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in Central and Eastern Europe and  
Social Barriers to Restructuring**

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**ECONOMICS DEPARTMENT**

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# REGIONAL DIMENSIONS OF UNEMPLOYMENT IN CENTRAL AND EASTERN EUROPE AND SOCIAL BARRIERS TO RESTRUCTURING

by

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Major regional unemployment differentials emerged in central and eastern Europe immediately after the start of transition, mainly as a result of the concentration of job losses in agricultural regions and areas dominated by heavy industry. Based on regional-level data on 6 central and eastern European countries (Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovak Republic), in this paper, we show that a distinguishing feature of the dynamics of regional disparities in transition countries is in the apparent feedback from widening unemployment differentials to the variance of regional employment declines. While in flexible labour markets like the US, regional differences in employment growth are persistent and regional unemployment differentials are reduced by interregional labour mobility, in central and eastern Europe the regional dispersion of employment reductions displays much less persistence than the dispersion of unemployment rates.

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## Introduction

Policy-makers in transition countries are becoming more and more concerned about regional labour market disparities. These disparities are a source of social unrest and political instability as they seem to be felt by public opinion far more than in many OECD countries (perhaps because regional income differentials were less apparent under the previous system) and income transfer mechanisms coping with such imbalances under market conditions are still lacking or are in the process of being reformed. Furthermore, centrifugal forces are always at work and are fed by the widening of differentials in the allocation of employment opportunities.

Wide differences in the incidence of unemployment across the various regions may make the restructuring process more difficult. In the short-term, they mobilise local communities against further employment reductions in large loss-making state enterprises, thereby delaying, if not altogether preventing, the reorganisation of production in high-unemployment areas. In the medium-run, the persistence of large unemployment differentials (especially when there are no rank reversals in the relative position of the various regions) can lead to permanent reductions in effective labour supply, increasing the social security burden on a (shrinking) active population and reducing the responsiveness of wages to rising unemployment.

Regional unemployment differentials experienced to date by transition countries are large by western standards. Top quartile to bottom quartile average unemployment rates reached peaks close to 5 in the 1991-1993 period and were close to 3 in 1993, while even in OECD countries with historically marked regional disparities -- such as Italy and Spain -- this ratio does not exceed 2-2.5. Differences in U/V ratios among the various regions are even more marked and there are no indications that the trend towards increasing regional mismatch in the allocation of job seekers and employment opportunities is close to an end.

The shape of regional labour market imbalances in transition countries combines disparities inherited from the previous system with new factors related to the speed and characteristics of the transition process in the various regions. Contrary to common wisdom, there were significant imbalances inherited from the previous system, although they were concealed by state subsidies (maintaining artificial full employment conditions across the board) and by a compressed structure of wages, which reduced regional income disparities. Under the previous regime, the location of economic activities was also based on principles of concentration of industrial sectors in the traditional industrial sites, and a lack of diversification of economic activities outside large urban areas is an important factor behind observed labour market imbalances.

The purpose of this paper is to characterise regional evolution since the start of transition and to make some inferences on the likely shape and depth of regional disparities in the years to come. Needless to say, the short time elapsed since the start of transitions makes it more difficult to evaluate the convergence or divergence of regional evolution, as experience from OECD countries suggests that regional re-equilibrating mechanisms tend to operate over decades. Yet, the crucial questions concern the *speed* of the adjustment mechanism and



the likelihood of *rank reversals* in the relative positions of the various regions and available evidence on labour market flows in local labour markets, on regional wage differentials and labour mobility may shed some light on these issues.

The plan of the paper is as follows. Section 1 reviews the dynamics of regional inequalities since the start of transition, and introduces a taxonomy of regional evolutions. Section 2 discusses the underlying sources of regional disparities, namely the role played by flows from employment to unemployment (and vice versa) as well as from employment and unemployment to non-participation. Finally, Section 3 brings in available evidence on the operation of re-equilibrating mechanisms involving widening regional wage differentials and increasing regional labour mobility.

## **1. Anatomy of regional disparities**

### *1.1 The rise and persistence of regional unemployment differentials*

Table 1 provides some measures of the magnitude of regional unemployment differentials in the first three years of transition. As with any index of regional unemployment variation, the proposed measures are sensitive to the number of observations available for each country and to the size of the average region within each country. In particular, data for the Czech and the Slovak Republics tend to over-estimate the dispersion of unemployment vis-à-vis the other countries, insofar as they are based on a larger number of observations and concern districts, which are significantly smaller than regional units used in the other countries. In order to minimise the bias involved in cross-country comparisons, all summary indicators, such as the top and bottom quartile

unemployment rates, take into account each region's share of the total labour force. Data are drawn from administrative sources (see Annex A for details), which provide the most detailed regional breakdown of regional labour market indicators<sup>1</sup>.

The first six columns of Table 1 suggest that the regional dispersion in unemployment rates emerged "at a stroke" at the beginning of the reforms in all countries, but followed different patterns afterwards. In Bulgaria, the Czech and Slovak Republics and Poland, the dispersion in regional unemployment rates increased monotonically in the 1991-93 period, whilst in Hungary the standard deviation of regional unemployment rates (normalised by the country-wide unemployment rate) would appear to have stabilised at about 0.3, that is, above the values encountered in southern European countries where regional disparities are most marked [OECD, 1989].

Regional differences are even more striking when the profile of labour demand is taken into account. The U/V rates displayed on the next two columns of Table 1 indicate that there were in 1993 as much as four times more unemployed per vacant job in the declining regions (top quartile) than in the lowest unemployment regions (bottom quartile). Differences between micro regions are, not surprisingly, even larger: in the Czech Republic, more than 10 job seekers had to compete for one job in certain areas while in Prague two jobs were available per job seeker.

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<sup>1</sup> An alternative would have been to use data from Labour Force Survey (LFS) implemented in most countries since 1992-3. However, the sample size of such surveys does not allow for small area representation. Furthermore, LFS data do not capture the initial rise of regional labour market disparities.

The last two columns on the right-hand-side of Table 1 present the following two indexes of regional mismatch<sup>2</sup>:

$$I_1 = \frac{1}{2} \sum_i \left| \frac{u_i}{U} - \frac{v_i}{V} \right| \quad (1)$$

$$I_2 = \frac{1}{2} \sum_i \frac{l_i}{L} \left| \frac{u_i - v_i}{l_i} - \frac{U - V}{L} \right| \quad (2)$$

where U, V and L denote, respectively, the country-wide number of unemployed, vacancies and persons in the labour force,  $l_i$  stands for the labour force share of region  $i$ , and  $u_i$  and  $v_i$  are, respectively, the regional unemployment and vacancy levels.

The first index ( $I_1$ ) suggests that structural unemployment accounted for 20-40 per cent of total unemployment in transition countries in 1993. Comparable values of the index could be observed in OECD only in the 1960s and the early 1970s [Jackman and Roper (1987)]. Moreover, after its initial rise,  $I_1$  has been fairly stable over time, which suggests that the proportion of unemployed workers located in the "wrong" regions has not increased over time. However, as shown by the second index ( $I_2$ ), the absolute number of "misplaced" workers (or job openings) has increased together with the increase in the

<sup>2</sup> Both indexes measure structural unemployment (SU) as the number of unemployed (or job openings) who would need to be relocated from one region to another in order to achieve structural balance. In  $I_1$ , SU is normalised on total unemployment and measured in terms of deviations from the country-wide U/V ratio. Thus  $I_1$  has an intuitive interpretation as the proportion of job seekers located in the "wrong" regions. However,  $I_1$  is sensitive to changes in aggregate unemployment levels, while  $I_2$  is not. The latter index is normalised over the labour force and defined in terms of (weighted) deviations between unemployment and vacancy rates (in levels, rather than in ratio terms) in each region.

absolute number of job seekers. The most striking case is Bulgaria where  $I_2$  tripled during the last three years reaching by 1993 levels for which there is no historical experience in OECD countries.

All in all, *regional unemployment differentials have emerged from the very beginning of the transition process and not changed significantly ever since. The mismatch between the regional distribution of unemployment and vacancies is large by western standards and a growing number of job seekers are located in areas offering a few employment opportunities.*

## 1.2 Winners and losers: a taxonomy of regional labour markets

Although the dispersion of regional unemployment rates has not decreased over time, important changes may have occurred in the relative position of the various regions. Chart 1 plots regional unemployment rates in 1991 and 1993, that is, immediately after the launching of the reform process and two years later. The observations lying along the diagonal in the chart denote regions which have not changed their relative position between the last two years, while those above (below) the diagonal are regions which have experienced a deterioration (improvement) in their relative position. The chart clearly indicates that there has been a marked persistence of the relative incidence of unemployment across the various regions. Those which suffered the most from the introduction of market-oriented reforms in 1991 and experienced a rapid increase in unemployment "at a stroke" are also those which two years later were still facing the largest labour market imbalances<sup>3</sup>. Thus, *there are no*

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<sup>3</sup> A clear distinction seems to emerge from Chart 1 between those countries, such as Bulgaria and Romania, which started the transition later and the others which already had relatively high unemployment in 1991. In Romania, particularly, regions are concentrated along the vertical line crossing the zero on the X-axis, indicating that

*signs as yet that the deepening of the restructuring process and/or re-equilibrating mechanisms have produced rank reversals in the labour market performance of the various regions.*

Who are then the winners and losers of the transition process? Table 2 reports several labour market indicators for six broad groups of regions defined on the basis of their structural characteristics. This taxonomy of regions uses a sequential selection process: three broad groups were identified in the first step, namely regions with a marked specialisation in agriculture, those dominated by industrial activities and a residual group of more diversified regions. In the second step, each of these three broad groups was split into two parts according to the degree of economic development. The latter was measured on the basis<sup>4</sup> of various structural indicators. In particular, a common discriminant factor used for the three groups is the index of infrastructure development, proxied by the telephone penetration rates (i.e., no. of telephone lines per 1 000 inhabitants). In the case of agricultural regions, indexes of tourism and trade activities were also used to identify the most developed areas. Employment shares in the private sector were used in industrialised regions together with the average size of industrial plants (tentatively capturing the emergence of a new, dynamic, small business sector). Finally, for diversified regions, the level of infrastructure development was used together with the share of the working-age population

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the geographical distribution of unemployment was still highly compressed in 1991. It is only during the following two years that the effects of reforms became evident and differences in relative regional positions emerged. In the other countries in transition, after the launching of the reforms late in 1990 or at the beginning of 1991, regional unemployment disparities suddenly materialised (or were simply unfolded) and have remained almost unchanged thereafter.

<sup>4</sup> See Scarpetta and Huber (1995) for details.

with higher education, the share of private enterprises as well as measures of the volumes of tourism activities.

Table 2 shows that agricultural areas and the most heavily industrialised regions suffer from the most severe labour market slack.

*Agricultural areas* display relatively high unemployment rates, but, especially in Hungary and Bulgaria, are characterised by a relatively high unemployment turnover, which may be attributed to the very many temporary or seasonal jobs offered in agriculture. In the other countries in transition, the relatively higher levels of unemployment in agricultural regions seems to be generated by lower outflows from unemployment rather than higher inflows. Especially in the countries like Hungary, where the labour shedding component of restructuring has gone quite far, *industrial areas* show severe labour market conditions with high unemployment, very low vacancy rates and a more stagnant unemployment pool. As expected, *diversified regions* experience the lowest unemployment rates, as labour shedding in some sectors can, at least partially, be offset by job creation in others. The diversified regions with a most developed infrastructure (Group 5 in the table) -- which include all capitals and most other large cities -- experienced also the highest vacancy rates and, consequently, the lowest U/V ratios.

The inherited employment structure of the various regions, however, only partly explains their employment (and unemployment) performance. For instance, the least developed diversified regions (group 6) display a low turnover of the unemployment pool. In these regions, a lack of specialisation is compounded by less developed infrastructures and a less skilled labour force, factors which contribute to high flows into unemployment and, even more

importantly, fewer new jobs being created, hence low flows out of unemployment. Similarly, the most developed agricultural or heavily industrialised regions (groups 1 and 3) -- ie., those with relatively large tourism (in the case of rural areas) and private trade (in the case of industrialised regions) activities -- have been experiencing relatively lower labour market tensions than their less developed counterparts<sup>5</sup>. All this suggests that new sources of regional disparities have added to those inherited from the previous system, which were mainly related to the sectoral specialisation of the various regions.

Overall, *agricultural and heavily industrialised regions with little tourism and small private sector activities have been the most hard hit by the rise of unemployment, and their relative position has not improved over time.* Even in the countries where regional labour market imbalances do not display a rising trend and there are no clear vicious and virtuous regional cycles prevailing, the names of the high unemployment regions have not changed over time.

## **2. Demand and Supply Determinants of Regional Disparities**

### *2.1. Employment Decline and Labour Force Participation*

Charts 2 and 3 shed some light on the role played by labour demand and supply in the widening of regional unemployment differentials. Chart 2 displays

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<sup>5</sup> The relatively good performance of group 4 in Poland stems from the inclusion of the large (in terms of labour force) region of Katowice -- the mining and steel-mill centre of Upper Silesia. Albeit characterised by huge (and partly unviable) enterprises, the industrial restructuring has, at best, only started [Gorzela (1993)] and production decline has not been followed by comparable contractions in employment. Therefore, unemployment has remained relatively low, but it may well be aggravated as soon as the planned restructuring programmes gain momentum.

the correlation between normalised growth rates of employment (horizontal axis) and normalised growth rates of unemployment rates (vertical axis) in the period 1991-93<sup>6</sup>. As all countries started from a position of virtual full employment, one would expect to observe a strong negative correlation between employment growth and the incidence of unemployment in the various regions. In other words, the regions with the highest unemployment should be those which have experienced the strongest employment losses. As shown by Chart 2, in all countries there seems indeed to be a negative correlation between the growth of employment and the incidence of unemployment across the various regions. Nevertheless, the correlation coefficients reported at the bottom of the chart show that in countries like Hungary and the Czech Republic, the association between  $\Delta e$  and  $\Delta u$  was rather weak at early stages of transition, pointing to an important role played in the dynamics of unemployment differentials by flows from *employment to non-participation* instead of to open unemployment. However, in all countries, the association between employment declines and unemployment growth in the various regions has increased over time. This may suggest that the potential for accommodating employment reductions without strong pressures on the labour market -- i.e., by using "soft measures" like early retirement schemes -- has been nearly exhausted. Hence, the regional profile of employment declines bears a almost perfect correspondence (e.g., Bulgaria in 1992-3) with the regional distribution of unemployment growth.

This does not mean that flows from and to non-participation are no longer important in shaping unemployment differentials. Quite the contrary,

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<sup>6</sup> Data for Poland refer to the period 1990-92, as no more recent employment data at the regional level are available in this country. Note, however, that Poland started experiencing mass unemployment already at the beginning of 1990, unlike the other countries in the table.



Chart 3, points to a significant (and increasing over time) negative correlation between unemployment growth and changes in labour force participation rates. This association between unemployment growth and declines in participation may point to discouragement effects associated with the concentration of unemployment in some regions. The increasing correlation between growth of unemployment and declines in participation could also be attributed to direct flows from employment to out-of-the-labour force, but this would be inconsistent with the observed increasing association between  $\Delta e$  and  $\Delta u$ . In other words, Charts 2 and 3 jointly suggest that, in the more recent period, flows from employment to out-of-the labour force are mediated by periods of unemployment, while at earlier stages of transition they had not involved intervening unemployment spells.

All in all, *the geographical distribution of employment losses is the dominant factor in the appearance and widening of labour market imbalances across the various regions. Labour supply reductions, associated initially to flows from employment to non-participation and, subsequently, to discouragement effects, would appear to have somewhat mitigated the spread of disparities.* Other supply factors, like migration decisions, may not have played a major role in the dynamics of regional disparities, insofar as they would reduce the negative association between  $\Delta e$  and  $\Delta u$ , and would be neutral with respect to participation, unlike discouragement effects. Labour mobility in response to unemployment differentials is, however, assessed more in detail in Section 3 below.

## 2.2. Unemployment Inflows and Outflows

Are regional unemployment differentials mainly fed by differences in the pace of inflows into unemployment or by lower outflow rates in the high unemployment regions? Table 3 provides a simple decomposition of the variance of regional unemployment growth rates across regions. In particular, we use the identity:

$$\frac{U_{it+1} - U_{it}}{1/2(LF_{i,t+1} + LF_{it})} = \frac{I_{it+1} - O_{it+1}}{1/2(LF_{i,t+1} + LF_{it})} \quad (3)$$

where  $U_{it}$  denotes (registered) unemployment at time  $t$  in region  $i$ , and  $I_{it}$  and  $O_{it}$  denote respectively inflows and outflows between  $t$  and  $t+1$ . All magnitudes are expressed as proportions of the average-period labour force,  $LF$ . The total variance of changes of unemployment rates in the various regions was then decomposed as follows:

$$Var(u_{it+1} - u_{it}) = Var(i_{it,t+1}) + Var(o_{it,t+1}) - 2Cov(i_{it,t+1}, o_{it,t+1}) \quad (4)$$

where lower case letters denote magnitudes weighted by the average-period labour force in each region.

Table 3 shows that in all countries *the dispersion of gross flows in and out of unemployment is much more marked than the dispersion of net flows* in spite of the fact that gross flows are remarkably small in these countries relative to the size of the unemployment pool [Boeri, 1994]. Put another way, regional

unemployment differentials would be even larger if regions with high inflows were not also regions with relatively large outflows as a proportion of the labour force (as shown by the positive and sizeable covariance term in the third column of the table). Disproportions in the dispersion of gross versus net flows are particularly striking in the case of the Czech Republic, where variations in regional unemployment stocks have been relatively modest given the low incidence of unemployment in this country.

More importantly, Table 3 suggests that at the beginning of transition<sup>7</sup>, differences in unemployment growth rates (hence, in levels given that the various regions were starting from virtual full employment conditions) were dominated by the dispersion of inflow rates<sup>8</sup>. The dispersion in outflow rates has, however, increased over time relative to the dispersion of inflow rates, and in 1993 dominated the variance of regional unemployment variations in countries like Poland and Hungary. This increasing role of unemployment outflows in the cross-sectional variation of unemployment growth rates has, however, gone hand-by-hand with a reduced variance of regional unemployment growth rates (fourth row of Table 3).

To sum up, *inflows into unemployment have contributed more than outflows from unemployment to the widening of regional labour market disparities. However, differences in outflows relative to the regional labour*

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<sup>7</sup> Unfortunately, no flow data for Poland are available for 1990 and 1991, that is, the first two years of transition.

<sup>8</sup> Micklewright and Nagy (1994) in their study of individual records of the unemployed in Hungary also observed that inflow rates have played a major role in the build-up of regional disparities.

force seem to account for an increasing component of the variance of regional unemployment growth rates. As this increasing role of outflow rates is accompanied by increasing covariance terms and a reduced variance of unemployment growth rates, the impression is that regional differences in outflow rates have played an important role in preventing a further widening of unemployment differentials. The factors lying behind regional differences in inflow rates and the role that outflow rates could play in reducing unemployment differentials are discussed below.

### 2.3. *Structural Determinants of Regional Inflow Rates*

Which factors lie behind this reduced role of inflows in the dynamics of regional unemployment differentials? Do these reflect the sectoral patterns of disemployment prevailing nation-wide or local factors affecting the pace and employment impact of restructuring?

To better isolate the extent to which the inherited industry mix accounts for different inflow rates, we estimated for each region and year an expected "net separation rate" (NSR), by applying sectoral employment growth rates prevailing nation-wide to the employment structure of each region. Under the assumption that firms belonging to the same sector behave in the same way nation-wide, the expected net separation rate of each region should coincide with the actual rate and, thus, should be positively correlated with the inflow rate of the region [Scarpetta, 1995].

Table 4 reports results obtained by running the following regression against annual regional data for the Czech and Slovak Republics, Hungary and Poland for the period 1992-1993:

$$\ln Inflow_{it} = \alpha_i + X_{it}\beta + Z_i\gamma + \epsilon_{it} \quad (5)$$

where the dependent variable is the natural logarithm of the average number of individuals entering unemployment in the region  $i$  in an average month of the year  $t$ ;  $\beta$  and  $\gamma$  are vectors of coefficients associated with time-varying and time-invariant explanatory variables respectively. In particular, the  $\mathbf{X}$  vector includes -- in natural logarithm unless otherwise stated: the average of unfilled vacancy in a given year ( $\ln Vr$ ); the net separation rate (NSR) described above; the active population level ( $\ln Pop$ ); the number of private enterprises ( $\ln Priv$ ); the number of telephone lines ( $\ln Tel$ ); the number of tourist nights ( $\ln Tour$ )<sup>9</sup>. The  $\mathbf{Z}$  vector includes: a constant term as well as the natural log of the average employment in industrial enterprises in 1992 ( $\ln Esize$ ); the share of population with primary or lower education in 1992 ( $Lowed$ ); an Herfindahl index ( $HERF$ ) defined on the basis of regional employment shares of various industries and capturing the degree of diversification of the employment structure, and, a binary variable taking value 1 for regions on the border with western countries and zero otherwise (in the case of the Czech Republic, two variables have been included in the model identifying regions on the border with Austria  $BORDA_i$  and regions on the border with West Germany  $BORDG_i$ ). A more comprehensive description of the different regressors listed here is in *Annex B*.

Because residuals are likely to be correlated across yearly equations, estimation efficiency can be gained by using Zellner's seemingly unrelated regression (SUR) technique. As economic theory provides little guidance in

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<sup>9</sup> Because of data limitation:  $\ln Tel$  indexes are fixed at the 1992 levels in the Czech and Polish models;  $\ln Priv$  is constant at the 1992 level in the Hungarian model;  $\ln Tour$  is fixed at the 1992 level in the Hungarian and Slovak models.

selecting appropriate restrictions on the set of regressors<sup>10</sup>, we adopted a general-to-particular approach. For each country, the restricted model (see the last two columns on the right-hand-side of table 4) only includes those variables whose estimated coefficients were accepted at conventional significance levels. Furthermore, we used the Wald test to check for the joint insignificance of the set of regressors that failed the individual test. Likewise, we used the Wald test to check for the stability of coefficients between 1992 and 1993.

The regression results suggest that there are substantial differences in the determinants of inflows between 1992 and 1993 and across countries. A general finding is that local variables (like the number of telephone lines per inhabitant and the number of private enterprises) tend to dominate those capturing the effects of the industry mix (NSR) and labour demand conditions (lnVac). Regional vacancy rates become significant only in 1993 (with the exception of the Czech Republic where lnVac is always significant) and the elasticity of inflows with respect to vacancies is, in any event, remarkably low. The coefficients for the net separation rates are significantly different from zero in Hungary and in the Slovak Republic (1993). In the former, the industrial reallocation patterns of employment have increased their importance in shaping regional inflows, i.e. the estimated Nsr elasticities of inflows increased from .04 in 1992 to .27 in 1993. In the Slovak Republic the elasticity in 1993 was low while in the other two countries either no significant correlation was found (Czech Republic) or a counter-intuitive negative association emerged (Poland),

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<sup>10</sup> See, however, Burgess and Nickell (1991) and Svejnar and Terrel (1994) for empirical analyses of determinants of inflow rates.

i.e. high separation rates were found in regions with low inflows into unemployment<sup>11</sup>.

The degree of sectoral diversification of economic activities (HERF) is, as expected, positively correlated with flows into unemployment in Hungary, where the process of industrial restructuring is more advanced, but enters negatively the inflow equation in Poland and in the Slovak Republic. This may suggest that the concentration of employment in a few industries and large conglomerates may end-up reducing the pace of restructuring. The sign of ESIZE is indeed negative in most countries, whilst we would have expected that a greater share of employment in large (mainly state-owned or under privatisation) plants would have positively affected inflow rates. An hypothesis that could be pursued by further studies is that the widespread employment effects that any restructuring process of these large plants could have produced have exerted a sort of social threat and, at least so far, slowed down the modernisation of the local economy.

Other structural factors account for the bulk of the regional differences in inflow rates in all countries and their elasticities are consistent with a-priori expectations. In particular, the development of the private sector seems to reduce the flows into unemployment despite the need for restructuring the privatised

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<sup>11</sup> Combining these partially disappointing results for Nsr in the inflow equations with previous results [Scarpetta (1995)] in which the industry mix had an important role to play in explaining aggregate unemployment rates, we can tentatively conclude that the sectoral composition plays a role mainly in the outflows from unemployment while, especially at the beginning of the transition, almost all sectors had to reduce the excessive workforce and flows into unemployment were not highly differentiated across sectors.

enterprises. As expected, better local infrastructures help the enterprises and thus reduce inflows, other things being equal.

Overall, *local "endogenous potential" factors seem to play an increasingly important role in the regional variation of inflow rates. Surprisingly enough, the dominance of large plants and the strong specialisation of certain industrial sites seem to be associated with low inflow rates as if the concentration of surplus labour in a few sites could have slowed down the adjustment of employment. The quality of local infrastructure, and the size of the private sector are also important in determining flows into unemployment while prevailing industrial reallocations patterns are, with the sole exception of Hungary in 1993, much less important in shaping the regional distribution of inflow rates.*

### **3. The Re-equilibrating Mechanism**

#### *3.1 Regional Differences in the Job Matching Process*

As shown above, higher than average inflows into unemployment tend to be associated with higher than average outflows, which may point to the work of local labour markets promoting the matching between jobs and unemployed workers. Yet, large outflows in high-inflow regions may be simply the byproduct of discouragement effects like those suggested by Chart 3. Moreover, what ultimately matters is the *speed* by which different regions succeed in absorbing unemployment. Varying degrees of efficiency in the work of regional labour markets, and the presence of diseconomies of scale in the matching of labour demand and supply would make it more difficult the operation of re-equilibrating mechanisms.



There are two countervailing forces that seem to affect returns to scale in job-matching. On the one hand, a larger unemployment pool and stock of vacancies may lead to the so-called "*thick market externalities*", whereby "choosy" employers have more degrees of freedom in screening workers and highly specialised workers have a better chance of finding the job corresponding to their qualifications and career expectations. On the other hand, a larger number of unemployed even when accompanied with a likewise larger number of vacancies may be a source of "*congestion*" costs, thereby labour markets become less efficient in promoting job-matching when there are too many job seekers. The stronger the effects of *congestion* with respect to the *thick labour market externalities*, the more likely that "vicious circles" are set in motion in which, *ceteris paribus*, high unemployment regions tend to absorb a decreasing proportion of the population of job seekers. Hence, an analysis of returns to scale in job-matching in various regions can provide some insights on the likely dynamics of regional labour market disparities in transition countries.

Table 5 reports estimates of a "*matching function*" relating monthly outflows from unemployment to jobs, to the initial stock of vacancies and unemployed in all countries for which data were available<sup>12</sup>. The functional form used for the empirical estimation of the matching function is the usual Cobb-Douglas form:

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<sup>12</sup> Matching functions in central and eastern Europe were previously estimated by Burda (1993) in the case of the Czech and Slovak Republic, Lehmann (1993) in the case of Poland and Boeri (1994) in the same four countries displayed in Table 5 (but within a shorter time period).

$$\ln(O_{it}) = \ln(A_{it}) + \alpha \ln(U_{it-1}) - \beta \ln(V_{it-1}) + LTU_{it-1} + u_{it} \quad (6)$$

where  $A$  denotes regional and time effects (e.g., improvements in the work of labour markets),  $O$  denotes outflows to jobs,  $U$  unemployment and  $V$  vacancy stocks, and regions and months are, respectively, indexed by the subscripts "i" and "t". The sum of the two coefficients  $\alpha$  and  $\beta$  measures returns to scale in job-matching: decreasing if it is less than one, and increasing above unity. As previous estimates of matching functions in central and eastern Europe pointed to important effects of unemployment duration on job matching [Boeri, 1994] and high-unemployment regions are also characterised by relatively large long-term unemployment rates (Table 2), we included in the set of regressors the share of long-term to total unemployment (LTU). The omission of such a variable could, in fact, bias downwards the unemployment coefficients in high-unemployment regions. Finally we allowed the  $U$  and  $V$  coefficients to vary across the three main groups of regions (agricultural, heavily industrialised, diversified) described in Section 1. The test of constant returns to scale reported in the fourth column refer, however, to the restricted estimates in which we imposed the homogeneity of slope coefficients across the three regional groupings<sup>13</sup>.

Consistent with previous findings, the coefficients for unemployment and vacancies are found to be both positive (with the exception of vacancies in

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<sup>13</sup> The computer programme used in our estimations is DPD, developed by Arellano and Bond (1988). An important advantage of this programme is that it provides a good battery of test-statistics. However, it does not produce efficient estimators in the case of serial correlation of residuals. We therefore developed a routine to separately compute the Newey-West covariance matrix.

Hungary<sup>14</sup>, whose coefficient is, however, insignificant) and statistically significant at conventional levels<sup>15</sup>. The estimated elasticity of job finds with respect to vacancies is also still remarkably low by western standards as in OECD countries, V coefficients of the order of .3-.5 are typically observed<sup>16</sup>. Due to this low responsiveness of job finds to changes in the number of employment opportunities notified to the labour exchange, the matching function was found to exhibit decreasing returns to scale in all countries except Hungary, as shown by the t-tests reported on the right-hand side of Table 5. There is, therefore, some indication that congestion in job matching may create obstacles to the reduction of unemployment in the regions where the largest number of job seekers is concentrated.

<sup>14</sup> Available data on unemployment flows in Hungary refer only to unemployment benefit recipients. Competition for jobs between voluntary quitters who can receive benefits only after a 180-days waiting period and benefit claimants can contribute to explain the absence of a significant effect of vacancies on outflows to jobs in this country.

<sup>15</sup> Both White (heteroscedastic-consistent) and Newey-West (corrected for serial correlation of residuals) standard deviations of coefficients are reported in the table as Lagrange multiplier tests revealed the presence of (mild) first-order autocorrelation of residuals in the Czech Republic. Under these conditions, the OLS estimators are asymptotically unbiased but inefficient. Hence, we used OLS estimators of the coefficients and computed the Newey-West (1987) covariance estimator:

$$S^* = S_0 + \frac{1}{T} \sum_{j=1}^L \sum_{t=j+1}^T w_j e_t e_{t-j} (x_t x_t' + x_{t-j} x_{t-j}')$$

where  $S_0$  stems for the White estimator for heteroscedasticity while  $L$  denotes the maximum lag-length (in our case 3; see, however, Newey-West (1993) for an automatic procedure to establish the maximum lag-length) and  $w$ :

$$w(j) = 1 - \frac{j}{L+1}$$

which implies that observations which are far apart in time have increasingly small covariance, but does not impose any specific structure to the autocorrelation of residuals.

<sup>16</sup> See Pissarides, 1986; Blinchar and Diamond, 1990 and Burda and Wyplosz, 1994 for estimates of matching functions in OECD countries. As argued in Boeri [1994], measurement errors in vacancy data are not likely to be more serious than in OECD countries.

Moreover, especially in large countries like Poland, significant differences across regions persist in the job-matching process. As shown by the Wald-tests reported on the right-hand side of Table 5, dummies capturing the various regional groups introduced in Section 1 are, with the exception of Slovakia, generally jointly significant. Moreover, in all countries, except the Slovak Republic<sup>17</sup>, a greater elasticity of job finds to unemployment is generally observed in diversified regions (U3 and V3 coefficients) than in the other two groups of regions whereas industrialised regions display the lowest responsiveness of outflows to jobs to changes in the number of registered job seekers (U2 coefficients). Perhaps due to the variety of occupations and skills that they offer, diversified regions may enjoy, more than other areas, *thick labour market externalities* of the kind discussed above, which could contribute to reduce or even fully offset the negative effects of congestion of job finds. However, deviations across the three main groups of regions in the two relevant elasticities are often not significant, both individually and jointly, when t-statistics robust to both heteroscedasticity *and* autocorrelation of residuals are used.

All in all, there are not yet signs of improvements in the functioning of regional labour markets which could reduce the risk that a sort of vicious cycle is set in motion whereby high unemployment regions experience low outflow to job rates even in the presence of relatively high vacancy rates. Furthermore,

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<sup>17</sup> The Slovak Republic is the only country where the capital, Bratislava, is not characterised by much better (than the country average) labour market conditions. This may contribute to explain the negative (although not significant when robust test-statistics are used) U3 coefficient observed in this country: Bratislava is indeed, the largest diversified region in the Slovak Republic. Studies on the determinants of individual unemployment durations [Ham, Svejnar, Terrel, 1994] had also observed that job seekers located in Bratislava do not have better reemployment prospects than unemployed in rural areas.

more marked diseconomies of scale in job-matching seem to be present in regions dominated by heavy industry. This suggests that *even an increase in vacancy rates in these regions which would bring their u/v ratios in line with those registered in low-unemployment areas may not be sufficient to ensure the convergence of unemployment rates.* Put another way, the convergence of regional labour market developments seems to require a much more rapid increase of vacancy rates in heavily industrialised regions than elsewhere during recovery periods, if not lower rates of entry into the unemployment pool in these areas. The following sections assess the likelihood that such events may occur.

### 3.2 *Regional Wage and Unemployment Differentials*

Widening wage differentials between high and low unemployment regions may lead to more job openings in the less developed industrialised or agricultural regions, thereby contributing to absorbing their large stocks of job seekers. In Chart 4, regional wage growth (1991-1993) is plotted against regional unemployment rates in transition countries. Wage data tend to undersample small units<sup>18</sup>, and hence a large component of the private sector. Unfortunately the direction of the bias induced by the undersampling of small units is difficult to assess. Private ventures in particular, are usually thought to offer higher wages than declining state enterprises, but they have often have a "gap-filling nature"<sup>19</sup> and are concentrated in retail trade and other low-paid service sectors. Furthermore, wage data exclude most of the agricultural co-operatives. Insofar

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<sup>18</sup> Wage data come from enterprise surveys which systematically exclude the smallest units. For instance, in the Czech and Slovak Republics enterprises with less than 25 employees are excluded; those with less than 20 employees are excluded from the Hungarian data (50 employees before 1993). Furthermore, enterprise surveys tend to undersample the small units above the threshold scale, given that the sampling frame often does not cover adequately the emerging small business sector.

<sup>19</sup> See Blanchard, Commander and Coricelli, (1994).

as agricultural cooperatives tend to offer some of the lowest wages in the distribution of earnings, their exclusion from the sample tend to bias wage data upwards in rural areas.

Bearing the above caveats in mind, Chart 4 suggests that earning differentials so far have not been particularly responsive to evolving regional unemployment differentials. The slope coefficients are negative, pointing to lower wages in high-unemployment areas, but they are not often statistically significant. This may be due to the fact that the spread of the distribution of wages by region, albeit increasing<sup>20</sup>, is still limited in spite of the disclosing and then widening of unemployment differentials in the 1990-92 period. The capitals are, however, the outliers: they are experiencing lower than average unemployment and higher relative wages in all countries.

Several factors may have prevented the widening of regional wage differentials. Firstly, in most countries real wages have been falling nationwide. In the Czech Republic and Poland, for instance, real wages stood in 1993 at 80 per cent of their pre-reform levels, which left little room for further downward wage adjustment in high-unemployment areas. Secondly, the decline of heavy industry sites, which were offering the highest wages under central-planning, has prevented the traditional tips of the wage distribution from increasing their distance from the bottom-end. Thirdly, as stressed above, the emerging private sector has often involved mainly the creation of gap-filling,

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<sup>20</sup> The coefficient of variation of the regional wage distributions increased only by 5 per cent in Hungary in period 1990-93 and by 20 per cent in Poland over the 1990-2 period. However, it doubled in the Slovak Republic and increased by 60 per cent in Czech lands, the two countries with the most compressed structure of earnings at the start of the transition process.

low-paid jobs. Finally, tax-based income policies may have also contributed to maintaining a relatively compressed wage structure in some countries<sup>21</sup>.

In conclusion, *wage differentials are still contained and only partly responsive to unemployment differentials.*

### 3.3. Labour Mobility

Another important re-equilibrating factor, especially in the short-term, is regional labour mobility. Chart 5 plots net regional migration flows and unemployment rates for the countries in which data on regional migration were available. In particular, the diagram on the left-hand-side of Chart 5 shows net migration flows together with unemployment rates in 1992, while the diagram on the right-hand side plots changes in (net) in-migration and unemployment rates.

If migration flows were responsive to labour market conditions, one should observe regions disposed along a negatively sloped curve, whereby high unemployment rates are associated with emigration (left diagram) or at least declines in net in-migration over time (right diagram). The impression given by Chart 5 is that in Poland, Hungary and to a lesser extent the Czech Republic, net migration flows are negatively correlated to unemployment. In other words, regions experiencing higher than average unemployment rates tend to be characterised by relatively large net outflows, which is consistent with the operation of the labour market adjustment mechanism.

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<sup>21</sup> Punitive excess wages taxes were introduced in the Czech and Slovak Republics, Hungary and Poland in order to avoid the decapitalisation of state owned enterprises and to keep inflation under control, but they often proved not binding or ineffective in preventing wage increases.

However, the picture is less bright when the focus is on the absolute number of individuals who changed their region of residence and on the correlation between *changes* in net migration flows and unemployment over the 1991-93 period. Given the widening of regional disparities, increased flows of population from declining to growing regions could have been expected. However, unemployment rates and changes in net migration do not seem to be correlated. Hungary is the exception, the two variables being positively correlated<sup>22</sup>. The absolute number of individuals changing region of residence has actually decreased since the beginning of the transition<sup>23</sup> and even flows into country capitals, like Budapest and Prague, display a marked reduction despite the concentration of most of the new employment opportunities in these towns.

Why is regional migration not responding to the widening of regional unemployment differentials? As shown by the experience of OECD countries<sup>24</sup>, migration flows tend to have a marked procyclical pattern, which -- combined with the dramatic output losses experienced by central and eastern European countries -- may contribute to explain the in-migration flows in transition countries.

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<sup>22</sup> Simple correlation coefficients of changes in net migration flows (1991-1993) and unemployment rates (1993) were as follows: Czech Republic 0.158; Hungary 0.43; and Slovak Republic 0.062.

<sup>23</sup> In Poland, inter-voivodeship migration declined by 7 per cent from 1990 to 1992, that is, from 1.4 per cent of the population in 1990 down to 1.3 per cent in 1992. In the Czech Republic, the decline of inter-regional migration was even more pronounced: from 0.65 per cent of the population in 1989 to 0.55 per cent in 1993.

<sup>24</sup> Jackman and S. Savouri, (1991).



Another possible explanation for decreasing interregional migration is in the increasing costs of mobility associated with a shortage of rental housing in urban areas. Strict rent controls are negatively affecting the supply of housing, and creating a dualistic housing market in which rents prevailing in the liberalised segment are not affordable by domestic citizens<sup>25</sup>. A migrant is likely to be concerned about the expected earnings over the remainder of his/her working life and high housing costs in low-unemployment areas may offset the incentives to mobility associated with regional unemployment differentials, especially if the latter are viewed as having a short-term nature<sup>26</sup>.

Although *inter-regional* migration flows have decreased in the transition phases, there is evidence in some countries that short-range labour mobility has increased. Workers were used, even before the transition, to commute to work outside the place of residence, given the fact that most of the jobs were in large enterprises concentrated in few sites and that commuters benefited from reduced tariffs and, in many cases, from a system of transport network managed by the enterprises. Most of these facilities faded away in the aftermath of the transition. State-owned enterprises are not able to subsidise commuters and most of the pre-existing transport networks managed by enterprises have been closed down or

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<sup>25</sup> See OECD (1994b).

<sup>26</sup> Under central-planning, large state enterprises used to provide subsidised dwellings and owned a large share of the apartments available in the neighbour of the industrial plant which were given to their workers on rent. At present, the ownership of these apartments has not changed nor the people who live there, even if in some cases their work relationship with the employer (landlord) has come to an end or is severely threatened by the process of restructuring. Thus, some of the unemployed or workers at risk of losing their job -- that is, the core of the potential emigrants -- may be unwilling to relinquish an existing tenancy at a rental which may be below market prices in exchange for high uncertainty as to the availability and costs of accommodation in the intended place of destination. The combination of high housing costs in growing regions, lack of information as regarding the availability of accommodation may explain the low migration flows in central and eastern Europe.

replaced by more expensive public services. Yet, there is some indication [see Erbenova (1995) for the Czech Republic] that daily labour mobility has actually increased. Furthermore, commuting flows seem to be closely correlated to underlying labour market differentials between the place of residence and of work.

*Summarising, the direction of migration flows seems to be consistent with underlying market fundamentals insofar as net outflows are larger in high unemployment regions. However, the magnitude of regional labour mobility is decreasing just at a time when major unemployment differentials are emerging. The lack of regional mobility is partly compensated by the increasing number of workers commuting to work outside their region of residence despite the significant boost in transport costs. Increasing daily mobility and decreasing inter-regional labour migration are consistent with obstacles to mobility induced by a shortage of rental housing in urban areas.*

## **Final Remarks**

The purpose of this paper was to shed some light on the characteristics and dynamics of regional disparities in central and eastern Europe. Our main findings can be summarised as follows:

- 1) Regional unemployment differentials are large by western standards and the number of job seekers located in areas where a very few employment opportunities are offered has increased substantially since the start of transition.

- 2) Very minor changes have occurred in the ranking of regions by incidence of unemployment: the names of the high-unemployment sites are the same as at the beginning of transition.
- 3) Prevailing regional patterns of dis-employment -- giving rise to differential inflows into unemployment -- have played a major role in the initial widening of unemployment differentials and are increasingly associated with unemployment growth in the various regions as the potential for accommodating labour shedding via direct flows from employment to out-of-the labour force (e.g., via early retirement schemes and decreased participation of women) has eroded.
- 4) The regional dispersion of inflow rates has decreased over time and the sectoral specialisation of the various regions does not play a crucial role in explaining differentials in inflow rates. On the contrary, local factors (e.g., the degree of labour market slack, the presence of large conglomerates, etc.) are becoming increasingly important.
- 5) Outflows from unemployment, notably outflows to jobs, do not increase proportionally to the number of job seekers and vacancies. Congestion effects in job matching seem to be particularly serious in heavily industrialised regions, which are also characterised by relatively low inflows into unemployment.
- 6) While regional wage differentials are increasing, regional labour mobility is not. Both wages and migration flows are consistent with underlying regional imbalances, but they have not yet reacted to the *widening* of unemployment differentials.

Facts 1 and 2 corroborate the increasing concern of policy-makers about regional disparities. Facts 3 and 4 suggest that industrial restructuring has somewhat slowed down and that local factors (e.g., associated with social resistance to further labour shedding in large loss-making state enterprises) are increasingly important in affecting regional patterns of dis-employment. Finally, facts 5 and 6 suggest that high unemployment especially in industrialised regions is characterised by a stagnant pool of job seekers rather than by large inflows, and thereby the rise of unemployment leads to a decline in effective labour supply.

While it is perhaps too early to assess the speed of re-equilibrating mechanisms and even more difficult to make inferences about the future course of events, a distinguishing feature of the dynamics of regional disparities in transition countries is in the apparent feedback from widening unemployment differentials to the variance of regional employment declines. While in flexible labour markets like the US, regional differences in employment growth are persistent and regional unemployment differentials are reduced by labour supply dynamics, notably interregional labour mobility, the impression is that in central and eastern Europe something different is happening. Here, the regional dispersion of employment reductions seems to be less persistent, while the dispersion of unemployment rates is highly persistent. If unemployment differentials have not increased any further in the last two years, this is not because labour supply has adjusted, but because changes have occurred in the regional profile of labour demand. Whether these changes are associated to social resistances to change or to other factors remains a scope for further research combining evidence from case-studies with microeconomic evidence on labour market flows.

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## Annex A

### Data sources

Data used in this paper come from the OECD Regional Labour Market Database and from national submissions. Data on the stock of unemployed, inflows into unemployment, outflows from unemployment, unfilled vacancies, and labour force are all drawn from the registers maintained by the labour market administrations in the various countries. More details are provided in the notes at the bottom of tables and charts.

Regional data on the composition of employment by sectors of activity come from the Central Statistical Offices of the transition countries. The net separation rate has been computed by using national data on employment by sector of activity. According to the availability of data at the regional level, the following sectoral breakdown was used:

- *Czech Republic*: agriculture, industry, transport and communication, and other services;
- *Hungary*: agriculture, industry, construction, transport and communication, trade and catering, social services including health and education, public administration, and other services;
- *Poland*: agriculture, industry, construction, transport and communication, trade and catering, education, health and other services;
- *Slovak Republic*: agriculture, industry, construction, transport and communication, trade and catering, social services, public administration, and other services.

Sources and definitions of the other variables used in the empirical analysis are as follows:

#### *Czech Republic*



Data on active population, employment by sector of economic activity, number of private enterprises, and number of telephone lines are from the Czech Statistical Office (1992), *Districts of the Czech Republic, 1992*, Prague.

### *Hungary*

Data on active population, employment by sector of activity, number of nights spent by tourists, number of private enterprises, and number of telephone lines are all from the Hungarian Central Statistical Office (1993), *Hungarian Regional Yearbook, 1992*, Budapest. Data on education come from: Hungarian Central Statistical Office (1993), *1990 Population Census: Summary Data*, Budapest. Data on the distribution of employment by sectors refer to employees.

### *Poland*

Data on active population and total population by level of education, employment by sector of activity, number of nights spent by tourists, number of private enterprises, and number of telephone lines are all from Central Statistical Office (1993), *Rocznik Statystyczny*, Warsaw. The distribution of population by level of education refers to individuals 15 or more years of age.

### *Slovak Republic*

Data on active population and total population by level of education, employment by sector of activity, number of nights sent by tourists, and number of telephone lines are all from Slovak Statistical Office (1993), *Districts of the Slovak Republic -- 1992*, Bratislava.

## Annex B

### The specification of the inflow equations

A number of factors influence flows into unemployment and economic theory provides little guidance in selecting a proper set of regressors. To start with, differences in the regional demand for labour are likely to affect unemployment, especially if labour mobility is weak. A possible measure of differences in labour demand is the vacancy rate (e.g. the number of vacancies divided by the regional labour force). As shown in Section 1, vacancy rates have greater variability than unemployment rates. However, vacancy data may provide a very low coverage of the actual number of job openings, especially in the labour markets with a dynamic small business sector.

The NSR index (described in the text) measures the structure of employment by branches but ignores the heterogeneity of firms within each industrial branch. As often stressed, regions dominated by large industrial plants are often those with the most severe labour market problems, insofar as the pace of the restructuring process in the main plant affects a considerable share of local employment. In order to control for the size of industrial firms, a variable called ESIZE is included which measures the average plant size (employment) in the industrial sector.

Furthermore, we introduced the Herfindahl index (HERF) of industrial diversity to test for the hypothesis that, *ceteris paribus*, more diversified local economy enjoy better labour market conditions. The Herfindahl index has been constructed as the sum of the squares of sectorial employment shares. It ranges from  $1/N$  to 1, where  $N$  is the number of sectors in economy. It is equal to 1 when there is only one sector in the economy which absorbs all the employment and  $1/N$  in case of a uniform distribution of employment of all sectors of the economy. Therefore, the greater the value of the index, the lower the degree of industrial diversity.

However, a lack of diversification (especially when accompanied with the concentration of employment in a few large conglomerates) may increase social resistance to restructuring, thereby reducing, at least in the short run, the pace of flows into unemployment.

Inflows into unemployment may be fostered by changes in the skill profile of labour demand. Experience from OECD countries suggests that the most educated people are those who are quicker to adjust to new tasks. Regional data on education in transition countries offer the following breakdown of educational attainments of the workforce: primary or lower levels of education; vocational education; secondary general education; and higher education. In our estimates we used the share of population with a primary or lower level of education  $LOWED_i$  as an indicator of differences in the educational attainment of the regional population.

The behaviour of enterprises in the new market based framework is also likely to be affected by the quality of local infrastructure, entrepreneurial capacity, etc. For this reason, we included in the set of regressors some of these structural variables. Firstly, the number of telephone lines per inhabitant (TEL) to proxy the degree of development in the local infrastructure. Secondly, the model includes the number of private enterprises per inhabitant (PRIV) as a proxy of the entrepreneurial capacity of a region or, alternatively, the attractiveness of a local area for the location of new private ventures. Thirdly, we included the number of nights spent by tourists in the region (TOUR) because tourism has often contributed to ease labour market tensions in certain regions (particularly in agricultural areas).

**Table 1. Regional unemployment differentials in central and eastern Europe 1991 - 1993**

		Annual average of monthly data (a)												
A		B	C		D		E		F		G		H	
Number of regions		rate national (%)	Unemployment coefficient of variation (e) (%)	Unemployment rate of top quartile (e) (%)	Unemployment rate of bottom quartile (e) (%)	Top / bottom (%)	Unemployment rate of top quartile (f) (%)	Unemployment rate of bottom quartile (f) (%)	Un./Vac. ratio of top quartile (%)	Un./Vac. ratio of bottom quartile (%)	Un./Vac. of top quartile (%)	Un./Vac. of bottom quartile (%)	Mismatch indexes (g) I	Mismatch indexes (g) II
<b>Bulgaria</b>	1991	9	6.7	0.2	8.2	5.5	1.5	24.4	8.6	0.2	0.7			
	1992		13.2	0.2	16.9	9.4	1.8	80.4	22.3	0.2	1.5			
	1993		16.7	0.2	21.0	10.6	2.0	101.9	32.6	0.2	2.1			
<b>Czech Republic (b)</b>	1991	76	2.9	0.4	4.6	1.4	3.2	8.6	1.4	0.3	0.6			
	1992		3.0	0.4	3.5	0.9	3.8	2.5	0.5	0.4	0.9			
	1993		3.2	0.5	4.6	1.0	4.6	6.4	0.5	0.4	1.0			
<b>Hungary</b>	1991	20	4.8	0.4	8.3	1.5	5.4	28.6	6.7	0.3	1.0			
	1992		10.3	0.3	16.0	5.0	3.2	35.7	18.0	0.2	1.7			
	1993		12.9	0.3	19.2	6.9	2.8	34.4	8.9	0.3	2.0			
<b>Poland</b>	1991	49	11.4	0.3	16.6	5.9	2.8	77.5	9.9	0.4	1.7			
	1992		13.6	0.3	18.4	7.7	2.4	138.2	30.8	0.3	1.8			
	1993		15.6	0.3	21.5	8.5	2.5	149.7	33.6	0.3	2.2			
<b>Romania (c)</b>	1991	41	2.0	0.7	3.4	0.7	4.9	..	..	..	..			
	1992		5.3	0.4	8.3	3.0	2.8	..	..	..	..			
	1993		9.4	0.4	14.6	5.7	2.6	381.1	76.2	0.4	1.4			
<b>Slovak Republic (d)</b>	1991	38	7.0	0.3	9.9	4.5	2.2	40.4	11.8	0.3	0.9			
	1992		11.3	0.3	16.1	6.7	2.4	35.1	7.3	0.3	1.5			
	1993		14.4	0.3	21.7	7.5	2.9	78.0	22.9	0.4	2.2			

.. Data not available.

a) National unemployment rates and vacancy rates are weighted by the size of the regional labour force which are derived from reported regional data.

b) Annual averages except for missing data in February and August 1991.

c) Romanian unemployment rates were calculated using the same 1993 labour force data. Data on notified vacancies were not available in 1991 and 1992.

d) Rates were calculated using annual averages in 1991 and 1992, and with December data in 1993.

e) Coefficient of variation is the standard deviation divided by the mean of regional unemployment rates.

f) Unemployment rates for the top quarter of the labour force by regions were calculated by ordering regions in terms of descending unemployment rates; taking regions until the cumulative labour force exceeded one quarter of the total and similarly for the bottom quarter.

g) See text for explanation of index.

Sources: OECD, *Regional Labour Market database*.

**Table 2. Labour market conditions in different region types, 1992-1993**  
Yearly average of monthly data\*

Type of region	Average unemployment rate (a)		Long-term unemployment (More than 12 months)		U/V ratio (c)		Monthly inflow rate (d)		Monthly outflow rate (e)		Monthly outflow to job rate (f)	
	'92	'93	'92	'93	'92	'93	'92	'93	'92	'93	'92	'93
<b>Bulgaria</b>	<b>13.2</b>	<b>16.7</b>	..	..	<b>49.0</b>	<b>71.5</b>	<b>0.9 (h)</b>	<b>0.6 (h)</b>	<b>9.2 (h)</b>	<b>6.37 (h)</b>	<b>1.27 (h)</b>	<b>0.92 (h)</b>
Group 1	10.6	12.6	..	..	40.0	42.1	0.8	0.5	11.5	7.9	1.9	1.5
Group 2	13.1	20.7	..	..	74.5	113.6	1.0	0.7	11.2	6.0	1.1	1.0
Group 3	10.5	16.1	..	..	58.2	108.3	0.7	0.6	9.0	5.1	1.1	0.7
Group 4	14.5	18.8	..	..	54.0	72.8	1.0	0.8	8.6	6.0	1.3	0.9
Group 5	8.3	9.1	..	..	15.6	26.7	0.5	0.4	11.4	7.1	1.6	1.0
Group 6	16.0	19.2	..	..	77.6	101.0	0.9	0.6	8.1	6.7	1.1	0.8
<b>Czech Republic (g)</b>	<b>2.6</b>	<b>3.7</b>	<b>17.0</b>	<b>14.8</b>	<b>1.7</b>	<b>3.4</b>	<b>0.5</b>	<b>0.5</b>	<b>16.6</b>	<b>12.1</b>	<b>10.4</b>	<b>8.4</b>
Group 1	2.4	2.7	17.0	14.1	1.1	1.9	0.4	0.4	12.1	12.6	9.1	9.2
Group 2	3.6	4.7	18.4	13.9	3.7	5.9	0.6	0.7	14.1	10.3	9.1	7.7
Group 3	2.7	4.4	16.2	15.0	1.8	4.5	0.5	0.5	15.6	11.8	9.2	8.0
Group 4	3.3	4.5	17.0	14.9	2.8	5.7	0.6	0.6	18.0	11.9	10.9	7.7
Group 5	0.8	1.1	12.5	12.0	0.4	0.7	0.2	0.2	27.6	23.2	19.3	15.2
Group 6	3.4	4.7	18.2	15.8	2.6	5.3	0.5	0.6	16.0	11.3	9.7	8.0
<b>Hungary</b>	<b>10.3</b>	<b>12.9</b>	<b>21.6(e)</b>	<b>60.6</b>	<b>25.6</b>	<b>19.5</b>	<b>0.5 (h)</b>	<b>0.4 (h)</b>	<b>4.9 (h)</b>	<b>7.14 (h)</b>	<b>2.94 (h)</b>	<b>2.31 (h)</b>
Group 1	9.2	10.6	18.1	59.8	21.5	30.7	0.5	0.4	6.5	7.6	4.3	3.2
Group 2	14.1	17.2	22.7	65.6	30.3	27.5	0.6	0.4	5.1	7.0	3.2	2.1
Group 3	10.4	12.8	20.3	58.0	34.6	24.4	0.6	0.4	4.8	7.4	3.4	2.9
Group 4	16.7	20.5	26.3	69.5	48.5	41.1	0.5	0.4	3.9	6.2	1.8	1.5
Group 5	5.0	6.9	16.6	47.0	18.0	8.7	0.3	0.3	5.0	7.6	2.7	2.6
Group 6	9.2	11.7	20.7	56.6	17.9	16.2	0.5	0.4	5.1	7.4	3.0	2.5

Table 2 (continued)

Type of region	Average unemployment rate (a)			Long-term unemployment (More than 12 months)			U/V ratio (c)			Monthly inflow rate (d)			Monthly outflow rate (e)			Monthly outflow to job rate (f)			
	'92	'93	'92	'92	'93	'92	'92	'93	'92	'93	'92	'93	'92	'93	'92	'93	'92	'93	
<b>Poland</b>	<b>13.6</b>	<b>15.7</b>	<b>45.2</b>	<b>44.8</b>	<b>75.9</b>	<b>85.2</b>	<b>1.2</b>	<b>1.5</b>	<b>4.3</b>	<b>4.9</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	
<b>Agricultural</b>																			
Group 1	14.9	16.6	45.2	43.7	129.1	152.3	1.2	1.6	3.9	5.1	1.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Group 2	14.7	17.2	50.3	49.3	155.2	171.3	1.1	1.4	3.9	3.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Group 3	14.7	17.5	38.8	42.9	94.9	93.2	1.4	1.9	5.0	5.0	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Group 4	12.4	13.6	44.3	42.4	73.3	87.5	1.0	1.3	4.0	5.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
<b>Industrialised</b>																			
Group 5	9.5	10.5	38.2	35.4	28.4	31.5	1.0	1.3	5.3	6.8	2.9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Group 6	18.2	21.4	48.8	48.8	123.6	145.8	1.4	1.8	3.9	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
<b>Romania</b>	<b>5.3</b>	<b>9.4</b>				<b>181.6</b>													
Group 1	4.0	7.2				55.8													
Group 2	7.3	12.4				289.7													
Group 3	4.4	7.8				181.5													
Group 4	5.0	9.0				190.7													
Group 5	4.2	7.4				95.0													
Group 6	6.9	12.2				451.0													
<b>Slovak Republic</b>	<b>11.3</b>	<b>12.9</b>	<b>35.9</b>	<b>31.6</b>	<b>20.8</b>	<b>31.0</b>	<b>0.6</b>	<b>0.8</b>	<b>10.1</b>	<b>7.7 (h)</b>	<b>5.2</b>	<b>3.2</b>	<b>3.2</b>	<b>3.2</b>	<b>3.2</b>	<b>3.2</b>	<b>3.2</b>	<b>3.2</b>	<b>3.2</b>
Group 1	12.0	14.3	36.0	30.9	24.6	46.4	0.9	1.1	10.7	7.5	5.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Group 2	14.8	17.9	40.9	36.9	38.6	60.2	0.9	1.3	8.2	6.8	4.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Group 3	8.6	8.8	25.7	20.1	17.4	20.6	0.3	0.3	12.6	10.6	8.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Group 4	12.4	14.4	34.7	29.6	27.3	34.2	0.8	1.2	10.5	8.3	5.8	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Group 5	6.2	5.8	19.8	23.1	5.5	9.9	0.6	0.8	12.2	10.0	5.4	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Group 6	12.4	14.0	39.6	34.6	32.1	34.9	0.5	0.7	9.8	7.0	4.9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

\* Data not available; † data not comparable.

\*\* Group averages are weighted by the size of the labour force of the regions.

a) Number of registered unemployed as a percentage of the labour force.

b) Number of vacancies as a percentage of the labour force.

c) Unemployed persons divided by vacant jobs.

d) Average monthly inflows into unemployment as a percentage of the average yearly registered unemployed.

e) Average monthly outflows from unemployment as a percentage of the average yearly registered unemployed.

f) Average monthly outflows to jobs as a percentage of the average number of unemployed.

The working age population is defined as the population from the minimum school leaving age to the official retirement age.

g) Data refer to December of the year.

h) Data refer to beneficiaries of unemployment compensations.

Sources: OECD, Regional Labour Market database.

Table 3

**Decomposition of the variance of unemployment growth across regions**  
(as percent of the variance of unemployment growth rates)

	Poland		Hungary			Czech Republic			Slovak Republic		
	1992	1993	1991	1992	1993	1991	1992	1993	1991	1992	1993
<i>Var (fi)</i>	67.2	134.9	253.4	203.6	69.2	622.2	596.8	757.5	96.2	68.3	138.5
<i>Var (Oi)</i>	119.6	140.4	106.4	151.5	152.7	551.2	716.2	705.3	26.0	106.1	102.7
<i>Cov (fi, Oi)</i>	43.4	87.7	129.9	127.6	60.9	540.2	606.5	681.4	12.9	37.2	70.6
<i>Var (dUi)</i>	100.0	41.6	100.0	172.3	95.4	100.0	57.6	26.5	100.0	91.3	53.7

Notes:

Poland 49 regions, Czech Republic 76 regions, Slovak Republic 38 regions, Hungary 20 regions

Source: OECD-CCEET Regional Database.

**Table 4**  
**INFLOWS INTO UNEMPLOYMENT - CZECH REPUBLIC**  
 Results from seemingly unrelated regressions (1992-1993)

Variable	<i>Unrestricted model</i>		<i>Restricted model</i>	
	1992	1993	1992	1993
<b>Constant</b>	<b>-7.843 ***</b>	<b>-7.820 ***</b>	<b>-7.565 ***</b>	
	<i>1.442</i>	<i>1.550</i>	<i>0.969</i>	
<b>LnVr</b>	<b>-0.204 **</b>	<b>-0.162 *</b>	<b>-0.188 **</b>	
	<i>0.098</i>	<i>0.096</i>	<i>0.088</i>	
<b>Nsr</b>	<b>1.294</b>	<b>2.518</b>	-	-
	<i>5.381</i>	<i>5.444</i>		
<b>Lnpriv</b>	<b>-0.238</b>	<b>-0.420 *</b>	<b>-0.331 *</b>	
	<i>0.207</i>	<i>0.245</i>	<i>0.179</i>	
<b>BorderA</b>	<b>0.141</b>	<b>0.332 ***</b>	<b>0.160 *</b>	<b>0.365 ***</b>
	<i>0.110</i>	<i>0.117</i>	<i>0.100</i>	<i>0.114</i>
<b>BorderG</b>	<b>-0.053</b>	<b>-0.050</b>	-	
	<i>0.268</i>	<i>0.180</i>		
<b>Lnesize</b>	<b>0.120 *</b>	<b>0.033</b>	<b>0.090 *</b>	-
	<i>0.071</i>	<i>0.123</i>	<i>0.052</i>	
<b>Lntour</b>	<b>-0.031</b>	<b>-0.031</b>	<b>-0.030</b>	-
	<i>0.023</i>	<i>0.023</i>	<i>0.021</i>	
<b>Lntel</b>	<b>-0.280 **</b>	<b>-0.488 ***</b>	<b>-0.279 **</b>	<b>-0.519 ***</b>
	<i>0.144</i>	<i>0.151</i>	<i>0.133</i>	<i>0.149</i>
<b>Lnpop</b>	<b>1.749 ***</b>	<b>2.091 ***</b>	<b>1.800 ***</b>	<b>2.060 ***</b>
	<i>0.225</i>	<i>0.261</i>	<i>0.199</i>	<i>0.209</i>
<b>N. of obs.</b>	76	76	76	76
<b>R<sup>2</sup></b>	0.67	0.70	0.66	0.70
<b>Wald</b>				chi <sup>2</sup> (3)= 0.84

Standard errors computed from heteroscedastic-consistent matrix (Robust-White) are in italics.

\*\*\* significant at 1% confidence interval.

\*\* significant at 5% confidence interval.

\* significant at 10% confidence interval.



**Table 4 (cont.)**  
**INFLOWS INTO UNEMPLOYMENT - HUNGARY**  
 Results from seemingly unrelated regressions (1992-1993)

Variable	<i>Unrestricted model</i>		<i>Restricted model</i>	
	1992	1993	1992	1993
<b>Constant</b>	<b>-8.340 ***</b>	<b>-4.719 *</b>	<b>-8.734 ***</b>	<b>-4.375 **</b>
	<i>2.803</i>	<i>2.434</i>	<i>0.971</i>	<i>1.988</i>
<b>LnVr</b>	<b>-0.065</b>	<b>-0.241 ***</b>	-	<b>-0.231 ***</b>
	<i>0.069</i>	<i>0.069</i>		<i>0.062</i>
<b>Nsr</b>	<b>15.559 *</b>	<b>23.368 ***</b>	<b>13.995 *</b>	<b>26.360 ***</b>
	<i>9.050</i>	<i>6.342</i>	<i>7.137</i>	<i>4.110</i>
<b>Lowered</b>	<b>8.203E-05</b>	<b>4.330E-04 ***</b>	-	<b>4.379E-04 ***</b>
	<i>1.888E-04</i>	<i>1.938E-04</i>		<i>1.549E-04</i>
<b>Lnpriv</b>	<b>-0.247 *</b>	<b>0.154</b>	<b>-0.298 **</b>	-
	<i>0.146</i>	<i>0.166</i>	<i>0.138</i>	
<b>Herf</b>	<b>11.370 ***</b>	<b>3.116</b>	<b>11.099 ***</b>	-
	<i>4.502</i>	<i>3.877</i>	<i>3.600</i>	
<b>Lnesize</b>	<b>-0.503 ***</b>	<b>-0.260</b>	<b>-0.490 ***</b>	<b>-0.167</b>
	<i>0.169</i>	<i>0.156</i>	<i>0.115</i>	<i>0.104</i>
<b>Lntel</b>	<b>-0.175 ***</b>	<b>-0.334 ***</b>	<b>-0.126</b>	<b>-0.257 ***</b>
	<i>0.069</i>	<i>0.104</i>	<i>0.074</i>	<i>0.086</i>
<b>Lnpop</b>	<b>1.605 ***</b>	<b>1.116 ***</b>	<b>1.609 ***</b>	<b>1.136 ***</b>
	<i>0.239</i>	<i>0.212</i>	<i>0.164</i>	<i>0.152</i>
<b>N. of obs.</b>	20	20	20	20
<b>R<sup>2</sup></b>	0.92	0.90	0.92	0.90

Standard errors computed from heteroscedastic-consistent matrix (Robust-White) are in italics.

\*\*\* significant at 1% confidence interval.

\*\* significant at 5% confidence interval.

\* significant at 10% confidence interval.

**Table 4 (cont.)**  
**INFLOWS INTO UNEMPLOYMENT - POLAND**  
 Results from seemingly unrelated regressions (1992-1993)

Variable	<i>Unrestricted model</i>		<i>Restricted model</i>	
	1992	1993	1992	1993
Constant	<b>-0.201</b> <i>1.649</i>	<b>0.709</b> <i>1.320</i>	-	-
LnVr	<b>-0.0004</b> <i>0.034</i>	<b>-0.048 *</b> <i>0.029</i>	-	<b>-0.034 *</b> <i>0.021</i>
Nsr	<b>-18.348 *</b> <i>9.687</i>	<b>3.243</b> <i>4.867</i>	<b>-11.467 **</b> <i>5.021</i>	-
Lowered	<b>2.606E-05</b> <i>3.101E-05</i>	<b>5.644E-05 **</b> <i>2.617E-05</i>	-	<b>1.460E-05 **</b> <i>7.177E-06</i>
Lnpriv	<b>-0.159 *</b> <i>0.980</i>	<b>-0.161 *</b> <i>0.097</i>		<b>-0.070 *</b> <i>0.042</i>
Herf	<b>-1.148</b> <i>0.752</i>	<b>-2.105 ***</b> <i>0.602</i>	<b>-1.349 **</b> <i>0.685</i>	<b>-2.065 **</b> <i>0.508</i>
Lnesize	<b>-0.047</b> <i>0.068</i>	<b>-0.085 **</b> <i>0.042</i>	-	<b>-0.064 ***</b> <i>0.022</i>
Lntour	<b>-0.021</b> <i>0.027</i>	<b>-0.006</b> <i>0.016</i>	-	
Lntel	<b>0.018</b> <i>0.192</i>	<b>0.164</b> <i>0.150</i>	-	-
Lnpop	<b>0.746 ***</b> <i>0.224</i>	<b>0.593 ***</b> <i>0.204</i>	<b>0.671 ***</b> <i>0.048</i>	<b>0.732 ***</b> <i>0.049</i>
N. of obs.	49	49	49	49
R <sup>2</sup>	0.85	0.88	0.83	0.86
Wald				chi <sup>2</sup> (3)= 0.09

Standard errors computed from heteroscedastic-consistent matrix (Robust-White) are in italics.

\*\*\* significant at 1% confidence interval.

\*\* significant at 5% confidence interval.

\* significant at 10% confidence interval.

**Table 4 (cont.)**  
**INFLOWS INTO UNEMPLOYMENT - SLOVAK REPUBLIC**  
 Results from seemingly unrelated regressions (1992-1993)

Variable	<i>Unrestricted model</i>		<i>Restricted model</i>	
	1992	1993	1992	1993
Constant	<b>-3.638 *</b> <i>2.030</i>	<b>-2.720 *</b> <i>1.503</i>	<b>-3.884 ***</b> <i>0.610</i>	
LnVr	<b>0.008</b> <i>0.037</i>	<b>-0.013</b> <i>0.033</i>	-	-
Nsr	<b>-0.404</b> <i>1.142</i>	<b>10.520 **</b> <i>4.632</i>	-	<b>10.310 **</b> <i>4.532</i>
Lowered	<b>2.315E-04</b> <i>8.254E-04</i>	<b>4.524E-04</b> <i>5.199E-04</i>	-	-
Lnpriv	<b>0.010</b> <i>0.017</i>	<b>0.054</b> <i>0.046</i>	-	-
Herf	<b>-1.699 **</b> <i>0.690</i>	<b>-0.804 *</b> <i>0.407</i>	<b>-1.441 ***</b> <i>0.483</i>	<b>-0.796 *</b> <i>0.451</i>
BorderA	<b>-0.180 ***</b> <i>0.055</i>	<b>-0.062</b> <i>0.050</i>	<b>-0.132 ***</b> <i>0.048</i>	-
Lnesize	<b>0.071</b> <i>0.085</i>	<b>0.048</b> <i>0.067</i>	-	-
Lntour	<b>0.015</b> <i>0.027</i>	<b>0.020</b> <i>0.022</i>	-	-
Lntel	<b>-0.272 ***</b> <i>0.070</i>	<b>-0.232 ***</b> <i>0.067</i>	<b>-0.252 ***</b> <i>0.055</i>	
Lnpop	<b>1.112 ***</b> <i>0.248</i>	<b>0.954 ***</b> <i>0.225</i>	<b>1.178 ***</b> <i>0.090</i>	<b>1.136 ***</b> <i>0.098</i>
No. of obs.	38	38	38	38
R <sup>2</sup>	0.87	0.91	0.86	0.90
Wald			chi <sup>2</sup> (2)= 0.17	

Standard errors computed from heteroscedastic-consistent matrix (Robust-White) are in italics.

\*\*\* significant at 1% confidence interval.

\*\* significant at 5% confidence interval.

\* significant at 10% confidence interval.

Table 5

**Job matching and regional effects**

(regression results)

Variables		Varying regional coefficients (b)						Test statistics (c)						
Estimated equation (a): $\log(Oit) = At + Di + b1 \log(Uit-1) + b2 \log(Vit-1) + b3 LTU_{it-1} + b4 \log(U2it-1) + b5 \log(V2it-1) + b6 \log(U3it-1) + b7 \log(V3it-1) + eit$		U	V	LTU	U2	V2	U3	V3	Wald	CRS	W(Di)	$\overline{W(U2,U3,V2,V3)}$	$\overline{W(U2,U3)}$	$\overline{W(V2,V3)}$
<b>POLAND</b>														
Jul 92 - Dec 93		0.787	0.139	-1.055	-0.419	0.055	0.021	-0.052						
49 regions		(0.081)**	(0.037)**	(0.233)**	(0.116)**	(0.046)	(0.109)	(0.046)	881**	-3.29**	35.10**	23.23**	18.07**	4.88
833 observations		(0.126)**	(0.061)*	(0.289)**	(0.142)**	(0.078)	(0.131)	(0.066)*	415**	-2.19*	27.42**	17.22**	13.03**	2.56
<b>HUNGARY</b>														
Jan 92 - Dec 93		0.783	-0.024	-1.672	-0.055	0.011	-0.003	0.006						
20 regions		(0.130)**	(0.112)	(0.414)**	(0.140)	(0.118)	(0.131)	(0.113)	3,302**	-7.55**	13.97*	2.49	0.45	2.04
460 observations		(0.169)**	(0.133)	(1.083)	(0.196)	(0.138)	(0.178)	(0.127)	846**	-6.16**	4.91	1.92	0.20	1.52
<b>CZECH REPUBLIC</b>														
Feb 91 - Dec 93		0.794	0.080	-1.068	-0.072	0.007	0.056	0.023						
76 regions		(0.043)**	(0.062)	(0.559)	(0.055)	(0.075)	(0.075)	(0.072)	1,157**	-3.12**	10.84	5.66	3.35	0.14
2584 observations		(0.060)**	(0.077)	(0.582)	(0.066)	(0.086)	(0.084)	(0.093)	597**	-2.52*	8.77	4.34	2.84	0.08
<b>SLOVAK REPUBLIC</b>														
Dec 90 - Jul 94		0.688	0.225		0.022	-0.127	-0.071	-0.012						
38 regions		(0.171)**	(0.081)**		(0.198)	(0.125)	(0.164)	(0.164)	1,721**	-1.18	7.85	1.74	0.36	1.10
1596 observations		(0.183)**	(0.098)*		(0.261)	(0.155)	(0.207)	(0.187)	346**	-1.05	5.17	0.87	0.19	0.71

**Notes:**

Standard errors robust to heteroschedasticity in parentheses. Standard errors robust to heter. and serial correlation of residual displayed in parentheses and italics.

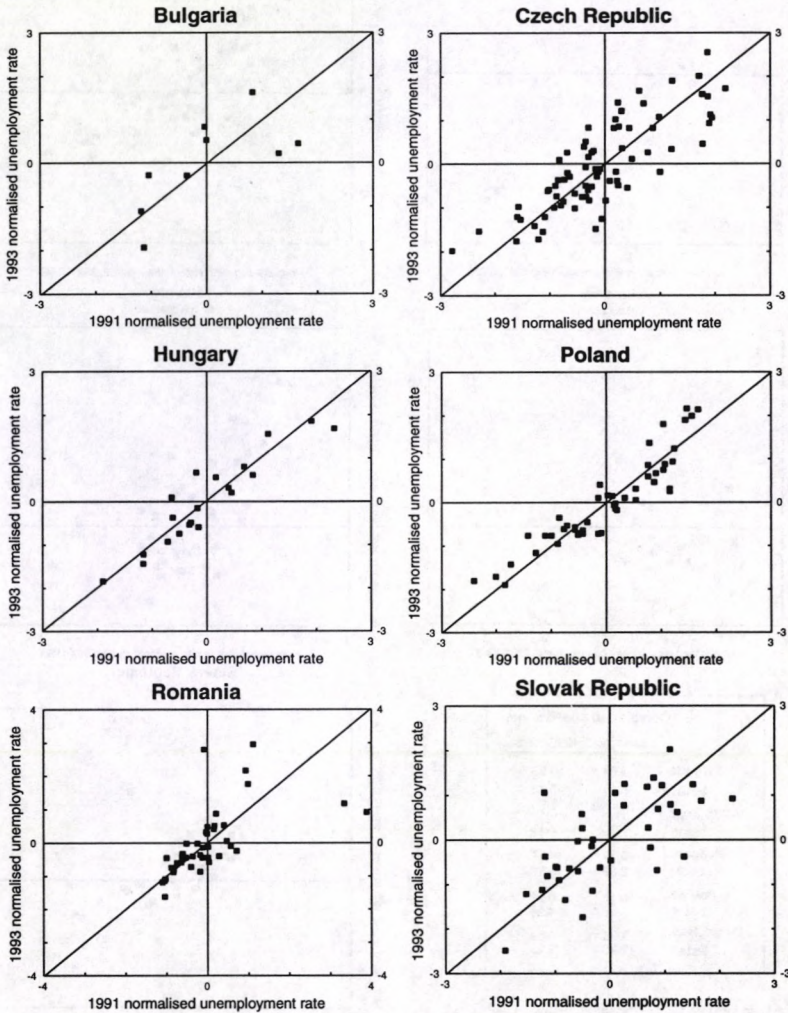
One asterisk denotes significance at 5%; two asterisks denote significance at 1%.

a)  $Oit$  = outflows to jobs in region  $i$  at  $t$ ;  $Uit$  = unemploy.stock;  $Vit$  = vacancy stock;  $LTU_t$  = share of unemployed for 12 months or longer.b)  $U+U2$  = slope coefficient for industrialised regions,  $U+U3$ =slope coefficient for diversified regions.c) Wald = Wald-test of joint significance. CRS =  $t$ -test of the hypothesis of constant returns to scale ( $b1+b2=1$ ). One asterisk denotes significance at 5 per cent, two asterisks at 1 per cent.  $W(Di)$  Wald-test of the joint significance of regional dummies;  $\overline{W(U2,U3)}$  = Wald-test of joint-significance of  $U2$  and  $U3$ ;  $\overline{W(V2,V3)}$  = Wald-test of joint-significance of  $V2$  and  $V3$ .

Source: OECD-CCEBT Regional Database.

Chart 1.

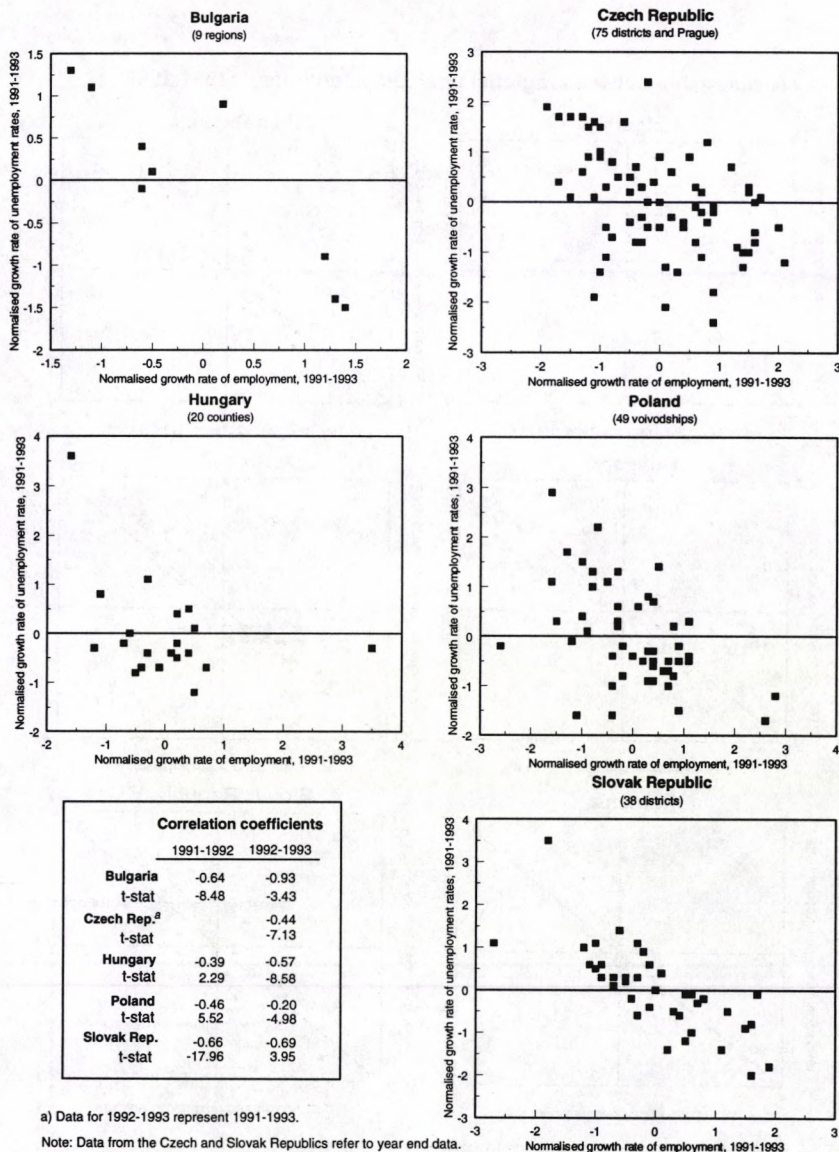
**Relationship between regional unemployment rates\*, 1991-1993**



Bulgaria: data for the 9 administrative regions; Czech Republic: data for Prague and the 75 districts; Hungary: data for the 20 counties; Poland: data for the 49 voivodships; Romania: data for the 41 counties; Slovak Republic: data for the 38 districts.

Source: OECD-CCET, Regional Labour Market database.

Chart 2.  
**Relationship between growth rates of  
 employment and unemployment rates, 1991-1993**



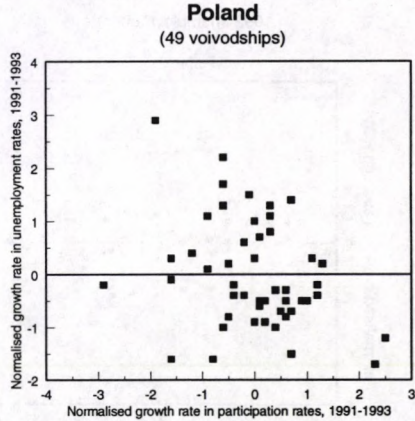
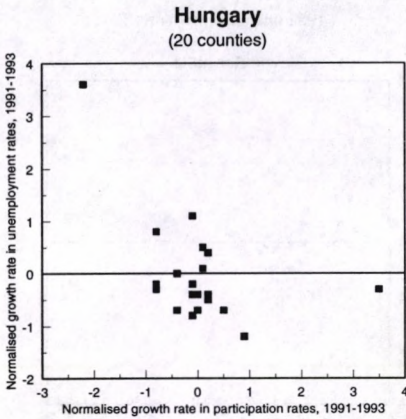
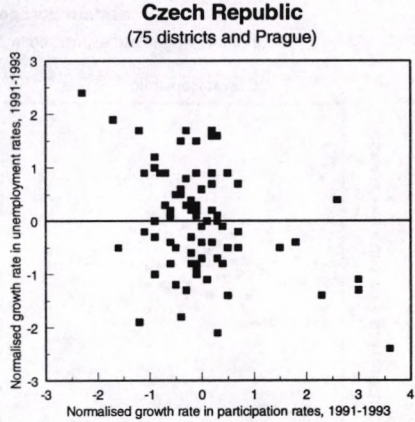
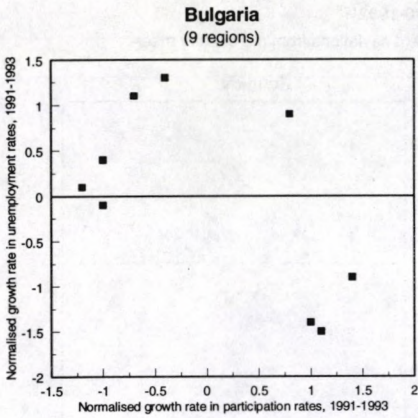
a) Data for 1992-1993 represent 1991-1993.

Note: Data from the Czech and Slovak Republics refer to year end data.

Source: OECD-CCET, Regional Labour Market database.

Chart 3.

**Relationship between regional growth rates  
of participation and unemployment, 1991-1993**



a) Data for 1992-1993 represent 1991-1993.

Note: Bulgarian figures are annual averages; Czech Republic data are year-end.

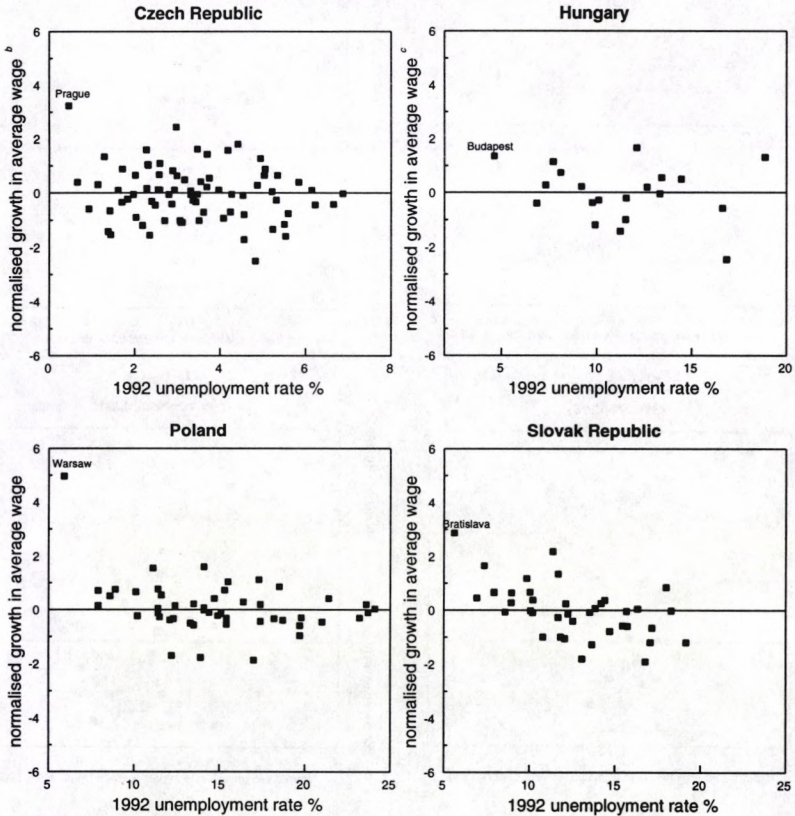
Source: OECD-CCET, Regional Labour Market database.

	Correlation coefficients	
	1991-1992	1992-1993
<b>Bulgaria</b>	-0.04	-0.48
t-stat	-1.51	-2.40
<b>Czech Rep.<sup>a</sup></b>		-0.39
t-stat		-2.86
<b>Hungary</b>	-0.46	-0.58
t-stat	3.97	-5.29
<b>Poland</b>	-0.28	-0.59
t-stat	6.98	-1.49

Chart 4.

**Average wages\* and unemployment over regions in central and eastern Europe, 1990-1992<sup>(a)</sup>**

\* Changes in wages are expressed in standard deviations from the country mean.



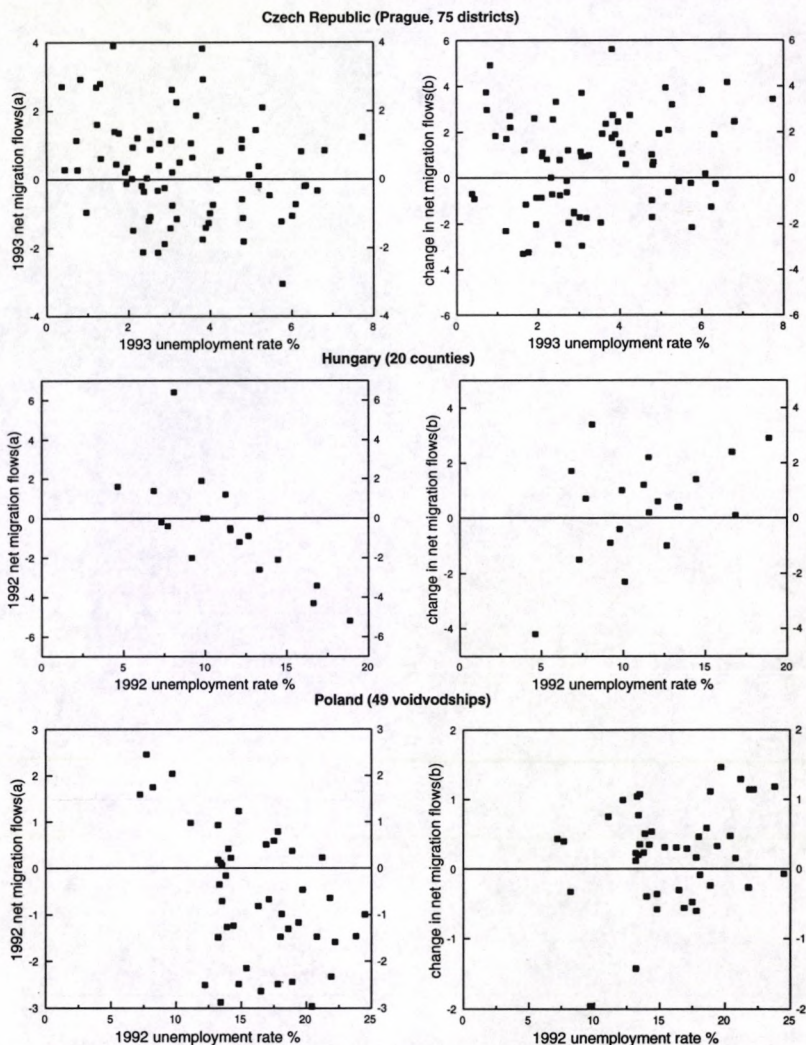
Country	Slope	t-stat
Czech Republic	-0.23	-1.35
Hungary	-0.78	-0.95
Poland	-1.49	-2.49
Slovak Republic	-0.16	-3.86

- a) Change in annual average monthly wage between 1990 and 1992.
- b) December 1992 in Czech Republic.
- c) Hungary wages for mining, manufacturing and energy sectors.

Sources: *Districts of the Czech Republic 1992*; *Hungarian Regional Yearbook, 1992*; *Voivodships Statistical Yearbook, 1993*; *Districts of the Slovak Republic, 1992*.



Chart 5.  
Regional unemployment rates and net migration flows



a) Net migration flows per 1000 persons.

b) Difference between net migration flow in 1991 and 1993 in the Czech Republic and 1990 and 1992 in others.

Sources: *Districts of the Czech Republic, 1991 and 1993; Hungarian Regional Yearbook, 1992; Voivodships Statistical Yearbook, 1991-1993.*





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