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**LABOUR MARKET MATCHING EFFICIENCY IN THE
CZECH REPUBLIC TRANSITION**

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Abstract

Using the matching function and the monthly and yearly data from 1992 to 2000 of 76 Czech districts, this paper studies district specific characteristics affecting matching efficiency. Among the conclusions, it was found that the higher the educational level of the labour force and the higher the number of firms in new sectors, except in the commercial one, the more efficient the matching process. The results give evidence supporting the idea that employed workers participate in the matching process and, therefore, they are one of the sources of increasing returns to scale in the Czech matching function. Small new enterprises in the commercial sector are also a source of increasing returns.

JEL Classification J6, J64, J69

Keywords: Transition Labour Markets, matching efficiency

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Introduction.

The Czech transition was characterized by the restructuring process and two aggregate activity crises; the initial one that ended in 1994 and the 1997 crisis. The evolution of unemployment during the Czech transition is characterized by a period of very low unemployment before 1997 followed by a period of unemployment levels around 10% and increasing differences across districts in terms of unemployment levels, LTU incidence and declining differences regarding v/u ratio. The relationship between unemployment and vacancies shows declining matching efficiency and increasing differences in matching efficiency across districts coinciding with the speed-up of restructuring after 1997. This paper estimates the Czech matching function and seeks to find matching efficiency determinants.

The use of the matching function as a device to study transforming labour markets has been very common. It has certainly helped labour market researchers to understand nascent labour markets. At the same time, the economic transformation undergone during the 1990s in Central Eastern Europe gave rise to a large amount of matching literature that increased our existing knowledge about how to estimate the matching function and what can be learnt from it. This paper, using the Czech case, provides evidence and new results on how transforming labour markets operate. The findings reinforce the idea that the matching function is a useful device. The paper is divided into three sections. The first consists of a review of the literature. In the second one, I estimate the matching function in two stages. In the third one I obtain conclusions.

1.-Review of the literature

The increase in matching literature is a direct consequence of the importance of outflow from unemployment in transforming economies. Outflow from unemployment increases with the number of vacancies, the number of unemployed and the efficiency of both in matching each other. There are two kinds of studies regarding outflow from unemployment. On the one hand, we have those that estimate hazard functions and on

the other hand, studies that, using aggregate data of vacancies, unemployment and outflow, estimate matching functions.

Among the former using Czech data there is Ham et al. (1998), Ham et al. (1999), Sorm and Terrel (1997), Finta and Terrel (1997), Lubyova and van Ours (1997), Sorm and Terrel (1998). Unemployment duration models have also been applied to other Central Eastern Europe (CEE) countries, Bellman et al. (1995) use data from East Germany, Abraham and Vodopivec (1993) from Slovenia, Micklewright and Nagy (1995 and 1997) from Hungary, Jones and Kato (1997) from Bulgaria, Dushi (1997) from Albania and Foley (1997) from Russia. Although the results obtained by hazard literature differ among the above studies, most of them coincide in the following. Firstly, the probability of leaving unemployment varies across regions, increases with the level of education and decreases with the duration of unemployment spells. Secondly, the Czech Unemployment Compensation System (UCS) does not seem to have a strong negative impact on reducing the efficiency of the labour market by lengthening unemployment spells. Finally, there has been a significant movement from old to new sectors. In this respect, Sorm and Terrel (1999 a, b) do not focus on re-employment probabilities but on the importance of labour mobility. They show that there has been a significant movement into finance, trade and tourism and out of the agricultural and industrial sectors. They also find that over half of the people who change jobs have changed employment sector and that change in sector occurred more among people who found a job out of unemployment or out of the labour force than among job-to-job movers. They conclude that there has been a significant shift in the structure of employment and that the Czech labour market has demonstrated a high degree of flexibility and efficiency. According to Petrongolo (2001), *micro studies control for a number of characteristics which can be aggregated to give shift variables in the aggregate matching function besides U and V^l .*

The literature has also approached outflow from unemployment at an aggregate level, using the matching function that gives complementary evidence to the hazard estimates identifying demand factors (vacancies) and the interaction between demand and supply. It is assumed that outflow to employment (O) is a function of the number of

¹ Petrongolo (2001), page 414.

unemployed (U) and the number of posted vacancies (V), in the same way that in a production function output is a function of labour and capital.

$$O=f(U,V) \tag{1}$$

The matching process is seen as a technological search process where searching firms and workers try to find the best match given exogenous factors that influence matching efficiency such as availability of information, skills mismatch and spatial mismatch. The different dimensions of mismatch can be captured by the estimation of the matching function. When using panel data, *the most frequently used functional form is a Cobb Douglas like*

$$\log O_{i,t} = c + \beta_u \log U_{i,t-1} + \beta_v \log V_{i,t-1} + \alpha_i + \lambda_t + \varepsilon_{i,t} \tag{2}$$

Where $U_{i,t-1}$, and $V_{i,t-1}$ represent the number of unemployed and vacancies at the end of period $t-1$, $O_{i,t}$ represents outflow to jobs, the number of successful matches between vacancies and unemployment, constant c captures the efficiency of the matching and α_i , λ_t and $\varepsilon_{i,t}$ represent the district- specific and time-specific and overall unexplained stochastic part of the matching process².

Burda (1993) was the first one to use the matching function to study transition labour markets. He used panel data from 1990 to 1992 and estimated by OLS simple static matching functions for the Czech and Slovak Republics. He found that the matching function displayed constant returns to scale (CRTS)³ and that estimated coefficients for unemployment were twice those for vacancies. He states that the existence of a stable matching function can provide guidance for policy design in transforming economies

² Svejnar 1999, page (2847).

³ The existence of constant or increasing returns to scale has political implications. The existence of constant returns to scale (CRTS) would imply a unique, stable and optimal equilibrium. On the contrary, the existence of increasing returns to scale (IRTS) may imply multiple equilibria. Therefore, increasing returns to scale are considered to be an argument in favour of government intervention because they constitute a necessary condition for multiple equilibria. In the presence of IRTS government intervention would be justified to bring the economy to low unemployment equilibrium. In a matching function like

$M = A V^\beta U^\alpha$ there are constant returns to scale if $\alpha + \beta = 1$ and increasing returns to scale if $\alpha + \beta > 1$.

because the growth of the private sector would depend on the efficiency with which workers and jobs can be brought together and on how quickly vacancies can be created. He focuses on the optimal speed of transition (OST) implied by the estimated matching function. In other words, he uses the matching function to study how rapidly the state sector should be shrunk. Based on Czech estimates⁴ he computed the implied rate of monthly layoffs from the state sector to keep unemployment constant along the optimal path suggested by the Equilibrium Unemployment Theory (see Pissarides 2000). He found that neither a “big bang” nor a “go slow” are optimal; instead a “mixed bang” is more appropriate. He recognizes that his analysis ignores several important issues such as the effects of unemployment on human capital. Munich et al. (1998) followed Burda (1993) and searched for factors affecting matching efficiency. The following pages are a natural extension of Burda (1993) and Munich et al. (1998).

Boeri (1994) found that vacancies have a small effect and that the impact of long term unemployment on outflow is lower than the impact of short term unemployment. Svejnar et al. (1995) introduced more explanatory variables apart from vacancies and unemployment. Regarding Active Labour Market Policies (ALMPs), they found that an increase of 1% in expenditure per capita increases outflow by 0.17%. Lubyova and van Ours (1994) searched for structural breaks and found differences across regions. Boeri and Scarpetta (1995) augmented the matching function by the introduction of agricultural employment and a proxy for the diversification of economic activity. Burda and Lubyova (1995) found that ALMPs have a significant positive effect on outflow. Boeri and Burda (1996), like Burda and Lobyova (1995), set out to quantify the effects of ALMPs. They followed a similar methodology and found a significant but small effect of ALMPs on flows from unemployment to jobs. They turned their attention to the wide and increasing dispersion of unemployment rates across regions while the vacancy rate coefficient of variation decreased in the Czech Republic. They considered that development as evidence for the emergence of decentralized small enterprises and

⁴ His estimations implied that in a matching function like

$$M = A V^{\beta} U^{\alpha},$$

$\alpha = 0.74$, $\beta = 0.26$ and the efficiency of matching $A = e^{-1.3023}$. He disagrees that aggregate demand and supply are sufficient for analysing Eastern Europe. He assumes that the matching function *captures spatial aspects of the search process, imperfect information, and all types of occupational and industrial mismatch between jobs and workers* (Burda 1993, Page 107).

for the emergence of mismatch. They also pointed out the importance of industrial structures inherited from CPE by some districts: *the matching process is affected by the industry mix inherited from the centrally planned system*⁵. They rejected the spatial stability of the matching function, outflow rates were higher at the German border because *German businesses have shifted manufacturing operators over the Czech border to take advantage of lower labour costs*⁶.

Many of the above works accept the hypothesis of CRTS. However, Profit (1996) focused on instruments to solve autocorrelation and heteroscedasticity and showed that by using the Anderson-Hsiao instrumental variable increasing returns to scale (IRTS) are found.

Munich et al. (1998) introduced the new unemployed separately, accounted for the varying size of districts and controlled for the endogeneity of explanatory variables and the heterogeneity of unemployed searchers. They rejected CRTS and found that the unemployed play a very important role. As explanatory variables of the technological factor of the Czech matching function they introduced the educational levels of unemployed, long term unemployed, expenditure on ALMPs, distance to the European Union (15) border, density of population and a dummy for the Sudeten Lands. They used a two stage estimation methodology like the one used below.

Profit (1999), using data from 1991 to 1994, found that *a properly specified and consistently estimated matching function which accounts for autocorrelation in unemployment to-job-exits, the presence of heteroscedasticity, and validity of instruments renders elasticities of outflows to jobs with respect to unemployment and vacancies which imply increasing returns to matching. Early studies have failed to find this effect*⁷. He interprets IRTS as the result of competition between state-owned enterprises and the emerging private sector for skilled labour which gives rise to larger job-to-job movements. Such a search intensity of employed job seekers produces IRTS. This interpretation is at odds with Burda's (1993) assumption that on-job-search is not important during transition. It is also at odds with the Munich et al. (1998) finding

⁵ Burda and Profit (1996), page 263.

⁶ Burda and Profit (1996), page 259.

⁷ Profit (1999), page 27.

regarding the important role played by the unemployed. Unfortunately, there is no direct information on employed job-searchers available for the Czech Republic; therefore, *the effect of on-the-job-search is difficult to infer directly*⁸. In the estimations below I find that both the employed and the unemployed play a role in the matching process and that the emergence of small decentralized enterprises identified by Boeri and Burda (1996) is one of the sources of high estimated coefficients for the unemployed.

The study by Profit and Sperlich (2004) *explores the properties and the developments of matching technology in the Czech Republic during the transition to a market economy*⁹. They focused on the regional variation of the returns to scale and found them to be related to a set of structural economic characteristics such as the employment rate in agriculture, industry and services, immigrations, outmigrations and ALMP. They point out that *further research could entail a finer disintegration of matching factors such as the educational composition of the unemployment pool*¹⁰. The difference between the approach followed by Profit and Sperlich (2004) and the one followed here is that they concentrate on differences in unemployment and vacancies elasticities across regions and the second stage of this work assumes common elasticities across districts¹¹ and concentrates on the efficiency factor. The methodology followed here is closer to that of Munich et al. (1998).

2.- The estimation of the matching function and the efficiency factor

The estimations below are divided into two stages. The first one aims to efficiently estimate Czech matching function parameters. To do this, I took into consideration unobserved heterogeneity, correlation of the error term and varying district size following the aforementioned findings of Profit (1996, 1999) and Munich et al. (1998). I estimated an augmented matching function including as explanatory variables lagged outflow and new unemployed in the current period¹².

⁸ Profit (1999), page 24.

⁹ Profit and Sperlich (2004), page 695.

¹⁰ Profit and Sperlich (2004), page 710.

¹¹ In order to test for this assumption, I estimated the matching function eliminating Prague and Brno from the sample. I found that U and V estimated coefficients did not differ very much.

¹² Find more details on how the first stage was estimated in Pedraza (2007). He gives detailed information on how unobserved heterogeneity, autocorrelation of the error term and varying size of districts were solved. He also offers detailed comparisons of results found in augmented and non-augmented matching

This paper focuses on the second stage that aims to estimate factors affecting matching efficiency and possible sources of high unemployment elasticities. Using first stage estimated parameters and the mean log values of the associated variables, I calculated district specific efficiency residuals and regressed them on explanatory variables that do not vary through time. In other words, I used matching function estimated parameters from the first stage to estimate the effect of district specific characteristics on matching technology. These variables capture firms' and workers' characteristics as well as district specific conditions.

Although according to Munich et al. (1998), the source of IRTS are the unemployed, according to Profit (1999) IRTS are a consequence of employed searchers. In order to test whether employed workers are playing a role in the matching process, I assumed no search on the job in the first stage and, in the second stage, included as explanatory variable of matching efficiency educational levels of district labour force instead of educational levels of unemployed.

In order to test for the role that economic structure is playing in the matching process I introduced the number of firms in new sectors. I followed a similar methodology to that of Munich et al. (1998). However, I was able to obtain more conclusions for two reasons. First, in the second stage, I introduced more explanatory variables, the number of firms per member of the labour force in new sectors and the educational levels of the labour force. Second, the above and recent bibliography related to those variables helped to obtain conclusions from results.

2.1.- The first stage: The estimation of the matching function parameters

The usefulness of identifying district specific characteristics that affect the matching efficiency is to learn what should be the focus of government policies regarding flows¹³

functions. He concludes that the best specification and estimation strategy of the first stage are those used here.

¹³ Regarding both outflow from unemployment and, to a certain extent, inflow into unemployment especially in a context of a huge economic transformation as shown in Burda (1993). For example, according to literature, long term unemployment has a negative effect on outflow; so it should be taken into account regarding the speed of the transformations that produce inflow into unemployment. If a

in the labour market. Such a goal was fulfilled in the second stage; therefore, because of limited space, a detailed description of the first stage estimation strategy is not given. However, it is important to note that, like other studies that take into account correlation and unobserved heterogeneity, I found IRTS.

Early studies used a Cobb-Douglas specification of the matching function like equation (2). However, the matching function has been augmented by the introduction of two more explanatory variables. On the one hand, it has been made dynamic by introducing the lagged value of outflow ($O_{i,t-1}$) as another explanatory variable. Lagged value of outflow allows for partial adjustment of the matching process. *Partial adjustment of the matching function may be produced by two reasons. Firstly, the fact that the acceptance of a job offer precedes the reported date of the match and secondly, that the information about newly posted vacancies is not diffused instantly to all job searchers*¹⁴. On the other hand, to account for the Coles and Smith (1998)¹⁵ finding, the number of people entering unemployment in the current period has also been included separately from those already unemployed. The data support the existence of partial adjustment of the matching function and that the newly unemployed interact with vacancies in a different manner than those already unemployed.

In the first stage, I worked on a panel data set of 76 districts over 12 months that were to be estimated for every year from 1992 to 2000; I ran nine panel estimations where N=76 and T=12 of a model like this

$$y_{i,t} = \beta' x_{i,t} + \alpha_i + \varepsilon_{i,t} + \alpha_t \quad (3)$$

Where y is the dependent variable, general outflow from unemployment (O_t).

certain district specific characteristic is proved to have a negative effect on outflow, a priori measures can be taken to offset its effect. In this respect, the conclusions may exceed the limits of labour economics and give information on how discipline and encouragement can be coordinated to avoid long term unemployment.

¹⁴ Munich et al. (1998).

¹⁵ Coles and Smith found that the newly unemployed, those entering unemployment in the current period, interact in a different manner with posted vacancies than those already unemployed. The reason is to be found in search intensity and human capital.

$x \equiv (x_1, x_2, \dots, x_k)$ refers to the aforementioned explanatory variables: the lagged value of unemployment ($U_{i,t-1}$), the lagged value of vacancies ($V_{i,t-1}$), lagged value of outflow ($O_{i,t-1}$), and newly unemployed in the current period ($N_{i,t}$). Therefore I estimated the augmented matching function below:

$$\ln O_{i,t} = \beta_o + \beta_{o_{t-1}} \ln O_{i,t-1} + \beta_n \ln N_{i,t} + \beta_u \ln U_{i,t-1} + \beta_v \ln V_{i,t-1} + v_{i,t} \quad (4)$$

The composite error is divided into three components

$$v_{i,t} = \alpha_i + \alpha_t + \varepsilon_{i,t} \quad (5)$$

α_i refers to the unobserved time constant factors called unobserved heterogeneity. These individual time invariant variables are the same for a given cross-sectional unit through time but vary across cross-sectional units (districts). For example, the distance from the district capital to the national one, the density of population, agricultural and industrial production at the beginning of the transition and district location in the southern part of the country. These variables are not available at district level with monthly frequency and therefore, not included in this first stage. Assuming that they affect the technology factor of the matching function, I introduced them in the second stage. They are included in the first stage error term. If unobserved heterogeneity is correlated with any of the explanatory variables, putting it into the error term can cause serious problems: we cannot consistently estimate β_s because the pooled OLS would be biased and inconsistent. This problem can be solved by first differences.

α_t refers to factors that vary over time but not across districts. These are variables that are the same for all cross-sectional units at a given point in time but vary through time.

Regarding serial correlation, it can be easily identified that the idiosyncratic error term, $\varepsilon_{i,t}$, is correlated with the explanatory variables because we are working on a matching function like

$$O_{i,t} = f(U_{i,t-1}, V_{i,t-1}) + \varepsilon_{i,t} \quad (6)$$

The OLS procedure assumes that the explanatory variables are not correlated with the error term. However, that assumption does not hold in a matching function because

$$U_{i,t-1} = U_{i,t-2} + I_{i,t-1} - O_{i,t-1} \quad (7)$$

The number of unemployed at the end of period t-1 is equal to the number of unemployed at the end of period t-2 plus those entering unemployment in period t-1 ($I_{i,t-1}$)¹⁶ minus those leaving unemployment. At the same time

$$O_{i,t-1} = f(U_{i,t-2}, V_{i,t-2}) + \varepsilon_{i,t-1} \quad (8)$$

Therefore, $U_{i,t-1}$ and $\varepsilon_{i,t-1}$ are correlated. As a consequence, in the original model the OLS assumptions are not completed even if α_i is uncorrelated with the rest of the explanatory variables.

These difficulties were first detected by Profit (1996) and Munich et al. (1998). I have taken into account and solved them by first differences and Prais-Winsten transformation. The first stage results, following the above methodology, are reported in table 1. Two conclusions can be obtained. Firstly, the Czech matching function displays IRTS. Secondly, estimated parameters for the unemployed are larger than those for vacancies. These results are very similar to those of Munich et al. (1998), who used deviations from backwards means.

It is also important to notice that in 1999, vacancies are not significant. This is due to a misrepresentation of the number of vacancies in the data. This misrepresentation of vacancies has been found quite often in matching function literature. For example, working with British data, Pissarides (1989) found that *there is evidence that the high compensation offered to the unemployed led to a full registration of all those eligible for*

¹⁶ $I_{i,t-1}$ is the inflow into unemployment in period t-1 in district i.

benefits. For that reason we shall assume, as a first approximation, that all the unemployed are registered at the unemployment agencies. Vacancies, however, do not receive compensation, so firms do not always register them¹⁷.

Table 1.- First stage estimation coefficients

Explanatory variables	1992			1993			1994		
	Coef.	t	sig. lvl.	Coef.	t	sig. lvl.	Coef.	t	sig. lvl.
Ot-1	-0.041*	-0.99	0.320	-0.081	-2.61	0.009	-0.078	-2.50	0.013
Ut-1	1.579	14.26	0.000	1,727	18.15	0.000	2.446	17.08	0.000
Vt-1	0.177	3.19	0.001	0.229	4.69	0.000	0.330	6.94	0.000
Nt	0.266	7.01	0.000	0.406	16.16	0.000	0.490	17.44	0.000
R ²	0.282			0.409			0.453		
Chi ²	0.000			0.000			0.000		
Explanatory variables	1995			1996			1997		
	Coef.	t	sig. lvl.	Coef.	t	sig. lvl.	Coef.	t	sig. lvl.
Ot-1	0.203	6.75	0.000	0.003*	0.10	0.920	-0.085	-3.07	0.002
Ut-1	2.727	19.87	0.000	2.397	15.78	0.000	2.142	16.21	0.000
Vt-1	0.157	2.69	0.007	0.147	2.61	0.009	0.222	3.93	0.000
Nt	0.613	22.34	0.000	0.599	20.67	0.000	0.521	22.59	0.000
R ²	0.455			0.465			0.508		
Chi ²	0.000			0.000			0.000		
Explanatory variables	1998			1999			2000		
	Coef.	t	sig. lvl.	Coef.	t	sig. lvl.	Coef.	t	sig. lvl.
Ot-1	0.022*	0.74	0.462	-0.000*	-0.01	0.988	0.076	2.23	0.026
Ut-1	2.115	14.53	0.000	3.048	16.98	0.000	3.627	17.86	0.000
Vt-1	0.143	4.50	0.000	0.031*	0.84	0.402	0.171	4.11	0.000
Nt	0.615	22.95	0.000	0.593	17.83	0.000	0.492	13.90	0.000
R ²	0.498			0.459			0.374		
Chi ²	0.000			0.000			0.000		

Data: Czech Districts Labour Offices

2.2.- Second stage: The efficiency factor and district specific characteristics

Using matching function estimated parameters, I analyzed whether aggregated district-specific characteristics explain inter-district matching efficiency differences.

Therefore, I estimated

$$\ln O_{i,t} = \beta_o + \beta_{o_{t-1}} \ln O_{i,t-1} + \beta_n \ln N_{i,t} + \beta_u \ln U_{i,t-1} + \beta_v \ln V_{i,t-1} + \delta W_i + v_{i,t}$$

$$v_{i,t} = \alpha_i + \alpha_t + \varepsilon_{i,t} \quad (9)$$

¹⁷ Pissarides, C (1989), page 819.

where W_i is a $K_1 \times 1$ vector of time invariant and district specific variables and δ is a $K_1 \times 1$ vector of associated parameters. The term $v_{i,t}$ represents the unexplained stochastic part of the matching process.

Using first stage estimated β_s , I estimated δ which reflects the impact of district specific variables W_i on the efficiency of matching, given unemployment, newly unemployed (inflow into unemployment) and vacancies. I computed the unexplained first stage residuals and used them on the left hand side of the following cross-section OLS regression which was estimated for each year from 1993 to 2000:

$$\overline{\ln O_i} - \hat{\beta}_{o_{-1}} \overline{\ln O_{-1,i}} - \hat{\beta}_n \overline{\ln N_i} - \hat{\beta}_u \overline{\ln U_{-1,i}} - \hat{\beta}_v \overline{\ln V_{-1,i}} = \beta_o + \delta'W_i + \alpha_i \quad (10)$$

The first stage was estimated using monthly observations of the variables. In the second stage, I used variables that are time invariant or are measured with annual frequency. There are many variables, apart from those introduced here that may affect efficiency. However, the disadvantage of working with district level data is that many variables are not available at district level even with annual frequency. The advantage is that, working with districts of the same country narrows the number of matching efficiency explanatory variables because they are all subject to the same labour market institutions and policies.

I tested whether the following district characteristics are able to explain district differences in matching efficiency: Educational levels of the labour force, proportion of long term unemployed, self-employment, expenditure in ALMPs, distance to EU border, density of population, Sudeten Lands, ratio of agricultural to industrial production in 1990 and number of enterprises in new sectors of activity.

Some of them were already tested by Munich et al. (1998) for a period between 1992 and 1996. However, they used educational levels of the unemployment pool and I use educational levels of the labour force. Likewise, they did not take into account the effect of self-employment and the number of firms in new sectors of activity. I am reporting

two models: Model 1 using almost the same variables as Munich et al. (1998) and Model 2 adding new variables.

2.2.1.- Educational levels of the labour force (edu1, edu2, edu3).-

Both labour force structure by educational levels and educational structure of the unemployed pool should have an impact on district matching efficiency. In the latter case, the results would be interpretable in terms of search theory. According to search theory and much of the hazard functions literature, the higher the educational level of a job seeker, the more easily he/she will find a vacant position because he/she is more attractive to firms. At an aggregate district level, it would mean that a larger proportion of the unemployed with a university education would have a positive impact on matching technology. However, the reservation wage of the university educated is higher. They are more likely not to accept a job offer because they might prefer to wait for a better chance, another offer with higher salary and better conditions. Therefore, a bigger proportion of the university educated unemployed would have a negative impact on matching technology. However, in the context of the hard times of transition the first positive effect is likely to be stronger than the second negative one. I used the 1991 proportion of the labour force that had completed university education (edu3) and the proportion of the labour force that had completed secondary education (edu2), and measured their effect on matching efficiency with respect to the proportion of the labour force with lower educational levels (edu1: primary education and no education).

Table 2.- Czech districts proportion of the labour force that have completed Primary, Secondary and University education 1991¹⁸.

	Mean	Std. Dev.	Min.	Max.
Primary education (edu1)	19.9%	2.4%	17%	30.5%
Secondary education (edu2)	73%	4.3%	53%	78.5%
University education (edu3)	7.1%	2.1%	3.4%	16%

Source: Czech Statistical Office (CZSO)

¹⁸ The maximum share of the labour force that had completed University education is in Prague, and the second maximum is in Brno, the capital of Moravia. Divergences in the educational composition across districts increased as transition evolved. The numbers reported here are only comparable to numbers from 2001; there are no figures for the years in between. See Jurajda S. (2005).

Labour force proportions have been introduced instead of unemployed proportions for two reasons. Firstly, the goal was to test whether the total labour force, employed and unemployed, play a role in the matching process. If these two variables (edu3 and edu2) are able to explain matching efficiency differences across districts, it would support the idea of the importance of on-the-job search highlighted by Profit (1999). Recall that he found evidence of searching employed workers as a source of increasing returns to scale of the Czech matching function. The hypothesis is that the higher the educational composition of the labour force, the lower the skill and educational mismatch, the more efficient the matching process is.

Secondly, long term unemployment has also been introduced, and most of the long-term unemployed have low educational levels. I avoid collinearity problems coming from two correlated explanatory variables by introducing proportions of the labour force as a proxy of proportions of the unemployed pool. In this respect, these variables can also be interpreted as a proxy of educational levels of the unemployed pool, in terms of search theory. If more educated individuals are in a better position to find jobs than their less educated counterparts and if this effect is not offset at an aggregate level by the reservation wage effect, edu2 and edu3 should have a positive effect. Therefore the hypothesis is that both variables (edu3 and edu2) should have a positive impact on matching technology. However, it is difficult to hypothesize which one has a stronger impact because although the university educated might be more attractive to firms, the secondary educated are also very attractive but have lower reservation wages. It has been proven that a high share of secondary educated labour force provides *workers with a few of the flexible skills required for success in the changing labour market*¹⁹.

It is also important to bear in mind that the proportions refer to 1991 district labour forces. They should be able to capture the concentration of skilled workers and an educational endowment inherited from communist times. However, they are not able to capture the concentration of skills in certain districts during transition, before 1991. As pointed out by Jurajda (2005), there is *a tendency of skill-intense production to locate in areas relatively abundant in skills*²⁰. He also showed that, *the districts' inequality in the*

¹⁹ Munich et al. (1999), page viii.

²⁰ Jurajda (2005), page 1.

*endowment of different levels of education is responsible for about half of the overall district variation in current unemployment rates (...) while unemployment rates of the college educated vary little across labour market areas*²¹. Labour mobility across districts moves highly educated workers to more dynamic districts where there are more opportunities. In this sense, as the “new economic geography” literature argues, spatial concentration of production factors reinforces divergence. District human capital concentration may be detected through the matching function. This variable only captures movements before 1991 and although educational composition inequality between districts can be traced to communist times²² and several districts had a better starting position, divergences across the districts’ educational composition increased very much as transition evolved. Therefore, it is hypothesised that the ability of these variables to explain differences in matching efficiency across districts decreases as transition evolves.

Summarizing, it is hypothesised that the variables edu2 and edu3 have a positive effect on matching efficiency and that their effect decreases as transition evolves. Their ability to explain matching efficiency in the early stages of transition would support the idea that the whole labour force is taking part in the matching process and therefore the importance of on-the-job search.

2.2.2.- Long Term Unemployment (LTU).

Table 3 shows the increasing importance of LTU as transition evolved. It also shows that differences across districts with respect to LTU also increased.

According to hazard models, the longer the unemployment spells of an individual, the lower his/her probabilities of finding a job. Therefore, it is hypothesised that the share of long term unemployment (LTU), those with spells longer than twelve months, has a negative impact in matching efficiency. This causal relationship also holds in the opposite direction: low matching efficiency implies lower outflow which increases LTU.

²¹ Jurajda S. (2005)

²² See CERGE-EI Economic Review (2005), page 51 and Jurajda (2005).

Table 3.- Unemployment rate and LTU.

	Unemployment %	Share of LTU on unemployment, %	Share of LTU on labour force, %	Std. Dev.*	Min.*	Max.*
1992	3.00	14.4	0.4	0.2	0.04	1.3
1993	2.99	17.4	0.5	0.3	0.01	1.4
1994	3.37	20.2	0.7	0.5	0.01	1.9
1995	3.07	23.4	0.7	0.5	0.01	2.2
1996	3.18	23.2	0.7	0.5	0.02	3.2
1997	4.36	23.6	1.0	0.7	0.04	4.5
1998	6.13	27.4	1.7	1	0.04	5.6
1999	8.62	32.4	2.8	1.4	0.15	8.1
2000	8.99	37.5	3.4	2	0.4	11
2001	8.54	38.6	3.3	-	-	-

Source: Columns 1, 2 and 3 CERGE-EI 2002 and 2005 economic surveys;
Columns 4,5,6 District Labour Offices.

*Of proportion of LTU on the labour force of the 74 Czech Districts.

The long term unemployed have been considered to be the losers of the transition. On the one hand, they have different characteristics than the short term unemployed²³; they mainly have low levels of education. On the other hand, the longer a worker is unemployed, the more difficult it is for him/her to be attractive to a firm because his/her human capital is worn out. They suffer from discouragement, stigma, loss of skills and skills mismatch.

Apart from the effect of unemployment on human capital, the literature has also pointed out the importance of the disincentive effect of social welfare transfer. *The welfare system may represent a floor preventing downward wage adjustment in districts with high unemployment rates and for the long term unemployed*²⁴. This study does not help in finding out the relative importance of disincentive effects of welfare transfers with respect to skills, education, discouragement and stigma effects.

²³ See Jurajda and Munich (2002).

²⁴ Galusčák and Munich (2003), page 1.

2.2.3.- New enterprises: Self employment and new start up firms

This variable was introduced as the number self-employed persons and firms with less than 25 employees per member of the district labour force (e). Both self employment and small and medium size enterprises are a new phenomenon, during communist times state firms were huge conglomerates. *Almost all new job creation in the early transition occurred in small firms*²⁵. Although it should have a positive effect on matching efficiency, there are factors that make it difficult to hypothesize the sign of the effect of this variable. At the same time, there are also problems regarding the identification, often made in the literature, of small firms with new firms²⁶.

It is known that new firms are always a source of dynamism and jobs. Sometimes they are a phenomenon of districts with favourable local conditions, a consequence of Greenfield foreign direct investment (FDI) or are born as providers to multinationals. However, they are also the consequence of unfavourable local conditions. Therefore, they are also common in districts with poor infrastructure and low FDI where self-employment is the only alternative.

Figure 1 and figure 2 show that there is a positive relationship between the number of new enterprises and outflow from unemployment, but there is also a positive relationship between the number of new enterprises and the level of unemployment. Neither of these correlations is very strong, but the second one seems clearer. Looking at other transition economies, it can be observed that high unemployment countries like Poland have more self-employment²⁷. At the same time, table 4 shows that standard deviation across Czech districts decreased as transition evolved while unemployment differences increased. Therefore, the positive effect of this variable might have been absorbed by unemployment in the first stage estimations. In that case self-employment

²⁵ CERGE-EI Economic Review 2002, page 51. See also Jurajda and Terrell (2002 a and b) who consider these new enterprises as the engine of job creation.

²⁶ Although it has been commonly used by literature, the assumption that data for small enterprises can be used to approximate new enterprises might not be very accurate. See IBRD (2002) for a discussion on the hypothesis that small enterprises can be taken as approximating new enterprises. The terms “new enterprises” and “small enterprises” are often used interchangeably. See also Jurajda and Terrel (2002b), CERGE-IE Economic Review 2002, pages 49 to 52 and Kumar et al. (1999).

²⁷ In 2003, the unemployment level in the Czech Republic was 8.9%, in Hungary 5.8%, and in Poland 19.3%. The respective proportions of self-employed workers were 15.3%, 14.6% and 28%. Source: Eurostat, Employment in Europe.

would be one of the reasons behind high unemployment elasticities and IRTS. In this respect, it is important to notice that Boeri and Terrell (2002) found that the Unemployment Compensation System (UCS) plays an important role encouraging self-employment²⁸, as a source for financing this type of business.

Figure 1.- New enterprises rate and outflow to jobs.

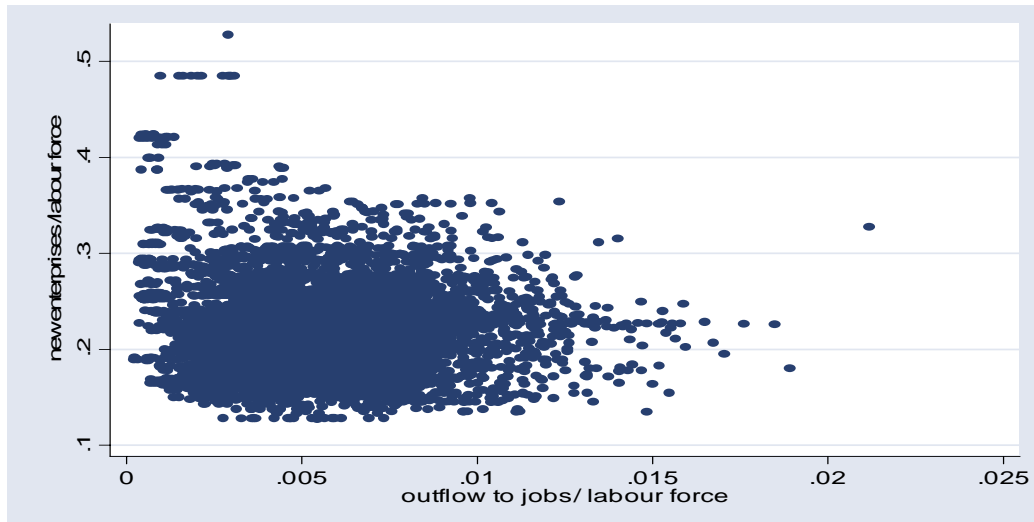
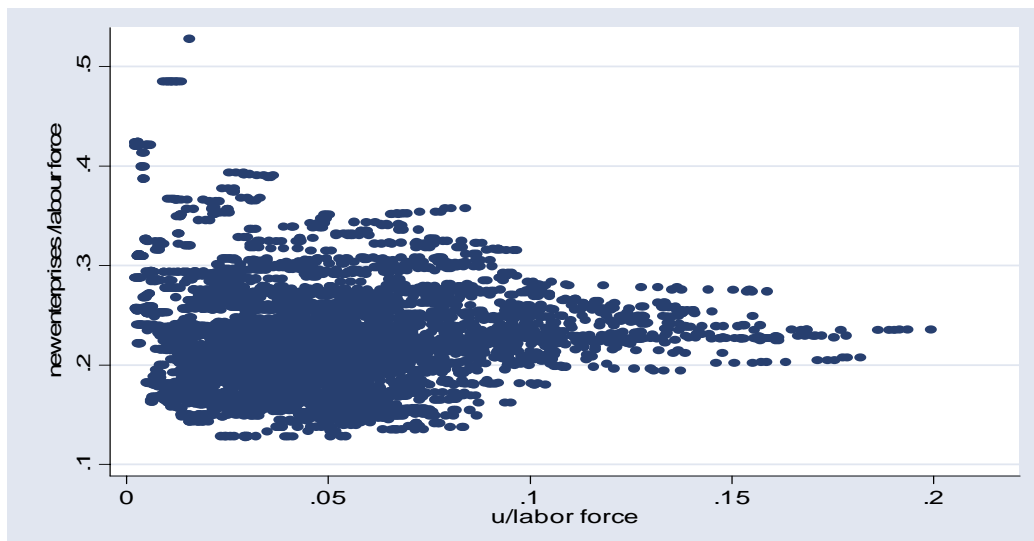


Figure 2.- New enterprises rate and unemployment rate



Source: District Labour Offices, Ministry of Finance, CZSO

²⁸ Boeri and Terrell (2002), page 52.

As a result, it is a hypothesis that this variable has no effect on matching efficiency, because it has been absorbed by unemployment in the first stage, or else it has a negative effect because it captures the negative conditions of high unemployment districts.

Table 4.- Mean, standard deviation, maximum and minimum of new enterprises as a proportion of the labour force in Czech districts.

Year	Mean	Std. Deviation	Min.	Max.
1993	0.22	0.054	0.13	0.53
1994	0.19	0.026	0.13	0.33
1995	0.20	0.044	0.14	0.42
1996	0.21	0.029	0.15	0.31
1997	0.23	0.036	0.17	0.35
1998	0.25	0.039	0.19	0.36
1999	0.25	0.037	0.20	0.39
2000	0.26	0.035	0.20	0.40

Source: Ministry of Finance, CZSO

2.2.4.- Active labour market policies (ALMPs)²⁹

The amount of government funds spent on active labour market policy programs per member of the labour force (ALMPs) captures the policies of district labour offices that aim to improve matching and hence reduce unemployment. If these programs are successful, this variable should have a positive impact on matching efficiency. A common explanation of low Czech unemployment rates *was the stance of ALMPs, in particular, their extensive use and an effective delivery system*³⁰. Boeri and Burda (1996) found that *estimates of an augmented matching function suggest a significant albeit small effect of ALMPs on flows from unemployment to jobs in the Czech Republic*³¹. However, Munich et al. (1998) found that ALMPs have an insignificant role in matching.

²⁹ Data on ALMP are available in three measures:

- 1) Total ALMPs expenditures, this is the measure used here.
- 2) Positions created with the assistance of PES (Public Employment Services)
- 3) Person in ALMP programs. Either in public jobs financed by PES and local authorities (Publicly useful jobs –PUJ-) and beneficiaries of interest-free loans for new jobs creation (Social Purposeful Jobs –SPJ-).

Slovakia developed a similar programme, see van Ours (2000). See Davia et al (2001) for a review of the effects of ALMPs in Spain.

³⁰ Boeri and Burda (1996), page 805. They try to overcome the difficulties in the measurement of the effect of ALMPs.

³¹ See Boeri and Burda (1996).

ALMPs are distributed with a view towards the unemployment and vacancy situation in individual districts. As a result, districts with unfavourable labour market conditions and higher mismatch are likely to receive more funds. Therefore, this variable may absorb the effect of district characteristics that have a negative impact on matching efficiency but have not been included in this model. As a consequence, the estimated coefficient may be biased downwards³². Problems in measuring the effects of ALMPs also come from the crowding out phenomena and the dead weight loss. Through the crowding out phenomena, treatment may increase the job finding rate of “treated” workers but only at the expense of “non-treated” workers. Through dead weight loss treated unemployed workers would have found a job even without treatment.

2.2.5.- Distance to EU border.-

The logarithm of the distance from the district capital to the West German or Austrian border (*ldis*) aims to capture the ease with which the population can move to work in western countries. It was widely believed that low Czech unemployment until 1997 was due to the fact that Czech workers could participate in the German and Austrian labour markets. *In the border districts Cheb, Tachov, Domalice, Prachatice, Klatovy, and the Plzen region legal cross border commuting accounted for up to 6% percent of employed residents in 1994*³³. The Czech Republic seems to have benefited from the geographical proximity of the EU border in creating new employment opportunities. It is hypothesized that this variable has a negative effect on matching: The further the EU(15), the lower the matching efficiency.

2.2.6.- Density of population.-

Density of population measures the average geographic proximity of agents in the labour market. The hypothesis is that geographic proximity has a positive effect on matching.

³² See OCDE (1995) chapter 3, appendix C, pages 100 and 101. The appendix tackles different econometric estimates of the impact of labour market policies on job findings that corroborate this view.

³³ See Burda and Profit (1996). Even Erbenova (1995) suggests that up to ten percent of the total labour force in these districts works abroad

2.2.7.- Sudeten Lands.-

A dummy variable is introduced to distinguish districts that fall into the Sudeten lands. They may have special characteristics in matching as they were depopulated after World War II when the German population was moved away from these regions to West Germany. During transition, property rights were less clearly established and labour market adjustment may differ in these regions.

2.2.8.- Industry and agriculture.-

Industry and agriculture liberate resources, such as labour force, that are to be implemented in new sectors. I use the ratio of the value of agricultural production to industrial production in 1990 (*ia90*). This variable is important for two reasons. On the one hand, it refers to initial conditions in the labour market. On the other hand, it can give evidence of whether having an agricultural background has a positive impact with respect to having an industrial one. A positive impact would mean that agricultural districts are more effective in matching than industrial ones.

Unemployment in transition countries is higher in rural than in urban areas. This is consistent with prevailing patterns of structural change in employment in Central and Eastern Europe: declining employment in agriculture and increasing employment in the private service sector concentrated in urban areas. The privatisation of state farms, the rationalisation of production in agricultural co-operatives, which were largely overstaffed, and the collapse of trade with CMEA involve large-scale labour shedding in agriculture. However, agriculture has also been proved to be an alternative for the unemployed.

Regarding industry, due to the vertical concentration of economic activities, industry disguised service-type jobs, such as transport, distribution, repairs and provision of food and services to workers³⁴. The presence of disguised service employment in industry could have played a role in containing unemployment through job-to-job switches without unemployment experience in between. The hidden service sector may also increase the matching efficiency in industrial places with respect to agricultural ones due to the existence of workers with experience in the expanding service sector.

³⁴ See Nesperova (1990) and Boeri and Keese (1992)

However, most of the skills developed during communist times were useless for finding a job during transition. Indeed, changes within industry have been enormous. At the same time, the Czech Republic's rich industrial tradition, dating back to the Austro-Hungarian Empire and concentrated in certain parts of Bohemia and Moravia, is likely to play an important role in the promotion of entrepreneurship³⁵ and matching efficiency.

Therefore, it is difficult to establish a hypothesis about the effect of the proportion of agricultural to industrial output in 1990 in district matching efficiency. Munich et al. (1998) introduced this variable and found that during the period between 1992 and 1995 it had a negative but not significant effect on matching.

2.2.9.- Sectors of activity

The geographical distribution of economic activities in the previous regime was based on highly specialised industrial sites. The lack of diversification of economic activities and the reliance on one or a few conglomerates, especially in small towns, was inherited from the past. Regional disparities were revealed during the transition and new ones were generated. Economic structure plays an important role in widening district differences and the resulting distribution of unemployment, vacancies, the number of unemployed persons per vacancy and the way they interact in the matching function. Profit (1999) shows the importance of the industrial structures of Czech districts in increasing unemployment differences.

During the transition, the importance of each sector changed. In communist times the main one was heavy industry, which lost its importance, both as a percentage of national output and as a percentage of the labour force, as transition evolved. Industry and agriculture liberated resources and labour to be implemented in new sectors such as the service and new technology industries. *The sectors creating employment most rapidly were the ones that had not been considered important under communism: financial services, trade and hotels and restaurants*³⁶.

³⁵ See OCDE (1994).

³⁶ Sorm and Terrell (1999a,b), page 1.

Data on output production or proportion of the labour force of each sector are not available at district level. To overcome the lack of data, I use the number of firms per member of the labour force of each of the following seven sectors: Industry, services 1³⁷, services 2, agriculture, transport, trade, construction. Variable ia90 has been omitted in the second specification to avoid collinearity.

As shown in Sorm and Terrell (1999), the Czech labour force has been very efficient in changing from old to new sectors, and therefore it is hypothesised that the effect of new sectors is positive. The more firms in new sectors, the more dynamic the district economy and the lower the mismatch. Most of these sectors are in private hands, are constituted by new firms and some have benefited from FDI. As a result, it is hypothesized that services, construction, transport and trade have a positive effect on matching efficiency, agriculture has a negative one, and industry has an ambiguous effect because there are expanding and contracting sectors within industry. Manufacturing industry increased at the cost mainly of mining and quarrying. There have also been significant changes within manufacturing itself from raw materials and labour intense industry to more sophisticated production. Foreign industries dominate technology driven industries. Regarding services, it is important to recall that banking and financial services which increased its share of employment from 0.5% to 1.7% between 1991 and 1995³⁸, are included in services 2.

3.- Results and conclusions

The estimated parameters can be found in the Appendix. The main conclusion is that the efficiency factor of the matching function can give information about the functioning of labour markets. Apart from being a *Black Box*³⁹ and a modelling device, the aggregate matching function can be considered as an empirical tool to shed light on how the aggregate matching process operates. It has been corroborated that the hazard models can be used as aggregated matching function microfoundations. Finally, the matching function is a very useful device to study transforming labour markets.

³⁷ Services 1 includes: hotel, restaurants and repair of vehicles and household goods. Services 2 includes: real estate, renting, finance and other business activities.

³⁸ See CERGE-EI Economic Review 1997, page 51.

³⁹ Petrongolo (2001).

Variables like service 2 and long term unemployment have a very clear effect on matching efficiency; the results are in accordance with what was hypothesised. The estimated effect of some other variables, such as ALMPs, is not clear. The presence of contradictory forces operating together and the complexity of the matching process in a transition environment make obtaining conclusions from several of the estimated parameters, such as the number of trade firms in proportion to the labour force, a task in which the existing literature regarding a variety of topics has to be taken into account.

Regarding the labour force educational levels, in model 1, whenever edu2 and edu3 are significant they have a positive impact. Comparing edu2 and edu3, the proportion of university educated population is only significant during the early stage of transition (1992, 1993 and 1994), while the proportion of the secondary educated is significant throughout the sample period. Furthermore, edu3 was higher than edu2 only in 1992. In model 2, once districts' economic structures have been introduced, edu2 is also only significant until 1995. In the second specification, the edu3 estimated parameter is larger than edu2 not only in 1992 but whenever they are significant. These findings give evidence of the following:

(1) The higher the educational composition of the labour force, the lower the mismatch.

(2) Both variables show decreasing significance levels; the effect of the 1991 educational structure explains matching efficiency until 1994-1995 (model 2). The reason is that, as shown by Jurajda (2005), there was a process of labour mobility and concentration of skills during transition. According to Equilibrium Unemployment Theory the higher the mismatch the lower the v/u rate because it is more expensive to post and fill a vacancy. Firms set up in districts where it is cheaper to find a skilled worker. At the same time, highly educated people move to big cities and more dynamic districts⁴⁰. This is one of the dynamics behind district increasing differences that go hand in hand with educational structures of the labour force.

⁴⁰ However, it is important to note that the literature has found that mobility across sectors has been much stronger than mobility across regions. See Sorm and Terrell (1999a, b).

(3) According to Munich et al. (1999), skills possessed by the secondary educated were very useful throughout the transition. The positive effect of the proportion of secondary educated and university educated with respect to the proportion of lower levels is very clear; however, differences between edu2 and edu3 are not, their aggregate effect in matching efficiency is very similar. Probably the effect of being eligible is compensated by the reservation wage effect. Edu2 have flexible skills that make them attractive for new sectors. Edu3 have higher reservation wages enhanced by the increasing demand for this kind of worker which increases their expected distribution of wage offers.

(4) The matching function was specified without search-on-the-job and educational structure using proportions of the labour force. Higher educated workers are more likely than lower educated workers to search on the job and move from one job to another, without experiencing unemployment. The capacity of this variable to explain matching efficiency is in accordance with Profit's study (1999), which pointed out the importance of search-on-the-job. However, it is at odds with the assumption made in the first stage estimations above and that of Burda (1993), according to which search-on-the-job is not important during transition. The estimations corroborate that labour force, employed and unemployed workers and their educational characteristics play a role in matching efficiency. Further evidence of the importance of search-on-the-job of employed workers as a source of increasing returns to scale will be the subject of future research.

(5) In this respect, political intervention should focus both on programs for low educated people and on investment in low educated districts that inherited a low educational labour force from communist times or are losing human capital in favour of other districts.

As hypothesised above, the effect of the proportion of the long term unemployed is always strong, significant and negative. Its effect increased at the beginning of transition and after the 1997 crisis. Therefore, government intervention in the matching process should focus on avoiding long term unemployment.

(1) Firstly, regarding inflow into unemployment, reforms should be implemented avoiding the emergence of long term unemployment. The two ways of entering long

term unemployment should be taken into account. On the one hand it can be due to dependence duration; the probability that the unemployed worker will find a job declines over time because he/she has lost his/her skills. In this case policy should prevent workers from being unemployed for a long time and encourage them to accept a job early on. On the other hand, there is heterogeneity among workers; there are workers who, owing to their characteristics (education, age, skills...), are more likely to suffer long unemployment spells. It is known that low educated workers are an important part of the Czech long term unemployment pool. To overcome the heterogeneity effect, policy should focus on the lower educated. In the approach followed here, it is not possible to obtain conclusions regarding the relative importance of skill mismatch, stigma, loss of skills and the disincentive effects of the welfare system. This should be the matter of future research.

The effect of the number of self-employed persons and firms with less than 25 employees was not significant at the early stage of the transition. However, from 1996 to 2000, when unemployment started to increase, it was significant but its estimated parameter was close to zero. Again, these kinds of firms seem to be a phenomenon of adverse labour market conditions. As stated above, an important part of the effect of this variable might have been absorbed by unemployment in the first stage estimation because self-employment has been an important way of leaving unemployment. Therefore, self-employment is one of the reasons behind high unemployment elasticities and IRTS. At this point it is important to recall that the increase of unemployment rate dispersion across districts have been accompanied by a decrease in the vacancy rate coefficient of variation and a decrease in the v/u relation ship standard deviation. Burda and Profit (1996) considered that as an evidence for the emergence of decentralized small enterprises which is in accordance with the above interpretation of the results obtained here.

As for ALMPs, it is still difficult to measure their effect. Sorm and Terrell, using micro data, (1998) found that ALMPs shortened the spells of the groups that tended to have longer unemployment durations. Boeri and Burda (1996) and OCDE (1995) found a small but significant and positive effect. Munich et al. (1998), introducing more variables, found a non-significant positive effect. Finally, I found a negative and

significant effect. As the amount of money spent by the government in each district depends on the unemployment level, districts with higher expenditures in ALMPs may have characteristics, not introduced in this model, that have a negative effect on outflow. This variable needs further research. For example, it can be introduced taking into account not only expenditures per member of the labour force, but the other two aforementioned available dimensions.

The distance of the district capital from the West German or Austrian (Idis) border has a negative effect on matching efficiency. The further the district capital is from the EU border the lower the matching efficiency.

Density of population seems to have a very small (close to zero) and always significant effect on matching efficiency. This result supports the idea that it may have a quadratic form. The hypothesis was that geographic proximity has a positive effect on matching; however, above a certain level the positive effect may decrease. Even too high a density of population might have a negative impact.

The differences that the variable sud (being part of the Suddeten lands) was supposed to capture are far from clear. This variable is significant in the second specification but not in the first one.

The effect of agricultural with respect to industrial output was not significant at the beginning of transition; however, the significance level increased after the 1997 crisis. It has a positive sign but is close to zero; therefore former agricultural districts were more effective than former industrial ones, especially after the crisis, but the difference is very low. It can be considered as a consequence of the speed-up of industry restructuring during and after the 1997 crisis. In that case, workers losing their jobs in districts with old industries were having trouble finding a job in the new expanding sectors. Workers' mismatch between communist agriculture and transition agriculture is lower than the mismatch between communist heavy industry and transition industry. The difference, however, is very small.

Regarding the number of firms by sectors with respect to labour force, adjusted R^2 increases in model 2; it better explains district differences in matching efficiency than model 1. Therefore, district economic structures are important in matching efficiency. Most of them have the expected effect. Service 2 is always significant and positive, reflecting the increasing aforementioned importance of the financial sector. Service 1 is not significant most of the time. Although service1 is a new sector, it does not imply any effect in mismatch, either positive or negative. Construction and transport are always positive and significant. Industry is never significant; it is composed of declining and expanding sectors and both effects may compensate each other. Agriculture is not significant at the beginning of the transition, but its level of significance increases from 1996 to 2000, and it has explanatory power and a positive sign. This is in accordance with the estimated parameters for ia90 in model 1. Both results are in line with the common idea that agriculture has been an escape for many unemployed workers. The higher the number of firms in new sectors with respect to the labour force, with the exception of trade, the more efficient the matching function. Trade displays a persistent negative effect. Considering that a lot of new small firms created in high unemployment districts are concentrated in the trade sector, and that self employment is often a phenomenon linked to adverse conditions, this variable may capture district characteristics not included in the model that have a negative impact on matching.

According to Sorm and Terrel (1999) about half of the people that change jobs also change their sector of employment. Therefore, the Czech labour force has proved to be very flexible and efficient in changing from old to new sectors. It can be concluded that mismatch has more to do with education, unemployment spells, and LTU characteristics than with sectors.

Summarizing, the main conclusions obtained are the following. Firstly, the first stage shows that the matching function exists and that it displays IRTS that are a necessary condition for multiple equilibria that would support Pareto-improving government intervention in the search process. Strong positive externalities in the search process displayed by the unemployed, the fact that UCS do not have strong effects in lengthening unemployment and Boeri and Terrell's (2002) finding regarding UCS as an important source encouraging self-employment are in accordance with the second stage

conclusions: small firms in the trade sector are an alternative in districts with worse conditions and one of the sources of strong positive externalities of the unemployed in the search process.

Secondly, district characteristics regarding the educational composition of the labour force and economic structures, defined as the number of firms per member of the labour force in different sectors, are able to explain differences in matching efficiency across districts.

Thirdly, the duration of unemployment spells, especially long term unemployment, plays a very important role and it should be avoided in reform processes. The special characteristics of LTU should be taken into account in Optimal Speed of Transition (OST) models. Looking at the Czech experience it is clear that the gradual phasing out of the state sector is not enough to avoid long term unemployment. Apart from the speed of transition, the type of workers freed by the closure of the state sector should be taken into account, especially if the workers entering unemployment are low educated and live in districts where new sectors have not been developed. Whatever the speed of transition, it seems a very strong assumption to think that *at optimal speed of state sector demolition, significant LTU does not arise because jobs in the new sector are being created at a pace that balances the rate of decline of the old sector*⁴¹. This is true specially in the case of a low educated person searching for a job in a context where new sectors are posting vacancies in another district and there is *imperfect regulation in areas like housing markets, transportation infrastructure, capital market, corporate governance, legal framework, and business environment*⁴².

Fifthly, the flow approach that has been followed here shows how the “*cleansing effects*”⁴³ of transition transformation and recession operate. The process of restructuring, closing of factories and the displacement of large numbers of workers produces a pool of workers that is far from homogeneous. Although some of them with flexible skills are able to find jobs in expanding sectors after changing occupations,

⁴¹ Jurajda and Terrell (2002) referring to OST models, page 1.

⁴² Svejnar (2002), page 2.

⁴³ See Davis and Haltiwanger (1990). Burda (1993) stated that *after four decades of socialism, a severe bout of spring cleaning was sorely needed* (Burda 1993, page 106).

industry, or location, some others are unable to find their place in the new environment. The aggregate effect is reflected in the matching efficiency through the negative impact of LTU and the low educated proportion of the labour force. A matter of further research should be to identify the relative importance of the aggregate disincentive effect of the welfare system, preventing a downward wage adjustment and increasing reservation wages of LTU, and the effect of educational mismatch and stigma. Hazard models have given evidence of the importance of education but not of the disincentive effect of unemployment benefits and the welfare system.

Finally, it is not clear whether ALMPs have been effective or not. Regional-district level programmes focusing on education and the development of new sectors could have a positive impact on matching efficiency and outflow from unemployment aiming to narrow the gap between developed and less favourable districts.

District specific characteristics affect matching efficiency and most of the results obtained are in accordance with the established hypotheses. However, the conclusions obtained are limited and results can be improved by further research focusing on the Czech Republic. The Czech labour market has been studied very frequently because of its special characteristics. The large amount of literature and deep knowledge we have about it makes it a useful case study.

Further research should focus on ALMPs, taking into account other available dimensions of ALMPs, LTU, trying to identify the relative importance of skill mismatch, stigma, and loss of skills and the disincentive effects of the welfare system.

Other variables, which are not available at district level, may explain matching efficiency. For example, it is necessary to test whether FDI, which increases the demand for skilled workers, also increases wage inequality and that, although it increases employment, it is not likely to contribute to the alleviation of structural unemployment suffered in certain regions as described in Driffield and Taylor (2000). In light of the results obtained above regarding economic structures and, considering that FDI is not likely to be placed in districts where it would be very costly to find skilled workers, it seems plausible to believe that FDI increases district differences. FDI consequences

regarding within country inequality may be related to the aforementioned concentration of skills and resources. Another variable could be the informal sector of the economy. It is an important characteristic of transition economies. According to Equilibrium Unemployment Theory, the availability of revenues coming from the informal sector may have an effect on search intensity. The Research Institute of the Ministry of Labour estimated that in 1994 between 200,000 and 350,000 persons were engaged in some kind of unrecorded activity. Finally, the OCDE⁴⁴ has recommended the computerization of employment agencies and job advertising as the most cost-effective ALMP. Different channels used by job seekers (newspapers, job agencies, internet use...) during search may have an impact on matching efficiency. Evidence has been found in other countries that employment offices are more effective than newspaper advertisements⁴⁵.

Increasing within-country differences are a common feature of transforming economies. However, comparing different units of the same country has the disadvantage of the lack of data. At the same time, the need to study short periods of time makes the use of panel data necessary but comparing different countries is often criticized because they are subject to different policies. The compilation of district or regional data in transforming economies would be a useful tool for political advice.

⁴⁴ See OCDE (1994 and 1999).

⁴⁵ See Lindeboom et al. (1994).

Appendix I Second Stage estimations

1992	Model 1			Model 2		
Variable	coefficient	t	significance	coefficient	t	significance
ldis	-0.104	-3.42	0.001			
edu2	7.109	3.53	0.000			
edu3	8.763	2.67	0.008			
ia90	0.045	1.66	0.097			
sud	0.297	5.26	0.000			
dens	-0.0006	-5.37	0.000			
LTUpmlf	-22.916	-13.26	0.000			
ALMPpmlf	-1.550	-10.74	0.000			
e	-	-	-	n.a		
industry	-	-	-	n.a		
service1	-	-	-	n.a		
service2	-	-	-	n.a		
agriculture	-	-	-	n.a		
transport	-	-	-	n.a		
trade	-	-	-	n.a		
construction	-	-	-	n.a		
constant	-8.880	-26.06	0.000			
Adj R ²	0.445					

1993	Model 1			Model 2		
	coefficient	t	significance	coefficient	t	significance
ldis	-0.178	-4.45	0.000	-0.190	-4.76	0.000
edu2	11.306	4.29	0.000	8.138	3.04	0.003
edu3	9.502	2.21	0.027	15.803	3.42	0.001
ia90	0.023	0.66	0.511	-	-	-
sud	0.250	3.37	0.001	0.326	4.19	0,000
dens	-0.001	-6.25	0.000	-0.0007	-4.57	0.000
LTUplf	-30.846	-13.63	0.000	-50.300	-15.22	0.000
ALMPpmlf	-2.011	-10.64	0.000	-2.104	-6.62	0.000
e	-	-	-	-1.71e-6	-0.87	0.387
industry	-	-	-	-0.00004	-0.25	0.803
service1	-	-	-	5.374	2.57	0.010
service2	-	-	-	42.652	4.91	0.000
agriculture	-	-	-	-2.084	-0.85	0.397
transport	-	-	-	8.344	4.58	0.000
trade	-	-	-	-6.482	-2.73	0.007
construction	-	-	-	-0.390	-0.09	0.930
constant	-11.085	-24.84	0.000	-10.931	-23.69	0.000
Adj R ²	0.452			0.629		

1994	Model 1			Model 2		
Variable	coefficient	t	significance	coefficient	t	significance
ldis	-0.255	-3.86	0.000	-0.256	-3.89	0.000
edu2	18.791	4.32	0.000	13.656	3.09	0.002
edu3	13.375	1.89	0.059	21.950	2.88	0.004
ia90	0.107	1.81	0.071	-	-	-
sud	0.364	2.98	0.003	0.573	4.47	0.000
dens	-0.001	-6.57	0.000	-0.001	-4.06	0.000
LTUplf	-52.744	-14.13	0.000	-82.373	-15.13	0.000
ALMPpmlf	-3.335	-10.70	0.000	-3.461	-6.61	0.000
e	-	-	-	-3.84e-6	-1.18	0.239
industry	-	-	-	-0.0001	-0.53	0.599
service1	-	-	-	6.340	1.84	0.066
service2	-	-	-	75.055	5.25	0.000
agriculture	-	-	-	2.502	0.62	0.537
transport	-	-	-	10.576	4.29	0.000
trade	-	-	.-	-1.234	-3.38	0.001
construction	-	-	-	8.378	1.15	0.249
constant	-18.640	-25.32	0.000	18.784	-24.71	0.000
Adj R ²	0.455			0.631		

1995	Model 1			Model 2		
	Variable	coefficient	t	significance	coefficient	t
ldis	-0.210	-3.01	0.003	-1.827	-2.63	0.009
edu2	12.196	2.67	0.008	6.260	1.34	0.180
edu3	4.383	0.59	0.556	9.900	1.23	0.219
ia90	0.117	1.88	0.060	-	-	-
sud	0.177	1.38	0.167	0.464	3.43	0.001
dens	-0.001	-6.33	0.000	-0.001	-3.45	0.001
LTUplf	-58.706	-14.96	0.000	-89.197	-15.52	0.000
ALMPpmlf	-3.624	-11.06	0.000	-3.994	-7.22	0.000
e	-	-	-	-4.43e-6	-1.29	0.198
industry	-	-	-	-0.0001	-0.43	0.666
service1	-	-	-	2.727	0.75	0.454
service2	-	-	-	78.165	5.17	0.000
agriculture	-	-	-	7.014	1.64	0.102
transport	-	-	-	10.235	4.21	0.000
trade	-	-	-	-4.490	-3.50	0.001
construction	-	-	-	10.293	1.34	0.180
constant	-16.670	-21.54	0.000	-16.988	-21.17	0.000
Adj R ²	0.435			0.612		

1996	Model 1			Model 2		
	coefficient	t	significance	coefficient	t	significance
ldis	-0.190	-3.18	0.002	-0.156	-2.61	0.009
edu2	10.111	2.59	0.010	3.694	0.92	0.358
edu3	4.954	0.78	0.436	5.126	0.74	0.460
ia90	0.095	1.8	0.073	-	-	-
sud	0.008	0.08	0.935	0.291	2.51	0.013
dens	-0.001	-6.52	0.000	-0.0007	-3.15	0.002
LTUplf	-50.112	-14.94	0.000	-75.184	-15.20	0.000
ALMPpmlf	-3.070	-10.97	0.000	-3.401	-7.15	0.000
e	-	-	-	-6.38e-6	-2.16	0.031
industry	-	-	-	-0.00001	0.06	0.953
service1	-	-	-	-0.230	-0.07	0.942
service2	-	-	-	71.931	5.53	0.000
agriculture	-	-	-	8.003	2.17	0.030
transport	-	-	-	4.320	4.22	0.000
trade	-	-	-	-3.681	-3.84	0.000
construction	-	-	-	10.052	1.52	0.129
constant	-14.79	-22.38	0.000	-15.074	-21.82	0.000
Adj R ²	0.443			0.611		

1997	Model 1			Model 2		
Variable	coefficient	t	significance	coefficient	t	significance
ldis	-0.146	-2.74	0.006	-0.124	-2.33	0.020
edu2	9.377	2.68	0.007	3.339	0.93	0.351
edu3	5.648	0.99	0.322	4.103	0.66	0.507
ia90	0.117	2.44	0.015	-	-	-
sud	-0.006	-0.07	0.948	0.262	2.52	0.012
dens	0.001	-6.97	0.000	-0.007	-3.16	0.002
LTUplf	-42.954	-14.31	0.000	-63.660	-14.44	0.000
ALMPpmlf	-2.610	-10.42	0.000	-0.638	-6.22	0.000
e	-	-	-	-7.85e-6	-2.98	0.003
industry	-	-	-	0.00001	0.07	0.945
service1	-	-	-	-1.787	-0.64	0.522
service2	-	-	-	72.419	6.25	0.000
agriculture	-	-	-	8.079	2.46	0.014
transport	-	-	-	10.355	5.29	0.000
trade	-	-	-	-4.361	-4.53	0.000
construction	-	-	-	8.872	1.51	0.132
constant	-14.780	-24.98	0.000	-15.158	-24.62	0.000
Adj R ²	0.443			0.615		

1998	Model 1			Model 2		
	coefficient	t	significance	coefficient	t	significance
ldis	-0.131	-2.74	0.0006	-0.111	-2.33	0.020
edu2	8.548	2.73	0.0006	3.210	1.00	0.316
edu3	5.112	1.00	0.316	3.855	0.70	0.486
ia90	0.103	2.40	0.017	-	-	-
sud	-0.015	-0.17	0.866	0.226	2.43	0.015
dens	-0.001	-6.87	0.000	-0.006	-3.13	0.002
LTUplf	-38.709	-14.41	0.000	-57.325	-14.53	0.000
ALMPpmlf	-2.347	-10.46	0.000	-2.374	-6.25	0.000
e	-	-	-	-6.62e-6	2.81	0.005
industry	-	-	-	0.00002	0.13	0.898
service1	-	-	-	-1.689	-0.68	0.499
service2	-	-	-	64.25	6.20	0.000
agriculture	-	-	-	7.312	2.49	0.013
transport	-	-	-	9.303	5.25	0.000
trade	-	-	-	-2.729	-4.48	0.000
construction	-	-	-	8.068	1.53	0.126
constant	-13.116	-24.80	0.000	-13.484	-24.47	0.000
Adj R ²	0.442			0.614		

1999	Model 1			Model 2		
Variable	coefficient	t	significance	coefficient	t	significance
ldis	-0.215	-2.69	0.007	-0.186	-2.33	0.020
edu2	15.087	2.88	0.004	6.417	1.20	0.231
edu3	9.388	1.10	0.272	7.465	0.81	0.419
ia90	0.156	2.18	0.029	-	-	-
sud	-0.040	-0.27	0.784	0.368	2.37	0.018
dens	-0.002	-6.39	0.000	-0.0009	-2.93	0.004
LTUplf	-66.024	-14.68	0.000	-97.259	-14.75	0.000
ALMPpmlf	-4.02	-10.71	0.000	-4.200	-6.620	0.000
e	-	-	-	-9.06e-6	-2.30	0.022
industry	-	-	-	0.0002	0.57	0.57
service1	-	-	-	-3.404	-0.82	0.415
service2	-	-	-	104.8	6.05	0.0000
agriculture	-	-	-	12.448	2.54	0.012
transport	-	-	-	15.678	5.09	0.000
trade	-	-	-	-2.289	-4.49	0.000
construction	-	-	-	15.197	1.73	0.085
constant	-20.490	-23.11	0.000	-21.088	-22.91	0.000
Adj R ²	0.437			0.624		

2000	Model 1			Model 2		
Variable	coefficient	t	significance	coefficient	t	significance
ldis	-0.240	-2.74	0.006	-0.207	-2.37	0.018
edu2	15.918	2.76	0.006	6.133	1.04	0.297
edu3	9.662	1.03	0.303	7.305	0.72	0.471
ia90	0.182	2.31	0.021	-	-	-
sud	-0.016	-0.10	0.919	0.426	2.5	0.013
dens	-0.002	-6.69	0.0000	-0.001	-3.06	0.0002
LTUplf	-71.682	-14.52	0.0000	-105.912	-14.63	0.0000
ALMPpmlf	-4.371	-10.61	0.0000	-4.513	-6.48	0.0000
e	-	-	-	-0.00001	-2.65	0.008
industry	-	-	-	0.0001	0.33	0.741
service1	-	-	-	-3.267	-0.71	0.476
service2	-	-	-	117.158	6.16	0.0000
agriculture	-	-	-	13.241	2.46	0.0014
transport	-	-	-	19.218	5.17	0.0000
trade	-	-	-	-3.532	-4.52	0.0000
construction	-	-	-	15.851	1.64	0.101
constant	-23.319	-23.96	0.0000	-23.935	23.68	0.000
Adj R ²	0.440			0.615		

References

Abraham, K. and Vodopivec (1993), "Slovenia: a study of labour market transitions", *Mimeo (The World Bank, Washington, DC)*

Bellmann, Lutz, Saul Estrin, Hartmut Lehmann and Jonathan Wadsworth (1995), "The Eastern German labour market in transition: gross flow estimate from panel data", *Journal for Comparative Economics* 20, 139-170.

Boeri, T. and M. Keese (1992) "Labour Market and the Transition in Central Eastern Europe", OECD *Economic Studies*, No 18, Paris.

Boeri, T. (1994), "Labour Market Flows and Persistence of Unemployment in Central Eastern Europe." *Unemployment in Transition Countries: Transient or Persistent?* 13-56, Paris OCDE, ed.

Boeri, T. and M. Burda (1996), "Active labour market policies, job matching and the Czech miracle", *European Economic Review Papers and Proceedings* 40:805-818.

Boeri, T. and S. Scarpetta, (1995) "Emerging Regional Labour Market Dynamics in Central and Eastern Europe". *The Regional Dimension of Unemployment in Transition Countries*, 75-87, Paris OCDE ed.

Bonin, John P., Iftekhhar Hasan, and Paul Wachtel. (2004). Privatization Matters: Bank Efficiency in Transition Countries. *William Davidson Institute Working Paper* 679.

Burda, M. (1993), "Unemployment, Labour Markets and Structural Change in Eastern Europe", *Economic Policy* 16: 101-138.

Burda, M. and M. Lubyova (1995), "The impact of active labour market policies: a closer look at the Czech and Slovak Republics", in *Tax and benefit reform in Central Eastern Europe*, D. Newbery, ed. (CEPR London).

Coles, M.G., Smith, E.(1998). Market Places and Matching. *International Economic Review* 39 pp 239-354.

Driffield, N. and Karl Taylor (2000). FDI and the Labour Market: A Review of the Evidence and Policy Implications. *Oxford Review of Economic Papers*, vol. 16, No.3.

Dushi, I. (1998), "Labour market, unemployment and the impact of training programs in the transition economies", *Mimeo, CERGE-EI Doctoral Dissertations, Prague*.

Finta, Jana and Katherine Terrell (1997), "Gender differences in flows across labour market states in the Czech Republic" *Unpublished paper* (University of Michigan, Ann Arbor, MI).

Foley, M.C. (1997), "Determinants of unemployment duration in Russia", *William Davidson working paper no.81*, University of Michigan Business School, Ann Arbor, MI.

Galušćák, Kamil and Daniel Munich (2003). Microfoundations of the Wage Inflation of the Czech Republic. *The Working Paper Series of the Czech National Bank 1/2003*.

Ham, J., J. Svejnar and K. Terrell (1998), "Unemployment and the social safety net during transitions to a market economy: evidence from the Czech and Slovak Republics", *American Economics Review* 88 (5): 1117-1142.

Ham, J., J. Svejnar and K. Terrell (1999), "Women's unemployment during transition: evidence from Czech and Slovak micro-data", *Economics of Transition* 7(1):47-78.

Jurajda, Stepan (2005). Are There Increasing Returns to Local Concentration of Skill? Evidence on Wages and Returns to Education in Transition. *CERGE-EI Working Paper No.260, 2005*.

Jurajda, S. and Daniel Munich (2002). Understanding Czech Long-term Unemployment. *CERGE-EI Discussion Paper No. 91*.

Jurajda, S and K.Terrel (2002a) “What Drives the Speed of Job Reallocation During Episodes of Massive Adjustment” *William Davidson Institute working paper no.432*.

Jurajda, Š. and Katherine Terrell (2002b). Job Growth in Early Transition: Comparing Two Paths. *CERGE-EI Working Paper No. 2002*.

Kumar, Rajan and Zingales (1999). What determines the firm size? *NBER Working Paper no. 7208*.

Lubyova, Martina and van Ours (1997), “Work incentives and the probability of leaving unemployment in Slovak Republic”, *William Davidson working paper no.82*, University of Michigan Business School, Ann Arbor, MI.

Micklewright, J. and G. Nagy (1995), “Unemployment insurance and incentives in Hungary”, *Discussion paper no. 1118* (CEPR, London).

Munich, D. Jan Svejnar and K. Terrel (1998), “The worker firm matching in transition: (Why) Are Czechs more successful than others?” *William Davidson Institute working paper no.82*, University of Michigan Business School, Ann Arbor, MI.

Munich, D., Jan Svejnar, and Katherine Terrell. (1999). Returns to Human Capital under the Communist Wage Grid and during Transition to a Market Economy. *CERGE-EI Discussion Paper Series no. 1999-29*.

Nesperova, A. (1990), “Prospective development of the service sector in Czechoslovakia”, paper prepared for the 5th International Conference, World Service Forum, Geneva.

OCDE (1994a), *Industry in the Czech and Slovak Republics*, OCDE ed. Paris.

OCDE. (1994b). Unemployment in Transition Countries: Transient or Persistent? OCDE ed. Paris.

OCDE. (1994c). The OCDE jobs study. OCDE ed. Paris

OCDE. (1995). The Regional Dimension of Unemployment in Transition Economies. OCDE ed. Paris.

OCDE (1999). Implementing the OCDE jobs strategy: Assessing performance and policy. OCDE ed. Paris.

Petrongolo B., and C.A. Pissarides. (2001). Looking into the black box: A survey of the matching function, *Journal of Economic Literature* vol. XXXIX (June) pp. 390-431.

Pissarides , C.A.(2000) *Equilibrium unemployment Theory*, MIT second ed.

Profit, S (1996), “Unemployment dynamics and returns to scale in job matching in emerging labour markets: the Case of the Czech Republic”, Mimeo, Humboldt University, Berlin.

Profit, S. (1997), “Twin Peaks in Regional Unemployment and Returns to Scale in Job Matching in the Czech Republic”, Discussion paper No. 63, Humboldt University, Berlin.

Profit, Stefan and Stefan Sperlich (2004). Non-uniformity of jobs-matching in a transition economy – A nonparametric analysis for the Czech Republic. *Applied economics* 36: 695-714.

Sorm, V. and K. Terrell (1997), “Employment, unemployment in transition in the Czech Republic: where have all the workers gone?” Mimeo (*William Davidson Institute*, University of Michigan Business School, Ann Arbor, MI)

Sorm, V. and K. Terrell. (1998) Labour Market Policies and Unemployment in the Czech Republic. *The William Davidson Institute Working Paper no. 216*

Sorm, V. and K. Terrell. (1999a). A Comparative Look at Labour Mobility in the Czech Republic: Where Have All the Workers Gone? *The William Davidson Institute Working Paper no. 140*

Sorm, V. and K. Terrell. (1999b). Sectoral Restructuring and Labour Mobility: A Comparative Look at the Czech Republic. *The William Davidson Institute Working Paper no. 273*

Svejnar, Jan (1999) "Labour Markets in the Transitional Central and East European Economies" *Handbook of Labour Economics*, volume 3, 2809-2857, Edited by O. Ashenfelter and D. Card.

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