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# UNEMPLOYMENT DURATIONS OF JOB LOSERS IN A LABOR MARKET IN TRANSITION

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## *Abstract*

*Slovakia is one of the Central European countries in transformation from a centralized command system to a decentralized market economy. Along with the transition of the economy came unemployment. Other than before workers who lost their job did not find a new job immediately. This paper studies the labor market position of Slovak job losers. Using data from labor force surveys we analyze exit rates out of unemployment. We find that male, young, higher educated job losers in districts with low unemployment rates have substantially shorter unemployment durations than their counterparts. There is evidence that for some job losers it is very hard to find a new job.*

Keywords: Unemployment durations, Job losers, Transition economy

JEL-codes: C41, J64, J65

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## 1. INTRODUCTION

Since the late 1980s Central and Eastern European countries have economies in transition. Their economies change to adjust the old centralized command system to a new competitive market economy. Along with this economic change the countries adjust their institutional structure. For the labor market this implies that a social security system is set up to cope with the new phenomenon of unemployment. Whereas unemployment in the past did not occur, in the period of transition workers laid off by shrinking firms are not rehired immediately by expanding or newly created firms. Unemployment is especially worrying for job losers, of whom it is not clear whether or not because of the transition process their skills have become obsolete. If the skills of job losers do not match the demand for labor in new economic activities they may become unemployed for a long time.

This paper focuses on the labor market in Slovakia, a small country in Central Europe with about 2 million employed workers. The economic transition in Slovakia started in 1991 when it still was part of Czecho-Slovakia. There was an initial decline of GDP of about 24% between 1991 and 1994 (OECD 1996). The economy rebounded in 1994 with a 5% growth of GDP. Real wages fell sharply in the first years of the transition, with 1994 real wages about 23% below their pre-reform level of 1990. As can be seen in Figure 1 unemployment increased strongly in 1991 from practically zero in the beginning to 400,000 at the end of the year. In the beginning of 1992 there was a decline while there were fluctuations afterwards with the number of unemployed varying between 250,000 and 400,000 and the monthly outflow from unemployment varying between 8 and 10% of the stock of unemployment.

We investigate the labor market position of displaced workers also analyzing possible disincentive effects of social security. Like in other social security systems the Slovak structure of unemployment benefits and unemployment assistance is a compromise of the adequacy to give unemployed workers social protection and the incentives to induce workers to leave unemployment and take a job. Being in transition Slovakia adjusted the rules of the benefit system several times in several ways. In 1992 to increase incentives for unemployed to find a job, eligibility criteria for UI benefits were tightened by cutting the eligibility period by one half and reducing the replacement ratios slightly. In 1995, to increase social protection for some age groups, the UI scheme was loosened by means of softening the eligibility criteria for UI benefits (back to the pre-1992 rules) and prolonging the eligibility period depending on the age of unemployed. Thus, the Slovak government was 'experimenting' with the social security system in search for an optimal balance between incentives and social protection. In addition to this, like other countries in transition, Slovakia faces the problem of displaced workers who may not find a new job easily because their skills do not match new

demand for labor. The combination of low incentives and great difficulties for job losers to find a new job may lead to long unemployment durations for some job losers. In this paper we investigate to what extent this is the case.

As far as labor markets in Western Europe and the United States are concerned a lot of research has been done on the impact of unemployment benefit levels on the exits out of unemployment. Usually, the research is focused on a comparison of unemployment durations of individuals with different levels of unemployment benefits (see Devine and Kiefer (1991) for an overview). There is a wide variety in the characteristics of the studies performed. Some studies deal with the benefit level, other studies also include the duration of the benefits, the distinction between unemployment benefits and unemployment assistance, the difference in behavior between unemployed that collect benefits and others that do not, etcetera. Some studies only consider exits out of unemployment, while other studies take the destination of the exit into account. A lot of the studies conclude that there is a modest effect of benefits on unemployment durations, but the results are not robust (Atkinson and Micklewright (1991), Devine and Kiefer (1993)). Abbring, Van den Berg and Van Ours (1997) study the effect of financial incentives by comparing the unemployment duration of individuals that have been penalized and face a reduction of their benefits with similar individuals that have not been penalized. They find that benefit sanctions have a positive effect on individual transition rates from unemployment to a job. Alternatively, the effect of financial incentives is studied by means of social experiments. Meyer (1995) gives an overview of evaluations of unemployment insurance reforms in the United States, many of which have had an experimental nature. The unemployment insurance experiments mainly concern cash bonuses and job search programs. From the bonus experiments it appears that economic incentives do affect the speed with which unemployed workers leave unemployment, i.e. reduce the duration of unemployment. Job search experiments also have positive effects: they reduce the receipt of unemployment benefits, increase earnings after unemployment and have benefits that exceed costs.

So far, not a lot of research has been done on the incentive and disincentive effects of the Eastern-European benefit systems with respect to transitions from unemployment to a job. Lubyova and Van Ours (1997) examine the effect of unemployment insurance reforms on the exit rates from unemployment. The tightening and subsequent loosening reforms of unemployment insurance in the first half of the 1990s has not influenced re-employment probabilities very much. Instead, the alternative exit state - out of labor force - seems to be more sensitive to the changes. Furthermore, they find that the exit rate from unemployment to a regular job is lower for females and low educated workers, while the age of the workers has no effect on this exit rate. Micklewright and Nagy (1995 and 1996) do similar studies on the effect of the 1993 reform in Hungary. They conclude that this

reform did not have a big effect on the outflow from unemployment. Apart from that they find that the exit rate out of unemployment rises with education and falls with age. In his analysis for Slovenia Vodopivec (1995) concludes that although the unemployment exit rate to employment increases just before the potential exhaustion of benefits and decreases after the exhaustion of the benefits, the overall effect on the outflow from unemployment was small. Earle and Pauna (1996) do a similar analysis for Romania. Ham, Svejnar and Terrell (1996) analyze micro data to investigate the incentive effects of the unemployment compensation system of Czecho-Slovakia before the split-up of the two countries in 1993. They find that unemployment benefits have a moderate to small effect on the duration of unemployment. Furthermore, they find that older workers, low educated workers, gypsies and handicapped have longer unemployment durations than other workers. Lubyova and Van Ours (1998) investigate possible disincentive effects of the Slovak benefit system on exits from unemployment provided by unemployment insurance and social assistance benefits. They find no indications of significant disincentive effects. They also find that single unemployed, highly educated unemployed and unemployed living in Bratislava have higher exit rates both to a job and to out of the labor force. The characteristic with a distinctly different effect on both exit rates is the previous labor market position. Unemployed workers coming from a job appear to have a higher exit rate to a job and a lower exit rate to out of the labor force.

In labor markets in transition it is very important to have skills that match with newly established economic activities. For a lot of workers this implies that they have to acquire new skills, adjust to other working methods, change jobs to new firms or other economic sectors, etcetera. For those workers who become unemployed it may not be easy to find a new job. The main purpose of this paper is to study the labor market position of these job losers and investigate whether or not they face big problems in leaving unemployment. We extend the analysis in Lubyova and Van Ours (1998) by distinguishing between job losers and unemployed school leavers and allowing for unobserved characteristics to affect the unemployment exit process. We also investigate the incentive/disincentive effects of the Slovak unemployment benefit system. The system of benefits has a complex structure with unemployment benefits, social assistance and family support as its main components. All in all, the benefit system seems to have some serious disincentive effects since for some groups of unemployed the replacement ratio is 100%. However, it is not clear that the potential disincentive effects actually discourage workers in the search and job acceptance behavior to the extent that they are reluctant to leave unemployment and go back to work. It may be that job losers do not take current disincentive effects into account because they evaluate their current position from a lifetime perspective. If so, they are more interested in a future labor market career with the prospect of eventually getting into a high wage job.

Even if there is no direct instantaneous gain from accepting a job there may be a long-term gain if workers move up the job ladder. Furthermore, job losers may find that there is a lot of uncertainty about the sustainability of the benefit system. Even though the current incentives may be small, the position of unemployed may deteriorate in the future. If the long-term perspective dominates short-term considerations then current disincentive effects do not matter. Therefore, to answer the question whether or not there are serious disincentive effects related to the Slovak benefit system we have to study differences in the unemployment exit behavior of workers with different work (dis) incentives. That is what this paper does. We analyze information about unemployment durations of Slovak job losers collected in the quarterly labor force surveys of 1994-1996.

The paper is set up as follows. In section 2 we provide stylized facts about recent developments in Slovak unemployment and the Slovak benefit system. In section 3 we discuss our data and our statistical model. In section 4 we present our estimation results. Section 5 concludes.

## **2. UNEMPLOYMENT AND UNEMPLOYMENT BENEFITS**

The Slovak Republic has a well-educated labor force. In 1994 only 14% of the Slovak labor force had primary or less education, 74% had secondary education and 12% had a high education (OECD 1996). Furthermore, participation rates are high. The participation rate of males was 83% and of females 71%. Wages rise with educational level, but the increase is not very big. In the first quarter of 1994 the average hourly salary of a worker with primary or less education was 30.4 Sk (Slovak crowns). A worker with secondary vocational training earned 35.4 Sk, an academic worker earned 43.7 Sk. So, the difference in salary between a worker without education and an academic worker is less than 50%.

There are big differences with respect to the extent to which Slovak workers are confronted with unemployment. In 1994 the unemployment rate of workers aged 15-24 was 29%, for workers aged 25-49 it was 12%, while for the age group 50-59 it was 8%. The duration of unemployment is also different for different age groups. For unemployed between 25-29 years 50% was unemployed for more than 1 year, which was 61% for workers between 50-59 years. So, unemployment rates decrease with age, but long-term unemployment is more severe among older workers. This indicates that the high unemployment rate of young workers is caused by bigger inflow rates and not by smaller outflow rates from unemployment. Furthermore, there are big differences between educational categories with unemployment rates being lower for higher educated workers: The unemployment rate of workers with basic or no education was 28%, while for academics it was 3%. In the fourth quarter of 1994 the

elapsed duration of unemployment was more than 1 year for 64% of the unemployed with primary or less education. For workers with academic education this was 29%. Since both unemployment rates and unemployment duration decrease with educational level the exit rates out of unemployment probably increase with the educational level of the worker (Lubyova and Van Ours (1997, 1998) confirm this). Finally, there are big differences between regions, with the unemployment rate of 4% in Bratislava being the lowest and rates of 25-30% in the Eastern parts of Slovakia being the highest.

The system of unemployment benefits in the Slovak Republic has been discussed elsewhere (for a detailed description of institutions we refer the reader to OECD (1996)). Therefore, we restrict ourselves to a summary of the key features of the system as it was in 1994.

Workers who lost their job were entitled to unemployment benefits if they were registered at the labor office and had 12 months of work experience during the previous 3 years. The entitlement period lasted 6 months. During the first 3 months of their unemployment workers received 60% of their average net earnings during the last quarter of employment and 50% during the second 3 months. The maximum benefit was set at 150% of the minimum wage. In 1995 the entitlement period was made dependent on the age of the worker. Since January 1, 1995 workers are entitled to 6 months of benefits if they are younger than 30 years. Workers 30-45 years old are entitled to 8 months of unemployment benefits, workers 45-50 years old to 9 months and workers over 50 years are entitled to 12 months of unemployment benefits. The level of the benefits was 60% of the previous wage in the first 3 months and 50% in the remaining entitlement period<sup>3</sup>.

Unemployed who exhaust their unemployment benefits eligibility or who are not eligible for unemployment benefits or whose household income does not reach the minimum guaranteed income while collecting unemployment benefits are entitled to social assistance benefits. These benefits are in principle available for anyone who is socially deprived. Eligibility is based on a means test and a benefit is only given when the household income is below the minimum living standard. The structure of social assistance benefits is the same for unemployed and others. There is, however, one distinction for the unemployed: they are required to register at the labor office. This may induce persons who cannot or do not want to work for various reasons (except the officially recognized reasons like full-time study, retirement or disability) to register themselves at the labor office in order to be eligible for some kind of benefits.

The means test is related to the household income rather than to the individual income. This makes household income and household composition significant factors in the analysis of disincentive effects of social assistance benefits. Therefore, it is not

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<sup>3</sup> As will be discussed in section 3 we use inflow-into-unemployment data from 1994 and 1995.

possible to judge one's disincentives simply by comparing his or her potential labor income to the income from unemployment insurance or social assistance. Rather, one has to take into consideration the income position of the whole household, also because the individuals' eligibility for social assistance is derived from the household income.

Every household is entitled to the minimum guaranteed income denoted as the Minimum Living Standard (MLS)<sup>4</sup>. In case the household income from employment and other activities (including income from social insurance schemes) does not reach this level, the person is brought to this level by social assistance benefits. The MLS is determined by law and consists of two components: a household allowance and a personal allowance. The household allowance depends solely on the number of household members. In 1994 the household allowance was 630 Sk for a 1-person household, 810 Sk for a 2 persons household, 1000 Sk for a 3-4 persons household and 1190 Sk for a household with 5 or more persons. The personal allowance depends on the age of persons. In 1994 the allowance for a child up to 6 years of age was 1010 Sk, while for a child above 14 years it was 1460 Sk and for an adult it was 1350 Sk. The household allowance and personal allowances for individual household members are added up in order to determine appropriate MLS for the particular household. So, in 1994 a 1 person household had a MLS of 1980 Sk, while a 2 adults - 2 children below 7 years household had a MLS of 4710.

The income threshold capturing potential disincentives to work for a one-member household in 1994 was about 2450 Sk per month, the level of the gross minimum wage (which was 34% of the average wage). If in 1994 an unemployed single on social assistance benefits accepted a minimum wage job, his or her net monthly income increased by only 10%. Under these conditions, low-skilled workers and young workers with lower education who tend to stay at the lower tail of the wage distribution had hardly any incentive to accept a job. For members of households consisting of two adults the replacement ratio in case of a minimum wage job was about 80%. As soon as children are involved the replacement ratio for minimum wage jobs was 100%. Even for average wage jobs the replacement ratio for adults with children and unemployment benefits was no less than about 80%. After transfer to the social assistance benefits their replacement ratio was about 50-60% (for more details see Lubyova and Van Ours (1998)). All in all, it is clear that in the short run a lot of Slovak unemployed did not have big financial incentives to accept a job.

### **3. DATA AND STATISTICAL MODEL**

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<sup>4</sup> The MLS was introduced in 1991 and has been increased several times since then.



### 3.1 Data

In our analysis we use information from twelve subsequent waves of the quarterly Slovak Labor Force Survey (LFS) of the period 1994-1996. In each quarter, the LFS sample consists of approximately 10.000 households (which represent about 1% of all Slovak households), or 30.000 individuals. The survey is performed with 20% rotation. Therefore, we can trace individuals for utmost five subsequent quarters. For each unemployed we check his or her status in the subsequent quarters. We allow for three mutually exclusive states: unemployment, employment and out-of-labor force (OLF). From these three states we derive whether for an unemployed individual between two subsequent quarters there occurred no transition from unemployment, a transition from unemployment to job or a transition from unemployment to OLF. The labor force surveys contains information about personal characteristics but unfortunately not about wages earned on the previous job. Information about benefits is poor since there are many missing observations.

We merged information from the LFS samples by personal identification numbers. We selected those persons who became unemployed in 1994 or 1995 and used information about their labor market position until the end of 1996. We also selected those who entered the sample as unemployed if they responded that they had been unemployed (actively seeking a job) for less than three months. In this way we obtained an inflow sample consisting of all persons who entered unemployment during 1994 and 1995. The total inflow consists of 2153 individuals, of which 1196 are males and 957 are females. Appendix 1 contains details about our dataset. Table A1 shows that about 70% of the total inflow into unemployment was due to workers who lost their job and 25% was due to young people entering the labor market after they left school. The remaining 5% mainly consist of females re-entering the labor force after maternity leave or a period of child-care. There are obvious fluctuations in the inflow into unemployment with peaks in the first quarters of the years. The inflow of school leavers has the expected peak in the third quarter. Table A2 presents information about the duration of unemployment. The duration of a spell of unemployment is defined as the period of time elapsed between the quarters of inflow into and outflow from unemployment. As indicated before, we cannot trace individuals for more than five subsequent quarters. Therefore, the unemployment spells that were not completed by an exit to employment or OLF up to the fifth quarter of their duration are censored at that length. The right censoring is also due to sample attrition between subsequent quarters or at the end of the observation period (end of 1996). As shown in Table A2 there are many censored observations. In the sample of job losers 60% of unemployment spells is censored, 35% ends in a job and 5% ends in a transition to out of the labor force. Unemployment spells of school leavers are also

censored for about 65%, while 25% ends in a job and 10% in a transition to out of the labor force.

### 3.2 Preliminary analysis

To get a first idea about the dynamics of Slovak unemployment we use the data to estimate a simple competing risk model, without explanatory variables, but with separate hazard rates to a job ( $\theta_J$ ) and to out of the labor force ( $\theta_L$ ). The density of completed unemployment durations  $f(t)$  is:

$$f(t) = (\theta_J(t) + \theta_L(t)) \cdot \exp\left[-\int_0^t (\theta_J(s) + \theta_L(s)) ds\right] \quad (1)$$

where  $t$  is the completed duration of an unemployment spell.

We do not have exact information about the length of the unemployment spell, but we know the spells by quarterly intervals. So, we know whether the completed unemployment spell was smaller than 1 quarter, 1-2 quarters, 2-3 quarters, 3-4 quarters, 4-5 quarters. Since we want to get an impression about the pattern of duration dependence we allow the hazard rates to differ between these duration intervals, while they are assumed to be constant within the intervals. Because we do not know the exact length of the unemployment spell we have to integrate the density function over the duration intervals.

We observe three types of spells: spells that end in a job, spells that end in a transition to out of the labor force and spells that are censored, either because of (voluntary or forced due to the set-up of the sample) attrition or because the worker was still unemployed at the date of the survey in the fourth quarter of 1996.

The log likelihood consists of three parts. The first part is the contribution of spells ending in a job:

$$\text{Log}L_1(t) = \text{Log}(\theta_J(t) / (\theta_J(t) + \theta_L(t))) + \text{Log}[(F(t) - F(t-1))] \quad (2)$$

where  $t = 1, \dots, 5$  is a discrete variable indicating the quarterly interval in which the spell ended and  $F(t)$  is the distribution function of  $f(t)$ . The second part is the contribution of spells ending in out of the labor force:

$$\text{Log}L_2(t) = \text{Log}(\theta_L(t) / (\theta_J(t) + \theta_L(t))) + \text{Log}[(F(t) - F(t-1))] \quad (3)$$

The third part is the contribution of the censored spells:

$$\text{Log}L_3(t) = \text{Log}(1 - F(t)) \quad (4)$$

The log likelihood is the sum of the three parts in (2), (3) and (4) for all the observations in our sample:

$$\text{Log}L(t) = \sum_i \{d_{Ji} \cdot \text{Log}L_1(t) + d_{Li} \cdot \text{Log}L_2(t) + (1 - d_{Ji} - d_{Li}) \cdot \text{Log}L_3(t)\} \quad (5)$$

where  $d_{Ji} = 1$  for individual  $i$  of which the unemployment spell ended in a job and  $d_{Ji} = 0$  otherwise, while  $d_{Li} = 1$  if the spell of individual  $i$  ended in out of the labor force and  $d_{Li} = 0$  otherwise. We estimated the parameters of the model and the models below using the method of maximum likelihood. Table 1 shows the estimation results. It appears that for job losers the hazard rate to a job is larger in the first two quarters than it is afterwards. The same holds for the hazard rate to out of the labor force, but this hazard rate is much smaller than the first one. For school leavers the hazard rate increases after the first quarter and is about constant in rest of the first year. The hazard rate to out of the labor force is smaller than the hazard rate to out of a job, but larger than the hazard rate to out of the labor force of the job losers. The overall survival rates of job losers and school leavers are very much the same. After 1 quarter 80% is still unemployed, after two quarters 65%, after three quarters 55% and after 1 year 50%.

### 3.3 Mixed proportional hazard model

The estimates in Table 1 give information about Slovak unemployment dynamics, but do not reveal the determinants of the exit rates out of unemployment, nor do they give information about whether the decline in the exit rates is due to true or spurious duration dependence because of the possible effect of unobserved heterogeneity.

We use a mixed proportional hazard model with a flexible baseline hazard (see Lancaster (1990) for an overview of models of transition data). As in the previous subsection the hazard rate is assumed to be constant within time intervals but is allowed to differ between time intervals. The specification of the transition rate from unemployment to destination  $j$  at time  $t$  conditional on observed characteristics  $x$  and unobserved characteristics  $v_j$  is as follows:

$$\theta_j(t|x, v_j) = \exp(\beta_j'x + \sum_k \lambda_{kj} \cdot I_k(t) + v_j) \quad (6)$$

where  $j = J, L$  refers to both possible destinations. Furthermore  $I_k$ ,  $k=1, \dots, 5$  are time-varying dummy variables such that  $I_k=1$  in interval  $k$  and  $I_k=0$  otherwise. Finally,  $\beta_j$  and  $\lambda_{1j}, \dots, \lambda_{5j}$  are destination specific parameters to be estimated.

The duration dependency coefficients indicate whether or not conditional on the explanatory variables the exit rate changes over the duration of unemployment. These changes may occur because of employers' behavior, workers' behavior or a combination of both. If employers prefer short-term unemployed to long term unemployed then the exit rate to a job declines over the duration of unemployment. If the unemployed worker is discouraged by remaining unemployed and lowers his or her search intensity the exit rate will also decline. It may also be that the rules of the benefit system influence the exit rate.

Unemployed may be more inclined to leave unemployment when their benefit drops or even expires. In this case there is no continuous change in the exit rate but a sudden jump. It may also be that unemployed anticipate the future drop in their benefit. In that case the exit rate may increase continuously (Mortensen (1990)). So, from the pattern of duration dependence we may get information about the effect of financial incentives, which change over the duration of unemployment.<sup>5</sup>

The density of  $t$  conditional on  $x$  and  $v_j$  is:

$$f(t|x, v_j) = \sum_j \theta_j(t_j|x, v_j) \cdot \exp[-\int_0^t \sum_j \theta_j(t_j|x, v_j) ds] \quad (7)$$

The density of  $t$  conditional on  $x$  can be found by integrating  $v_j$  out:

$$f(t|x) = \int_{v_J} \int_{v_L} f(t|x, v_j) dG(v_J, v_L) \quad (8)$$

where  $G$  denotes the joint distribution of  $v_J$  and  $v_L$  in the inflow into unemployment. We assume  $G$  to be a discrete distribution of unobserved heterogeneity with four points of support  $(v^a_J, v^a_L)$ ,  $(v^b_J, v^a_L)$ ,  $(v^a_J, v^b_L)$ ,  $(v^b_J, v^b_L)$ . The associated probabilities are denoted as follows:

$$\begin{aligned} \Pr(v_J = v^a_J, v_L = v^a_L) &= p_1 & \Pr(v_J = v^b_J, v_L = v^a_L) &= p_2 \\ \Pr(v_J = v^a_J, v_L = v^b_L) &= p_3 & \Pr(v_J = v^b_J, v_L = v^b_L) &= p_4 \end{aligned} \quad (9)$$

where  $0 \leq p_l \leq 1$  for  $l=1, \dots, 4$  and  $p_4 = 1 - p_1 - p_2 - p_3$ .

Some of the explanatory variables  $x$  are related to the labor market position of the individuals, i.e. the availability of vacant jobs. Other variables are related to the benefit system. We found that direct information on the benefit of the worker is either unavailable or unreliable. We consider the following explanatory variables to have a possible effect on the transition from unemployment to a job (See appendix 2 for a definition of the variables and some summary statistics). The *age* of the worker, that may reflect the labor market position, can be important. Older workers may have more difficulties in finding a new job since his or her skills are more likely to be obsolete. In previous empirical studies of Slovak unemployment age was not found to be very important. However, in this paper we focus on job losers instead of all unemployed, so we may find different results. The *sex* of the worker is found to be important in previous studies. This variable probably represents the labor market positions to the extent that males are coming from different industries or

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<sup>5</sup> As indicated in the previous section for workers older than 30 years the rules of the Slovak unemployment benefit system changed in 1995. For these workers the length of the entitlement period was increased. If the exit rate would be related to the length of the entitlement period we would have to account for these changes. We did this as part of the sensitivity analysis of which the results are discussed at the end of this section.

segments of the labor market than females. The *marital status* of the worker may be important because of supply side considerations. Single workers may be more mobile so they are easier to accept job offers. On the other hand married workers may be inclined to search more intensive since they feel responsibility to increase family income. The *education* of the worker represents the labor market position. As indicated before especially low educated workers are inclined to stay long term unemployed. The *presence of children* may affect search behavior of unemployed workers because they may limit the range of jobs for example in terms of working hours that an unemployed worker finds acceptable. The *minimum living standard* that applies to the family of the unemployed worker is an indicator of the financial incentives that the worker has to accept a job. Of course the MLS only applies if the worker collects unemployment assistance. Conditional on the wage offered the higher the MLS the smaller the financial incentive of the worker on unemployment assistance. Finally, the *district unemployment rate* is an indicator of local labor market conditions. We expect that in districts with a high unemployment rate, workers on average need more time to find a job. As far as the exits from unemployment to out of the labor force are concerned we have no particular expectations about the way the explanatory variables have an effect. We will investigate the possible effect of all the variables mentioned here.

## **4. ESTIMATION RESULTS**

### **4.1 Parameter estimates**

We started the analysis by estimating a single risk model, in which there is no distinction between exit states. Then the discrete distribution of unobserved heterogeneity has two points of support  $v^a$  and  $v^b$  with  $\text{Prob}(v=v^a)=p$  and  $\text{Prob}(v=v^b)=1-p$ . The results are shown in Table 2. The first column shows the estimated coefficients in case we do not allow for the presence of unobserved heterogeneity. The second column shows the estimation results if we allow for the presence of unobserved heterogeneity. The two unobserved-heterogeneity coefficients  $v^a$  and  $v^b$  are significantly different from each other. The estimated probability is significantly different from zero and one. It appears that in the inflow into unemployment there is a group of 80% that has a low exit rate out of unemployment, while a group of 20% has a substantially higher exit rate. A comparison of the two columns of Table 2 shows that the introduction of unobserved heterogeneity removes the negative duration dependence in the observed exit rate. So, the observed average exit rate is declining because the best-qualified unemployed workers leave unemployment first. Furthermore,

we find that young, male and high-educated workers in regions with a low unemployment rate leave unemployment faster than their counterparts. Below, where we distinguish between exits to a job and exits to out-of-the labor force we give an interpretation of these results.

In the next step of our analysis we estimated a competing risk model without unobserved heterogeneity and with two exit states.<sup>6</sup> The estimation results are shown in Table 3. The first two columns of this table present the results of estimates without unobserved heterogeneity, the second two columns show the results when unobserved heterogeneity is accounted for. Unobserved heterogeneity appears to be present in both exit rates. The estimation results with respect to unobserved heterogeneity are very interesting and remarkable. It appears that probability  $p_2$  is not significantly different from zero. It also appears that one of the exit rates to out of the labor force is approximately equal to zero. According to the estimates there is a group of job losers of 68% that has a low exit rate to a job and a zero exit rate to out of the labor force. This is the group, which has a high probability of becoming long-term unemployed. There is a second group of 15%, which has a high exit rate to a job and a zero exit rate to out of the labor force. This is the group that obviously has an excellent labor market position. Finally, there is a third group of 17% that has a low exit rate to a job and a larger exit rate to out of the labor force. So, with respect to the exits to a job 85% of the inflow into unemployment has a low transition rate and 15% has a high transition rate. With respect to the exits to out of the labor force 83% of the inflow into unemployment has a zero transition rate and 17% has a positive transition rate.

As was to be expected the introduction of unobserved heterogeneity causes the negative duration dependency in the exit rate to a job to change into positive duration dependence.

With respect to the exit to a job age seems to matter, in the sense that younger job losers find a job more quickly. Being female or single has a negative effect on the exit rate to a job. In analyses not presented here we investigated whether the effect of the other explanatory variables was different for males and females, but found that this is not the case. Education is also important. Higher educated workers have a higher exit rate to a job than lower educated workers. The presence of children does not seem to affect the exit rate to a job. Furthermore, the level of the minimum living standard does not affect the exit rate to a job. Finally, there are also differences in exit rates between districts, with low unemployment districts having significantly higher exit rates than high unemployment districts.

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<sup>6</sup> We started the analysis specifying the unobserved heterogeneity distribution  $G$  as a multinomial logit function with four states. One of the probabilities turned out to be very small. We set this probability equal to zero. Then, we directly estimated the three remaining points of support of  $G$ .

The only variables that affect the exit rate to out of the labor force are the age and education of the worker and the district unemployment rate. Workers aged 30-45 years have a smaller transition rate to out of the labor force than both younger and older workers. It may be that younger workers are more inclined to go back to school, while older workers are more inclined to retire. Taken together both inclinations lead the middle age group to have a smaller transition rate to out of the labor force. High-educated workers also have a higher exit rate to out of the labor force. In districts with a high unemployment rate the exit rate to out of the labor force is relatively smaller than in districts with low unemployment rates. Perhaps this has to do with the possibilities of starting as a self-employed worker, possibilities that probably are smaller in high unemployment districts and lower for low educated workers. Another possible explanation is that in the high unemployment districts there is a much lower probability that an unemployed can be offered a suitable job by the labor office. Non-acceptance of such a suitable job results in discarding the person from the register and the loss of entitlements for social benefits. Therefore, those who are on the register but not really seeking a job are at much higher risk of being detected in the low unemployment districts and they may opt for withdrawing from labor force more often than those in high unemployment districts.

As indicated before the effect of the minimum living standards reflects the effect of financial incentives. Table 3 does not indicate that there is an effect of minimum living standard on the exit rate out of unemployment. Additional analysis did not change these results. We investigated the effect of variables in which minimum living standards interacted with the education of the worker, but found no effect. We also took the time structure of the unemployment benefits into account, doing estimates in which we investigated whether there is only an effect in the period after 6 months, when individuals have run out of unemployment benefits and may be on subsistence benefits. We still did not find any effect.

We also did some further sensitivity analyses. We investigated whether the results changed if we introduce interaction terms between the year 1995, duration dependence and age. Such interaction terms would account for the changes in the entitlement period for workers older than 30 years. The coefficients of these interaction terms were not significantly different from zero. We also introduced a dummy variable for the capital Bratislava, because here unemployment is very low. So, it could be that the effect of the district unemployment rate is dominated by the difference between Bratislava and the rest of the country. The inclusion of such a dummy variable did not affect our estimation results. To account for changes in the quality of the inflow over calendar time we also introduced a dummy variable for each inflow quarter. This too did not affect the estimated coefficients of the other variables.

Finally, we did a similar hazard rate analysis for the school leavers in our sample. The estimation results of this analysis are

shown in Table 4. Because of the composition of this sample that predominantly consists of young, single workers, a lot of explanatory variables are omitted. Hardly any coefficient appears to be significantly different from zero at a 5% level. However, from a likelihood ratio test that compares the results of Tables 1 and 4 it appears that taken together the explanatory variables are relevant. Nevertheless, labor market dynamics for Slovak school leavers appear to be quite random.

One of the main conclusions from our analysis is that the variables that represent potential disincentive effects for job losers do not seem to affect the exit out of unemployment. Neither the minimum living standard variables nor the variable representing the presence of children have coefficients that are significantly different from zero.

## **4.2 Simulations**

To illustrate the implications of our estimation results we performed some simulations. First, for a hypothetical group of job losers we calculated the labor market position after 6 months, 1 year and 2 years. The hypothetical group consists 8 groups stratified by sex (50% males and 50% females), age (50% of workers age below 30 years and 50% of workers aged 30-45 years) and education (80% higher education and 20% low education).<sup>7</sup> We did this for the estimates with and without unobserved heterogeneity as presented in Table 3. The results of these simulations are in Table 5. Clearly, until 1 year there is not much difference between the two simulations. After 6 months 30% of the unemployed have found a job, while 2% has gone out of the labor force. After 1 year 44% has found a job, while about 4% has left the labor force. The results of the two simulations diverge afterwards. According to the simulations based on the estimates with unobserved heterogeneity after 2 years 58% has found a job. According to the simulations based on the estimates without unobserved heterogeneity 71% has found a job. The difference between the two simulation results has to do with the share of 85% of the unemployed which have a low exit rate according to the estimation results with unobserved heterogeneity. According to these estimation results, one year after the inflow, the cohort of unemployed remaining almost entirely consists of unemployed workers that have this low exit rate. It is important to note that the big difference between both simulation results occurs outside the duration interval of which we have information since we only know what happened to unemployed until a maximum unemployment of 5 quarters.

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<sup>7</sup> The groups are heterogeneous between and homogenous within. All individuals in the group are single, part of a family with children, are subject to a non-low MLS and live in a district with an unemployment rate of 15%.



From a policy point of view there is a big difference between a labor market in which the inflow into unemployment of job losers is heterogeneous according to the estimates with unobserved heterogeneity and a labor market in which the inflow of job losers behaves according to the estimates without unobserved heterogeneity. In the first case long term unemployment is much more problematic than in the second case. Therefore, it is important to put additional research effort in finding out whether there truly is such unobserved heterogeneity. For this additional data are needed.

To illustrate the effects of explanatory variables on the labor market position of the unemployed we performed some simulations for different types of job losers. The simulations are based on the estimates with unobserved heterogeneity. The results are given in Table 6. The reference group consists of non-single male job losers with an age between 30 and 45 years, with a higher education, a non-low MLS and children in a district with an unemployment rate of 15%. As shown in Table 6 in such a situation after 6 months 31% of the job losers has found a new job, which increases to 43% after 1 year. Not many job losers of this type leave the labor force. Young workers with otherwise similar characteristics leave unemployment more quickly, both because they find a job and because they leave the labor force more quickly than older workers do. Females with otherwise similar characteristics have a smaller job finding rate. After 1 year 36% of the females has found a job. Workers with low education and otherwise the same characteristics as the reference group have a much smaller job finding rate than the reference group. After 1 year only 32% of these workers has found a job. Finally, the bottom row of Table 6 shows the effect of the district unemployment rate. In districts with a low 5% unemployment rate workers with otherwise similar characteristics as the reference group after 6 months already 43% has found a job. In low unemployment rate districts there is also a bigger transition rate towards out of the labor force. After 1 year 8% has left the labor force.

Finally, we did some simulations to compare the labor market positions of job losers and school leavers. The simulations were done for a group of single males younger than 30 years of age with higher education, part of a family with children, subject to a non-low MLS and living in a district with an unemployment rate of 15%. The results are shown in Table 7. From this it is obvious that for job losers it is much easier to find a job. After 6 months 32% of this hypothetical group of job losers has found a job, while for the hypothetical group of school leavers this is only 17%. After 1 year 47% of the job losers has found a job, while only 33% of the school leavers has.

## **5. CONCLUSIONS**

The economy of the Slovak Republic is one of the Central European economies in transition. The old centralized command system is gradually changing into a new competitive market economy. For the Slovak labor market this implies that a social security system is set up to cope with the new phenomenon of unemployment. Whereas unemployment in the past did not occur, in the period of transition workers laid off by shrinking firms were not rehired immediately by expanding or newly created firms. In the beginning of the 1990s Slovak unemployment rose sharply to remain high in the years since then. This high unemployment is especially worrying for job losers, of whom it is not clear whether their skills can be used in the new situation or have become obsolete. The labor market position of job losers may also be problematic because of a possible lack of incentives due to the structure of unemployment benefits. The Slovak benefit system has potentially large disincentive effects for job losers with respect to the outflow from unemployment to a job. This is especially the case for low educated unemployed and unemployed that have young children. However, it is not clear that the potential disincentive effects actually discourage workers in the search and job acceptance behavior to the extent that they are reluctant to leave unemployment and go back to work. It may be that unemployed workers do not take the current disincentive effects into account because they evaluate their current position from a lifetime perspective. If so, they are more interested in a labor market career with the prospect of eventually getting into a high wage job. Even if there is no direct instantaneous gain from accepting a job there may be a long-term gain if workers move up the job ladder. If the long-term perspective dominates short-term considerations then current disincentive effects do not matter.

In this paper we investigate whether the potential disincentive effects of the Slovak benefit system have an actual meaning. Using data from subsequent labor force surveys we investigate for job losers the determinants of the outflow from unemployment to a job. We find young, male, highly educated job losers and job losers living in low unemployment districts have higher exit rates to a job than their counterparts have. For unemployed school leavers the exit out of unemployment seems to be more or less a random process.

One of the results that is new compared to previous studies is the effect of age. We find that young job losers have a higher exit rate to a job. In other studies age does not seem to be important. A possible explanation for this is that other studies do not make a distinction between job losers and school leavers. We find that school leavers, who are on average young, have a smaller exit rate to a job. So, it may be that both effects cancel out causing the average young unemployed to have an exit rate to a job that is about the same as that of an older worker.

One of our main conclusions is that there do not seem to be disincentive effects of the benefit system. We conclude that although there are potential disincentive effect in the Slovak benefit system we find no evidence that these potential effects materialize. The job finding

behavior of Slovak job losers does not seem to be influenced by the structure of the benefit system.

Another main conclusion is that there are indications of a severe sort of unobserved heterogeneity among job losers. According to our estimates 85% of the Slovak job losers has a low job finding rate. Of course, one has to keep in mind that the data from the labor force surveys we use only contain information up to a maximum of 5 quarters of unemployment. Therefore, this result is preliminary in the sense that more sophisticated data are necessary to investigate the extent to which this phenomenon exists. Nevertheless, we think that we may conclude that in the Slovak labor market in transition the labor market position of unemployed workers is influenced more by the skills of the workers than it is by the potential disincentive effects of the unemployment benefit system.

## LITERATURE

Abbring, Jaap H., Gerard J. van den Berg and Jan C. van Ours (1997), "The Effect of Unemployment Insurance Sanctions on the Transition Rate from Unemployment to Employment", *Working Paper Tinbergen Institute*, Amsterdam/Rotterdam.

Atkinson, Anthony B. and John Micklewright (1991), "Unemployment Compensation and Labor Market Transitions: A Critical Review", *Journal of Economic Literature*, 29,1679-1727.

Devine, Terry J. and Nick M. Kiefer (1991), *Empirical Labour Economics; the Search Approach*, Oxford University Press, Oxford.

Devine, Terry J. and Nick M. Kiefer (1993), "The Empirical Status of Job Search Theory", *Labour Economics*, 1, 3-24.

Earle, John S. and Catalin Pauna (1996), "Incidence and Duration of Unemployment in Romania", *European Economic Review*, 40, 829-837.

Ham, John C., Jan Svejnar and Kathy Terrell (1996), "Unemployment, the Social Safety Net en Efficiency in Transition: Evidence from Micro Data on Czech and Slovak Men", University of Michigan Business School, *Davidson Institute Working Paper Series*.

Lancaster, Tony (1990), *The Econometric Analysis of Transition Data*, Cambridge, Cambridge University Press.

Lubyova, Martina and Jan C. van Ours (1997), "Unemployment Dynamics and the Restructuring of the Slovak Unemployment Benefit System", *European Economic Review*, 41, 925-934.

Lubyova, Martina and Jan C. van Ours (1998), "Work Incentives and Other Effects of the Transition to Social Assistance: Evidence from the Slovak Republic", *Empirical Economics*, forthcoming.

Meyer, Bruce D. (1995), "Lessons from the U.S. Unemployment Insurance Experiments", *Journal of Economic Literature*, 33, 91-131.

Micklewright, John and Gyula Nagy (1995), "Unemployment Insurance and Incentives in Hungary", in: *Tax and Benefit Reform in Central and Eastern Europe*, ed. by David M.G. Newbery, CEPR, London, 145-172.

Micklewright, John and Gyula Nagy (1996), "Labor Market Policy and the Unemployed in Hungary", *European Economic Review*, 40, 819-828.

Mortensen, Dale T. (1990), "A Structural Model of Unemployment Insurance Benefit Effects on the Incidence and Duration of Unemployment", in: *Advances in the Theory and Measurement of Unemployment*, ed. By Y. Weiss and G. Fishelson, Macmillan.

OECD (1996), *Labor Market and Social Policies in the Slovak Republic*, Paris.

Vodopivec, Milan (1995), "The Slovenian Labor Market in Transition: Evidence from Micro data", OECD technical workshop "What Can We Learn from the Experience of Transition Countries with Labor Market Policies?", Vienna, Nov. 30 - Dec. 2, 1995.

**Table 1 Preliminary estimates of unemployment exit rates to a job ( $\theta_J$ ) and to out of the labor force ( $\theta_L$ ) (t-values)**

Duration (quarters)	Job losers		School leavers	
	$\theta_J$	$\theta_L$	$\theta_J$	$\theta_L$
1	0.177 (15.6)*	0.022 (5.6)*	0.098 (6.8)*	0.055 (5.1)*
2	0.186 (12.8)*	0.019 (4.1)*	0.116 (6.0)*	0.026 (2.8)*
3	0.128 (8.0)*	0.024 (3.5)*	0.139 (5.1)*	0.027 (2.2)*
4	0.085 (4.9)*	0.011 (1.7)	0.149 (4.1)*	0.018 (1.4)
5	0.088 (3.7)*	0.025 (2.0)*	0.089 (2.2)*	0.036 (1.4)
Loglikelihood	-1756.7		-590.9	
Observations	1521		506	

**Table 2 Estimation results for job losers; exit rates out of unemployment (t-values)<sup>a)</sup>**

Age 30-45	-0.27 (2.4)*	-0.40 (2.4)*
Age >45	-0.27 (1.7)	-0.37 (1.6)
Female	-0.25 (2.8)*	-0.38 (2.7)*
Single	-0.19 (1.5)	-0.28 (1.6)
Higher education	0.42 (3.3)*	0.67 (3.2)*
Children	-0.17 (1.6)	-0.25 (1.6)
MLS-low	0.11 (1.2)	0.15 (1.1)
Log(u%/10)	-0.47 (4.7)*	-0.67 (4.0)*
Constant ( $v^a$ )	-1.44 (7.6)*	-2.46 (4.9)*
<i>Duration dependence</i>		
Quarter 2	0.06 (0.6)	0.65 (2.3)*
Quarter 3	-0.24 (1.8)	0.66 (1.5)
Quarter 4	-0.69 (3.4)*	0.29 (0.6)
Quarter 5	-0.49 (2.0)*	0.54 (1.0)
<i>Heterogeneity</i>		
$v^b-v^a$	-	2.69 (5.5)*
p	-	0.80 (13.5)*
Loglikelihood	-1520.6	-1519.0
Observations	1521	1521

<sup>a)</sup> A \* indicates that the coefficient is significantly different from zero at a 5%-level

**Table 3 Estimation results for job losers; exit rates to a job and to out of the labor force (t-values)<sup>a)</sup>**

	$\theta_J$	$\theta_L$	$\theta_J$	$\theta_L$
Age 30-45	-0.20 (1.8)	-0.87 (1.9)	-0.62 (2.5)*	-1.21 (3.1)*
Age >45	-0.37 (2.1)*	0.20 (0.4)	-0.61 (1.8)	-0.13 (0.3)
Female	-0.28 (3.0)*	-0.02 (0.1)	-0.52 (2.5)*	-0.29 (1.0)
Single		-0.18 (1.4)	-0.22 (0.5)	-0.49 (1.9)
(1.6)				-0.68
Higher education	0.40 (3.0)*	0.57 (1.4)	0.97 (3.1)*	1.50 (3.8)*
Children	-0.16 (1.5)	-0.20 (0.6)	-0.46 (2.1)*	-0.30 (0.9)
MLS-low	0.09 (0.9)	0.29 (0.9)	0.04 (0.2)	-0.04 (0.1)
Log(u%/10)	-0.47 (4.4)*	-0.53 (1.8)	-0.94 (4.3)*	-1.11 (3.4)*
<i>Duration dependence</i>				
Quarter 2	0.08 (0.8)	-0.12 (0.4)	1.72 (4.7)*	1.50 (4.0)*
Quarter 3	-0.30 (2.1)*	0.13 (0.3)	1.83 (3.5)*	2.50 (5.0)*
Quarter 4	-0.69 (3.2)*	0.67 (1.0)	1.78 (3.1)*	1.57 (1.8)
Quarter 5	-0.62 (2.2)*	0.24 (0.4)	1.96 (3.0)*	3.04 (3.2)*
<i>Heterogeneity</i>				
$v^a$	-1.55 (7.8)*	-3.77 (5.4)*	-3.79 (5.6)*	-1.22 (1.8)
$v^b-v^a$	-	-	5.15 (6.5)*	$-\infty$
$p_1$		-	0.17 (-)	
$p_2$		-	0.00 (-)	
$p_3$		-	0.68 (18.2)*	
$p_4$		-	0.15 (6.4)*	
Loglikelihood	-1719.4		-1715.4	
Observations	1521		1521	

a) A \* indicates that the coefficient is significantly different from zero at a 5%-level

**Table 4 Estimation results for school leavers; hazard rates to job and hazard rates out of the labor force (t-values)<sup>a)</sup>**

	$\theta_J$	$\theta_L$
Female	0.30 (1.7)	-0.21 (0.6)
Higher educ	0.40 (1.6)	0.37 (0.8)
Children	0.06 (0.3)	0.10 (0.3)
MLS-low	-0.32 (1.4)	0.14 (0.4)
Log(u%/10)	-0.16 (0.7)	-1.07 (3.1)*
Constant	-2.69 (8.0)*	-2.81 (5.6)*
<i>Duration dependence</i>		
Quarter 2	0.17 (0.7)	-0.70 (1.6)
Quarter 3	0.35 (1.4)	-0.68 (1.3)
Quarter 4	0.42 (1.5)	-1.06 (1.4)
Quarter 5	-0.11 (0.2)	-0.41 (0.5)
Loglikelihood	-580.5	
Observations	506	

a) A \* indicates that the coefficient is significantly different from zero at a 5%-level

**Table 5 Simulation results labor market position of job losers for sample averages; with and without unobserved heterogeneity<sup>a)</sup>**

	<b>Job</b>	<b>OLF</b>	<b>Unempl.</b>	<b>Total</b>
<i>With heterogeneity</i>				
After 6 months	25	3	72	100
After 1 year	35	4	61	100
After 2 years	46	7	47	100
<i>Without heterogeneity</i>				
After 6 months	25	2	73	100
After 1 year	35	5	60	100
After 2 years	60	7	33	100

<sup>a)</sup> Based on a hypothetical inflow sample. In the simulations we assume that there is no duration dependency after 5 quarters of unemployment.

**Table 6 Simulation results labor market position for different types of job losers on the basis of estimation results with unobserved heterogeneity**

	<b>After 6 months</b>			<b>After 1 year</b>			<b>Total</b>	
	<b>Job</b>	<b>OLF</b>	<b>U</b>	<b>Total</b>	<b>Job</b>	<b>OLF</b>		<b>U</b>
Reference group <sup>a)</sup>	31	3	66	100	43	5	52	100
Age < 30 years	36	7	57	100	49	10	41	100
Female	26	4	70	100	36	6	58	100
Low education	21	1	78	100	32	2	66	100
U rate 5%	43	5	52	100	60	8	32	100

<sup>a)</sup> Male, non-single, age 30-45 years, family with children, higher education, non-low MLS, district unemployment rate 15%

**Table 7 Simulation results labor market position for job losers and school leavers<sup>a)</sup>**

	<b>After 6 months</b>			<b>After 1 year</b>			<b>Total</b>	
	<b>Job</b>	<b>OLF</b>	<b>U</b>	<b>Total</b>	<b>Job</b>	<b>OLF</b>		<b>U</b>
Job losers	32	4	64	100	43	6	51	100
School leavers	17	6	77	100	33	5	62	100

<sup>a)</sup> Male, single, age<30 years, higher education, family with children, MLS non-low, unemployment rate 15%



## APPENDIX 1 INFORMATION ABOUT THE DATASET

**Table A1 Inflow into unemployment by origin**

Inflow quarter	From job	School leavers	Other <sup>a)</sup>	Total
1994.1	319	41	21	381
1994.2	179	17	17	213
1994.3	149	139	9	297
1994.4	191	76	17	284
1995.1	221	18	12	251
1995.2	174	12	18	204
1995.3	151	113	11	275
1995.4	<u>137</u>	<u>90</u>	<u>21</u>	<u>248</u>
Total	1521	506	126	2153

<sup>a)</sup> From household, maternity leave, retirement

**Table A2 Unemployment durations and destinations of outflow**

Duration (quarters)	Job Losers				School leavers			
	Job	OLF	Cens.	Total	Job	OLF	Cens.	Total
0-1	244	31	272	547	46	26	100	172
1-2	164	17	254	435	36	8	87	131
2-3	63	12	168	243	26	5	48	79
3-4	24	3	101	128	17	2	45	64
4-5	<u>14</u>	<u>4</u>	<u>150</u>	<u>168</u>	<u>5</u>	<u>2</u>	<u>54</u>	<u>60</u>
Total	509	61	945	1521	130	43	333	506

## APPENDIX 2 - DEFINITION OF VARIABLES

*All variables are dummy variables (with value 1 where indicated and value 0 for the reference group) except log (u%)*

Middle: Age 30-45 years; Old: Age>45 years - Reference group: Age<30 years

Female- Reference group: Male

Single - Reference group: Married, widow(er), divorced

High education: More than primary; Reference group: Primary or no education

Children: Family with children up to 15 years  
Reference group: Family with no children below 15 years

MLS-low: < 5840 Sk  
Reference group: MLS>5840 Sk

U%: District unemployment percentage in December 1993.

**Table A3 Sample averages**

	<b>Job losers</b>	<b>School leavers</b>
Age <30	0.44	0.99
Age 30-45	0.45	0.01
Age >45	0.11	0.00
Female	0.39	0.48
Male	0.61	0.52
Single	0.36	0.97
Married, widow(er), divorced	0.64	0.03
Primary or no education	0.18	0.21
High education	0.82	0.79
No children	0.28	0.56
Children	0.72	0.44
MLS-low	0.33	0.21
MLS-non low	0.67	0.79
Number of observations	1521	506

**Figure 1. Unemployment in the Slovak Republic, 1990 - 1996**

