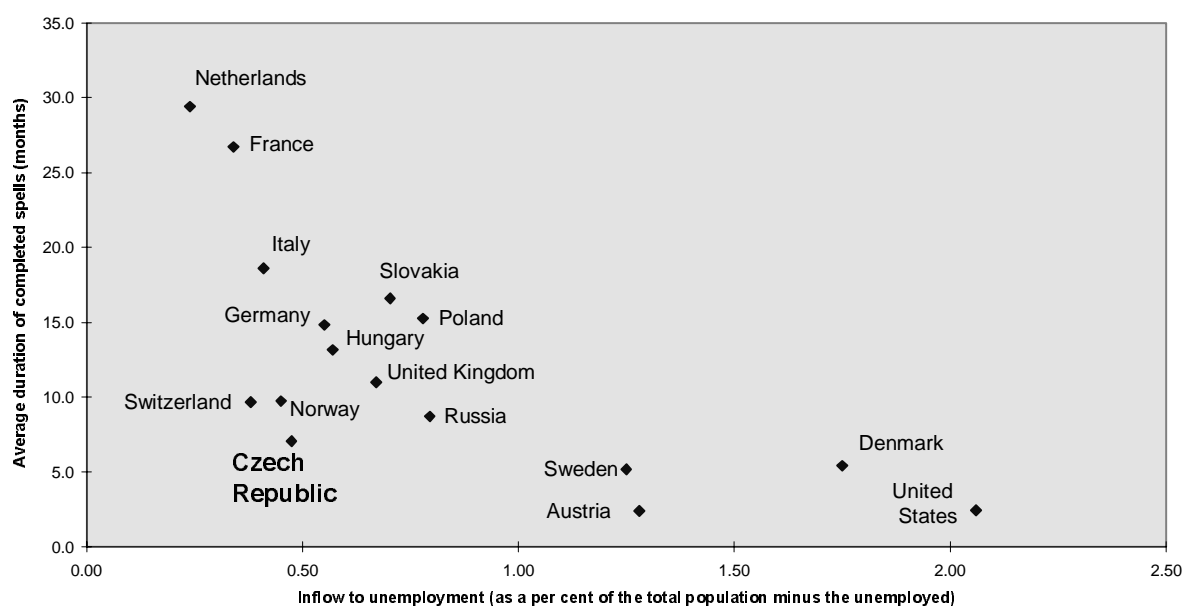
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Figure 1: Unemployment in the Czech Republic



Source: Register data from the Czech Ministry of Labour and Survey data from the Czech Statistical Office.

Figure 2: The Czech Labour Market in an International Perspective



Source: OECD (1994b) and the OECD-CCET Labour Market Database 1995/N.2)

Table A1. Definitions of the variables included in the multinomial logit estimation

- Demographic variables

- MALE (1: Male, 0: Female)
- AGE Five different age dummies: 15-19, 20-24, 25-34, 35-54 and 55-64. The youngest age group is used as a reference group in the regressions
- MARRIED (1: married, 0: not-married, incl. divorced and widow - er)
- EDUCATION Four different education dummies: PRIMARY (8-9 years at school), VOCATIONAL TRAINING (10-12 years), SECONDARY school (12-13 years) and UNIVERSITY.

- Demand variables

- UNEMPLOYMENT RATE The local unemployment rate, by districts (okres), 31.1.95.
- LABOUR MARKET POLICY The number of persons in a labour market program as a fraction of the total labour force, by district, 31.1.95.

- Variables used only in transitions out of unemployment

- DURATION Number of months (years) searching for a job
- SEARCH methods (1: the unemployed is using an active method to find a job (writing advertisements, visiting companies, using contacts or similar methods, 0: otherwise)
- UI (1: The unemployed receives unemployment compensation, 0: otherwise)

- Variables used in transitions out of employment

- JOB TENURE Number of months (years) at the same employer
- PERMANENT (1: the employed has a permanent job, 0: otherwise)
- PART-TIME (1: the employed works only part-time, 0: otherwise)

Table A2. Multinomial logit estimates of transitions from unemployment*

	U1		U2		U3 ^a	U4 ^b
Independent variables	U→E	U→N	U→E	U→N	U→E WOMEN	U→E MEN
VOCATIONAL TRAINING	0.765 ^{***} (0.197) 0.128	0.256 (0.331) 0.00014	0.774 ^{**} (0.198) 0.129	0.254 (0.335) -0.000051	0.907 ^{***} (0.290) 0.158	0.845 ^{***} (0.286) 0.109
SECONDARY	0.883 ^{***} (0.237) 0.126	1.327 ^{***} (0.340) 0.087	0.884 ^{***} (0.239) 0.125	1.326 ^{***} (0.343) 0.086	1.235 ^{***} (0.327) 0.198	0.572 (0.371) 0.014
UNIVERSITY	0.610 (0.440) 0.097	0.630 (0.686) 0.033	0.666 (0.444) 0.107	0.628 (0.690) 0.030	0.593 (0.685) 0.067	0.849 (0.592) 0.178
AGE: 20-24	-0.011 (0.279) -0.0056	0.162 (0.482) 0.012	0.0081 (0.282) -0.00047	0.086 (0.486) 0.0058	-0.563 (0.447) -0.077	0.425 (0.381) 0.043
AGE: 25-34	0.154 (0.270) 0.025	0.117 (0.470) 0.0047	0.160 (0.274) 0.028	-0.0014 (0.475) -0.0035	-0.107 (0.398) 0.0031	0.487 (0.395) 0.035
AGE: 35-54	0.180 (0.262) 0.027	0.218 (0.453) 0.011	0.203 (0.265) 0.032	0.152 (0.455) 0.0060	0.282 (0.386) 0.058	-0.052 (0.383) -0.040
AGE: 55-64	-0.797 (0.491) -0.126	0.389 (0.621) 0.050	-0.793 (0.495) -0.124	0.333 (0.625) 0.044	-1.062 (0.850) -0.140	-0.924 (0.647) -0.159
MARRIED	0.160 (0.181) 0.025	0.150 (0.287) 0.0068	0.155 (0.182) 0.023	0.185 (0.288) 0.0093	-0.154 (0.259) -0.039	0.607 ^{**} (0.274) 0.105
MALE	0.049 (0.158) 0.021	-0.572 ^{**} (0.264) -0.039	0.038 (0.160) 0.019	-0.592 ^{**} (0.266) -0.040	-	-
DURATION	-0.089 ^{***} (0.013) -0.023	-0.030 [*] (0.017) -0.0022	-	-	-	-
DURATION: 2-3 months	-	-	-0.244 (0.234) -0.041	0.016 (0.417) 0.0061	-0.036 (0.358) -0.0064	-0.433 (0.320) -0.068
DURATION: 4-6 months	-	-	-0.527 ^{**} (0.235) -0.081	-0.272 (0.421) -0.0077	-0.174 (0.333) -0.015	-0.927 ^{**} (0.357) -0.148
DURATION: 7-12 months	-	-	-1.053 ^{***} (0.253) -0.157	-0.238 (0.413) 0.0029	-0.842 ^{**} (0.362) -0.114	-1.260 ^{***} (0.372) -0.196
DURATION: 1-2 years	-	-	-1.480 ^{***} (0.300) -0.198	-0.706 (0.484) -0.023	-1.541 ^{***} (0.443) -0.189	-1.382 ^{***} (0.410) -0.201
DURATION: > 2 years	-	-	-2.179 ^{***} (0.440) -0.241	-0.690 (0.539) -0.019	-1.773 ^{***} (0.563) -0.201	-2.870 ^{***} (0.777) -0.286

Table A2. Multinomial logit estimates of transitions from unemployment (cont.)

	U1		U2		U3	U4
Independent variables	U→E	U→N	U→E	U→N	U→E WOMEN	U→E MEN
SEARCH	-	-	0.373 ^{☆☆} (0.158) 0.065	0.047 (0.262) -0.0050	0.156 (0.225) 0.025	0.615 ^{☆☆☆} (0.232) 0.109
UNEMPLOYMENT RATE	-0.082 ^{☆☆} (0.038) -0.021	-0.032 (0.060) -0.0022	-0.084 [☆] (0.044) -0.020	-0.102 (0.071) -0.0069	-0.152 ^{☆☆☆} (0.064) -0.037	-0.045 (0.063) -0.0089
LABOUR MARKET POLICY	-	-	0.00028 (0.054) -0.0029	0.140 ^{☆☆} (0.068) 0.0096	0.049 (0.076) 0.0080	-0.033 (0.078) -0.011
The total number of observations in each flow (The total number of observations)	272 (1035)	79 (1035)	272 (1035)	79 (1035)	140 (549)	132 (486)
Goodness of fit	0.104		0.148		0.101	0.143

* The numbers reported are the log-odds ratio. The base category is staying unemployed. Standard errors are displayed in the parentheses. The marginal effects are in the third row. ^{☆☆☆} indicates that the coefficient is significant at the 1 percent level, ^{☆☆} at the 5 percent level, and [☆] at the 10 percent level.

a. Multinomial logit estimation from unemployment for women. The numbers showed is only for exits to employment.

b. Multinomial logit estimation from unemployment for men. The numbers showed is only for exits to employment.

c. The goodness of fit is calculated as $1 - L_1/L_0$, where L_0 is the value of the likelihood with just the constant and L_1 the value with all the included variables.

Table A3. Multinomial logit estimates of transitions from unemployment*

	U5	U6	U7	U8
Independent variables	U→E	U→E	U→E	U→E
VOCATIONAL TRAINING	0.761 ^{☆☆} (0.198) 0.128	0.748 ^{☆☆} (0.198) 0.125	0.750 ^{☆☆} (0.199) 0.124	0.749 ^{☆☆} (0.199) 0.125
SECONDARY	0.875 ^{☆☆} (0.238) 0.124	0.840 ^{☆☆} (0.239) 0.117	0.839 ^{☆☆} (0.239) 0.117	0.834 ^{☆☆} (0.239) 0.117
UNIVERSITY	0.617 (0.444) 0.099	0.599 (0.444) 0.095	0.595 (0.444) 0.095	0.592 (0.445) 0.095
AGE: 20-24	0.0074 (0.281) -0.00097	0.031 (0.282) 0.0026	0.024 (0.282) 0.0018	0.023 (0.282) 0.0016
AGE: 25-34	0.166 (0.272) 0.029	0.174 (0.273) 0.030	0.177 (0.274) 0.030	0.176 (0.273) 0.030
AGE: 35-54	0.204 (0.264) 0.032	0.189 (0.265) 0.030	0.186 (0.265) 0.029	0.185 (0.265) 0.029
AGE: 55-64	-0.787 (0.493) -0.125	-0.781 (0.494) -0.124	-0.785 (0.494) -0.124	-0.784 (0.494) -0.124
MARRIED	0.164 (0.182) 0.024	0.184 (0.183) 0.027	0.182 (0.183) 0.027	0.183 (0.183) 0.027
MALE	0.065 (0.159) 0.023	0.068 (0.160) 0.024	0.062 (0.160) 0.023	0.062 (0.160) 0.023
DURATION	-0.086 ^{☆☆} (0.013) -0.022	-0.091 ^{☆☆} (0.013) -0.023	-0.090 ^{☆☆} (0.013) -0.023	-0.090 ^{☆☆} (0.013) -0.023
SEARCH	0.371 ^{☆☆} (0.158) 0.065	0.350 ^{☆☆} (0.159) 0.061	0.347 ^{☆☆} (0.159) 0.060	0.347 ^{☆☆} (0.159) 0.060
UNEMPLOYMENT RATE	-0.089 ^{☆☆} (0.044) -0.021	-0.092 ^{☆☆} (0.045) -0.022	-0.093 ^{☆☆} (0.045) -0.022	-0.093 ^{☆☆} (0.045) -0.022
LABOUR MARKET POLICY	0.0012 (0.054) -0.0028	-0.0013 (0.054) -0.0035	-0.00089 (0.054) -0.0034	-0.00070 (0.054) -0.0033
UI	0.224 (0.223) 0.032	-0.038 (0.246) -0.0099	0.117 (0.334) 0.011	-
UI*DURATION 1-3 months	-	-	-	0.152 (0.338) 0.016
UI*DURATION 4-6 months	-	-	-0.305 (0.454) -0.042	-0.185 (0.338) -0.030
UI*DURATION 7-12 months	-	1.456 ^{☆☆} (0.532) 0.255	1.300 ^{☆☆} (0.579) 0.232	1.418 ^{☆☆} (0.489) 0.238
<i>The total number of observations in each flow (The total number of observations)</i>	272 (1035)	79 (1035)	272 (1035)	79 (1035)
<i>Goodness of fit^a</i>	0.0935	0.0981	0.0985	0.0986

* The numbers reported are the log-odds ratio. The base category is staying unemployed. Standard errors are displayed in the parentheses. The marginal effects are in the third row. ^{☆☆} indicates that the coefficient is significant at the 1 percent level, ^{☆☆} at the 5 percent level, and ^{*} at the 10 percent level.

a. The goodness of fit is calculated as $1 - L_1/L_0$, where L_0 is the value of the likelihood with just the constant and L_1 the value with all the included variables.

Table A4: Multinomial logit estimates of transitions from employment*

	E1		E2		E3		E4^a
Independent variables	E→U	E→N	E→U WOMEN	E→N WOMEN	E→U MEN	E→N MEN	E→E'
VOCATIONAL TRAINING	-0.299 (0.230) -0.0017	-0.430 ^{☆☆} (0.179) -0.0035	-0.095 (0.296) -0.00063	-0.289 (0.235) -0.0029	-0.658 [☆] (0.371) -0.0030	-0.489 [☆] (0.296) -0.0030	-0.014 (0.132) -0.00017
SECONDARY	-0.582 ^{☆☆} (0.258) -0.0029	-0.707 ^{☆☆☆} (0.197) -0.0053	-0.578 [☆] (0.333) -0.0035	-0.298 (0.238) -0.0029	-0.526 (0.416) -0.0022	-1.356 ^{☆☆☆} (0.399) -0.0065	-0.154 (0.140) -0.0033
UNIVERSITY	-0.738 [☆] (0.409) -0.0031	-1.669 ^{☆☆☆} (0.408) -0.0077	-0.194 (0.483) 0.0012	-1.992 ^{☆☆☆} (0.734) -0.010	-1.616 ^{☆☆} (0.785) -0.0040	-1.448 ^{☆☆☆} (0.521) -0.0055	-0.369 [☆] (0.194) -0.0073
AGE: 20-24	-0.136 (0.331) -0.00071	-0.374 (0.417) -0.0026	-0.155 (0.471) -0.0010	0.085 (0.634) 0.00090	0.188 (0.504) 0.00090	-0.202 (0.599) -0.0011	0.300 (0.187) 0.0078
AGE: 25-34	-0.107 (0.335) -0.0058	-0.095 (0.385) -0.00075	0.116 (0.444) 0.00076	0.574 (0.577) 0.0069	0.021 (0.548) 0.00012	-0.662 (0.636) -0.0032	0.074 (0.194) 0.0018
AGE: 35-54	-0.120 (0.326) -0.0011	-0.308 (0.373) -0.0024	-0.110 (0.427) -0.00076	0.067 (0.570) 0.00069	-0.017 (0.544) -0.000066	-0.213 (0.568) -0.0013	0.086 (0.190) 0.0021
AGE: 55-64	-0.130 (0.458) -0.00091	2.003 ^{☆☆☆} (0.367) 0.035	-1.312 (0.831) -0.0055	1.767 ^{☆☆☆} (0.580) 0.035	0.419 (0.660) 0.0021	1.745 ^{☆☆☆} (0.561) 0.018	0.268 (0.237) 0.0059
MALE	-0.426 ^{☆☆} (0.172) -0.0024	-0.717 ^{☆☆☆} (0.149) -0.0058	-	-	-	-	0.129 (0.084) 0.0032
MARRIED	-0.480 ^{☆☆} (0.196) -0.0029	0.228 (0.181) 0.0018	-0.494 [☆] (0.260) -0.0037	0.369 (0.230) 0.0035	-0.417 (0.320) -0.0020	0.087 (0.332) 0.00054	-0.149 (0.100) -0.0035
JOB TENURE (months)	-0.0058 ^{☆☆☆} (0.0014) -0.000033	-0.0021 ^{☆☆} (0.00085) -0.000017	-	-	-	-	-0.0073 ^{☆☆☆} (0.00071) -0.00026
JOB TENURE: 1-3 months	-	-	-0.544 (0.533) -0.0030	-0.763 [☆] (0.400) -0.0059	-0.091 (0.518) -0.00041	0.354 (0.858) 0.0025	-
JOB TENURE: 3-6 months	-	-	-0.983 [☆] (0.520) -0.0050	-1.405 ^{☆☆☆} (0.425) -0.0092	-1.905 ^{☆☆☆} (0.716) -0.0049	0.405 (0.815) 0.0030	-
JOB TENURE: 6-12 months	-	-	-1.164 ^{☆☆} (0.511) -0.0060	-1.396 ^{☆☆☆} (0.396) -0.0097	-0.745 (0.507) -0.0029	0.506 (0.793) 0.0038	-
JOB TENURE: 1-3 years	-	-	-1.792 ^{☆☆☆} (0.472) -0.011	-2.009 ^{☆☆☆} (0.366) -0.016	-1.631 ^{☆☆☆} (0.502) -0.0072	-0.0017 (0.767) -0.000057	-
JOB TENURE: 3-5 years	-	-	-1.927 ^{☆☆☆} (0.563) -0.0088	-1.678 ^{☆☆☆} (0.419) -0.012	-2.259 ^{☆☆☆} (0.667) -0.0063	-0.068 (0.825) -0.00035	-
JOB TENURE: > 5 years	-	-	-1.780 ^{☆☆☆} (0.468) -0.014	-1.355 ^{☆☆☆} (0.345) -0.016	-2.405 ^{☆☆☆} (0.558) -0.011	-0.167 (0.778) -0.00091	-

Table A4: Multinomial logit estimates of transitions from employment (cont.)

	E1		E2		E3		E4
Independent variables	E→U	E→N	E→U WOME N	E→N WOMEN	E→U MEN	E→N MEN	E→E'
UNEMPLOYMENT RATE	0.122 ^{***} (0.042) 0.00068	0.027 (0.036) 0.00021	0.095 [*] (0.055) 0.00065	0.046 (0.046) 0.00045	0.142 ^{**} (0.064) 0.00064	-0.011 (0.060) -0.000075	-0.056 ^{**} (0.022) -0.0013
PERMANENT	-	-	-0.208 (0.397) -0.0015	-0.743 ^{**} (0.311) -0.0096	-0.630 [*] (0.382) -0.0035	-0.713 ^{**} (0.343) -0.0052	-
PART-TIME	-	-	0.333 (0.334) 0.0026	0.271 (0.241) 0.0030	-1.455 (1.050) -0.0038	0.398 (0.398) 0.0028	-
<i>The total number of observations in each flow (The total number of observations)</i>	145 (25621)	215 (25621)	83 (12066)	132 (12066)	62 (13555)	83 (13555)	617 (25621)
<i>Goodness of fit^b</i>	0.0708		0.0917		0.1050		0.0501

* The numbers reported are the log-odds ratio. The base category is staying employed. Standard errors are displayed in the parentheses. The marginal effects are in the third row. *** indicates that the coefficient is significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

a. Multinomial logit estimation from employment with four exits: unemployment, non-participation, new job, and the worker has stayed at his old job. The number showed are only for exit to a new job.

b. The goodness of fit is calculated as $1 - L_1/L_0$, where L_0 is the value of the likelihood with just the constant and L_1 the value with all the included variables.

Table A5. Multinomial logit estimates of transitions from non-participation*

	N1	
Independent variables	N→E	N→U
VOCATIONAL TRAINING	0.705 ^{☆☆} (0.331) 0.018	-0.081 (0.561) -0.00046
SECONDARY	0.681 ^{☆☆} (0.301) 0.016	-1.005 (0.744) -0.0035
UNIVERSITY	0.635 (0.598) 0.017	-0.118 (1.141) -0.00060
AGE: 20-24	0.230 (0.360) 0.0048	0.591 (1.011) 0.0033
AGE: 25-34	1.131 ^{☆☆☆} (0.403) 0.033	1.482 (0.964) 0.011
AGE: 35-54	0.840 ^{☆☆} (0.396) 0.022	1.728 ^{☆☆} (0.864) 0.013
AGE: 55-64	-0.340 (0.600) -0.0059	-0.237 (1.291) -0.00089
MARRIED	0.102 (0.314) 0.0019	1.156 (0.768) 0.0053
MALE	0.322 (0.222) 0.0066	0.746 (0.484) 0.0037
UNEMPLOYMENT RATE	-0.143 ^{☆☆☆} (0.053) -0.0030	-0.070 (0.110) -0.00030
<i>The total number of observations in each flow (The total number of observations)</i>	108 (5214)	23 (5214)
<i>Goodness of fit^a</i>	0.0657	

* The numbers reported are the log-odds ratio. The base category is staying unemployed. Standard errors are displayed in the parentheses. The marginal effects are in the third row. ^{☆☆☆} indicates that the coefficient is significant at the 1 percent level, ^{☆☆} at the 5 percent level, and [☆] at the 10 percent level.

a. The goodness of fit is calculated as $1 - L_1/L_0$, where L_0 is the value of the likelihood with just the constant and L_1 the value with all the included variables.