Klaus Chuan
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TITLE: **EXPLAINING UNEMPLOYMENT DYNAMICS in the CZECH and SLOVAK REPUBLICS**

AUTHOR: **Jan Svejnar & Katherine Terrell,** University of Pittsburgh,
in collaboration with **Daniel Munich,** CERGE-EI, Prague

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1755 Massachusetts Avenue, N.W.
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CONTRACTOR:	University of Pittsburgh
PRINCIPAL INVESTIGATORS:	John Ham, Jan Svejnar & Katherine Terrell
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Executive Summary

In this study we use time series of annual data from all district labor offices in the Czech and Slovak Republics to assess econometrically the determinants of inflows into and outflows from unemployment. The analysis is motivated by the need to explain the sizable differentials in district-level unemployment rates found in the Czech and Slovak Republics as well as in other transitional economies. The data are district averages of the relevant variables from all Czech and Slovak districts in 1992 and 1993.

The findings suggest that different factors determine inflows and outflows and that understanding the unemployment phenomenon requires a separate analysis of these two processes. The paper also demonstrates that the differences in the unemployment rates between the two republics (as well as between the Czech Republic and most other transitional economies) are driven largely by the large differences in the outflow rates. As a result it focuses on explaining why the Czech outflow rate is so much larger than that of Slovakia (and by implication the other Central and East European countries). The findings from this analysis point to the importance of three factors:

(a) *Demand Conditions.* The differential effect on outflows of changes in demand for industrial goods is very strong. Decreases in industrial output bring about a larger decrease in the outflow rate of the Slovak Republic than in the outflow rate of the Czech Republic.

(b) *Geography.* The geographic position of the Czech Republic plays a very important role, but more so for explaining inflows than outflows. In the Czech Republic, people living in districts near the Austrian and West German borders are less likely to become unemployed (significantly lower inflows) than those in districts that are further away. This relationship does not hold in the Slovak Republic. However, in Slovakia, the further the district is from the Austrian border, the lower is the *outflow rate*. Hence people in the more eastern districts of Slovakia have less opportunity to leave unemployment.

(c) *Active Employment Programs.* The relative effectiveness of active employment programs appears to be much higher in the Czech Republic than in Slovakia. The regression results shows that outflows (controlling for the number unemployed) are positively correlated with expenditures per capita (elasticity of .17) in the Czech Republic but uncorrelated in Slovakia.

The study represents the first quantitative analysis of the factors which may explain the wide differences in unemployment between the districts as well as the two republics.

LIST OF TABLES

APPENDIX

Explaining Unemployment Dynamics in the Czech and Slovak Republics

In this study we examine the dynamics of unemployment in the Czech and Slovak Republics, and their 114 districts, since the start of the economic transformation from a centrally planned to a market economy. We begin in Section 1 by describing the trend in unemployment and then proceed to discuss the various economic and institutional factors that have influenced this trend in Section 2. In Section 3 of the paper, we estimate a regression on district level data to learn about the relative importance of these various explanatory variables for each of the two republics and their districts over time. Conclusions are drawn in Section 4.

1. Unemployment and its Dynamics

The unemployment phenomenon started in the beginning of 1990 with a rate of .1% in both republics. By January 1991 the rates for the Czech and Slovak republics had risen to 1.1% and 2.4%, respectively but were still relatively low. However, throughout 1991 the rates increased rapidly and by January 1992 the Czech rate quadrupled to 4.4%, while the Slovak rate quintupled to 12.7%. During 1992 the respective unemployment rates fell continuously, ending up at 2.6% and 10.3% in December. Since the beginning of 1993 the rates have risen again and the increase has been more steady and pronounced in the Slovak republic. (For more detail, see Table 1 of Ham, Svejnar and Terrell, 1993.)

As this discussion indicates, the paths of the unemployment rates in the two republics are similar, but the gap between the two rates has grown over time. The gap became pronounced by May of 1990 when the unemployment rate in Slovakia was double the rate in the Czech Republic; in 1991 the differential grew and by the beginning of 1992 the ratio of the Slovak to the Czech unemployment rate was about 3:1 and grew to 4:1 by June. The gap has since then remained relatively stable at 4:1, except for April-July, 1993 when it edged closer to 5:1. (See Ham, Svejnar and Terrell, 1993, Table 1)

Within each republic, unemployment has been concentrated in certain regions and districts. For instance in December 1990, 60% of Slovak unemployed could be found in the East region and more than 30% of the unemployed in the Czech Republic came from North Moravia. In May 1993, East Slovakia and North Moravia continued to have the largest shares of total Slovak and Czech unemployment (33% and 31%, respectively) but Eastern Slovakia's share had declined substantially.

As seen in Table 1, as of the first quarter of 1992 and throughout that and most of the following year, the highest regional unemployment rate in the Czech Republic (North Moravia) was significantly lower than the lowest regional unemployment rate in the Slovak Republic (Bratislava). However, the differential decreased, and even reversed, over time: in 1Q92 North Moravia had an unemployment rate of 5.9 percent and Bratislava a rate of 8.8 whereas in 4Q93 the rates were 5.9 for North Moravia and 5.8 for Bratislava.

Table 1 also shows the range of unemployment rates for the districts of the Czech and Slovak Republics separately for each quarter. Whereas the average rates of North Moravia and Bratislava may be narrowing over time, the dispersion among the district rates has not. Again comparing 1Q92 with 4Q93, we find that the range in unemployment rates in the Czech Republic was 0.67% to 7.37% in 1Q92 and 0.57% to 8.16% in 4Q93. In Slovakia, the range was 7.83% to 19.51% in 1Q92. (Note that the lowest

rate in Slovakia was higher than the highest rate in the Czech Republic in 1Q92.) The range of unemployment rates in Slovakia in 4Q93 reached even higher levels: 7.38% to 24.33%.

In view of these particular features, the principal questions addressed in this paper are: i) What explains the tremendous differential in the Slovak and Czech unemployment rates? and ii) What explains the enormous diversity in rates at the district level?

In order to answer these questions, we examine the determinants of inflows into and outflows from unemployment. In doing so we are motivated by the fact that the number of unemployed at the end of a given month U_t is simply the number unemployed the end of the previous month U_{t-1} plus those flowing into unemployment during the month $Inflow_t$ minus those who have left unemployment by the end of the month $Outflow_t$:

$$U_t = U_{t-1} + Inflow_t - Outflow_t. \tag{1}$$

The change in the level of unemployment is therefore simply

$$U_t - U_{t-1} = Inflow_t - Outflow_t. \tag{2}$$

Using quarterly data on average monthly inflows into unemployment relative to the labor force, we show in Table 2 that the Czech Republic has lower inflows (.5% to .8%) than Slovakia (0.9% to 1.4%). While in the Czech Republic about 5 to 8 out of every thousand employed people enter unemployment every month, in Slovakia 9 to 15 out of every thousand do so. The variation across regions is substantial with Northern Moravia consistently showing the highest inflow rates in the Czech Republic and Prague the lowest. In Slovakia, there is less variation across regions. The rates for East, West and Central Slovakia are very similar and those for Bratislava far lower. A comparison of the range of district inflow rates across the two republics shows that the maximum rates are more similar than the minimum rates. The maximum rate among the districts in the Czech Republic falls between 1.1 and 1.7 over 1992-1993 and the maximum for Slovakia is between 1.4 and 2.2 over the same period. On the other hand, the minimum rate for the districts in Slovakia over this period ranges between .4 and 1.0 whereas the comparable range in the Czech Republic is 0.1 to 0.3. Clearly there are more layoffs and/or more people entering from out of the labor force into unemployment in Slovakia.

The outflow rates in Slovakia were less than half those in the Czech Republic in all but one quarter over 1992-1993. About 19 to 30 out of every one hundred unemployed persons in the Czech lands left the unemployment register each month over these two years whereas in Slovakia only about 8 to 12 out of a hundred did so.[1]

[1]The inflows of the two republics are actually low when compared to OECD rates in 1992. On the other hand, the outflow of the Czech Republic is near the upper tail of the OECD countries while that of Slovakia is near the bottom. (See Boeri, 1993.)

2. Factors Influencing Unemployment

A number of factors influenced the above dynamics of unemployment. While a detailed discussion of these factors may be found in Ham, Svejnar and Terrell (1994), it is useful to identify the main factors here.

2.1 Demand Side Factors

Overall Growth: Clearly, differences in demand for labor will strongly influence the inflow and outflow rates across districts or republics. One measure of differences in demand is the vacancy ratio (i.e., the number of unemployed persons per vacancy). An examination of these data indicates that demand conditions have been weaker in the Slovak than in the Czech Republic (Table 4). At its peak in October 1993, there were 42.3 unemployed Slovaks for every vacancy whereas the corresponding number in Czech lands was 2.8. This means there were 15 times the number of unemployed per vacancy in the Slovak Republic compared to the number in the Czech Republic.

The diversity of demand conditions in the various districts and regions is exemplified in Table 4 as well. In the second quarter of 1993, for example, the lowest unemployment-vacancy ratio in the Czech Republic was 0.1 (in Cheb), while the highest was 18.7 (in Zdar and Sazavou). In comparison, in the Slovak Republic the range went from 5.6 in Bratislava to 183.2 in Roznava. The data show the enormous variation across districts and highlight the regions with the most serious unemployment problems (Moravia and Central Slovakia).

Structure of Demand: In addition to differences in overall demand conditions, changes in the structure of demand are relevant since they may create serious mismatching in the demand and supply of certain skills. Variables best capturing the structure of economic activity and its changes over time are perhaps the relative share of GDP produced by each sector (agriculture, industry, and services). It is hypothesized that those regions with a large initial share of agricultural output will display more labor market dynamics as agriculture experienced significant labor turnover. Moreover, in 1993 there have been significant changes in property rights in the agricultural sector. Rapid change in industrial output will also signal important changes in the structure of demand for labor since it has been historically such an important economic activity.

2.2 Structural Factors

Educational Structure: Structural unemployment may also be the result of a mismatch among educational skills. The education structure of the population or of the unemployed in each district may thus help explain differences in inflows into and outflows from unemployment.

Urban Areas: It is hypothesized that urban areas would tend to have more rapid outflows than less rural areas because of the greater diversity in the structure of demand.

Sudeten Lands: Given that well defined areas of the Czech Republic were inhabited by a significant population of (Sudeten) Germans before World War II, it is often hypothesized by labor market specialists that less defined property rights (e.g., there has been less restitution in these areas) and other factors in these regions may cause lower labor market adjustment. We test this hypothesis.

Distance From West European Border: Another factor that may account for the lower unemployment in some districts is the greater ease with which their population can work in West Germany and Austria. This could be represented as either a leftward shift in the labor supply curve or a rightward shift in the demand curve for labor. Aggregate data for both republics suggest that foreign employment nearly doubled in 1990-1991, from 35,100 to 65,720. Although this accounts for only a small fraction of total employment (0.9% in 1991), when one realizes that about 60% of all estimated foreign employment is in West Germany and Austria, it is worth checking if the phenomenon is affecting inflows and outflows across districts. Moreover, it is widely believed that the official figures underestimate the true number of people working in western countries.

2.3 Labor Market Programs

When compared to OECD countries, the Czech and Slovak governments allocate relatively small shares of their GDPs to labor market programs. The range in the OECD countries in 1990 was .4% in Switzerland to 4.2% in Ireland (OECD, 1993). The maximum that has been allocated by the Czech and Slovak governments was .4% and 1.9%, respectively, in 1992 (see Table 5). Nevertheless, the incentive structure of these programs, which have been changed over the last three years, is widely believed to influence the inflow and outflow from unemployment. Moreover, the overall budget has fluctuated substantially in the past three years: in 1992 the Czech (Slovak) budget was 30% (70%) higher than the 1991 budget; by 1993 it had fallen back to 1992 levels in each republic (see Table 5).

Passive employment program: The government put into place an unemployment compensation scheme almost immediately after the revolution, in January 1990. The original scheme entitled anyone who was laid off, who graduated from school, or who took care of a child up to three years of age to one year of benefits which were especially generous in the first six months for those laid off for organizational reasons (90% of previous earnings). The replacement ratio was 65% for all others in the first six months and there was no maximum on the level of benefits. In view of the disincentives and budgetary costs inherent in the original scheme, the replacement ratio was reduced in August of 1990, to 65% in the first six months for everyone and a maximum was set. However, the most important changes in the unemployment benefit system took place in January 1992: the entitlement period was reduced from one year to six months and the replacement ratios were reduced to 60% in the first three months and 50% thereafter. One could expect that all districts will show *ceteris paribus* a marked decline in the inflow rate and increase in the outflow rate in 1992 as the incentives to register for unemployment fell. As of the writing of this paper, there were no major changes in the benefit scheme in the Czech Republic in 1993 but there were changes in the Slovakia in November 1993.

Until the end of 1991 there was also an important difference in the application of labor laws and regulations between the two republics. In particular, unlike in the Czech Republic, before January of 1992 some district labor offices in Slovakia allowed individuals to collect severance pay and unemployment benefits concurrently. After this date, the rule has been enforced that a person who is granted severance pay in his last employment can be granted unemployment benefits only after the expiration of the severance pay (usually zero to five months since severance pay may represent up to five months salary). This should affect inflow rates substantially.

Active Employment Policy: Although the Federal Law on Employment had a paragraph noting that the state supports job seeking, it was not until February of 1991 that each of the republics enacted legislation

governing the specific programs to be administered by the district labor offices.[2] The active labor market policy includes the creation of "socially purposeful jobs" (SPJs) which include subsidizing both new self-employed (SE) and long term jobs with existing employers; "publicly useful jobs" (PUJs) which are short-term public works jobs; jobs for new graduates, and retraining.

With our data, we can compare the total number of jobs created plus the number of people in retraining in the two republics over the 1992-1993 period. The data in Table 6 show that throughout 1992, the Czechs created more jobs and retraining positions than the Slovaks. The turnaround came in the first quarter of 1993, when the total for Slovakia was 117,076 versus 103,598 for the Czech Republic. Since then, the Slovak numbers have exceeded the Czech ones. In 1992 the relative job creation therefore did not correspond to the relative severity of unemployment in the two republics. This fact is often offered as another important explanation of the lower unemployment rate in the Czech Republic.

Table 6 also shows that within the Czech Republic the emphasis has been placed on the subsidized jobs (referred to as SPJs in table) rather than subsidized self-employment (SE), which is where the Slovak district labor offices put their emphasis. In the beginning of the period, the Slovaks created relatively more public works jobs (PUJs) than the Czechs but as time passed both have placed less emphasis on PUJs. In the Czech Republic, the proportion in PUJs was about 9.5% in the first three quarters of 1992 but it declined to about 6% since then. The Slovaks began with a much larger proportion in PUJs -- between 21% and 31% in 1992 -- but they reduced the proportion to similar percentage as the Czechs in 1993 (about 6.5%). The number of people in retraining has always been a very small proportion of the total number in active employment programs -- between 1% and 10% in both republics.

The data in Table 7 indicate the relative importance of the SPJ program across the two republics and over time. The higher budget in 1992 clearly led to a greater number of new SPJ jobs as a proportion of all those leaving unemployment in a given month. At its peak, in the first quarter of 1992, 20% (18%) of all those leaving unemployment in the Czech (Slovak) Republic were being placed in a subsidized job. The proportions fell to 2.5% in the Czech Republic and 6.7% in Slovakia by the third quarter of 1993. Hence, the data lead us to believe the amount allocated to active employment programs should have a significant impact on outflow rates over time.

3. The Regression Model and Findings

3.1 Model Specification

In order to test the relative importance of the various factors, we estimate four separate regressions on the inflow and outflow with two years of data from 71 Czech and 38 Slovak districts. The inflow regression is specified as follows:

$$\ln Inflow_{dt} = X\alpha + Y\beta + \epsilon_{dt} \qquad (3)$$

[2] These were Law No. 22 in the Czech Republic (enacted Feb. 1, 1991) and Law No. 88 in the Slovak Republic (enacted Feb. 22, 1991).

where $\ln Inflow_{d,t}$ is the natural logarithm of the average number of people flowing into unemployment in district d in an average month of year t, and the X vector includes:

Constant	constant term;
lnAgr	natural logarithm of real value of production in agriculture in the district in year t (1990 prices, deflated with the agricultural price index, in millions of crowns);
lnInd	natural logarithm of real value of production in industry in the district in year t (1990 prices, deflated with the PPI, in millions of crowns);
lnVac	natural logarithm of the number of vacancies in the district in an average month in year t;
ExtAg90	extent of agriculture in 1990 -- ratio of the 1990 value of agricultural production to industrial production in the district;
lnDist	natural logarithm of the average distance from the district capital to the Austrian or West German border measured in kilometers (Only Austrian border Slovakia);
Sudet	a dummy variable = 1 if the district falls into the Sudeten lands and 0 otherwise;
Town	a dummy variable = 1 if the district has a large city (in the CR: Brno, Ostrava, Plzen and Prague; SR: Banska Bystrica, Bratislava and Kosice).

The Y vector includes:

PED2-PED6	Percentage of the *population* in the district in 1991 with the following education levels: 2 = apprentices without 'maturita' (final secondary school) exam; 3 = secondary school graduates without 'maturita' exam; 4 = graduates of apprenticeship schools, technical high schools and junior high schools with the 'maturita' exam; 5 = general high school graduates (with 'maturita'); 6 = university or higher. (The percentage of the population having only primary education, or no education or whose education is unknown is the base.)
lnPop	natural logarithm of population in district in 1992.

The outflow regression is specified as follows:

$$\ln Outflow_{d,t} = X\gamma + Z\delta + \mu_{d,t} \tag{4}$$

where $\ln Outflow_{d,t}$ is the natural logarithm of the average number of individuals in district d flowing out of unemployment in an average month of year t, the X vector is as defined above and the Z vector includes

PUED2-PUED6	Percentage of the *unemployed* in the district with the following education levels: 2 = apprentices without 'maturita' exam; 3 = secondary school graduates without 'maturita' exam; 4 = graduates of apprenticeship schools, technical high schools and junior high schools with the 'maturita' exam; 5 = general high school graduates (with 'maturita'); 6 = university or higher. (The percentage of the unemployed having only primary education, or no education or whose education is unknown is the base.)
lnExpCap	natural logarithm of the per capita expenditures (in thousands of crowns per unemployed person) on active employment programs in the district;
lnUnemp	natural logarithm of the average number unemployed in the district in a given month in the previous year.[3]

The specifications in equations (3) and (4) enable us to distinguish the various types of effects discussed in Section 2 of the paper. The log of the number of unemployed and the log of the population in the district, not mentioned in the discussion in Section 2, are of course added to standardize for the size of the pool from which the flow (to or from unemployment) is drawn.

Basic statistics relating to the data used in the regressions are provided in Tables 8 and 9. We have 152 observations in the Czech Republic (two years of data for 76 districts) and 74 observations for Slovakia (two years for 37 districts). It is clear from these two tables that there are significant differences in the Czech and Slovak data. The log of average inflows, outflows, and unemployment are far lower in the Czech Republic and log of vacancies are higher in the Czech Republic. Average expenditures per capita on active employment programs are about the same, although there is greater dispersion in Slovakia. The variation in the ratio of agricultural to industrial output is much greater, as is the mean, in the Czech Republic. The district capitals' distances from the border are higher on average (as is the range) in the Slovak Republic. Finally, whereas the educational structure of the population in 1991 did not differ substantially across the two republics the structure of education of the unemployed did. In Slovakia, there are relatively more unemployed with a secondary education without the maturita exam and relatively fewer unemployed who are apprentices without the exam, than in the Czech Republic.

3.2 Methodology

In estimating equations (3) and (4), our strategy was to maximize efficiency of estimates while allowing the data to reveal the most parsimonious specification and indicate if structural changes occurred in the

[3] The Slovak data use the number unemployed in December, 1991 for the lnUnemp variable for 1991.

process of inflow and outflow between 1992 and 1993.[4] As a result, within each republic we used the seemingly unrelated regression (SUR) technique to estimate jointly 1992 and 1993 cross-sectional regressions. We used the Wald test to check coefficient restrictions within each year as well as to see if coefficients for 1992 differ significantly from those for 1993.

We tested for multicollinearity by examining the correlation matrix and by regressing one of the right hand side variable on the other right hand side variables. These diagnostics indicated that we had severe problems of multicollinearity between the variables for agricultural output and industrial output and between agricultural output and the extent of agriculture in 1990. We dropped lnAgr from the regression since this enabled us to keep the ExtAg90 variable and the lnInd variable. There appears to be some multicollinearity between the education structure variables but all were left in the equation in the belief that the problem was not as severe.

3.3 Findings

The results from estimating the SURs on inflows into unemployment are presented in Tables 10 and 11 for the Czech and Slovak republics, respectively, while the corresponding results on outflows from unemployment are contained in Tables 13 and 14. Columns 1 and 2 in each table present the estimated coefficients of the full, unrestricted model, while columns 3 and 4 contain estimated coefficients of more restricted models that were accepted by tests at conventional significance levels.

In order to arrive at the specifications corresponding to estimates in columns 3 and 4, we tested for the joint insignificance of plausible sets of coefficients within each year as well as for the equality of plausible sets of coefficients across the two years. The extreme hypotheses of equality of all or virtually all coefficients across the two years were always rejected, thus indicating that the structure of the process of inflow and outflows changed between 1992 and 1993. These findings confirm that 1992 and 1993 were indeed years of significant structural transformation in the labor markets.

3.3.1 Inflow into Unemployment

The estimates of the unrestricted model of inflow into unemployment in the Czech Republic, reported in columns 1 and 2 of Table 10, indicate that the variables capturing structural differences in the districts tend to dominate those reflecting demand (economic activity) in the district. In particular, apart from the population size of the district, significant coefficients are found on the variables capturing the distance of the district capital to the Austrian or West German border, whether the district falls into the Sudeten lands or not, and the extent to which the population of the district has not completed secondary school education (PED2-3) or has university and higher education (PED6). In contrast, the coefficients on industrial production (in both years) and on the number of vacancies (in 1992) are statistically insignificant. In 1993, the coefficient on the number of vacancies is more precisely estimated as is the coefficient on the original extent of agriculture.

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[4] Our goal is to include 1991 data in our analysis but as of the writing of this paper, we have been unable to acquire all of the necessary data.

The results suggest that inflow into unemployment increases with the distance of the district from the Austrian or West German border, decreases if the district has Sudeten lands, and is substantially lower in districts with relatively more individuals with incomplete secondary education and university or higher education than in districts with relatively more people with little or no education and completed secondary school education. Interestingly, the coefficient on the population of each district is greater than unity and in 1993 the difference is statistically significant. There is hence an indication that at least in 1993 the inflow rate -- defined as ln(inflow/population) -- was higher in more populated districts.

The estimated coefficients from the restricted models in the Czech Republic, presented in columns 3 and 4 of Table 10, confirm and sharpen the results of the unrestricted model. A one percent increase in the number of vacancies lowers the inflows by .10% *ceteris paribus* in 1993, but has no effect on inflows in 1992. A one percentage point increase in the ratio of agricultural to industrial output in 1990 (i.e., the extent of agriculture) increases inflows by .04% in 1993 but not in 1992. The elasticity of inflow with respect to the distance of the district to the western border is .175. Districts in the Sudeten lands experience a 30% lower inflow in both years, *ceteris paribus*.[5] The proportion of population with unfinished secondary education or with completed university and higher education is negatively related to inflow. The coefficients on population size are more than two standard deviations above unity, thus suggesting that population size has a significant positive effect on the inflow rate in both 1992 and 1993. Moreover, the Wald test indicates that the coefficients for 1992 and 1993 are statistically different. Hence, the increase in the inflow with population size is even greater in 1993 than it is in 1992.

The corresponding estimates for the Slovak Republic are presented in Table 11. The unrestricted model is identical to that used for the Czech Republic except that the Sudeten lands dummy variable is excluded. As can be seen from columns 1 and 2 of Table 11, in 1992 inflows vary systematically only with population and whether the district contains a major town or not. The three districts with large towns have 43% lower inflows on average. Unlike the Czech Republic, in Slovakia the coefficient on population size is less than unity, indicating that the inflow rate is negatively related to population size. In other words, increases in the inflow are less than proportionate than increases in population size across districts. In 1993 the coefficient on the town dummy variable becomes insignificant, but coefficients on two of the educational structure variables -- those on apprentices without final examination and general high school graduates -- become significant and are positive.

The insignificance of many of the coefficients in the unrestricted model in Slovakia is in part due to the fact that there are considerably fewer districts in Slovakia than in the Czech Republic. Indeed, more coefficients became significant as we started imposing restrictions. Interestingly, more differences remain between coefficients across the two years in Slovakia than in the Czech Republic. Nevertheless, as seen from column 3 of Table 11, the 1992 results are still primarily driven by the town dummy variable and the population of the district. The districts with major towns had inflows that were about one-third lower than districts without major towns (unlike the Czech Republic where there was no difference between districts with and without towns).

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[5]The quantitative effects that we report here and later in the text are the coefficients appearing in the tables. Since we do not carry out the antilogarithmic transformation, they are only approximating (and for large absolute numbers of the coefficients they overstate) the percentage effects.

The relationship between inflows and the population size of a district is not significantly different over the two years and is estimated to have an elasticity of .89. Districts with higher industrial production in 1992 tended to have higher inflows, although the magnitude (elasticity) is very low: .049.

In 1993, the educational composition of the district became statistically significant, although the coefficients are smaller than those found in the Czech Republic. Moreover, one finds that inflows increase with the proportion of the population who are apprentices without the final exam and general high school graduates, whereas inflows are lower in those districts where a larger proportion of population are graduates of apprenticeship programs and technical schools.

As in the Czech lands, there is also a significant positive effect of the distance to western border on inflows but it is a much smaller effect (elasticity of .056 vs. .175 in the Czech lands) and only significant in one year (1992). Again, like in the Czech Republic, the extent of agriculture has a significant effect only in 1993, the year when employment and property rights in agricultural cooperatives became better defined. However, unlike the Czech Republic, the more agricultural districts had substantially lower (-14.5%) inflows whereas the Czech districts had slightly higher (4.4%) inflows.

The two republics thus display different patterns of inflow behavior. The main differences across the two republics appear to lie in the fact that the educational structures of districts affect inflows in different ways; the more agricultural districts (as of 1990) have an opposite inflow rates in each republic (higher in the CR and lower in the SR); and finally, the effect of population size of the district on the inflow rate -- ln (inflow/population) -- is positive in the Czech lands but negative in Slovakia.

3.3.2 Outflow from Unemployment

The estimated coefficients of the outflow regressions for the Czech Republic are presented in Table 12. The corresponding estimates for Slovakia are in Table 13.

The demand situation, proxied by industrial production, is found to have a significant positive effect on outflow. The estimated elasticity of outflows with respect to industrial production varies from 7% to 12% in the Czech Republic and 14% to 19% in Slovakia. The decline in economic activity in the first four years of the transition thus appears to have had a larger negative effect on outflows in the Slovak Republic than in the Czech lands.

The outflow elasticity with respect to financial expenditures on active labor market policies is significant at 13-17% in the Czech Republic. In Slovakia, however, the point estimate is much smaller and statistically insignificant. The result is consistent with the perceived greater effectiveness of the active labor market policies in the Czech Republic than in Slovakia.

The number of vacancies does not have a significant effect on outflow in the Czech Republic, but the elasticity is positive and significant at 14-16% in Slovakia. The placement of unemployed workers hence appears to be much more related to the posting of vacancies in Slovakia than in the Czech lands, where more informal mechanisms seem to be at work.

In both republics, the logarithm of the number of individuals flowing out of unemployment has a strong positive relationship with the logarithm of the number of individuals in the pool of unemployed. However, the elasticity is less than unity and considerably so in Slovakia. The rate of outflow, defined

as ln(outflow/no. of unemployed), is thus negatively related to the number of unemployed and the effect is stronger in Slovakia. Put in other words, controlling for other factors one finds that the proportion flowing out from a given pool of unemployed is smaller, the larger the pool. The lower coefficient on lnUnemp in Slovakia, as compared to the Czech Republic, reflects the fact that the duration of unemployment is longer in Slovakia. The larger the pool of unemployed, the more stagnant it tends to be. Since the duration of the average spell of unemployment rose in 1993, it is not surprising that the coefficient is even lower in that year than in 1992. (The proportion of the pool that left unemployment became smaller as the pool grew.)

The extent of agriculture at the start of the reform is unrelated to outflow except in the Czech Republic in 1993, where the effect is found to be positive at 6%.

Interestingly, outflow has a negative elasticity of about 10% with respect to the distance of the district from the western border in Slovakia but not in the Czech Republic. While the distance of the border has a stronger (positive) effect on inflow in the Czech republic, the effect on outflow is stronger and negative in Slovakia. Given that the distance from Austria to the Slovak district capitals essentially measures the distance west to east, this variable is perhaps also capturing historical structural differences in Slovakia due to the influence of the west.

As with inflows, the effect of the town on outflows is significant and negative in Slovakia in 1992 but it is insignificant in Slovakia in 1993 and in the Czech Republic in both years.

The educational structure of the unemployed plays a significant part in the outflow behavior in the Czech Republic in both years and in Slovakia in 1993. Surprisingly, it has no significant effect in Slovakia in 1992. In the Czech Republic, one finds that the outflow is lower in districts where a greater proportion of the unemployed are without the secondary school exam and in 1992 also with university or higher education. In the Slovak Republic in 1993, the outflow is greater in districts with a greater proportion of individuals with non-university education. These findings are consistent with preliminary analysis by Ham et al. (1993) on the duration of unemployment of different educational groups.

The effect of the Sudeten lands variable, measured in the Czech Republic, is insignificant in both years. Hence, whereas inflows are considerably lower in districts with Sudeten lands, there are no significant differences between outflow rates. This seems to indicate that there is less of a transition to a market economy in these areas and hence fewer layoffs than in districts without Sudeten land.

4. Conclusions

In this paper we have noted the enormous differentials in the unemployment rates of the Czech and Slovak Republics and their 114 districts during the 1991-1993 period. We have also highlighted potential factors explaining these differences and tested their relative importance with district level data for 1992-1993 using seemingly unrelated regression models on inflows to and outflows from unemployment.

The findings suggest that different factors operate on inflows and outflows and that understanding the unemployment phenomenon requires a separate analysis of these two processes. In particular, while demand factors (proxied by the level of industrial production) have a significant positive effect on outflows from unemployment, they have virtually non-existent effect on inflows. In contrast, structural variables such as distance from the district capital to the western border, the educational composition of

the population, extent of agriculture in the district at the start of the reform are significant for inflows but not for outflows.

There are significant differences between the Czech and Slovak Republics and across the two years. Concerning the difference between the two republics, one finds for instance, that the number of vacancies and the distance of the district from the western border have significant effects on outflows in Slovakia but not in the Czech Republic. Similarly, the extent of agriculture has an opposite effect on inflows in the two republics and the educational composition has a more important effect on inflows in the Czech Republic than in Slovakia. Regarding differences over time, we are unable to accept the hypothesis that the structure of the coefficients is stable over time. This is indicative of the fact that the two republics were still undergoing structural change in these two years. Important changes in coefficients over time occurred with the extent of agriculture in the inflow equation, effect of the town (urban) variable on both inflows and outflows in Slovakia and the effect of educational composition in both equations in the two republics.

We began this paper by noting that the unemployment rates of Slovakia are larger and rising faster over time than the unemployment rates of the Czech Republic. We also noted that this pattern is being driven largely by the large differences in the outflow rates of the Czech and Slovak republics. The Slovak inflow rates are only somewhat larger than the Czech inflow rates.

These findings can help explain why the Slovak outflow rate is so far below the Czech outflow rate. Part of the answer from our analysis lies in the coefficient on lnInd which is significantly larger for Slovakia than it is for the Czech Republic. Hence, decreases in industrial output bring larger decrease in the outflow rate of the Slovak Republic than in the outflow rate of the Czech Republic. In Slovakia the relationship has not changed over time, such that a 1% decline in industrial output yields a .19% decline in the outflow rate. On the other hand, the relationship in the Czech Republic did change over time; differences in the level of industrial output had less of an impact in 1993 (coefficient of .087) than in 1992 (coefficient of .119).

Another factor that is clearly playing a role in the differential outflow rates in the Czech and Slovak Republics is the relative effectiveness of their active employment programs. The regression results shows that outflows (controlling for the number unemployed) are positively correlated with higher expenditures per capita (coefficient of .17) in the Czech Republic and there is no correlation in Slovakia.

The coefficient on lnDist is -0.10 for Slovakia whereas it is not significantly different from zero in the Czech Republic. This means the further the district is from the Austrian border, the lower is the outflow rate. Why should this be true in Slovak Republic and not in the Czech Republic? In addition to reflecting the ability of people near the border to find work in Austria, the variable may also be capturing historical development patterns. Perhaps those Slovak districts near the Polish and Ukraine border have been historically more isolated from western influence, as compared to the Czech lands, and this may also be influencing the rate of the economic transformation/growth and the rate at which people leave unemployment.

In future research, we plan to add 1991 data to the analysis and continue to test for structural changes over time.

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TABLE 1: UNEMPLOYMENT RATES, IN PERCENT, BY REGION (1Q92-4Q93)

REGION	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Praha	0.87	0.43	0.30	0.29	0.41	0.28	0.27	0.34
Middle Bohemia	3.71	3.03	2.83	2.66	3.10	2.76	3.03	3.24
South Bohemia	3.16	2.30	2.12	2.08	2.45	2.02	2.23	2.60
West Bohemia	4.01	3.23	2.91	2.87	3.34	3.14	3.46	4.01
East Bohemia	3.87	2.72	2.40	2.20	2.50	2.09	2.48	2.76
South Moravia	4.51	3.44	3.08	2.89	3.40	2.96	3.28	3.61
North Moravia	5.85	4.52	4.14	3.90	4.68	4.50	5.34	5.92
Czech Republic	3.89	2.92	2.64	2.51	2.95	2.64	3.00	3.36
District maximum	8.19	6.74	6.27	5.58	7.02	6.14	6.91	8.16
District minimum	0.94	0.71	0.46	0.39	0.53	0.33	0.35	0.57

REGION	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Bratislava	8.79	8.29	5.44	4.71	5.34	5.45	5.97	5.80
West Slovakia	12.49	11.26	10.82	10.12	11.54	12.00	13.16	13.68
Central Slovakia	11.84	10.50	9.96	9.48	11.08	11.45	13.02	13.67
East Slovakia	12.82	12.03	12.08	11.85	13.47	14.04	15.66	16.38
Slovakia	12.60	11.50	11.00	10.40	11.40	12.10	13.50	
District maximum	18.51	17.24	18.01	17.70	18.61	20.13	22.74	24.33
District minimum	7.83	6.24	6.29	6.06	6.86	7.16	7.45	7.38

TABLE 2: RATE OF INLOW TO UNEMPLOYMENT, IN PERCENT[a]

REGION	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Praha	0.24	0.12	0.12	0.14	0.23	0.11	0.14	0.16
Central Bohemia	0.67	0.55	0.66	0.56	0.74	0.57	0.73	0.64
S. and W.	0.59	0.47	0.57	0.48	0.64	0.45	0.63	0.60
North Bohemia	0.80	0.67	0.72	0.65	0.83	0.63	0.84	0.80
East Bohemia	0.66	0.51	0.60	0.47	0.64	0.48	0.71	0.60
South Moravia	0.74	0.57	0.79	0.66	0.83	0.63	0.87	0.77
North Moravia	0.89	0.76	0.95	0.84	1.04	0.88	1.21	1.00
Czech Republic	0.67	0.53	0.65	0.56	0.73	0.56	0.76	0.67
District maximum	1.20	1.11	1.30	1.29	1.54	1.21	1.63	1.66
District minimum	0.27	0.12	0.08	0.07	0.16	0.12	0.14	0.17

REGION	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Bratislava	0.82	0.69	0.66	0.62	0.92	0.69	0.95	0.64
West Slovakia	1.01	0.82	0.91	1.05	1.59	1.22	1.48	1.06
Central Slovakia	0.99	0.87	0.99	1.09	1.50	1.27	1.45	1.21
East Slovakia	1.06	0.88	0.99	1.24	1.56	1.32	1.51	1.26
Slovakia	0.90	0.80	0.90	1.00	1.40	1.10	1.30	1.00
District maximum	1.88	1.36	1.39	1.67	2.19	1.91	2.04	1.78
District minimum	0.55	0.42	0.51	0.64	0.98	0.77	1.02	0.72

[a]The rate is the average number flowing in a month divided by the average number in the disposable labor force at the end of the previous year.

TABLE 3
RATE OF OUTFLOW FROM UNEMPLOYMENT, PERCENTAGE*

Region	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Praha	48.19	52.72	43.27	45.60	51.82	52.48	41.30	45.56
Central Bohemia	21.56	27.22	24.24	22.01	20.82	23.41	20.25	17.20
S and W Bohemia	24.42	33.43	25.96	22.55	23.84	28.00	22.02	18.56
North Bohemia	22.15	30.42	25.80	23.20	20.17	22.92	18.59	15.71
East Bohemia	22.06	32.76	26.96	22.68	24.15	27.73	20.88	18.82
South Moravia	19.94	28.34	26.80	23.41	21.08	25.33	21.46	17.29
North Moravia	18.25	27.88	24.44	22.21	17.44	20.43	16.08	13.89
Total Czech Republic	21.48	29.93	25.87	23.04	21.09	24.17	19.42	16.63
district minimum	7.95	12.21	11.35	12.59	12.96	14.55	11.63	11.09
district maximum	42.34	59.46	53.95	47.43	43.31	56.07	38.60	32.74
REGION	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Bratislava	8.01	11.61	28.10	17.09	11.29	13.52	12.25	13.14
West Slovakia	8.08	10.28	10.03	11.82	8.69	9.00	8.34	6.64
Central Slovakia	8.28	12.65	11.76	11.59	8.33	9.65	7.70	6.39
East Slovakia	6.74	8.68	8.64	10.66	6.65	7.86	6.73	5.71
TOTAL Slovakia	7.74	10.58	10.94	11.59	8.02	9.00	7.78	6.50
District Minimum	2.56	3.88	3.43	6.90	2.97	4.19	4.47	3.40
District Maximum	13.23	18.26	20.42	17.45	14.38	16.18	12.72	10.25

* The average number of people leaving unemployment in a month, divided by the average number of unemployed in a month.

TABLE 4
UNEMPLOYMENT/VACANCY RATIO (in percent)

REGION	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Praha	0.44	0.21	0.10	0.11	0.17	0.11	0.10	0.16
Central Bohemia	3.02	1.73	1.39	1.49	1.77	1.48	1.64	2.38
South & West Bohemia	2.88	1.38	1.09	1.19	1.48	1.19	1.53	2.21
North Bohemia	3.47	1.99	1.49	1.58	2.24	2.10	2.55	4.00
East Bohemia	3.79	1.77	1.34	1.33	1.68	1.34	1.74	2.26
South Moravia	7.00	4.04	3.24	3.67	4.60	4.04	4.95	6.00
North Moravia	7.22	4.36	3.48	3.71	5.83	6.83	8.66	11.13
Czech Republic	3.61	2.13	1.53	1.61	2.13	1.89	2.26	3.13
District minimum*	0.74	0.32	0.14	0.13	0.16	0.11	0.15	0.38
District maximum	54.26	24.27	15.68	13.65	16.36	18.73	30.59	30.26
REGION	1Q92	2Q92	3Q92	4Q92	1Q93	2Q93	3Q93	4Q93
Bratislava	6.89	4.98	3.02	2.98	4.05	5.60	8.87	11.63
West Slovakia	51.72	39.33	24.77	19.30	28.54	28.40	38.03	47.35
Central Slovakia	42.81	31.95	25.05	21.87	27.70	37.64	44.47	57.26
East Slovakia	34.80	25.03	19.79	17.95	28.28	33.18	43.25	47.14
Slovak Republic	31.65	22.99	17.48	15.75	22.52	27.08	36.21	44.44
District minimum*	12.88	10.46	7.05	7.01	8.44	10.02	13.59	17.05
District maximum	158.91	164.08	133.33	128.59	151.25	183.19	192.20	245.86

*Excludes Bratislava and Prague.

TABLE 5
BUDGET ALLOCATION TO THE ACTIVE AND PASSIVE EMPLOYMENT PROGRAMS, SHARE AND PERCENT OF GDP 1991-1993
(millions of Crowns)[a]

CZECH REPUBLIC										
Year	**Total**		**Active Policy**		**Passive Policy**		**Share of Total**		**Share of GDP**	
1991	2450.3	1.0	773.0	1.0	1677.3	1.0	31.5%	68.5%	0.1%	0.2%
1992	3141.4	1.3	1718.1	2.2	1423.4	0.8	54.7%	45.3%	0.2%	0.2%
1993	2166.1	0.9	749.4	1.0	1416.7	0.8	34.6%	65.4%	0.1%	0.2%
SLOVAK REPUBLIC										
Year	**Total**		**Active Policy**		**Passive Policy**		**Share of Total**		**Share of GDP**	
1991	3276.5	1.0	515.3	1.0	2761.2	1.0	15.7%	84.3%	0.2%	1.0%
1992	5523.7	1.7	3812.8	7.4	1710.9	0.6	69.0%	31.0%	1.3%	0.6%
1993	2966.2	0.9	1107.2	2.1	1858.9	0.7	37.3%	62.7%	0.3%	0.6%

[a] In 1993 Slovak expenditures are expressed in Slovak Crowns. The exchange rate between the Slovak crown and the Czech crown changed from 1:1 to about .8:1 over 1993.

Index relates to the expenditures of 1991.

Source: Czech and Slovak Ministry of Labor and Social Affairs.

TABLE 6
THE DISTRIBUTION OF PEOPLE IN THE ACTIVE POLICY PROGRAMS

	Czech Republic					Slovak Republic				
Quarter	Total	SPJ+	SE	PUJ	RET	Total	SPJ+	SE	PUJ	RET
1Q92	96807	68.6%	17.0%	7.9%	6.5%	41700	25.9%	41.5%	23.0%	9.7%
2Q92	129910	68.6%	16.5%	11.4%	3.5%	64970	24.4%	37.9%	30.7%	7.1%
3Q92	140619	71.3%	17.1%	10.2%	1.4%	81948	27.1%	38.9%	31.1%	2.9%
4Q92	144723	72.8%	18.0%	6.2%	3.0%	114143	31.7%	41.3%	21.0%	6.1%
1Q93	117950	70.8%	22.3%	4.0%	2.9%	117076	39.1%	48.7%	7.9%	4.4%
2Q93	115415	68.8%	22.8%	6.3%	2.1%	112016	42.7%	48.7%	6.0%	2.6%
3Q93	107637	69.0%	23.1%	6.8%	1.0%	112833	43.9%	49.2%	6.0%	0.9%
4Q93	95523	69.4%	22.4%	4.7%	3.5%					

+SPJ includes only subsidized jobs and excludes SE

NOTE:The data are monthly average values in a given quarter

TABLE 7
AVERAGE NUMBER OF NEW JOB MATCHES IN SPJs IN A GIVEN MONTH AS A PROPORTION OF THE NUMBER FLOWING OUT OF UNEMPLOYMENT

Quarter	Czech Republic	Slovak Republic
1Q92	19.6%	18.0%
2Q92	16.9%	13.5%
3Q92	17.1%	18.2%
4Q92	14.8%	n.a.
1Q93	4.1%	8.4%
2Q93	4.0%	10.5%
3Q93	2.5%	6.7%
4Q93	2.2%	

SPJ includes only subsidized jobs and excludes SE;
SPJ = Social Purposeful Jobs; SE = Self-employed

NOTE:The data are monthly average values in a given quarter

TABLE 8
CHARACTERISTICS OF THE ANNUAL DISTRICT DATA FOR THE CZECH REPUBLIC
(No. of observations = 152)

	Mean	Std.Dev	Minimum	Maximum
lnOutflow	5.958	0.626	3.890	7.512
lnInflow	5.908	0.637	4.033	7.531
lnUnemp	7.368	0.623	5.842	9.137
lnInd	8.270	0.820	6.343	11.139
lnVac	6.455	0.693	5.114	9.744
lnExpCap	1.925	0.608	0.215	3.592
ExtAg90	0.515	0.954	0.005	6.666
lnDist	4.452	0.759	1.792	5.298
Sudet	0.211	0.410	0.000	1.000
PUED1	0.364	0.107	0.218	0.703
PUED2	0.374	0.065	0.202	0.508
PUED3	0.022	0.013	0.004	0.084
PUED4	0.159	0.042	0.069	0.252
PUED5	0.040	0.013	0.009	0.094
PUED6	0.025	0.017	0.005	0.131
PED1	0.280	0.023	0.179	0.328
PED2	0.249	0.013	0.186	0.277
PED3	0.039	0.008	0.024	0.060
PED4	0.139	0.014	0.112	0.191
PED5	0.029	0.005	0.021	0.058
PED6	0.042	0.014	0.026	0.131
lnPOP	11.650	0.466	10.739	14.010

TABLE 9
CHARACTERISTICS OF SLOVAK DISTRICT ANNUAL DATA
(No. of observations = 74)

	Mean	Std. Dev	Minimum	Maximum
lnOutflow	6.467	0.490	5.269	7.654
lnInflow	6.580	0.450	5.400	7.540
lnUnemp.	8.518	0.525	7.148	9.508
lnInd	8.086	1.034	5.502	10.696
lnVac	5.373	0.839	3.072	8.223
LnExpCap	1.718	0.951	0.204	3.356
ExtAg90	0.362	0.390	0.000	1.907
lnDist	5.238	0.940	2.303	6.293
PUED1	0.370	0.099	0.170	0.580
PUED2	0.180	0.110	0.024	0.410
PUED3	0.180	0.120	0.003	0.460
PUED4	0.200	0.054	0.086	0.310
PUED5	0.043	0.017	0.021	0.120
PUED6	0.030	0.028	0.008	0.210
PED1	0.310	0.053	0.190	0.490
PED2	0.190	0.034	0.120	0.400
PED3	0.019	0.009	0.006	0.041
PED4	0.140	0.031	0.098	0.320
PED5	0.030	0.008	0.019	0.061
PED6	0.048	0.027	0.020	0.170
lnPop	11.750	0.450	10.700	13.010

TABLE 10
SEEMINGLY UNRELATED REGRESSIONS ON INFLOWS FOR THE CZECH REPUBLIC
(Standard Errors in Parentheses)

	Unrestricted Model		Restricted Model	
	(1)	(2)	(3)	(4)
Variable	1992	1993	1992	1993
Constant	-3.558 (2.371)	-4.661[b] (2.326)	-4.192[b] (1.871)	
lnInd	-0.036 (0.076)	-0.017 (0.077)		-
lnVac	0.008 (0.067)	-0.101 (0.064)	-	-0.101[a] (0.038)
lnPop	1.198[a] (0.166)	1.350[a] (0.163)	1.251[a] (0.124)	1.306[a] (0.126)
ExtAg90	-0.0004 (0.051)	0.070 (0.047)	-	0.044[b] (0.020)
lnDist	0.171[a] (0.064)	0.187[a] (0.062)	0.175[a] (0.058)	
Town	0.174 (0.350)	0.172 (0.338)	-	-
PED2	-0.114[b] (0.047)	-0.127[a] (0.045)	-0.130[a] (0.044)	
PED3	-0.200[a] (0.071)	-0.233[a] (0.069)	-0.246[a] (0.061)	
PED4	-0.014 (0.057)	0.006 (0.056)	-	-
PED5	-0.138 (0.170)	-0.067 (0.162)	-	-
PED6	-0.187[b] (0.089)	-0.231[a] (0.086)	-0.250[a] (0.053)	-0.230[a] (0.053)
SUDET	-0.271[b] (0.118)	-0.292[b] (0.116)	-0.306[a] (0.109)	
Observations	71	71	71	71
R^2	.738	.787	.736	.783

[a]Significant at 1% confidence interval.
[b]Significant at 5% confidence interval.
[c]Significant at 10% confidence interval.

TABLE 11
SEEMINGLY UNRELATED REGRESSIONS ON INFLOWS IN THE SLOVAK REPUBLIC
(Standard Errors in Parentheses)

	Unrestricted Model		Restricted Model	
	(1)	(2)	(3)	(4)
Variable	1992	1993	1992	1993
Constant	-2.81[c] (1.490)	-3.900[a] (1.230)	-4.370[a] (0.683)	
lnInd	0.092 (0.084)	0.020 (0.059)	0.049[a] (0.018)	-
lnVac	0.042 (0.055)	0.041 (0.043)	-	-
lnPop	0.690[a] (0.147)	0.823[a] (0.128)	0.893[a] (0.055)	
ExtAg90	-0.048 (0.123)	-0.160[c] (0.085)	-	-0.147[b] (0.058)
lnDist	0.011 (0.053)	0.047 (0.038)	-	0.056[a] (0.019)
Town	-0.434[a] (0.159)	-0.026 (0.119)	-0.344[a] (0.113)	-
PED2	0.011 (0.023)	0.029[b] (0.012)	-	0.035[a] (0.006)
PED3	-0.054 (0.047)	-0.006 (0.033)	-0.052 (0.032)	-
PED4	-0.021 (0.031)	-0.003 (0.002)	-	-0.040[a] (0.001)
PED5	0.063 (0.070)	0.133[a] (0.047)	-	0.080[a] (0.031)
PED6	0.025 (0.040)	-0.024 (0.030)	-	-
Observations	38	38	38	38
R^2	.823	.893	.803	.884

[a]Significant at 1% confidence level.
[b]Significant at 5% confidence level.
[c]Significant at 10% confidence level.

TABLE 12
SEEMINGLY UNRELATED REGRESSIONS ON OUTFLOWS FOR THE CZECH REPUBLIC
(Standard Errors in Parentheses)

	Unrestricted Model		Restricted Model	
	(1)	(2)	(3)	(4)
Variable	1992	1993	1992	1993
Constant	-1.571[a] (0.413)	-1.631[a] (0.418)	-1.507[a] (0.249)	
lnInd	0.069[c] (0.039)	0.121[a] (0.040)	0.119[a] (0.026)	0.087[a] (0.024)
lnExpCap	0.164[a] (0.047)	0.128[a] (0.048)	0.173[a] (0.039)	
lnVac	0.064 (0.047)	0.038 (0.047)	-	-
lnUnemp	0.834[a] (0.045)	0.826[a] (0.040)	0.870[a] (0.031)	
ExtAg90	-0.030 (0.025)	0.062[b] (0.025)	-	-
lnDist	0.038 (0.033)	0.027 (0.032)	-	-
Town	-0.023 (0.165)	0.042 (0.162)	-	-
PUED2	0.068 (0.046)	-0.056 (0.049)	-	-0.006[b] (0.003)
PUED3	-0.041[b] (0.017)	-.048[a] (0.016)	-0.040[a] (0.012)	
PUED4	-0.026 (0.083)	-.0004 (0.008)	-	-
PUED5	-0.012 (0.020)	0.005 (0.025)		-
PUED6	-0.038[c] (0.020)	0.013 (0.012)	-0.052[a] (0.012)	0.026[b] (0.012)
SUDET	0.037 (0.060)	0.008 (0.062)	-	-
Observations	71	71	71	71
R^2	.933	.940	.923	.937

[a]Significant at 1% confidence level.
[b]Significant at 5% confidence level.
[c]Significant at 10% confidence level.

TABLE 13
SEEMINGLY UNRELATED REGRESSIONS ON OUTFLOWS FOR THE SLOVAK REPUBLIC
(Standard Errors in Parentheses)

	Unrestricted Model		Restricted Model	
	(1)	(2)	(3)	(4)
Variable	1992	1993	1992	1993
Constant	-0.778 (0.901)	0.988 (0.573)	-	1.310[a] (0.458)
lnInd	0.152[b] (0.070)	0.138[a] (0.049)	0.190[a] (0.035)	
lnExpCap	0.061 (0.089)	0.038 (0.048)	-	-
lnVac	0.166[a] (0.059)	0.138[a] (0.044)	0.157[a] (0.035)	
lnUnemp	0.621[a] (0.102)	0.442[a] (0.076)	0.522[a] (0.039)	0.358[a] (0.064)
ExtAg90	-0.099 (0.112)	-0.077 (0.079)	-	-
lnDist	-0.103[a] (0.038)	-0.074[a] (0.026)	-0.097[a] (0.022)	
Town	-0.519[a] (0.150)	-0.068 (0.108)	-0.444[a] (0.127)	-
PUED2	-0.002 (0.007)	0.009[b] (0.005)	-	0.007[c] (0.004)
PUED3	0.003 (0.006)	0.012[a] (0.004)	-	0.012[a] (0.003)
PUED4	0.003 (0.007)	-0.006 (0.006)	-	-
PUED5	-0.006 (0.020)	0.033[a] (0.012)	-	0.030[b] (0.013)
PUED6	0.008 (0.016)	-0.023 (0.019)	-	-0.051[a] (0.014)
Observations	38	38	38	38
R^2	.894	.900	.876	.918

[a]Significant at 1% confidence level.
[b]Significant at 5% confidence level.
[c]Significant at 10% confidence level.

TABLE A1
CORRELATION MATRIX FOR THE ANNUAL DATA FOR THE CZECH REPUBLIC

	lnOutflow	lnInflow	lnUnemp(-76)	lnInd	lnVac	lnExpCap	ExtAg90	lnDist	PERSUDET	PUED1	PUED2
lnOutflow	1.000										
lnInflow	0.955	1.000									
lnUnemp(-76)	0.903	0.894	1.000								
lnInd	0.550	0.548	0.527	1.000							
lnVac	0.265	0.220	0.282	0.650	1.000						
lnExpCap	0.142	-0.060	-0.063	-0.053	-0.011	1.000					
ExtAg90	-0.032	-0.033	0.009	-0.433	-0.332	0.142	1.000				
lnDist	0.179	0.177	0.162	0.333	0.280	-0.112	-0.427	1.000			
PERSUDET	-0.075	-0.044	-0.162	-0.003	0.120	-0.059	-0.082	-0.216	1.000		
PUED1	-0.095	0.009	-0.158	0.178	0.180	-0.352	-0.199	-0.038	0.635	1.000	
PUED2	0.205	0.263	0.243	-0.264	-0.541	0.030	0.290	-0.045	-0.413	-0.602	1.000
PUED3	-0.215	-0.263	-0.113	-0.006	0.112	0.138	-0.062	0.344	-0.150	-0.179	-0.186
PUED4	-0.193	-0.206	-0.072	-0.201	-0.068	0.050	0.091	0.017	-0.522	-0.771	0.268
PUED5	0.004	-0.037	0.055	0.001	-0.007	0.148	0.066	0.162	-0.549	-0.699	0.260
PUED6	0.102	0.044	0.257	0.322	0.484	0.072	-0.065	0.066	-0.322	-0.492	-0.124
PED1	-0.110	-0.061	-0.235	-0.414	-0.505	-0.008	0.302	-0.382	0.390	0.366	0.149
PED2	-0.210	-0.184	-0.288	-0.307	-0.557	-0.035	0.019	0.029	-0.118	-0.040	0.422
PED3	-0.310	-0.355	-0.244	-0.025	0.203	0.056	-0.132	0.419	-0.420	-0.369	-0.102
PED4	-0.033	-0.075	0.054	0.295	0.510	0.004	-0.283	0.252	-0.261	-0.275	-0.316
PED5	0.179	0.141	0.324	0.486	0.643	-0.055	-0.218	0.344	-0.270	-0.232	-0.278
PED6	0.282	0.241	0.416	0.513	0.636	-0.029	-0.170	0.215	-0.251	-0.286	-0.221
LNED	0.748	0.740	0.788	0.770	0.615	-0.024	-0.174	0.234	-0.098	-0.084	-0.027

TABLE A1 CONT'D

	PUED3	PUED4	PUED5	PUED6	PED1	PED2	PED3	PED4	PED5	PED6	LNED
PUED3	1.000										
PUED4	0.158	1.000									
PUED5	0.133	0.730	1.000								
PUED6	0.232	0.549	0.444	1.000							
PED1	-0.251	-0.470	-0.407	-0.721	1.000						
PED2	-0.076	-0.136	-0.041	-0.573	0.423	1.000					
PED3	0.422	0.511	0.403	0.381	-0.572	-0.210	1.000				
PED4	0.154	0.563	0.377	0.676	-0.834	-0.603	0.585	1.000			
PED5	0.305	0.319	0.354	0.757	-0.763	-0.608	0.471	0.710	1.000		
PED6	0.141	0.356	0.296	0.892	-0.807	-0.699	0.337	0.765	0.873	1.000	
LNED	-0.081	-0.055	0.110	0.538	-0.457	-0.443	-0.078	0.315	0.559	0.679	1.000

TABLE A2

Correlation Matrix for Annual Data on the Slovak Republic

	lnOutflow	lnInflow	lnUnemp	lnInd	lnVac	lnExpCap	ExtAg90	lnDist	PUED1	PUED2
lnOutflow	1.0									
lnInflow	0.86	1.0								
lnUnemp	0.75	0.49	1.0							
lnInd	0.78	0.63	0.71	1.00						
lVac	0.73	0.60	0.57	0.68	1.00					
lnExpCap	0.10	-0.33	0.44	0.17	0.07	1.00				
ExtAg90	-0.47	-0.42	0.31	0.64	-0.35	4.7D-03	1.00			
lnDist	-0.51	-0.41	0.33	0.35	-0.38	-0.03	0.026	1.00		
PUED1	-0.54	-0.39	0.31	-0.53	-0.50	-0.18	0.48	0.39	1.00	
PUED2	0.17	0.19	0.13	0.41	0.19	1.46D-03	0.32	-0.038	-0.24	1.00
PUED3	-0.12	-0.10	0.21	0.39	-0.23	-2.66D-03	0.20	0.078	-0.025	-0.86
PUED4	0.41	0.33	0.22	0.47	0.51	-0.06	-0.46	-0.37	-0.77	0.25
PUED5	0.20	0.14	0.17	0.12	0.07	0.13	0.065	-0.33	-0.29	-0.098
PUED6	0.56	0.42	0.44	0.63	0.69	0.018	-0.34	-0.47	-0.55	0.076
PED1	0.47	0.35	0.27	-0.57	0.57	-0.05	0.51	0.17	0.48	-0.18
PED2	0.086	0.10	1.95D-03	-0.02	-0.06	0.05	-0.049	-0.016	-0.21	0.17
PED3	0.12	0.11	0.19	0.29	0.24	-0.12	-0.024	-0.30	-0.15	-0.057
PED4	0.42	0.40	0.30	0.59	0.50	-0.10	-0.50	-0.067	-0.51	0.26
PED5	0.34	0.35	0.31	0.39	0.39	-0.12	-0.054	-0.42	-0.26	0.010
PED6	0.55	0.50	0.42	0.68	0.68	-0.13	-0.41	-0.41	-0.52	0.14
lnPop	0.90	0.84	0.71	0.83	0.76	-0.02	-0.42	-0.51	-0.50	0.26

Table A2, (con't.)

	PUED3	PUED4	PUED5	PUED6	PED1	PED2	PED3	PED4	PED5	PED6
PUED3	1.00									
PUED4	0.25	1.00								
PUED5	8.44D-03	0.20	1.00							
PUED6	-0.22	0.61	0.27	1.00						
PED1	0.15	0.49	0.095	-0.59	1.00					
PED2	0.094	-0.019	0.069	-0.29	0.45	1.00				
PED3	-0.072	0.26	0.11	0.44	-0.12	-0.11	1.00			
PED4	0.24	0.58	0.078	0.53	0.23	0.37	0.44	1.00		
PED5	-0.14	0.29	0.46	0.60	-7.83D-03	0.060	0.47	0.55	1.00	
PED6	-0.25	0.61	0.24	0.90	0.48	-0.083	0.53	0.78	0.76	1.00
lnPop	-0.25	0.45	0.18	0.63	-0.62	-0.12	0.23	0.39	0.36	0.62