

Huitfeldt, Henrik

**Working Paper**

## Unemployment, Labour Market Programmes and Wage Determination: Evidence from the Czech and Slovak Republics

Working Paper, No. 2001:1

**Provided in Cooperation with:**

Department of Economics, Uppsala University

*Suggested Citation:* Huitfeldt, Henrik (2001) : Unemployment, Labour Market Programmes and Wage Determination: Evidence from the Czech and Slovak Republics, Working Paper, No. 2001:1, Uppsala University, Department of Economics, Uppsala, <https://nbn-resolving.de/urn:nbn:se:uu:diva-2504>

This Version is available at:

<https://hdl.handle.net/10419/82871>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Unemployment, labour market programmes and wage determination: Evidence from the Czech and Slovak Republics<sup>\*</sup>

by

Henrik Huitfeldt<sup>‡</sup>

8 January 2001

## Abstract

This paper studies effects of unemployment and labour market programmes on real wages in the Czech and Slovak Republics using district panel data for the period 1992-1998. Clear evidence of a “wage curve” exists in both countries. The estimated unemployment elasticity of pay is, however, higher in the Slovak Republic, than in the Czech Republic. The wage subsidy and the public works programme exert upward pressure on real wages in Slovakia. When accounting for effects from adjacent districts, a positive significant effect of labour market programmes is also estimated for the Czech Republic.

JEL classification: J31, J68, P39

Keywords: Wage determination; Unemployment; Labour market programmes

---

<sup>\*</sup> I am grateful to Bertil Holmlund, David Blanchflower, Andrew Oswald and seminar participants at the Department of Economics at Uppsala University for valuable comments, Daniel Munich, Ivana Projsova, Anna Porubska, Elena Kominkova and Daniela Mazurova for helping me to collect and understand the data, and HSFR for financial support.

<sup>‡</sup> Department of Economics, Uppsala University, Box 513, SE-751 20 Uppsala, Sweden.

Email: henrik.huitfeldt@worldonline.cz

## 1. Introduction

The purpose of this paper is to examine how unemployment and active labour market programmes influence real wages in the Czech and Slovak Republics. The study is related to two branches of recent research on wage determination, unemployment and labour market policies.

One strand of this research is the so-called wage curve literature, associated with Blanchflower and Oswald (see Blanchflower & Oswald (1994)). They claim, using different data sets, that there is strong empirical support for the existence of a negative relationship between wages and unemployment, a relationship they label 'wage curve'. This claim is not uncontroversial, however. There are questions about the theoretical foundations as well as the empirical robustness of the results. Only few studies have estimated wage curves for the countries in Central and Eastern Europe. Using pooled micro data from five Central and Eastern European countries, Blanchflower and Oswald (1999) find a similar degree of wage flexibility as in Western OECD countries. Evidence of wage curves in the former Eastern Germany is also reported by Baltagi, Blien and Wolf (2000).

Another strand of research is mainly of Nordic origin. The issue here is to study the effects of active labour market programmes (ALMPs) in a broad sense. ALMPs are usually defined as including direct job creation, labour market training and job broking for the unemployed. The main objective of ALMPs is to increase the employability of the participants, which should lead to decreasing unemployment rates. However, ALMPs will also affect non-participants: taxes have to be raised to finance the programmes, the competition for the existing jobs will increase, and the wages of participants and non-participants are likely to be affected.<sup>1</sup>

The issue in this paper is whether active labour market programmes contribute to wage pressure, thereby crowding out regular employment. Empirical studies on Nordic countries report mixed evidence of such effects (see e.g. Calmfors and Nymoén (1990); Calmfors and Forslund (1991), Forslund (1994), Edin, Holmlund and Östros (1994), Raaum and Wulfsberg (1997), Rödseth and Nymoén (1999), and Forslund and Kolm (2000)).

---

<sup>1</sup> A survey of macroeconomic evaluations of labour market programmes is given in Calmfors (1994)

In the 1990s, active labour market policy has been used in Central and Eastern Europe as an important measure to increase the employability of the unemployed. The use of ALMPs has varied considerably between countries and time periods. For example in 1997, the share of persons in active labour market programmes to the total number of unemployed was 11.4 percent in the Czech Republic, 24.4 in Slovakia, and 20.5 in Hungary<sup>2</sup>.

Most of the existing evaluations of ALMPs in Central and Eastern Europe focus on the effects of participants' future income or employment (Puhani (1998); Lubyova and van Ours (1998); Terrell and Sorm (1998); and Kluwe, Lehmann and Schmidt (1999)). A few studies have estimated augmented matching functions to study effects of ALMPs on the matching process of vacancies and unemployed persons (Boeri (1997); Boeri and Burda (1996) and Burda and Lubyova (1995)). Pannenberg and Schwarze (1998), which to my knowledge is the only study that try to estimate effects of ALMPs on real wages in a transition country, estimate individual wage equations for the former East Germany using regional data on unemployment and ALMPs.

In this paper, I use regional panel data to examine effects of ALMPs on wage setting in the Czech and Slovak Republics. The outline of the paper is as follows. Section 2 describes the developments on the labour market and the use of ALMPs in the Czech and Slovak Republics in the 1990s. Section 3 discusses the wage setting process in the Czech and Slovak Republics. Section 4 outlines the theoretical framework. The data is presented in section 5 and the results of the empirical analysis are reported in section 6. Section 7 concludes.

## **2. Unemployment and Active Labour Market Policy in the Czech and Slovak Republics<sup>3</sup>**

The Czech and Slovak Republics have had very different labour market experiences in the 1990s (see Figure 1). The Czech unemployment rate was until 1997 lower than four percent, much lower than in all other post-communist countries in Central Europe, and the Czech Republic's

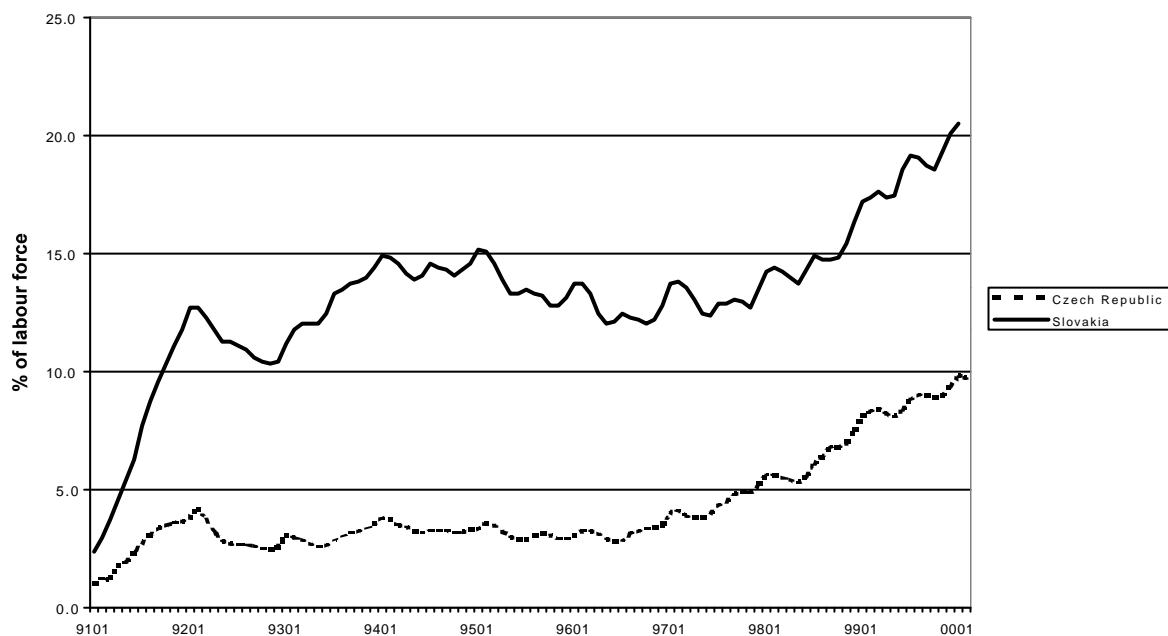
---

<sup>2</sup>Total number of unemployed is defined as the number of openly unemployed plus the number of participants in active labour market programmes

<sup>3</sup>The information and statistics in this section are mainly based on MPSV (1998) for the Czech Republic, Czech and Slovak legal provisions (mainly amended versions of the laws of employment No 1/1991 in the Czech Republic and No.

labour market performance was until recently characterised as a “miracle”. However, after a recession in 1997-98, the halo has tarnished and Czech unemployment rate reached nine percent in the end of 1999<sup>4</sup>. In Slovakia, the unemployment rate increased fast in the beginning of the 1990s to double-digit levels. After being stable around 13-14 percent during most of the decade, it started to increase again in 1998. In the end of 1999, more than 18 percent of the labour force was unemployed in Slovakia.

**Figure 1: Unemployment rate in the Czech and Slovak Republics<sup>1</sup>**



1. Registered unemployment rate

Active labour market policy was introduced in the former Czechoslovakia in the second half of 1991 as a key device to hamper an expected unemployment crisis. Expenditures on active labour market programmes increased fast in 1992 and 1993 (see table 1 and 2). The expenditures were divided on a per capita basis between the two republics, which led to a higher number of programme places per unemployed in the Czech part of the country, where the unemployment

---

387/96 in Slovakia) and discussions with officials at the Czech Employment Services and the Slovak National Labour Office.

rate was lower<sup>5</sup>. Differences in ALMP spending have been regarded as a key factor explaining the different labour market performance in the early 1990s of the Czech and Slovak Republics (see for example Boeri and Burda (1996)).

**Table 1. Active labour market programmes in the Czech Republic.**

	1992	1993	1994	1995	1996	1997	1998
Registered unemployed <sup>1</sup>	166,820	153,064	172,809	156,091	159,230	216,026	302,379
Unemployment rate	3.0	3.0	3.4	3.1	3.1	4.4	6.1
Active labour market programmes <sup>1</sup>	102,327	119,884	80,425	53,614	36,354	27,969	28,833
% share in:							
Training	4.3	2.2	3.6	4.7	6.0	7.8	7.9
Public works	11.2	5.2	7.7	10.8	15.3	20.2	23.9
Wage subsidies	84.5	84.7	81.0	74.0	66.4	57.9	52.1
Youth programmes	0.0	8.0	7.7	10.4	12.3	14.1	16.1
Share of ALMPs in total unemployment <sup>2</sup>	38.0	43.9	31.8	25.6	18.6	11.5	8.7

1. Average number of persons in unemployment and labour market programmes

2. Total unemployment is defined as openly unemployed plus ALMP participants

Source: Ministry of Labour and Social Affairs of the Czech Republic.

**Table 2. Active labour market programmes in Slovakia.**

	1992	1993	1994	1995	1996	1997	1998
Registered unemployed <sup>1</sup>	281,080	318,723	366,026	351,412	325,379	337,412	382,818
Unemployment rate	11.3	12.9	14.4	13.7	12.6	13.1	14.7
Active labour market programmes	75,133	115,471	115,525	127,110	135,558	108,656	na
% share in:							
Training	6.0	2.6	2.2	2.4	2.7	3.6	na
Public works	25.5	6.5	4.8	14.7	19.2	20.4	na
Wage subsidies	68.5	90.9	93.0	82.9	78.2	76.0	na
Share of ALMPs in total unemployment <sup>2</sup>	21.1	26.6	24.0	26.6	29.4	24.4	na

1. Average number of persons in unemployment and labour market programmes

2. Total unemployment is defined as openly unemployed plus ALMP participants

Source: National Labour Office of the Slovak Republic.

After the division of Czechoslovakia in 1993, the spending on ALMPs in the Slovak Republic increased fast and ALMP spending continued to be high during the following years. The Czech government chose a different path and the number of programme places decreased every year until 1998. In Slovakia, financial restrictions decreased spending on ALMPs in 1997. After the

<sup>4</sup> See OECD (1998) for a discussion of the “Czech miracle”

<sup>5</sup> Burda and Lubyova (1995)

change of government in the Czech Republic in 1998, the trend has reversed and spending on ALMPs was increasing in 1999.

The scope of the active labour market policy used has been more or less the same during the whole 1990s in both the Czech and the Slovak Republics and includes a broad range of measures, where the most important are labour market training, subsidies to stimulate job creation, public works and support to self-employed. The most important active labour market measures in the Czech and Slovak Republics during the 1990s have been different programmes to support job creation (wage subsidy programmes)<sup>6</sup>. To stimulate creation of permanent jobs mostly in the private sector, the labour offices could subsidise part of the labour costs of a newly hired unemployed worker. In both the Czech and Slovak Republics, the subsidised job must last a minimum of two years. The subsidy could be given to the employer in the form of loans, a direct subsidy to cover part of the participant's wage, to cover interest payments on credits, or to cover a part of specified investments. In the second half of the 1990s, the direct wage subsidy has been the most frequently used subsidy form. Special wage subsidy programmes is targeted at self-employment, youth, and disabled. The employer determines the wage for the participant in discussions with the local labour office. Collective agreements are taken under consideration and the paid wage should correspond to the overall wage level in the sector.

Public works<sup>7</sup> are subsidies for short-time manual jobs in the public sector for long-term unemployed and persons with low attachment to the labour market. The subsidy rate varies, but it is often close to actual labour costs. The programmes are normally lasting for a period up to 6-12 months. When the programme expires, the unemployed could be placed in a new programme after a waiting period. The public works programme is often used by the labour offices as a screening device to test how interested an unemployed is to obtain a job. The employer and the local labour office determine the wage for the participant. The wage is often not much higher than the minimum wage.

---

<sup>6</sup> Social Purposeful Jobs (In the Czech Republic, Spolecensky ucelne pracovne mista and Mista pro ziskani odborne prace absolventu skol. In Slovakia , Spolocensky ucelne pracovne miesta up to 1996 and Pracovne miesta na samozamestnanie (§88 in the Law of Employment (c. 387/1996 Z.z)) u zamestnavateľa (§89) and pre absolventa školy alebo mladistvých (§90) since 1996).

<sup>7</sup> Verejne prospesne prace in the Czech Republic and Verejnoprospešne pracovne miesta (since 1996 (§91)) in Slovakia

The number of persons in labour market training has been very low by OECD standards in the Czech and Slovak Republics. Most of the participants are offered training to meet a specific employer's needs. The length of the training is between a few weeks to a couple months. The participants receive a benefit that is slightly higher than the regular unemployment benefit.

In table 3 and 4, approximations of the average subsidy for different programme types are displayed. The average subsidy is calculated as the spending divided by inflow to a programme in a year<sup>8</sup>. The average subsidy for a participant in the wage subsidy programme has been much higher in Slovakia than in the Czech Republic during 1992-1996. Average subsidies for participants in public works and labour market training have, however, been at the same level in both countries.

In the Czech Republic, an overall budget for ALMPs is decided in the beginning of each year by the central authorities. It is financed through the state budget. The allocation of resources is then divided between districts depending on local labour market conditions as unemployment levels and rates, unemployment/vacancy ratios, stocks of participants in ALMPs, and past records of local labour offices in implementing programmes. Local labour offices have discretion over the allocation of the annual ALMP budget for different ALMPs. 10 – 15 percent of the budget is distributed during the year to cover special needs and finance special projects.

In Slovakia, the labour market policy is financed by a special payroll tax of 4 percent of the wage of the employed (3 percent is paid by the employer and 1 percent by the worker). Funds are distributed from the National Labour Office through regional labour offices down to the district labour offices<sup>9</sup>. Funds are allocated to local labour offices on a quarterly basis and follows a rule that is governed by the following criteria: unemployment rate, number of unemployed, share of unemployed in long-term unemployment, share of unemployed in retraining, and the number of contributions to the Employment Fund in the region. The regional labour offices have some discretion in distributing funds to the district labour offices. As in the Czech Republic, local

---

<sup>8</sup> As the programmes often last more than one year, this approximation is not entirely correct.

<sup>9</sup> After the administrative reform in 1996, Slovakia consists of 8 regions (kraj) and 79 districts (okres)



**Table 3. Cost of active labour market programmes in the Czech Republic**

	1992	1993	1994	1995	1996	1997	1998
<i>Wage subsidies</i>							
Inflow of participants	82,277	19,630	16,727	11,895	8,996	6,446	18,201
Expenditures (mil CZK)	1,294	463	368	281	202	168	374
Average cost of a programme place (CZK)	15,700	23,600	22,000	23,600	22,500	26,000	20,500
<i>Public works</i>							
Inflow of participants	25,503	11,760	12,927	10,821	10,259	11,888	11,088
Expenditures (mil CZK)	223	160	184	190	199	224	281
Average cost of a programme place (CZK)	8,700	13,600	14,200	17,600	19,400	18,800	25,300
<i>Labour market training</i>							
Inflow of participants	17,590	12,095	14,814	13,454	12,107	11,448	16,540
Expenditures (mil CZK)	98	73	103	100	92	90	147
Average cost of a programme place (CZK)	5,600	6,000	7,000	7,400	7,600	7,900	8,900
<i>Total</i>							
Inflow of participants	125,370	43,485	44,468	36,170	31,362	29,782	45,829
Expenditures (mil CZK)	1,615	696	655	571	493	482	802
Average cost of a programme place (CZK)	12,900	16,000	14,700	15,800	15,700	16,200	17,500

Source: MPSV (1998) and Munich/Jurajda/Cihak (1999)

**Table 4. Cost of active labour market programmes in Slovakia**

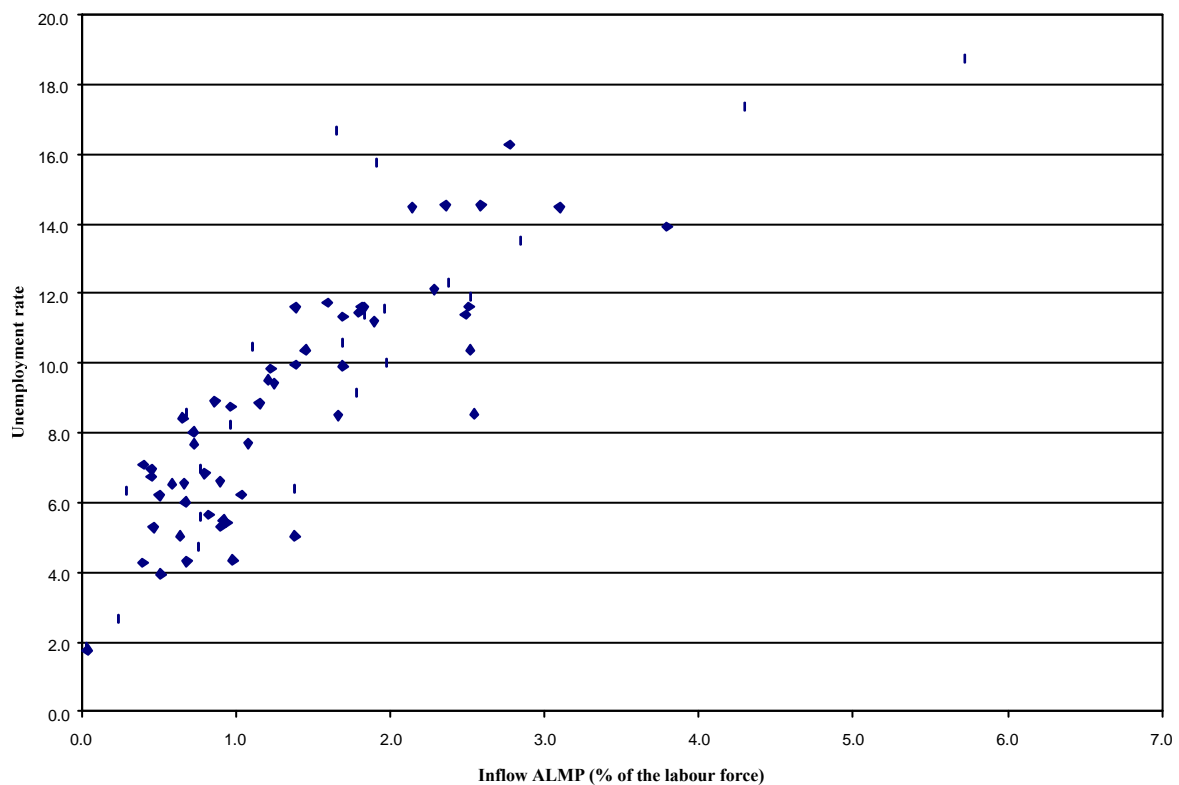
	1992	1993	1994	1995	1996	1997
<i>Wage subsidies</i>						
Inflow of participants	84,314	33,591	30,529	42,851	24,460	Na
Expenditures (mil SKK)	3,088	808	1,593	3,217	2,659	2,014
Average cost of a programme place (SKK)	36,600	24,000	52,200	75,000	108,700	Na
<i>Public works</i>						
Inflow of participants	40,977	13,137	14,962	43,520	35,856	Na
Expenditures (mil SKK)	419	166	171	819	1,330	744
Average cost of a programme place (SKK)	10,200	12,600	11,400	18,800	27,000	Na
<i>Labour market training</i>						
Inflow of participants	25,582	13,908	14,100	19,175	20,533	24,848
Expenditures (mil SKK)	305	122	114	156	215	217
Average cost of a programme place (SKK)	11,900	8,800	8,100	8,100	10,500	8,700
<i>Total</i>						
Inflow of participants	150,873	60,636	64,666	105,546	80,849	Na
Expenditures (mil SKK)	3,812	1,096	1,878	4,192	4,204	Na
Average cost of a programme place (SKK)	25,300	18,100	29,000	39,700	52,000	Na

Source: National Labour Office in Slovakia and Lubyova/Ochrankova (1999)

labour offices have discretion over the allocation of the ALMP budget for different ALMPs. About 10 percent of the budget are distributed during the year to cover special needs and to finance special projects.

In Figure 2 and 3, the correlation between inflow of participants in an ALMP in 1998 and the unemployment rate in the end of 1997 is displayed by districts in the Czech Republic and Slovakia. As the strong correlation indicates, the distribution of funds for ALMPs depends on the local labour market situation.

**Figure 2: Unemployment rate and inflow of participants into ALMPs by districts in the Czech Republic<sup>1</sup>**

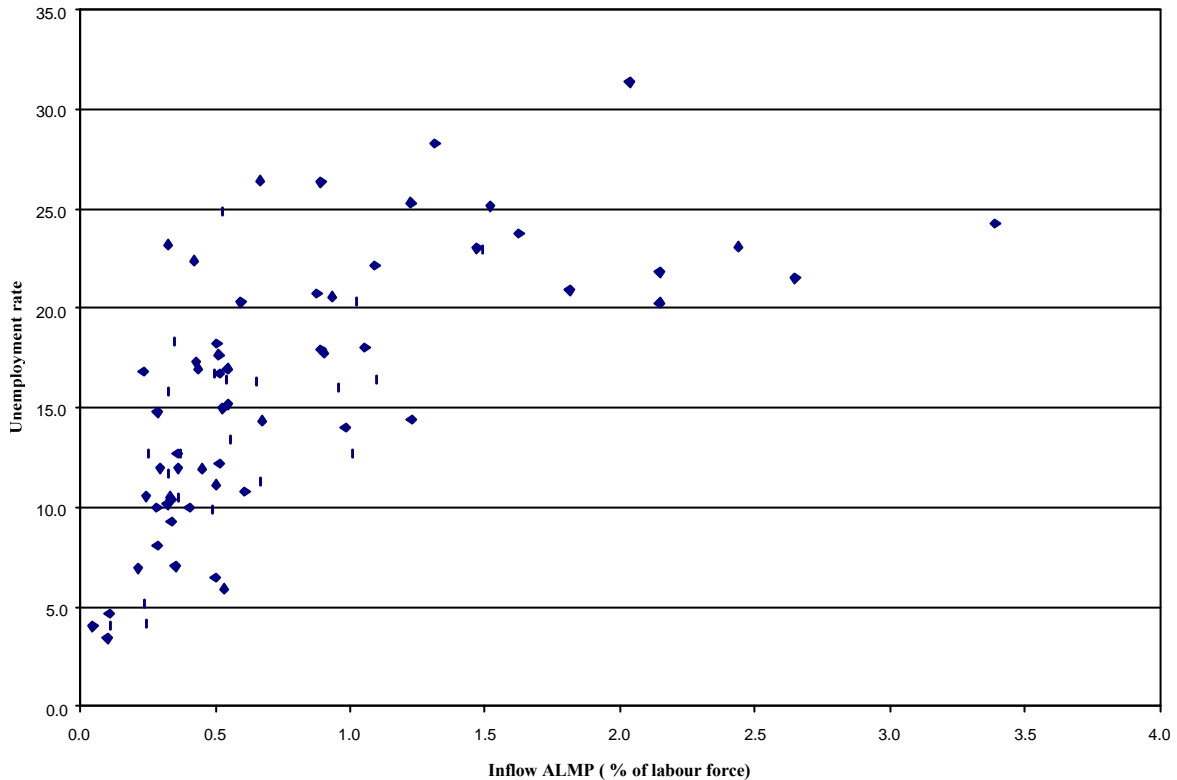


1. The unemployment rate in the end of 1997 and the inflow of ALMP participants in 1998

---

<sup>10</sup> After the administrative reform in 1996, Slovakia consists of 8 regions (kraj) and 79 districts (okres)

**Figure 3: Unemployment rate and inflow of participants into ALMPs by districts in Slovakia<sup>1</sup>**



1. The unemployment rate in the end of 1997 and the inflow of ALMP participants in 1998

Too summarise, during 1992-1998, the average number of programme participants per unemployed are at the same level in the Czech and Slovak Republics. But whereas the level has been more or less stable in the Slovak Republic, the trend has been negative in the Czech Republic. The programme “portfolio” is rather similar in the two countries. The main difference between the active labour market policy in the Czech and Slovak Republics is that average expenditures for a participant in the wage subsidy programme are higher in Slovakia.

### 3. Wage formation in the Czech and Slovak Republics<sup>11</sup>

At the first years of transition, real wages in the Czech and Slovak Republics sharply declined because of the high inflation that was a result of the price liberalisation (see table 5). Since 1993 in the Czech Republic and since 1994 in Slovakia real wages started to catch up. While real wages in Slovakia increased in line with GDP growth per worker for most of the 1990s, Czech real wages had a much stronger development than productivity until 1997. The strong real wage development in the Czech Republic has been cited as one of the main reasons for the exchange rate crises in 1997 that was the start of the recession<sup>12</sup>.

**Table 5: Wage developments in the Czech and Slovak Republics**

	1991	1992	1993	1994	1995	1996	1997	1998
<i>Czech Republic</i>								
Nominal wages <sup>1</sup>	3,789	4,585	5,817	6,869	8,166	9,679	10,696	11,709
Nominal wage growth (%) <sup>2</sup>	16.7	21.0	26.9	18.1	18.9	18.5	10.5	9.5
Inflation (%) <sup>3</sup>	56.6	11.1	20.8	10.0	9.1	8.8	8.5	10.7
Real wage growth (%)	-39.9	9.9	6.1	8.1	9.8	9.7	2.0	-1.2
GDP growth	-11.3	-3.3	0.6	3.2	6.4	3.8	0.3	-2.3
<i>Slovak Republic</i>								
Nominal wages <sup>1</sup>	3,748	4,519	5,379	6,294	7,195	8,154	9,226	10,347
Nominal wage growth (%) <sup>2</sup>	16.5	20.6	19.0	17.0	14.3	13.3	13.1	12.2
Inflation (%) <sup>3</sup>	61.2	10.1	23.2	13.4	9.9	5.8	6.1	6.7
Real wage growth (%)	-44.7	10.5	-4.2	3.6	4.4	7.5	7.0	5.5
GDP growth (%)	-14.6	-6.5	-3.7	4.9	6.9	6.6	6.5	4.4

Source: Czech Statistical Office and Statistical Office of the Slovak Republic

1. Czech respective Slovak crown s, annual average

2. Year to year changes in annual averages

3. Changes in CPI, annual average

In the Czech and Slovak Republics, a decentralisation of wage bargaining has taken place during the 1990s. In 1989, all employees in the Czech and Slovak Republics were covered by a system where the government regulated wages. In 1998, only about a third of the private-sector workers in the Czech Republic were covered by collective agreements. The corresponding figure for

<sup>11</sup> This section is based on discussions with officials at the Ministry of Labour and Social Affairs and the Czech-Moravian Confederation of Trade Unions in the Czech Republic, the Ministry of Labour, Social Affairs and Family and the Confederation of Trade Unions in the Slovak Republic.

Slovakia was about 50 percent. As not all collective agreements involve wages, the actual number of workers that negotiate wages through collective bargaining is even lower. Wage bargaining takes place at the industry and the firm level. Occasionally, there has also been bargaining through a top-level tripartite body, composed by representatives from trade unions, employer associations and the government. In 1998, 25 (56) industry-level collective agreements and several thousands firm-level collective agreements were signed in the Czech (Slovak) Republic. The trade union or the employer association can apply to the Ministry of Labour to get the industry-level agreement extended to firms initially not covered by the agreement. This option has only played a minor role during the 1990s in the Czech Republic, but it is used extensively in the Slovak Republic.

Wages to employees paid by the state budget is regulated through a complex tariff system, where the wages among other things depend on experience, education and the character of the work. About a third of the workforce in the Czech and Slovak Republics were covered by this system in 1998. The tariffs, and the wages, are changed irregularly by the government. For example in the Czech Republic, the wages were not increased at all in 1997 and 1998 due to the tight fiscal discipline maintained by the government. In the beginning of 1999, wages were then increased by 17 percent.

The remaining share of the workforce, not covered by collective agreements, is negotiating their wages individually at their firms. The wage-setting process is however influenced through a set of laws that regulate minimum wages, remuneration for overtime and other working conditions.

A legally binding minimum wage was introduced in the former Czechoslovakia in 1991. When the minimum wage was introduced, it was assumed that it should not be lower than the minimum living standard and not lower than 50 percent of the average wage. During the 1990s, the minimum wage has not been raised at the same pace as average wages. Thus, the effect of the minimum wage on the wage formation has gradually eroded. In 1998, the monthly minimum wage was 2,650 CZK and 3,000 SLK in the Czech and Slovak Republics respectively. That is 22.6 percent and 29.5 percent of the average wage for all workers. As a complement to the minimum wage, a three-level (twelve-level) minimum wage tariffs exist in the Czech (Slovak)

---

<sup>12</sup> OECD (1998) p. 15

Republic. It specifies a minimum wage depending on the status, responsibility and difficulty of the job. These minimum wage tariffs are legally binding for firms not covered by collective agreements.

As an aim to prevent excessive wage growth from the liberalisation of prices, wage regulations in the form of a tax-based income policy was in place 1991-1995 in the Czech Republic and sporadically 1991 – 1994 and 1998 in the Slovak Republic. Prohibitive taxes were imposed on firms that raised wages substantially more than the inflation. The tax also sometimes depended on firm performance. Some of the regulations were not applied to all industries and frequent exemptions were given.

#### 4. Theoretical framework

Following Calmfors and Forslund (1991), I will discuss how unemployment and labour market programmes influence wage formation. The wage is assumed to be determined by a monopoly union<sup>13</sup>. The employer then unilaterally sets employment. In the Czech and Slovak Republics, unions play a major role in bargaining over wages in some sectors (in particular in sectors where state ownership still is important). The wages determined in these sectors are often used as baselines for bargaining in other sectors where unions are weaker.

A union attached to a specific firm maximises an objective function that is given by

$$U_i = N_i (V_i^n(w_i) - \bar{V}) \quad (1)$$

where  $N_i$  is employment in firm  $i$ ,  $V_i^n$  the utility of a worker employed by firm  $i$ , and  $\bar{V}$  the utility for a laid-off worker. The individual union maximises (1) subject to a labour demand function for workers  $N_i = N_i(w_i)$ , where  $\partial N_i / \partial w_i < 0$ .

Assuming an interior solution, the first-order condition for the optimal wage is given by:

---

<sup>13</sup> The same qualitative results will go through in the case of Nash bargaining between unions and firms or in efficiency wage models.

$$\Phi = \frac{\partial N}{\partial w} (V(w) - \bar{V}) + N \frac{\partial V}{\partial w} = 0 \quad (2)$$

In a symmetrical equilibrium  $w_i = w$  for all  $i$ . Thus, (2) will represent an aggregate wage equation.

Labour market conditions will influence the wage equation through the utility of a laid-off worker,  $\bar{V}$ . We have  $\text{sgn } dw/d\bar{V} = \text{sgn } \Phi_{\bar{V}}$ , assuming that the second order condition is fulfilled.

Clearly  $\Phi_{\bar{V}} > 0$ .

In examining the effect of labour market conditions on  $\bar{V}$ , we assume that a laid-off worker will enter one of three different states. First, the worker can be re-employed receiving  $V(w)$ , or become openly unemployed receiving  $V(b)$ , or be enrolled in a labour market programme receiving  $V(a)$ . The alternative utility of a laid-off worker can be written as a weighted average of the utility in these three states, i.e.,

$$\bar{V} = \mathbf{a}V(w) + \mathbf{b}V(a) + (1 - \mathbf{a} - \mathbf{b})V(b) \quad (3)$$

where  $\mathbf{a}$  is the probability of being re-employed and  $\mathbf{b}$  the probability of being enrolled in a labour market programme.

The re-employment probability for a worker is assumed to be increasing in the employment rate and decreasing in average job search effectiveness (given constant job search effectiveness of the worker).

$$\mathbf{a} = \mathbf{a} \left( \frac{N}{L}, s_u \left( \frac{U}{U+R} \right) + s_r \left( \frac{R}{U+R} \right) \right) = \mathbf{a} (1 - U - R, s_u + \mathbf{j} (s_r - s_u)) \quad (4)$$

where  $s_u$  and  $s_r$  are the level of job search effectiveness of the openly unemployed and programme participants.  $U$  is the unemployment rate and  $R$  is the participation rate, both relative to the labour force,  $L$ .  $U/(U+R)$  is, thus, the share of openly unemployed in total unemployment.  $\varphi = R/(U+R)$  is the share of programme participants in total unemployment, thus the

accommodative stance of the government or the local labour office. The probability of being enrolled in a programme,  $\mathbf{b}$ , depends positively on the accommodative stance  $\mathbf{j}$ ,  $\mathbf{b} = \mathbf{b}(\mathbf{j})$ .

If total unemployment, defined as the sum of the open unemployment rate and the rate of programme participants to the labour force,  $U+R$ , increases given that the accommodative stance is constant, the utility of not being employed,  $\bar{V}$ , will decrease and the wage will be reduced.

$$\left. \frac{\partial \bar{V}}{\partial (U+R)} \right|_{\mathbf{j}} = -\mathbf{a}_1 \quad (5)$$

Thus, the wage will unambiguously decrease if unemployment increases. Consider now an increase in the accommodative stance,  $\mathbf{j}$ , given that total unemployment,  $U+R$ , is constant. The total effect on the alternative utility of a laid-off worker is

$$\left. \frac{\partial \bar{V}}{\partial \varphi} \right|_{U+R} = \beta'(\varphi)(V(a) - V(b)) + \alpha_2(s_r - s_u)(V(w) - V(b)) \quad (6)$$

Two effects are present. First, an increase in the accommodative stance will increase the utility of a laid-off worker, and the average wage, if the utility of being enrolled in a programme is higher than the utility of being open unemployed. Second, an increase in the accommodative stance reduces the utility of a laid-off worker, and the average wage, if the search effectiveness is higher for a programme participant than for an open unemployed and the utility of being employed is higher than the utility of being openly unemployed. The competition for available jobs increases, which will decrease the re-employment probability for an individual job seeker and put downward pressure on the average wage. Calmfors and Lang (1995) show that this effect will be stronger if programmes are targeted at long-term unemployed or labour force entrants.

If labour market programmes reduce the flow out of the labour force, job competition will increase and the re-employment probability will decrease, which will put downward pressure on wages. On the other hand, the decreased risk of dropping out of the labour force will put upward pressure on wages given that the utility of not participating in the labour force is lower than in other states (see Calmfors and Lang (1995)). The total effect of labour market programmes on the wage is thus ambiguous.



Which effects can we expect from different kinds of active labour market programmes? In general, programmes that will aim to increase the employability, in raising search effectiveness, of the unemployed will contribute to job competition and have a smaller effect on wages. Programmes that increase the relative utility of participants will have the opposite effect.

Labour market training focus directly on increasing the employability of the unemployed and the benefit for participants are often not higher than the unemployment benefits. The wage effect of an increase in labour market training is thus expected to be smaller. Wage subsidy programmes, where the wage for programme participants often significantly exceeds the unemployment benefit level, increase the utility for participants. The effect of wage subsidy programmes on wages is thus expected to be stronger. If the wage subsidy programme targets long-term unemployed, or unemployed with a low probability of obtaining a job, the effect will be smaller. Public works are an example of this kind of a programme.

## **5. The Data**

The data come from two sources. The Czech Statistical Office and the Statistical Office of the Slovak Republic provide annual data by district on employment and wages derived from surveys of most of the employers, both public and private, in the Czech and Slovak Republics<sup>14</sup>. The data on unemployment and number of persons in different labour market programmes are provided by the Ministry of Labour and Social Affairs in the Czech Republic and the National Labour Office in Slovakia.

Slovakia carried out a major administrative reform in 1996. The old territorial structure with 38 districts was turned into a new structure with 79 districts. The geographical composition of the new districts differs considerably from the old division of the country and aggregation into the old districts is not always possible. Only 22 out of the 38 old districts are possible to recreate. Through adding of old districts and re-creation of districts that are almost possible to recreate (where the difference is only a few municipalities with a population lower than 5,000

---

<sup>14</sup> The samples change slightly over time. Since 1997, the sample include all employers with more than 20 employees.

inhabitants), I have been able to construct 29 districts that cover almost the entire area of the Slovak Republic<sup>15</sup>.

To calculate average annual wages by districts, I use annual data that is based on the location of the workplace. The average wage is calculated by dividing the annual wage sum with the annual average number of employees for each workplace within the district. One concern is that the data do not separate between employees with different working hours. The number of employees with shorter working hours is however very low in the Czech and Slovak Republics.

Information on the number of unemployed and the number of programme participants is measured on a monthly basis. In the estimations, I use the stock at the end of December the preceding year. This will, at least partially, control for the simultaneity problem that arises because the number of unemployed and programme participants depend on the labour market situation and, hence, on wages.

Programme participants are divided into three categories: labour market training, wage subsidies, and public works. Basically, this categorisation is based on the theoretical presumptions that different kind of programmes could have different effects on the wage formation. These categories do also to a large extent coincide with the policies pursued by the Czech and the Slovak governments.

To control for district-specific shocks, I have constructed a local demand index using a one-digit breakdown by industry of employment in districts. The index is constructed as the change in employment that would occur between two years given that the district had the same employment development by industry as the whole country.<sup>16</sup>

---

<sup>15</sup> The area surrounding Bratislava was not possible to recreate in any good way. The old districts Galanta, Bratislava-vidiek and Senica are therefore not included in the analysis.

<sup>16</sup> The labour demand index is calculated as  $LDI_{it} = \sum_j N_{jt} \frac{N_{ijt-1}}{N_{jt-1}}$ , where  $N$  denotes employment,  $i$  district,  $t$  time, and  $j$  industry,

This leaves us with a panel of 73 districts for the Czech Republic and 31 districts in the Slovak Republic for the period 1992-1998<sup>17</sup>. The basic characteristics of the variables are displayed in Table 6.

**Table 6. Basic characteristics of the variables for Czech and Slovak districts**

Variable	Definition	Czech Republic		Slovak Republic	
		Mean	Std. Dev.	Mean	Std. Dev.
<i>RWAGE</i>	Real wage <sup>1</sup>	5,132	780	4,425	526
<i>UN</i>	The total number of unemployed <sup>2</sup> by December 31 <sup>th</sup> / labour force <sup>2</sup>	0.076	0.036	0.236	0.079
<i>LMP</i>	The number of programme participants / total number of unemployed (by December 31 <sup>th</sup> )	0.217	0.165	0.234	0.114
<i>LMT</i>	The number of participants in training / total number of unemployed (by December 31 <sup>th</sup> )	0.012	0.011	0.011	0.0089
<i>WS</i>	The number of participants in wage subsidy programmes / total number of unemployed (by December 31 <sup>th</sup> )	0.187	0.159	0.191	0.108
<i>PW</i>	The number of participants in public works / total number of unemployed (by December 31 <sup>th</sup> )	0.018	0.018	0.032	0.038
<i>LDI</i>	Labour demand index (see text)	67,706	92,940	48,885	37,238

1. 1992 prices, adjusted by CPI, Czech respective Slovak crowns

2. The total number of unemployed equals the openly unemployed plus participants in active labour market programmes.

To better display the time series and cross-sectional correlation in the data, I present so called Box-Whisker plots in the appendix for the key variables by year in both countries (real wage, unemployment rate, and the share of ALMP participants in unemployment, Figure A4-A9)<sup>20</sup>.

<sup>17</sup> Because the districts surrounding the main Czech cities, Prague and Brno, more or less are integrated into the Prague and Brno labour market, the districts Praha, Praha-vychod and Praha-zapad, and Brno and Brno-venkov, has been merged to one large district for Prague and Brno respectively.

<sup>18</sup> The line in the middle of the box represents the median or 50<sup>th</sup> percentile of the data. The box extends from the 25<sup>th</sup> percentile ( $x_{25}$ ) to the 75<sup>th</sup> percentile ( $x_{75}$ ). The lines emerging from the box are called *whiskers* and they extend to the upper and lower adjacent values. The upper adjacent value defined as the largest data point less than or equal to  $x_{75} + 1.5*(x_{75} - x_{25})$  and the lower adjacent value is defined as the smallest data point greater than or equal to  $x_{25} - 1.5*(x_{75} - x_{25})$ . Observed points more extreme than the adjacent values, if any, are referred to as outside values and are individually plotted (StataCorp (1999)).

<sup>19</sup> Mlada Boleslav is the hometown of the Volkswagen-owned Skoda Auto

<sup>20</sup> The line in the middle of the box represents the median or 50<sup>th</sup> percentile of the data. The box extends from the 25<sup>th</sup> percentile ( $x_{25}$ ) to the 75<sup>th</sup> percentile ( $x_{75}$ ). The lines emerging from the box are called *whiskers* and they extend to the upper and lower adjacent values. The upper adjacent value defined as the largest data point less than or equal to  $x_{75} +$

Note that the wage dispersion by districts has not increased in the Czech Republic, excluding Prague and Mlada Boleslav<sup>21</sup>, during the 1990s. In Slovakia, wage dispersion as measured by the box (the 75<sup>th</sup> percentile - 25<sup>th</sup> percentile) has more than doubled.

In Appendix (Figure A10-A13), I also display graphs of the correlation between real wages and the total unemployment rate (the share of ALMP participants in total unemployment) by year in both countries. The correlation between real wages and total unemployment is strongly negative in Slovakia, but almost no correlation is found in the Czech Republic. The share of ALMP participants in the total unemployment rate is negatively correlated with the real wage in the Czech Republic, but no correlation is found in Slovakia.

## 6. Results

Following the theoretical discussion in section 4, I choose an empirical specification given by

$$\ln RWAGE_{it} = \mathbf{s}_t + \mathbf{l} \ln UN_{it} + \mathbf{g}LMP_{it} + \mathbf{m}LDI_{it} + f_i + \mathbf{e}_{it} \quad (8)$$

where  $i$  denotes district,  $t$  year,  $\mathbf{s}_t$  is a time dummy,  $RWAGE_{it}$  the average real wage,  $UN_{it}$  the total unemployed rate ( $U+R$ ),  $LMP_{it}$  the number of programme participants to the total number of unemployed, thus the accommodative stance ( $\mathbf{j} = R/(U+R)$ ), and  $LDI_{it}$  the labour demand index.  $f_i$  is a district fixed effect that do not vary over time, and  $\mathbf{e}_{it}$  is an error term.  $\mathbf{l}$ ,  $\mathbf{g}$  and  $\mathbf{m}$  are parameters to be estimated (see table 6 for definitions of the variables).

First, I assume that the fixed effects,  $f_i$ , are equal for all districts. To do this, I apply ordinary least squares, OLS, on pooled data for the Czech and Slovak Republics, respectively<sup>22</sup>. The results are presented in Table 7 and Table 8 (Column 1 and 2).

---

1.5\*(x75 - x25) and the lower adjacent value is defined as the smallest data point greater than or equal to x25 - 1.5\*(x75 - x25). Observed points more extreme than the adjacent values, if any, are referred to as outside values and are individually plotted (StataCorp (1999)).

<sup>21</sup> Mlada Boleslav is the hometown of the Volkswagen-owned Skoda Auto

<sup>22</sup> Time dummies and a constant are included

**Table 7. Results for different specifications for the Czech Republic<sup>1</sup>**

	(1)	(2)	(3)	(4)	(5)	(6)
<i>lnUN</i>	-0.013* (0.007)	-0.016** (0.007)	-0.042*** (0.008)	-0.042*** (0.008)	-0.018** (0.009)	0.069*** (0.017)
<i>lnUN<sub>neigh</sub></i>	-	-	-	-	-0.086*** (0.012)	-
<i>LMP</i>	-0.119*** (0.036)	-	0.013 (0.022)	-	-0.00008 (0.022)	-0.150 (0.045)
<i>LMP<sub>neigh</sub></i>	-	-	-	-	0.150*** (0.035)	-
<i>lnUN + lnUN<sub>neigh</sub></i>	-	-	-	-	-	-0.086*** (0.012)
<i>LMP + LMP<sub>neigh</sub></i>	-	-	-	-	-	0.150*** (0.035)
<i>LMT</i>	-	0.239 (0.295)	-	-0.082 (0.170)	-	-
<i>WS</i>	-	-0.159*** (0.037)	-	0.017 (0.023)	-	-
<i>PW</i>	-	0.096 (0.189)	-	-0.033 (0.108)	-	-
<i>LDI</i> (in 100,000 persons)	0.443*** (0.039)	0.754*** (0.082)	0.192* (0.099)	0.193* (0.099)	0.267*** (0.094)	0.267*** (0.094)
<b>District fixed effects</b>	No	No	Yes	Yes	Yes	Yes
<b>No of districts</b>	73	73	73	73	73	73
<b>No of observations</b>	511	511	511	511	511	511
<b>R-square</b>	0.773	0.768	0.948	0.948	0.954	0.954

1. The log of the real wage (*lnRWAGE*) is the dependent variable. Standard errors in parentheses, \* indicates significance at the 10 percent level, \*\* significance at the 5 percent level, and \*\*\* significance at the 1 percent level. Year dummies are included.

**Table 8. Results for different specifications for the Slovak Republic<sup>1</sup>**

	(1)	(2)	(3)	(4)	(5)	(6)
<i>lnUN</i>	-0.128*** (0.014)	-0.133*** (0.014)	-0.109*** (0.015)	-0.117*** (0.016)	-0.102*** (0.018)	-0.082* (0.042)
<i>lnUN<sub>neigh</sub></i>	-	-	-	-	-0.020 (0.029)	-
<i>LMP</i>	0.148*** (0.041)	-	0.092*** (0.029)	-	0.079** (0.032)	0.018 (0.071)
<i>LMP<sub>neigh</sub></i>	-	-	-	-	0.062 (0.054)	-
<i>lnUN + lnUN<sub>neigh</sub></i>	-	-	-	-	-	-0.020 (0.029)
<i>LMP + LMP<sub>neigh</sub></i>	-	-	-	-	-	0.062 (0.054)
<i>LMT</i>	-	-0.220 (0.511)	-	-0.546 (0.373)	-	-
<i>WS</i>	-	0.137*** (0.043)	-	0.084*** (0.031)	-	-
<i>PW</i>	-	0.230** (0.107)	-	0.126** (0.059)	-	-
<i>LDI</i> (in 100,000 persons)	1.09*** (0.128)	1.08*** (0.129)	-0.224 (0.268)	-0.258 (0.267)	-0.215 (0.269)	-0.215 (0.269)
<b>District fixed effects</b>	No	No	Yes	Yes	Yes	Yes
<b>No of districts</b>	29	29	29	29	29	29
<b>No of observations</b>	203	203	203	203	203	203
<b>R-square</b>	0.808	0.810	0.897	0.899	0.897	0.897

1. The log of the real wage (*lnRWAGE*) is the dependent variable. Standard errors in parentheses, \* indicates significance at the 10 percent level, \*\* significance at the 5 percent level, and \*\*\* significance at the 1 percent level. Year dummies are included.

The results show a significant negative effect of unemployment and a significant positive effect of the accommodative stance of labour market programmes on wages in Slovakia. In the Czech Republic, the effects of labour market programmes are significant and with a negative sign, while the effect of unemployment on wages is much smaller than in Slovakia.

To investigate to what extent these differences between the Czech Republic and Slovakia are a result of imposing equal fixed unobservable effects between districts,  $f_i$ 's, I apply a standard fixed effect model, i.e. OLS on deviations from individual means. The results are presented in Table 7 and Table 8 (Column 3 and 4). The fixed effect regressions confirm that the results for Slovakia are stronger than for the Czech Republic.

The unemployment elasticity of pay is more than two times higher in Slovakia. This means that if the district unemployment rate doubles, real wages will decrease with 7 percent in Slovakia and 3 percent in the Czech Republic. The unemployment elasticity of pay for Slovakia is equal to, but the elasticity for the Czech Republic is lower than the 0.1 estimated by Blanchflower & Oswald (1994) for several western countries. The results for the Czech Republic are more in line with the results reported by Blanchflower & Oswald (1999) for five Central and Eastern European countries (including the Czech Republic, but not Slovakia). They use individual wage data and regional labour market data for the time period 1990-1995 and estimate an unemployment elasticity of pay of  $-0.042^{23}$ .

The elasticity of the accommodative stance of labour market programmes to wages is not significant in the Czech Republic. In Slovakia, I found a positive significant coefficient for the accommodative stance of labour market programmes (table 8, column 3) and a positive significant coefficient of the wage subsidy programme (*WS*) and public works (*PW*) (table 8, column 3). Less precisely, I also estimate a negative coefficient for labour market training (*LMT*). The wage subsidy programme seems to exert upward pressure on wages in Slovakia. If the number of participants in the wage subsidy programme in relation to the total number unemployed in a district increases with 10 percentages, holding total unemployment constant, average real wages will increase with 0.9 percent. Following the theoretical discussion in section

---

<sup>23</sup> They also report estimations for the shorter time periods, 1991-1995 and 1992-1995, where the unemployment elasticity of wages is estimated to  $-0.063$  and  $-0.090$ , respectively.

4, participation in the wage subsidy programme and public works increases the utility (or decreases the disutility) of becoming unemployed, and the negative effect of increased wages (in form of increased joblessness) becomes less awkward for the trade union or individual workers. For labour market training, which has a stronger focus on skill formation and where the average subsidies are lower, we do not find this effect on wages.

The estimated effects of the influence of unemployment and ALMPs on wages in a district are unbiased only if a district coincides with a labour market area. This need not always be the case. I will test for alternative measures of labour market areas by introducing variables of the labour market situation in neighbouring districts. Thus, the variable  $UN_{neigh}$  corresponds to the total unemployment rate in all adjacent districts<sup>24</sup>. The variable  $LMP_{neigh}$  is constructed in a similar way.

The results are presented in Table 7 and 8 (column 5). Effects of unemployment and ALMPs from neighbouring districts are very strong in the Czech Republic. Thus, the districts in the Czech Republic do not seem to correspond to labour market areas. Strong effects of unemployment and ALMPs are shared between adjacent districts. When including neighbouring districts in the equation for the Czech Republic, I estimate a significant positive effect on wages from ALMPs and a stronger negative effect from unemployment.

In Slovakia, the effects from the unemployment rate on wages within districts outweigh the effects from neighbouring districts. The effect of the accommodative stance in a district is, however, does not differ much from the effects of the accommodative stance in neighbouring districts.

The size of the districts used in the estimations in the Czech Republic and Slovakia are on average equal (with a working-age population of around 90,000). The results indicate that labour market areas are smaller in Slovakia than in the Czech Republic. This could be caused by less commuting and less diversified regional labour markets in Slovakia.

---

<sup>24</sup>  $UN_{neigh_{it}} = \sum_k UN_{kt} / \sum_k LF_{kt}$ , where  $k$  is the adjacent districts.

To test if the effects within districts are equal to effects in neighbouring districts, I estimate the specification

$$\ln RWAGE_{it} = \dots + \mathbf{I}_1 \ln UN_{it} + \mathbf{I}_2 (\ln UN_{it} + \ln UN_{neigh_{it}}) + \mathbf{g}_1 LMP_{it} + \mathbf{g}_2 (LMP_{it} + LMP_{neigh_{it}}) + \dots (9)$$

If  $\mathbf{I}_1 = 0$  and  $\mathbf{g} = 0$ , the coefficient of the unemployment rate and ALMPs in one district is equal to the coefficient of the unemployment rate in neighbouring districts. The results from these estimations are presented in Table 7 and 8 (column 6). The restriction does not hold for the Czech Republic ( $\mathbf{I}_1 \neq 0$  and  $\mathbf{g} \neq 0$ ). In Slovakia the restriction hold for ALMPs, but not for the total unemployment rate ( $\mathbf{I}_1 \neq 0$  and  $\mathbf{g}_1 = 0$ ). The effect of ALMPs is however not significant in Slovakia when allowing for effects from neighbouring districts.

## 7. Conclusions

In this paper, I have presented results regarding the effects of unemployment and labour market programmes on real wages in the Czech and Slovak Republics using district paneldata for the period 1992-1998. Clear evidence of a “wage curve” exists in both countries. The estimated unemployment elasticity of pay is, however, higher in the Slovak Republic, than in the Czech Republic. The wage subsidy and the public works programme exert upward pressure on real wages in Slovakia. When accounting for effects from adjacent districts, a positive significant effect of labour market programmes is also estimated for the Czech Republic.

According to the estimations in this paper, the use of active labour programmes had significant positive effects of wages in both the Czech and Slovak Republics. Following the theoretical framework presented in section 4, increased focus on active labour market programmes have two competing effects on wages. Increased utility among the unemployed will decrease the pain of becoming unemployed, and consequently, it will have a positive impact on wages. On the other hand, increased competition among jobs-seekers will exert negative pressure on wages. In the Czech and Slovak Republics, the first effect dominates. According to Calmfors and Lang (1995), the second effect will be stronger if programmes are targeted at long-term unemployed or labour force entrants. Some evidence (see for example Ham et al. (1994)) indicates that participation in active labour market programmes, at least early in the 1990s, to a large extent was offered to the



best applicants, rather than those with poor re-employment prospects. The evidence presented in this paper is consistent with these observations.

In this study, I found some differences between the Czech and Slovak Republics. These countries have had major differences in labour market performance during the 1990s. They have also to some extent chosen different policy options. It would be interesting to extend or complement this study with results from other countries in the region, for example Poland, Hungary and the Baltic countries. These countries have chosen other policy options and the labour market outcome varies considerably in the region. Another interesting extension would be to analyse crowding-out effects of programs on regular employment.

## References

- Baltagi, B. H., Blien, U. and Wolf, K., "The East German wage curve 1993--1998", *Economics Letters*, 69, 25-31
- Blanchflower, D.G. and Oswald, A.J. (1994) *The Wage Curve*, MIT Press, Massachusetts
- Blanchflower, D.G. and Oswald, A.J. (1999) "Unemployment, Well-being and Wage Curves in Eastern Europe" ILO
- Boeri, T., (1994) "Transitional Unemployment", *Economics of Transition*, Vol. 2, No. 1, 1-25.
- Boeri, T., (1997) "Learning from Transition Economies: Assessing Labor Market Policies across Central and Eastern Europe", *Journal of Comparative Economics*, 26, 366-384
- Boeri, T. and Burda, M. (1996) "Active labor market policies, job matching and the Czech miracle", *European Economic Review*, 40, 805-817
- Burda, M. and Lubyova, M. (1995) "The impact of Active Labour Market Policies: A closer look at the Czech and Slovak Republics", in *Tax and Benefit Reform in Central and Eastern Europe*, ed. By D.M.G. Newberry , Centre for Economic Policy Research, London
- Calmfors, L. (1994) "Active labour market policy and unemployment - a framework for the analysis of crucial design features", *OECD Economic Studies*, no. 22
- Calmfors, L. and Forslund, A. (1991) "Real-wage adjustment and labour market policies: the Swedish experience", *The Economic Journal*, Vol. 101. 1991

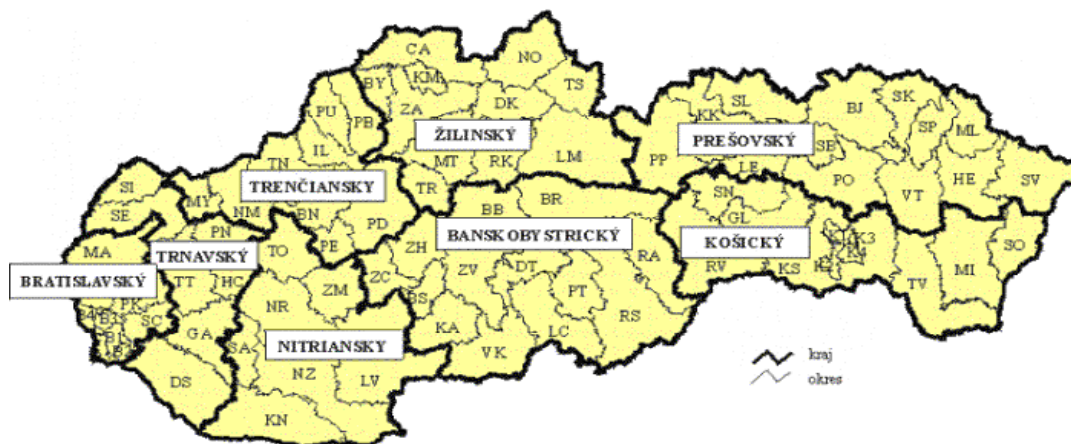
- Calmfors, L. and Lang, H. (1995) "Macroeconomic Effects of Active Labour Market Programmes in a Union Wage-Setting Model", *Economic Journal*, 105, 601-619
- Calmfors, L. and Nymoén, R. (1990) "Real wage adjustment and employment policies in the Nordic countries", *Economic Policy*, October 1990, 398-448
- Edin, P-A, Holmlund, B. and Östros, T. (1994) "Wage Behaviour and Labour Market Programmes in Sweden: Evidence from Microdata", in Tachibanaki (Ed.) *Labour Market and Economic Performance. Europe, Japan, and the USA*, Macmillan Press, Hampshire
- Forslund, A. (1994) "Wage Setting at the Firm Level - Insider Versus Outsider Forces", *Oxford Economic Papers*, 46(2), pages 245-61
- Forslund, A. and Kolm A.-S, (2000) "Active labour market policies and real-wage determination: evidence from Sweden", Working paper 2000:7, Office of labour market evaluation, Uppsala, Sweden
- Ham, J., Svejnar, J., and Terrell, K. (1995) "Czech Republic and Slovakia" in S Commander and F. Coricelli, eds. *Unemployment, restructuring and the labor market in Eastern Europe and Russia*, World Bank, Washington DC
- Kluwe, J., Lehmann, H. and Schmidt, C.M. (1999) "Active labour market policies in Poland: human capital enhancement, stigmatisation or benefit churning?", *Journal of Comparative Economics*
- Lubyova, M. and van Ours, J. (1998) "Effectiveness of Active Labour Market Programs in the Slovak Republic", Working Paper no. 127, CentER for Economic Research, Tilburg University
- Lubyova, M. and Ochrankova, D. (1999), *Background study on employment and labour market in the Slovak Republic*, European Training Foundation, Torino
- MSPV (1998), *Aktivni politika zamestnanosti v Ceske republice 1992-1997 (Active labour market policy in the Czech Republic 1992-1997)*, Ministry of Labour and Social Affairs, Prague
- Munich, D., Jurajda, S. and Cihak, M. (1999), *Background study on employment and labour market in the Czech Republic*, European Training Foundation, Torino
- OECD (1998), *OECD Economic Surveys: the Czech Republic*, May 1998, OECD, Paris
- Pannenberg, M. and Schwarze, J. (1998) "Labour market slack and the wage curve", *Economics Letters*, 58, 351-354
- Puhani, P.A. (1998) "Advantage through training? A microeconomic evaluation of the employment effects of active labor market programs in Poland", Discussion Paper 98-25, Centre for European Economic Research (ZEW), Mannheim
- Raaum, O. and Wulfsberg, F. (1997) "Unemployment, labour market programmes and wages in Norway", *Arbeidsnotater* 11, Norges Bank



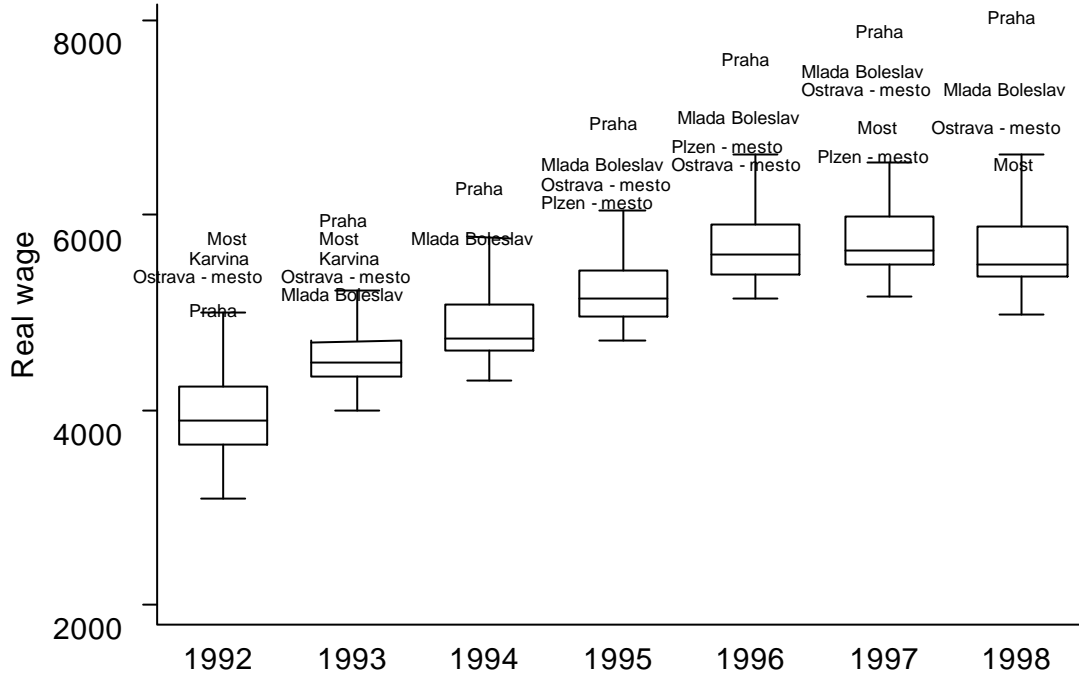
Figure A2: Administrative division of Slovakia before 1996



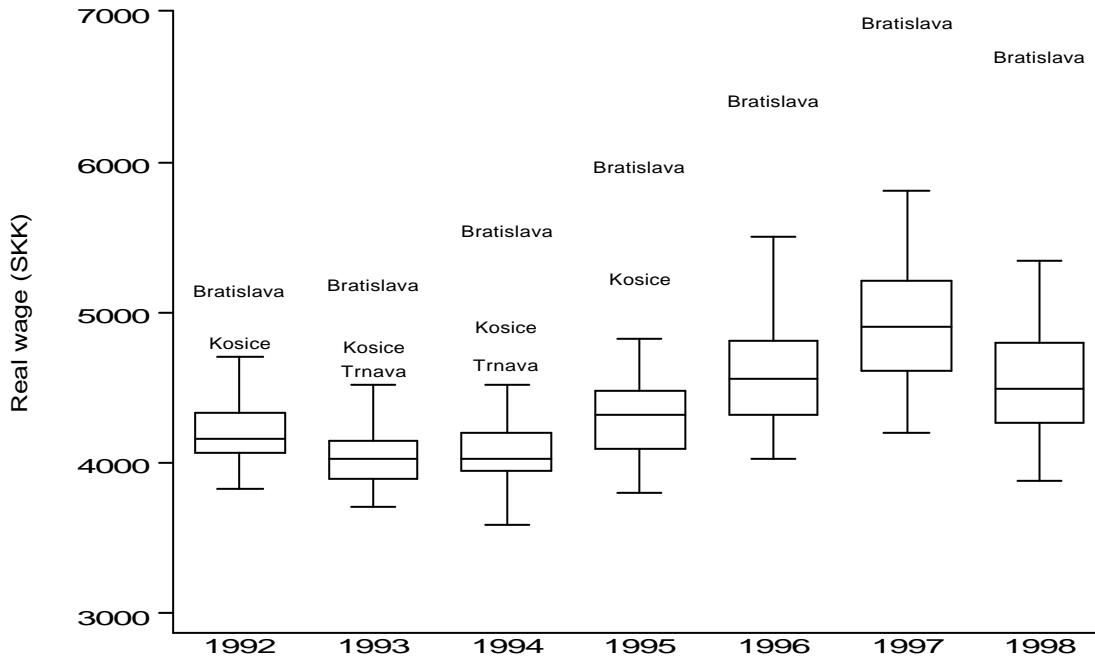
Figure A3: Administrative division of Slovakia after 1996



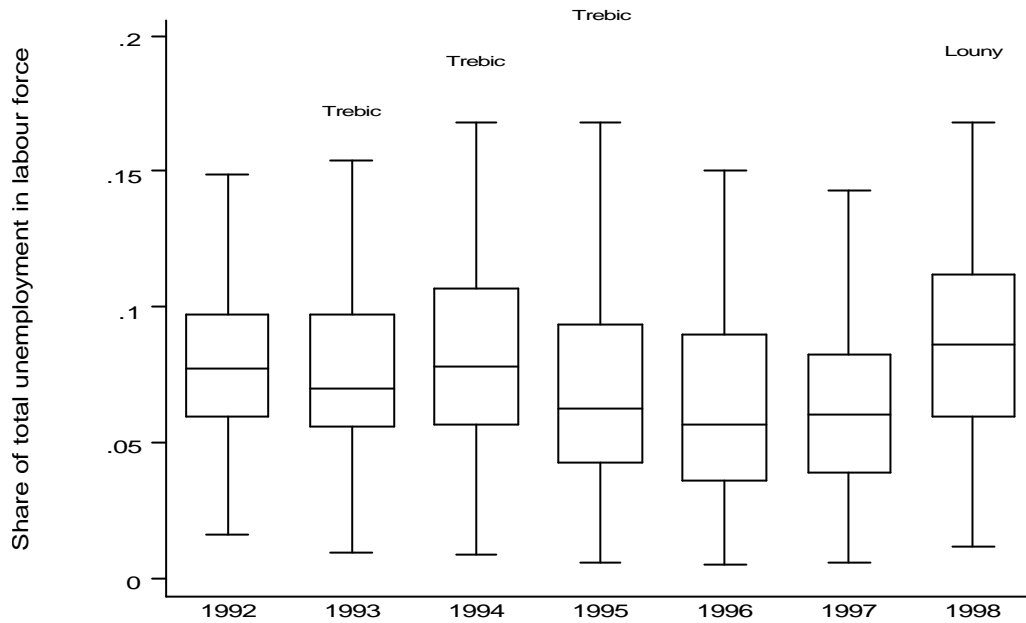
**Figure A4: Box - Whisker plot of the real wage by year in the Czech Republic**



**Figure A5: Box - Whisker plot of the real wage by year in the Slovak Republic**

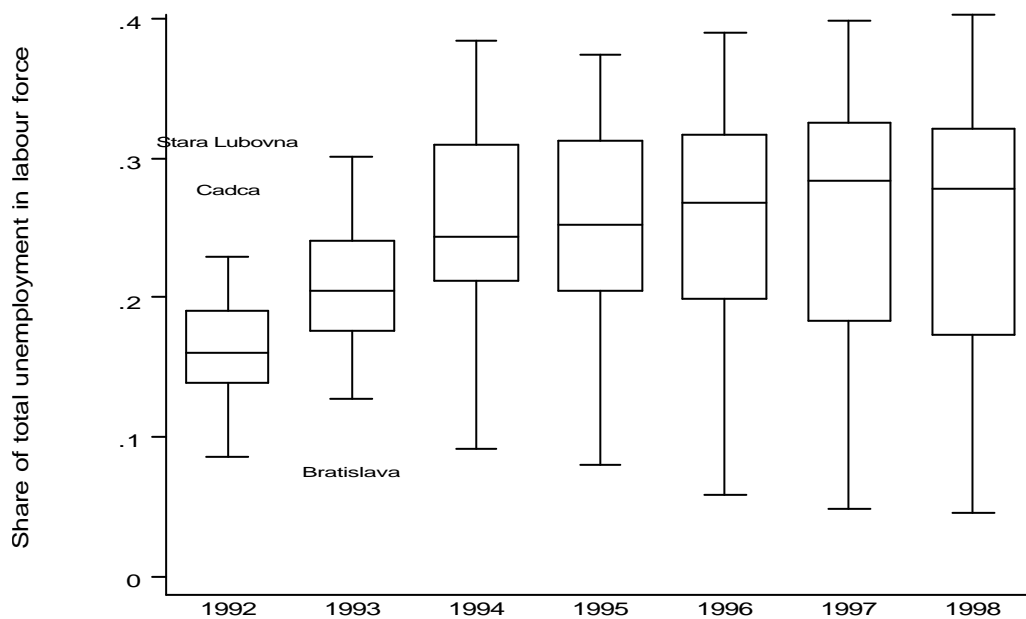


**Figure A6: Box - Whisker plot of the total unemployment rate<sup>1</sup> by year in the Czech Republic**



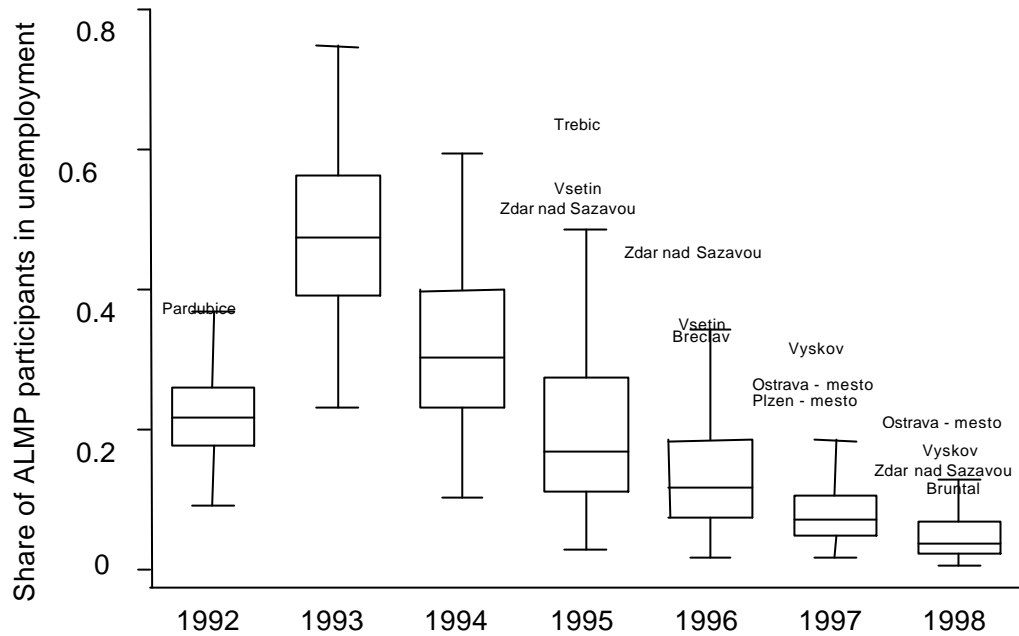
1. Openly unemployed plus ALMP participants as a share of the labour force

**Figure A7: Box - Whisker plot of the total unemployment rate<sup>1</sup> by year in the Slovak Republic**

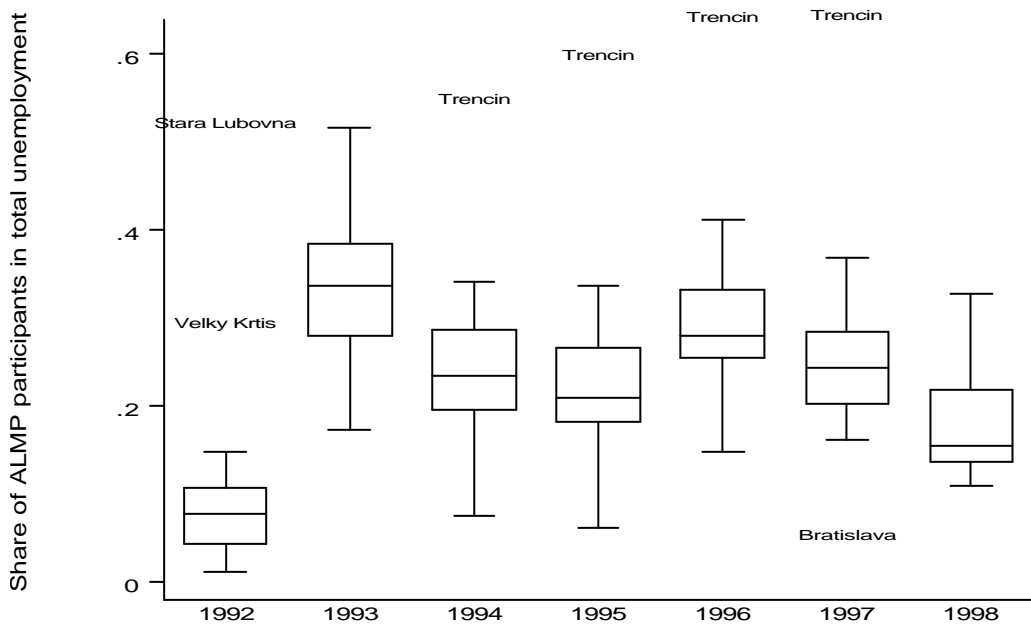


1. Openly unemployed plus ALMP participants as a share of the labour force

**Figure A8: Box - Whisker plot of the share of ALMP participants in total unemployment by year in the Czech Republic**



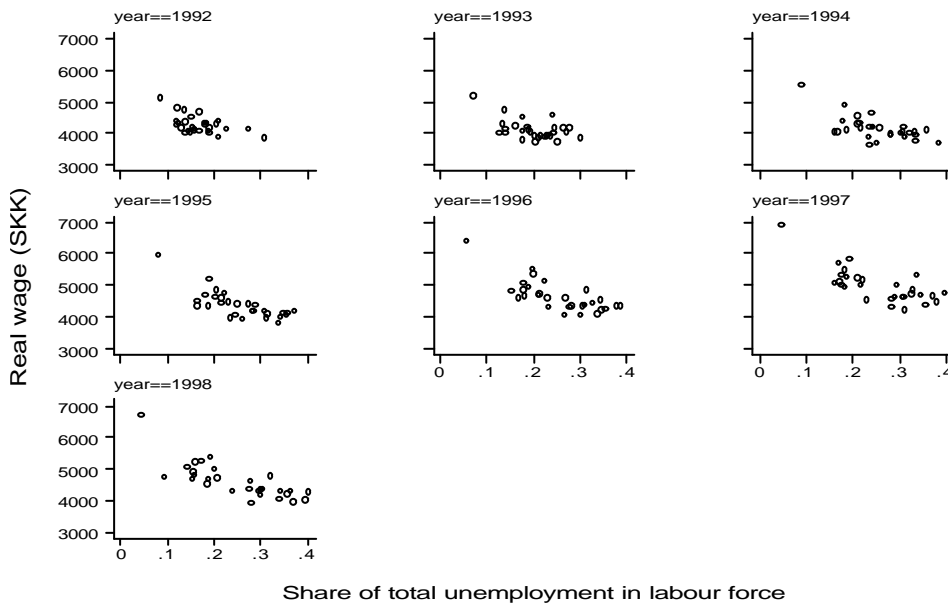
**Figure A9: Box - Whisker plot of the share of ALMP participants in total unemployment by year in the Slovak Republic**



**Figure A10: The correlation between real wages and the total unemployment rate by year in the Czech Republic**

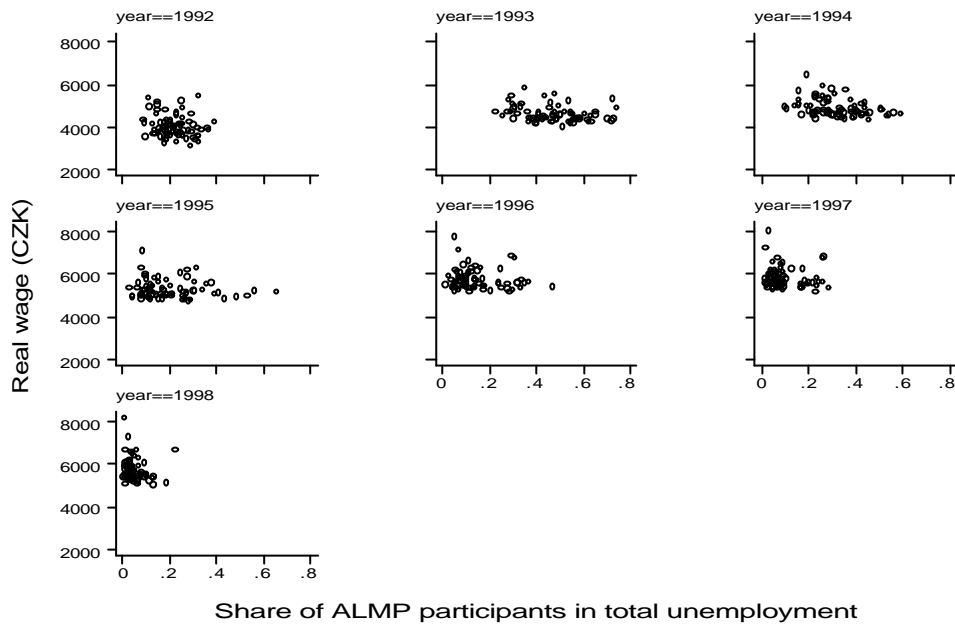


**Figure A11: The correlation between real wages and the total unemployment rate by year in the Slovak Republic**





**Figure A12: The correlation between real wages and the share of ALMP participants in total unemployment by year in the Czech Republic**



**Figure A13: The correlation between real wages and the share of ALMP participants in total unemployment by year in the Slovak Republic**

