

UNEMPLOYMENT AND UNEMPLOYMENT PROTECTION
IN TRANSITION ECONOMIES *

Vera Brusentsev

Department of Economics

University of Delaware, Newark DE 19716

brusentv@udel.edu

and

Wayne Vroman

The Urban Institute, Washington, DC 20037

Wvroman@UI.Urban.org

April 2008

* Revised paper first presented at the Eastern Economics Association Conference on March 7, 2008.

Abstract

Nearly twenty years have passed since the transition from a centrally-planned towards a market-oriented economy in the countries of Central and Eastern Europe and the Former Soviet Union (CEE-FSU). This paper documents the differing patterns of unemployment during the period 1990 to 2006 in the 28 countries that constitute the CEE-FSU group and outlines how unemployment protection programs developed in response. We also suggest some tentative explanations for the observed trends in unemployment and unemployment compensation. Our approach is novel in that we compare the performance of the CEE-FSU group to the worldwide average and to other major economies. In addition, we demonstrate important contrasts across the CEE-FSU sub-regions.

Similar to other research in the area, this paper demonstrates significantly below-average income growth between 1990 and 1995 but then significantly above-average growth in the years since 1995 when compared with the worldwide average. We also show a significant link between output growth and employment growth for many individual countries from the region. The transition economies developed new institutions to measure and offset the effects of the new phenomenon of open unemployment. The majority instituted labor force surveys to measure unemployment and all but one (Tajikistan) established unemployment compensation (UC) programs. Our analysis of unemployment rates finds that they have been high in many of these countries but, when placed within a global context, the CEE-FSU averages during 1994-1996 and again during 2004-2006 were only somewhat higher than the average unemployment rates in other major countries with labor surveys.

Category numbers

C33, J4, J6, P2

1. Introduction

Nearly twenty years have elapsed since the transition from a centrally-planned towards a market-oriented economy began in the countries of Central and Eastern Europe and the Former Soviet Union (CEE-FSU). The transition process was characterized by extensive changes to existing institutions, particularly the creation of private-owned enterprises. These changes resulted in a sizeable reallocation of labor away from state-owned enterprises, some of which was absorbed by private enterprises and some of which ended up in nonemployment. In addition, new institutions were established to measure the new phenomenon of open unemployment and to offset the dislocation that occurred in labor markets.

Open unemployment did not officially exist in the former centrally-planned economies. Hence, new measurement systems were needed to accurately gauge post-1990 labor market developments, especially among newly emerging classes of workers such as the self-employed. Across the 28 CEE-FSU countries, the adoption of new measurement systems for product and labor markets has been uneven. The majority instituted labor force surveys to measure unemployment and all but one (Tajikistan) established unemployment compensation (UC) programs. In 2008, for example, ongoing labor force surveys are still absent in about one-quarter of these countries and real Gross Domestic Product (GDP) estimates are not available for a similar fraction including Russia and Ukraine.

The objective of this paper is to document the differing patterns of unemployment in the 28 countries that constitute the CEE-FSU group and to outline how unemployment protection programs developed in response. All but one of the 28 countries have operated UC programs since the early 1990s, with some developing relatively well-functioning programs. We place the CEE-FSU countries in an international context by comparing the changes that have occurred in the region with developments in the rest of the world. Given that our goal is to assess unemployment in these 28 countries within a broader world context, the approach we take is eclectic. In addition to the descriptive analysis, we suggest some tentative explanations for the observed trends in unemployment and receipt of UC in the CEE-FSU countries.

Research on labor markets in transition economies has not addressed the development of institutions for all 28 countries that constitute the CEE-FSU group. A number of country-specific and regional assessments of the transition process have been undertaken by the European Bank for

Reconstruction and Development, the International Monetary Fund, and the World Bank.¹ Brown, Earle and Telegdy (2006) compare the productivity effects of privatization in two Central European countries relative to two countries in the former Soviet Union: Hungary, Romania, Russia, and Ukraine. Moreover, specific research on unemployment tends to be limited to individual countries or groups of countries. For instance, both Jurajda and Terrell (2004) and Faggio (2006) examine unemployment in Central Europe and the Baltic Republics; Münich and Svejnar (2006) use the western part of Germany as a benchmark to compare unemployment and worker-firm matching in five Central European countries: Czech Republic, Hungary, Poland, Slovak Republic, and the eastern part of Germany; Commander and Heitmueller (2007) focus on three Central European countries: Czech Republic, Hungary and Poland.

In contrast to previous research, this paper concentrates on all 28 countries of the CEE-FSU group within a broader world context. Not only is performance of this group compared relative to the worldwide average but also to other major economies. This approach is novel and departs from previous research on transition economies. A further departure from previous research is our classification of individual countries into six geographic aggregations. The rationale for creating these six categories is based on two observations: the CEE-FSU countries are quite diverse; and there are important institutional contrasts in the subregions that distinguish them.

The six geographic aggregations we identify are as follows. Five countries from Central Europe plus seven from Southern Europe comprise Central and Eastern Europe (CEE). The five from the former group are the Czech Republic, Hungary, Poland, Romania, and the Slovak Republic. In addition to the five successor countries to the former Yugoslavia, Albania and Bulgaria are included in the latter group. Within the Former Soviet Union (FSU) four geographic groupings are recognized: four core countries (Belarus, Moldova, Russia, and Ukraine), three from the Baltic littoral (Estonia, Latvia and Lithuania), three from the Caucasus (Armenia, Azerbaijan and Georgia)

¹ The European Bank of Reconstruction and Development (EBRD) has compiled an index to assess the transition process. The EBRD index is a composite indicator of progress in the following areas of reform: price liberalization, trade and exchange regime liberalization, private sector entry, and legal reforms. See various issues of the EBRD Transition Report. The International Monetary Fund continues to assess the performance of transition economies in their publication, World Economic Outlook as well as publishing country-specific briefs. The World Bank provides regular economic reports and addresses topics of special interest; for instance, Labor Markets in EU8+2: From the Shortage of Jobs to the Shortage of Skilled Workers (2007).

and six from Central Asia (Kazakhstan, Kyrgistan, Mongolia, Tajikistan, Turkmenistan, and Uzbekistan).² Other groupings might be considered but the logic for these six is defensible and imposes a coherence in the subsequent regression analysis. Given that the countries vary widely in population, size and level of development, we highlight these geographic contrasts.

Section two presents an overview of key macroeconomic and labor market statistics as background information. Section three reviews income growth in the CEE-FSU countries from 1990 to 2006. Statistics from the World Bank data base are examined for a set of 150 countries to compare the CEE-SU countries with contemporaneous worldwide trends. Section four examines the linkage between output growth and employment growth in the CEE-FSU countries. Since the demand for labor is a derived demand, above-average growth in real output should translate into faster employment growth and an associated reduction in unemployment. This relationship is tested for 13 individual countries using multiple regression analysis. Section five reviews developments in unemployment across the 28 economies. Three indicators are examined: unemployment as measured by periodic labor force surveys; registered unemployment (that is, job seekers registered at employment offices); and recipients of unemployment compensation (UC) benefits. This section includes both descriptive narrative and regression analyses of the linkages among the three unemployment measures. Unlike information on total and registered unemployment which can be obtainable from public sources, information on the receipt of UC benefits is less readily available. The data examined here are derived from a variety of sources, part of a multi-year collection effort to assemble a database appropriate for examining trends in the provision of UC. Section six summarizes our main findings.

2. Background information

The six geographic aggregations we identify are presented in the descriptive data appearing in Table 1. In order to ensure comparability and reliability, we construct a data set that includes information for all countries. As stated above, except for information on UC benefits, the other statistics are available from public sources. The data for population and per capita GDP are obtained

² While we recognize that the Commonwealth of Independent States (CIS) comprises Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgistan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan, we use a different approach in this paper.

from the World Development Indicators (WDI) database maintained by the World Bank; for total unemployment and registered unemployment we use statistics from Eurostat, the International Labour Organisation (ILO), and the Organisation for Economic Cooperation and Development (OECD); data on the receipt of UC benefits is assembled from information provided by country administrative agencies, Eurostat, the OECD, and Statistical Yearbooks.

The per-capita income information in 2005 is presented in two ways: the average level appears in column [2]; and the income relative to the worldwide average of \$9,801 in column [3]. Income is important because, in the long run, changes in real GDP convey whether an economy is growing fast enough to raise output per capita and standards of living, and fast enough to generate sufficient employment for a growing labor force. In Table 1, the similarity of income levels for many countries within the six CEE-FSU regions is noticeable. The highest average levels obtain in the CEE-Central and Baltic countries while the lowest are found in the Caucasian and Central Asian countries. Furthermore, a regression of the 28 per-capita income levels on a set of dichotomous variables for the six regions explains about half of the cross-country income variation in 2005. This descriptive regression reinforces the observation that the countries within the six regional groupings share similar institutional elements.³

Average unemployment rates for 1994-96 and 2004-06 appear in columns [4] and [5]. Because individual countries adopted labor force surveys at varying times after 1990, several entries in these columns are missing. Most CEE countries instituted a labor force survey by 1994 but several instituted it later. For instance, Kazakhstan and Kyrgistan initiated their surveys in 2001 and 2002, respectively. In column [5], note that there were still no regular surveys in six (of 16) FSU countries in 2004-2006.⁴

At the start of the transition, economic advisors anticipated that unemployment would initially rise but would subsequently fall. Unemployment would follow an inverted U-shape with

³ This observation, however, has limited force because Romania, Croatia, Slovenia, Kazakhstan and Turkmenistan have income substantially different from the other countries in their sub-regions.

⁴ The entries in columns [4] and [5] use liberal definitions of the two time periods. Some entries for 1994-96 refer to 1995-96 (Serbia, Latvia, Ukraine) or the individual years 1996 (Croatia, Macedonia), 1997 (Georgia) and 1998 (Moldova). Similarly the estimates for 2004-06 refer to fewer than three years for two countries: 2004-05 (Georgia, Kyrgistan), or the single years 2004 (Kazakhstan), 2005 (Azerbaijan) or 2006 (Bosnia).

the rate of increase in unemployment driven primarily by the speed of restructuring and closure of state-owned enterprises. Columns [4] and [5] show that high unemployment rates predominate in both periods. Of the 17 entries for 1994-96, five fall below 8.0 percent while seven are 12.0 percent or higher and four exceed 16.0 percent. The average for the 17 countries (weighted by population) is 9.2 percent.⁵ For the 22 countries with published labor force survey data, the overall average during 2004-06 is similar: 9.7 percent. Eight averages fall below 8.0 percent during this period; eight exceed 12.0 percent; and four exceed 16.0 percent.

Changes in unemployment rates between the two periods can be compared for 17 countries: eight show an increase, and nine display a decrease. For the CEE countries, six of the 10 changes were increases. For the FSU countries, five of the seven changes were decreases. While especially large decreases occurred in the Baltic countries, their combined population is less than 2 percent of the CEE-FSU total. In recent years, high unemployment rates have been much more prevalent in CEE countries. Note in column [5] that eight unemployment rates exceed 10.0 percent for these 12 countries compared to just one of 10 (Georgia) among FSU countries. Based on labor force survey data, open unemployment is considerably less prevalent in FSU countries. During 2004-06, the average unemployment rate in FSU countries was 7.7 percent compared to 13.7 percent for the CEE countries. As noted by the World Bank (2007), the persistence of unemployment suggests that the efficient reallocation of workers has been hindered and that private-owned enterprises have not created sufficient employment opportunities to absorb displaced workers.

Prior to the transition, job seekers relied upon job vacancy listings at employment service offices to secure new positions. While open unemployment was not permitted, labor turnover was common especially among blue collar workers (workers as opposed to employees in pre-transition terminology). Employment service offices continue to operate and data on those who register as unemployed and other job seekers are available from the ILO for 27 of the 28 countries.⁶

Column [6] in Table 1 shows the ratio of registered unemployment to total unemployment during 2004-05. Ratios for only 22 countries are shown, however, because six still do not conduct

⁵ Because many smaller countries had very high unemployment during 1994-96 the unweighted average of the 17 unemployment rates was 12.2 percent.

⁶ The URL for the International Labour Organisation (ILO) is <http://laborsta.ilo.org>.

a regular labor force survey. The registered-to-total unemployment ratios display clear geographic patterns. Among CEE countries, the ratios are generally close to 1.0 or larger with higher ratios present in several CEE-South countries. Much lower ratios are observed for the 10 FSU countries with available data. The ratios are 0.50 or higher for the Baltic Republics, but much lower (from 0.15 to 0.33) for all other FSU countries except Ukraine. The labor market presence of employment offices and associated services is much higher in CEE countries than in FSU countries.

At least four reasons motivate individuals to register at employment service offices: to secure a new employment through job listings and other employment services; to receive UC benefits; to receive social assistance benefits; and to maintain eligibility for health insurance benefits. All countries except Tajikistan pay UC cash benefits to at least some of the unemployed.

Column [7] in Table 1 shows estimates of UC reciprocity rates during 2004-05. For the 18 countries where data are available, the overall average reciprocity rate was 0.22 and reciprocity rates in several countries fall into the 0.20–0.40 range. Very low reciprocity rates, below 0.05, obtain in Moldova, Azerbaijan and Georgia. The count of countries in the latter group would be larger if relevant data were available from all 28 countries.

Note that every ratio in column [6] exceeds its counterpart in column [7]. Eligibility for services and cash payments enters individual motivations to register as a job seeker. From the disparities in the ratios in these two columns, it appears the potential of the employment offices to provide adjustment services to workers is much greater in CEE countries than in FSU countries. Absent detailed comparative data on these other services and cash benefits, however, it is difficult to make strong statements about why rates of registration differ so widely between the CEE and FSU geographic areas.

The following sections explore in more detail some issues related to economic performance and UC in the CEE-FSU economies. We start with income growth. In part of the empirical analysis, we estimate separate equations for each country, or set of countries, both to permit functional forms to vary across countries and to investigate differences in the estimated effects.

3. Growth in income among the CEE-FSU countries

Comparative national statistics on income are available from the WDI database maintained by the World Bank. Our analysis of income growth is based on a sample of 150 countries each with

a total population of 1.0 million or more in 1999. In order to capture differences in economic performance, we examine income growth not only for the full span from 1990 to 2006 but also for three sub-periods: 1990 to 1995, 1995 to 2000, 2000 to 2006. The earliest sub-period corresponds to the initial transition in the former centrally-planned economies while the second and third sub-periods capture developments later in the transition.

To compare the experience of the CEE-FSU countries with the worldwide average, we estimate the following equation in Panel A of Table 2:

$$(1) \quad Y_{it} = \alpha + \beta_1 LY_{it} + \beta_2 D_1 + \beta_3 D_2 + \varepsilon_{it}$$

where Y_{it} = relative income level of country i in period t
 LY_{it} = lagged relative income level of country i in period t
 D_1 = 1 if CEE-FSU economy, = 0 otherwise
 D_2 = 1 if Asian economy, = 0 otherwise

The dependent variable is relative income level; that is, per-capita GDP of each country compared with the simple average across the 150 countries.⁷ Per-capita GDP (adjusted by PPP) is used because it takes into account the differences in levels of country economic activity across years. Since many of the Asian economies have been experiencing above-average income growth, it is appropriate to include an Asian dichotomous (dummy) variable as an additional control variable.

Panel A in Table 2 displays the results of four regression equations for the three sub-periods and for the full span from 1990 to 2006. The coefficients on lagged relative income are close to unity indicating (not surprisingly) that each country's lagged relative income has a strong association with its current relative income. The lowest t -ratio for relative income is 46.6 in the regression for the longer 1990-2006 period. For the shorter periods, lagged relative income has an even closer association with current relative income (t -ratios of 85.0 or larger). Overall, income growth in the CEE-FSU countries exceeded the worldwide average during the most recent years.

The four coefficients for CEE-FSU countries in Panel A show an expected pattern. The dichotomous variable is negative and significant for the 1990-1995 sub-period, positive but only marginally significant for the 1995-2000 period and positive and highly significant for the 2000-2006 period. Controlling for lagged relative income, the relative income of these 28 countries increased at significantly below-average rates between 1990 and 1995, but then at significantly

⁷ The sample sizes are smaller than 150 because WDI data are not available for all countries for all years.

above-average rates during 1995-2000 and especially during 2000-2006. The comparative size of the dummy variable coefficients indicates that relative income growth across the CEE-FSU countries was more rapid in the 2000-2006 period but still significantly above-average during 1995-2000.⁸

Panel B in Table 2 focuses directly upon per-capita income growth during the same time periods. Here, we estimate the following equation:

$$(2) \quad YG_{it} = \alpha + \beta_1 D_1 + \beta_2 D_2 + \varepsilon_{it}$$

where YG_{it} = income growth of country i in period t

D_1 = CEE-FSU dichotomous variable (= 1 if CEE-FSU economy; = 0 otherwise)

D_2 = Asian dichotomous variable (= 1 if Asian economy; = 0 otherwise)

The coefficients for the two dichotomous variables show the average size of growth disparities between the CEE-FSU and the Asian countries, respectively, and the other countries in the sample. All four dichotomous variables for the Asian countries are positive and significant. Note, however that the Asian dummy variable is smallest during 1995-2000 which includes three years of the Asian financial crisis. For the full 1990-2006 period, the Asian dummy variable indicates that Asian per-capita income grew faster than the all-country average by 56.5 percent.

Both panels in Table 2 shows vividly that income growth in the CEE-FSU countries was significantly below the worldwide average between 1990 and 1995. Per-capita income for most of these 28 countries actually decreased during the first half of the 1990s, the initial transition years. Between 1995 and 2000 and again between 2000 and 2006, however, the CEE-FSU categorical variable is significant and positive with a very large coefficient for the latter period.

At least two forces have been operative during these years. One is a rebound from the economic dislocation that occurred in the earliest years of the transition. The second is the increase in productivity occasioned by the transition towards a market-oriented economy with its emphasis on production efficiency. Distinguishing between these two forces is an important research topic but not pursued in the present paper.

⁸ Quantitatively similar results are obtained using two variants of the Panel A regressions: removal of China and Vietnam from the data and weighting by 1999 population. Income growth between 1990 and 2006 was much higher in China (307 percent) and Vietnam (153 percent) than in all other countries. In weighted regressions, the CEE-FSU dummy during 1995-2000 was not significantly positive, but it was highly significant during 2000-2006.

The fourth regression equation in each panel summarizes income growth in CEE-FSU countries for the full period from 1990 to 2006. Note how the CEE-FSU coefficients are negative but not significant in both panels. This suggests that the low income growth between 1990-1995 and the subsequent rapid growth between 1995 and 2006 had roughly offsetting effects over the full period. Relative income in 2006 for these countries was not noticeably lower (nor higher) than it was in 1990. To the extent that the transition will yield improved average income for residents of the CEE-FSU countries, it will have to be realized in the years after 2006. The above-average income growth between 1995 and 2006 has essentially restored their relative income to 1990 levels.⁹

The next section explores the linkage between increases in real output and employment growth. Presumably at least part of the above-average growth in real output of the 1995-2006 period enhanced the growth in employment and income for labor force participants in these 28 economies.

4. Output growth and employment growth

In the long run, growth in employment is influenced by growth in real output. *A priori* above-average growth in real output would be expected to translate into robust employment growth. To examine the linkage, however, one needs time series data on both employment and real output. Among the 28 countries, 15 lack time series information on one or both of these variables. The counts of countries with missing data are as follows: 11 lack time series on employment as measured by a labor force survey; 11 lack estimates of real GDP and seven lack both. Thus, employment change regressions can be fitted for only 13 of the 28 CEE-FSU countries: nine of 12 CEE countries and just four FSU countries.¹⁰ Many FSU countries have not yet converted their national accounting systems from measuring net and gross material product to real GDP. Several countries still have not conducted labor force surveys for lengthy periods as indicated by the absence of unemployment estimates for several in Table 1, especially for 1994-96.

⁹ Note that the statement refers to aggregate average income and does not speak to its distribution across families. We obtain quantitatively similar results to those in Panel B in regression equations that remove China and Vietnam and in regressions that weight the data by population in 1999.

¹⁰ The three missing CEE countries are Albania, Bosnia and Serbia. The four FSU countries with the requisite data are Estonia, Latvia and Lithuania, and Georgia.

Two other issues in measuring employment should also be noted. First, there has been substantial out-migration from several countries. The employment estimates from labor force surveys are affected by this mobility. Additionally, not all countries fully revised their series after incorporating recent census benchmarks into their employment estimates. This caused breaks in some series for years when new benchmark estimates started to be used.

The specification of the employment change relationships recognizes productivity growth as well as growth in real output. The following equation is estimated in Table 3:

$$(3) \quad \% \Delta E_{it} = \alpha + \beta_1 \% \Delta \text{RGDP}_{it} + \beta_2 D_1 + \varepsilon_{it}$$

where $\% \Delta E_{it}$ = annual percent change in total employment in country i in period t
 $\% \Delta \text{RGDP}_{it}$ = annual percentage change in real output in country i in period t
 D_1 = 1 if 2001-2006, = 0 otherwise

The dependent variable is measured as the annual percent change in total employment including the self-employed and family workers. Thus, the intercept in the regression equation is expected to be negative due to productivity growth; that is, stable output between any two adjacent years will be accompanied by reduced employment in the second year, *ceteris paribus*.

Because, employment is known to be sticky in responding to changes in real output, we include the lagged as well as current real output change to allow for this institutional rigidity. After experimenting with a few specifications, the output change variable is measured as the average for the current and the previous year.¹¹ The regression analysis also tests for a change in employment growth over the last six years of the data period, 2001 to 2006. To the extent that the early years of the transition involved more restructuring and downsizing of former state-owned enterprises (hence especially large gains in labor productivity), one would expect the 2001-2006 dichotomous variable to be positive. For most countries, the data period ends in 2006, and it commences the year after the year employment estimates from the labor force survey were first available.

Table 3 displays the regression results. The data periods range from eight to 14 years, limiting the number of hypotheses to be tested. The goodness-of-fits are modest with five adjusted R^2 s falling below 0.25 and only five exceeding 0.50. The standard errors display a wide range: one is smaller than 1.0 percent (Czech Republic); two exceed 3.0 percent (Croatia and Macedonia).

¹¹ This specification also helps preserve degrees of freedom.

Many coefficients in Table 3 have expected signs and many are statistically significant. Twelve of the 13 constant terms are negative and seven have *t*-ratios of 2.0 or larger. Ten output change coefficients are positive and six are significant. Ten of the dichotomous variables for 2001 and later years are also positive but only three are significant. Consistently larger employment change responses are not observed after 2001 when compared to earlier years. Overall, most coefficients (32 of 39) have expected signs and half of these have *t*-ratios of 2.0 or larger but the explanatory power of the regressions is generally modest.

5. Unemployment and unemployment protection

Within the CEE-FSU countries, the bulk of household income is derived from labor market earnings. The inability to secure meaningful and remunerative employment results in economic hardship for affected individuals and their dependents. Inadequate demand for labor services has two important manifestations: unemployment and underemployment. An unemployed person is able to work and actively seeking work but unable to secure a position of employment. This contrasts with underemployment which occurs when an underemployed person is in one (or both) of two situations: has a job but at a skill level below that for which she or he has been trained; or has a job but is working fewer hours than desired. Both situations imply that earnings are less than those derived from working standard hours at the usual or customary occupation. Because unemployment is more directly amenable to measurement, it is generally used as an indicator to assess the labor market performance of a country.

The strong growth in real output across the CEE-FSU countries would be expected to yield noticeable reductions in unemployment rates. Evidence to support this hypothesis is mixed, with more consistent patterns observed in FSU countries than in CEE countries. Fifteen of the 28 countries from the region have been conducting labor force surveys for sufficient years to generate a time series of unemployment rates with at least 10 annual observations. Charts 1 and 2 display unemployment rates through 2006 for CEE-Central and CEE-South, respectively. Chart 3 shows unemployment rates for the same period for Russia plus Ukraine and the Baltic Republics.¹²

¹² As noted in Table 1, two other CEE countries and five other FSU countries currently conduct a labor force survey. For the two CEE countries the start dates for their published data are Albania – 2003 and Bosnia – 2006. The start dates for the five FSU countries are as follows: Georgia – 1997, Moldova – 1998, Kazakhstan

The CEE-Central countries in Chart 1 exhibit two broad patterns. Since 1998 three (Czech Republic, Hungary and Romania) have consistently maintained unemployment rates in the 6.0-9.0 percent range with no tendency for unemployment to decline since 2001. The other two (Poland and Slovak Republic) had higher unemployment rates during the mid-1990s, but rates then rose further during the late 1990s reaching the 18.0-20.0 percent range for several consecutive years. While their unemployment rates have been declining since 2001, the rates still exceeded 13.0 percent in 2006. A weighted average for the five countries (labor force weights) was nearly the same in 2006 as it was during 1993-1995 at roughly 10.5 percent. This is consistent with the findings of Münich and Svejnar (2006:25) who find that

The overarching portrayal of the labor market in all of these economies is that it is affected by ongoing long-term restructuring in the presence of limited demand for labor, while regional disparities in unemployment, inflows and outflows are quite persistent over time.

For the CEE-South countries, two of five have been consistent outliers for all years covered by Chart 2. Macedonia has consistently exhibited unemployment rates over 30.0 percent while Slovenia has always had rates below 10.0 percent and close to 6.0 percent since 2001. Bulgaria and Croatia have experienced reductions in unemployment since 2001 with the Bulgarian unemployment rates in 2006 being roughly half of the 2001 rate (9.0 percent versus 19.7 percent). During the same period, however, unemployment in Serbia increased, reaching nearly 21.0 percent during 2005 and 2006. As a consequence of no large changes in two countries and offsetting changes in the other three, the average unemployment rate in the CEE-South countries has averaged between 13.9 percent and 16.1 percent in each of the twelve years between 1995 and 2006. These two charts reinforce a point made in the earlier discussion of Table 1 that unemployment rates in the CEE region were not measurably lower during 2004-06 when compared to 1994-96.

Chart 3 presents a clear pattern of decreasing unemployment rates for Russia, Ukraine and the Baltic Republics in the years since 2001. The weighted average of the five unemployment rates peaked at 12.7 percent in 1998 and 1999, but has declined steadily since 1999, reaching 7.0 percent in 2006. While the experiences of the Russian labor market dominate in a weighted average, note in Chart 3 that all unemployment rates have decreased since 2001 with the Russian decreases being

among the smallest. Much larger reductions have occurred in the Baltic Republics. By 2006 all five unemployment rates had descended to the 6.0-7.0 percent range. This pattern probably fits more closely with the *a priori* expectations of many observers given the strong pattern of growth in real output that has occurred during the past decade for the majority of the FSU countries.

How high are the unemployment rates in the CEE-FSU countries when viewed from a global perspective? Labor force surveys are now conducted regularly in slightly more than half of the countries with a population of 1.0 million or more persons. Monthly and quarterly surveys are standard in many of these countries.

Unemployment rates are examined for two periods: 1994-1996 and 2004-2006, the same periods as in Table 1. We estimate the following equation in both panels of Table 4:

$$(4) \quad UR_{it} = \alpha + \beta_1 Y_{it} + \beta_2 D_1 + \beta_3 D_2 + \varepsilon_{it}$$

where UR_{it} = unemployment rate for country i in period t
 Y_{it} = per-capita real GDP (PPP) for country i in period t
 D_1 = 1 if CEE-FSU economy, = 0 otherwise
 D_2 = 1 if Asian economy, = 0 otherwise

Because several countries did not conduct surveys consistently during these periods, the data are examined for two sets of countries: a large and a small sample. The data points for the small samples are all based upon at least two of the three years.¹³ The large samples included countries where only a single year of data is available. Because very high unemployment rates were present in a few countries in the large samples, selected countries were removed from some regressions.

Table 4 displays the results of twelve regression equations, six for each period, that place CEE-FSU unemployment rates within a global context. In both panels, the CEE-FSU regional dichotomous variables display consistently positive coefficients ranging from 0.790 to 3.744. Only two, however, have t -ratios larger than 2.0 while four have t -ratios smaller than 1.0. These coefficients are not noticeably smaller during 2004-2006 than during 1994-1996. Unemployment rates across the CEE-FSU region were only moderately above-average during both periods.

Two other features of the Table 4 results are noteworthy. First, the dichotomous variables for the Asian region are consistently negative and significant. During 1994-1996 the coefficients

¹³ In a few instances the two year averages used data from 1997 or 2003. Among CEE-FSU countries this included Croatia, Georgia, Kazakhstan and Macedonia.

are all -5.9 or more negative while during 2004-2006 all are -2.5 or more negative. The negative differential between Asian and other unemployment rates was consistently larger during the earlier period, but the differential remained statistically significant during 2004-2006. Second, the regression results suggest a small negative gradient between country income and the unemployment rate. Four income coefficients have t -ratios of at least 2.0 in Table 4 and a fifth t -ratio is 1.9. On average, higher income countries have somewhat lower unemployment rates than other countries.¹⁴

Many CEE-FSU countries have experienced high unemployment rates since the mid 1990s, particularly several CEE countries as shown in columns [4] and [5] of Table 1. According the literature on transition economies, the rise in unemployment during the transition reflected high rates of inflow into unemployment as former state-owned enterprises laid off workers and relatively low outflow rates from unemployment as the unemployed found it difficult to find new labor market jobs. Our results indicate that these unemployment rates, however, have not been unusually high relative to unemployment rates throughout the world. The coefficients on the CEE-FSU dichotomous variables in the Table 4 regression results provide an empirical basis for this assessment.

5.1 Registered unemployment and total unemployment

The estimates of unemployment and associated unemployment rates displayed in Table 1 and Charts 1, 2 and 3 are derived from periodic labor force surveys (LFS) that use standardized definitions of employment, unemployment and the labor force. An unemployed person is someone able to work, available for work and actively seeking work during a recent reference period (either the previous week or the past four weeks).¹⁵ An employed person is someone who worked for pay

¹⁴ Regressions based on weighted data yield similar results: the coefficients on the CEE-FSU dichotomous variables are generally positive but insignificant. Other significant findings in the weighted data were a below-average unemployment rate among the Asian economies and a negative gradient between income and unemployment.

¹⁵ The Thirteenth International Conference of Labour Statisticians (<http://laborsta.ilo.org>) adopted a standard definition of unemployment that is applied by member countries. The unemployed comprise all persons above a specified age who during the reference period were: (i) without work; (ii) currently available for work; and (iii) seeking work.

or profit for at least one hour during the past week.¹⁶ The labor force is the sum of employment plus unemployment, and the unemployment rate is the ratio of unemployment to the labor force, usually expressed as a percentage of the labor force. The measurement of employment, unemployment and the labor force is typically done for persons of working age, either persons aged 15 and older or persons aged 15 to retirement age, say 15 to 64.

The estimate of LFS unemployment is derived from a measurement system where unemployed persons have not necessarily have contact with government programs providing cash benefit payments, job referrals or other employment services. Registered unemployment, in contrast, counts persons who have registered as job seekers at employment offices. All CEE-FSU countries operated an employment service system prior to the transition. Its primary purpose was to match job seekers with available job vacancies.

Employment service (ES) offices continued to operate during the transition and down to the present, maintaining a record of the number of registered job seekers. As identified earlier, four reasons motivate individuals to register at ES offices. First, unemployed persons looking to change jobs may register to receive services; for example, counseling or skills assessment, or to review job vacancies posted by employers at ES offices. Second, unemployed persons who wish to receive unemployment compensation benefits (unemployment insurance and/or unemployment assistance) are usually required to register at an ES office. Third, in several countries, unemployed persons of working age eligible for income-conditioned support payments (commonly termed social assistance or general assistance) usually are required to register in order to receive this support. Fourth, unemployed persons who wish to retain eligibility for state-provided health insurance benefits are often required to register at ES offices.

The reasons motivating registration at ES offices ensures that a large fraction of the unemployed register. Column [7] of Table 1 showed that the ratio of registered unemployment to total unemployment (RegU/TU) was quite high in many of the 28 countries, particularly those from the two CEE sub-regions. The attractiveness of cash benefits and other services would be expected to influence the number of individuals who register as job seekers.

¹⁶ Family members who work on a farm or some other family business may have to work ten or 15 hours to be counted as employed.

To explain developments in the ratio of registered unemployment to total unemployment, we employ a standard trend-cycle specification in Table 5:

$$(5) \quad \text{RegU/TU}_{it} = \alpha + \beta_1 \text{TUR}_{it} + \beta_2 \text{Trend}_i + \varepsilon_{it}$$

where RegU/TU_{it} = ratio of registered unemployment to total unemployment for country i
 TUR_{it} = total unemployment rate for country i in time t
 Trend_i = linear trend for country i

Table 5 displays regression results for 16 countries through 2005/2006. Eight regression equations have adjusted R^2 s of 0.75 or higher, and just one falls below 0.25. No obvious pattern is presented by the trend coefficients with seven positive and nine negative, with five significantly positive and five significantly negative. The absence of an overall pattern indicates that the trend in ES penetration over these years must be evaluated on a country-by-country basis.

The unemployment rate coefficients are mostly negative (10 of 16) with seven significantly negative and three significantly positive. The interpretation is that when unemployment changes, registered unemployment changes less rapidly, causing the (RegU/TU) ratio to move in the opposite direction. Significant exceptions to this general pattern are present in the results from Estonia, Lithuania and Ukraine, three FSU countries.

5.2 Unemployment protection

Following the collapse of the Soviet block, most economists recognized that the transition to a market-oriented economy would entail dislocations and unemployment. It was anticipated, however, to be short run. New unemployment compensation (UC) programs were enacted in the vast majority of the successor countries and, in most cases, the new program was an unemployment insurance (UI) program. The rate of adoptions was rapid with 18 countries enacting UC laws in 1991 and four in 1992. With the single exception of Kazakstan (which ended its program in 1996 and resumed it in 2005), these UC programs have functioned continuously down to the present.

Because both UC programs and the phenomenon of open unemployment were quite new, there were many surprises in the early transition years. As noted in the previous section, one was the rapid increase in unemployment followed by unemployment persistence. The second surprise was the unexpectedly high level of costs associated with UC programs. While the initial program provisions were often modest compared to the functioning systems in Western Europe, these new UC programs experienced unexpected problems associated with high costs and difficulties in

administering benefits. Because actual UC costs were much higher than anticipated, pressures to balance program expenditures with revenues emerged in the early years of operation. Adjustments to the funding imbalance included changes in UC statutory provisions and in administrative rules with the objective of reducing access to benefits, benefit duration and payment levels.

To explain developments UC programs, we concentrate on the reciprocity rate using the following equation in Table 6:

$$(6) \quad \text{RecR}_{it} = \alpha + \beta_1 \text{TUR}_{it} + \beta_2 \text{Trend}_i + \varepsilon_{it}$$

where RecR_{it} = UC reciprocity rate for country i in time t

TUR_{it} = total unemployment rate for country i in time t

Trend_i = linear trend for country i

The reciprocity rate is defined as the number of unemployed individuals who receive a benefit payment as a proportion of the labor force survey estimate of unemployment. As previously noted, one of the four reasons motivating an individual to register at an ES office is the desire to receive an UC benefit and this variable is explicitly measured. In the equation, a positive coefficient on the unemployment rate indicates that when unemployment increases, the number of UC recipients increases more than proportionately. Hence, a program with strong over-the-cycle responsiveness would display a positive coefficient for the unemployment rate.

Table 6 summarizes the results explaining UC reciprocity rates in 17 of the 28 countries. Here the goodness-of-fits are generally less than satisfactory with only seven of the 17 adjusted R^2 s being 0.50 or higher; nine fall below 0.25. The most obvious feature in Table 6 is the predominance of negative trends in UC reciprocity rates. Eleven of 17 trend coefficients are negative and six are significant. High costs of benefit payments caused by unemployment rates that frequently exceeded 10.0 percent were undoubtedly one factor contributing to the decrease in UC reciprocity rates in several countries.¹⁷ A second factor could be difficulty in monitoring availability and search activity by claimants. More active oversight of search activities may have contributed to lower reciprocity.

Note in Table 6 that positive trend coefficients were present in six countries and that significant positive trends were present for three (Latvia, Serbia and Ukraine). Thus, while all but

¹⁷ Restrictions on UC eligibility can be documented in past issues of Social Security Programs Throughout the World. See Chapter 4 and Appendix D in Vroman and Brusentsev (2005) that compares selected eligibility statutes for these countries during 1994-1997 and 1999-2002. Restrictive changes exceeded liberalizations by roughly a two to one ratio.

one of the 28 countries have operated a UC program since the early 1990s, their individual experiences have not followed a common path.

As stated above, a program with strong over-the-cycle responsiveness would display a positive coefficient for the unemployment rate. For these countries, however, the regression results suggest that the beneficiary ratio neither increases nor decreases significantly when unemployment changes. Fourteen of 16 unemployment coefficients are not significantly different from zero.¹⁸

While other reasons for registering at ES offices were identified, no data that distinguish among the separate motivations are available. We note that registration is widespread, particularly in CEE countries. Trends in registration relative to total unemployment were documented in Table 5, but analysis of the individual reasons for registration (besides receipt of UC benefits) cannot be conducted using data published by the ES offices of CEE-FSU countries.

6. Summary of findings

This paper examined the experiences of the 28 CEE-FSU countries during the period 1990 to 2006. It demonstrated significantly below-average income growth between 1990 and 1995 but then significantly above-average growth since 1995 when compared with the worldwide average. Above-average income growth was especially notable since 2000. For many individual CEE-FSU countries, a significant link between output growth and employment growth was also demonstrated. Higher rates of output growth (current and lagged) cause employment to increase more rapidly.

The transition economies have developed new institutions to measure and offset the effects of the new phenomenon of open unemployment. The majority have instituted labor force surveys to measure unemployment (22 of 28 by 2006), and all but one (Tajikistan) established an unemployment compensation program.

Our analysis of unemployment rates found that the rates have been high in many of these countries (Table 1). When placed within a global context, however, the CEE-FSU averages during 1994-1996 and again during 2004-2006 were only somewhat higher than the averages for other major countries with labor surveys. Unemployment rate regressions fitted for both periods found

¹⁸ Because annual data on UC reciprocity could not be obtained for Poland, the regression in Table 6 has four annual observations. A downward trend was clear for these years (1995, 1999, 2000 and 2005) but there were not enough degrees of freedom to estimate both an unemployment and trend coefficient.

that dummy variables for the CEE-FSU countries were positive but not significant. Unemployment rates are high in many other countries besides the CEE-FSU countries.

Throughout the paper, we documented important contrasts across the CEE-FSU sub-regions. To some extent, this reflects the dislocation associated with military conflicts and other political turmoil. Additionally, there are clear differences in the degree of penetration of labor market institutions and services across these countries. On average, there is greater penetration in CEE countries than in FSU countries.

Contrasts in registered unemployment rates and UC reciprocity rates have been persistent across the years. Moving eastward from Western Europe, the contrasts with the West become more vivid. While cross national differences in income undoubtedly contribute to the contrasts, other forces have also operated. This paper documented the evolution of some of these contrasts with particular attention to the years extending through 2006.

References

- Brown, David J., John S. Earle and Telegdy. 2006. "The Productivity Effects of privatization: Longitudinal Estimates from Hungary, Romania, Russia, and Ukraine." *Journal of Political Economy*. 114 (1): 61-99.
- Commander, Simon and Axel Heitmueller. 2007. "Does unemployment insurance help explain the unemployment in transition economies?" IZA/World Bank Conference on Employment and Development. Paper available from http://www.iza.org/conference_files/worldb2007
- European Bank of Reconstruction and Development. 2000. *Transition Report*. London: European Bank of Reconstruction and Development.
- , 2005. *Transition Report*. London: European Bank of Reconstruction and Development.
- Faggio, Giulia. 2006. "Job Destruction, Job Creation and Unemployment in Transition Countries: What can we learn?" Centre for Economic Performance. London School of Economics and Political Science.
- International Monetary Fund. *World Economic Outlook* (various issues).
- Jurajda, Štěpán and Katherine Terrell. 2004. "What Drives the Speed of Transition during Episodes of Massive Reallocation?" William Davidson Institute Working Paper No. 432 and IZA Working Paper no. 601
- Münich, Daniel and Jan Svejnar. 2006. "Unemployment and Worker-Firm Matching: Theory and Evidence from East and West Europe." IZA/World Bank Conference on Employment and Development. Paper available from http://www.iza.org/conference_files/worldb2007
- Social Security Administration. 2006. *Social Security Programs throughout the World: Europe, 2006*. Washington, DC: U.S. Government Printing Office.
- Social Security Administration. 2006. *Social Security Programs throughout the World: The Americas, 2005*. Washington, DC: U.S. Government Printing Office.
- Social Security Administration. 2005. *Social Security Programs Throughout the World: Asia and the Pacific, 2004*. Washington, DC: U.S. Government Printing Office.
- Vroman, Wayne, and Vera Brusentsev. 2005. *Unemployment Compensation Throughout the World: A Comparative Analysis*, Kalamazoo, MI: W.E. Upjohn Institute.
- World Bank. 2002. *Transition: The First Ten Years. Analysis and Lessons from Eastern Europe and the Former Soviet Union*. Washington, DC: World Bank.

- 2005. *Enhancing Job Opportunities: Eastern Europe and the Former Soviet Union*. Washington, DC: World Bank.
- 2007. *Labor Markets in EU8+2: From the Shortage of Jobs to the Shortage of Skilled Workers*. Washington, DC: World Bank.

Table 1. Summary Statistics for CEE-FSU Economies

	Popu- lation 2005 [1]	Per Capita GDP 2005 [2]	Relative Income 2005 [3]	Unemploy- ment Rate 1994-96 [4]	Unemploy- ment Rate 2004-06 [5]	Reg. Un./ Total Un. 2004-05 [6]	N UC Ben./ Total Un. 2004-05 [7]
CEE - Central Europe	86	13,208	1.35	10.4	12.1	0.96	0.20
Czech Republic	10	18,341	1.87	4.1	7.0	1.27	0.37
Hungary	10	16,823	1.72	10.3	7.0	1.41	0.40
Poland	39	12,994	1.33	13.4	16.9	0.95	0.12
Romania	22	8,785	0.90	7.6	7.5	0.76	0.45
Slovak Republic	5	16,041	1.64	12.7	15.9	0.82	0.12
CEE - Southern Europe	34	8,316	0.85	14.9-a	17.8	1.22	0.17-a
Albania	3	5,405	0.55	INA	14.5	1.00	INA
Bosnia	4	6,035	0.62	INA	31.1	0.91	INA
Bulgaria	8	9,223	0.94	17.0	10.4	1.22	0.23
Croatia	5	12,324	1.26	10.0	12.5	1.31	0.30
Macedonia	2	7,748	0.79	31.9	36.8	1.19	0.16
Serbia	11	5,348	0.55	13.3	20.1	1.40	0.10
Slovenia	2	21,808	2.23	7.9	5.9	1.55	0.27
FSU - Core Countries	204	9,836	1.00	8.5-a	7.4-a	0.37-a	0.26-a
Belarus	10	7,711	0.79	INA	INA	INA	INA
Moldova	4	2,527	0.26	9.2	7.6	0.19	0.03
Russia	143	11,041	1.13	9.1	7.4	0.33	0.26
Ukraine	46	7,231	0.74	6.6	7.5	0.55	0.24
FSU - Baltic Republics	7	14,095	1.44	16.5	8.4	0.74	0.21
Estonia	1	16,414	1.67	9.1	7.8	0.50	0.22
Latvia	2	12,666	1.29	19.8	8.7	0.82	0.36
Lithuania	3	14,158	1.44	17.1	8.4	0.77	0.10
FSU - Caucasus	16	4,253	0.43	INA	10.4-a	0.15-a	0.01-a
Armenia	3	4,270	0.44	INA	INA	INA	INA
Azerbaijan	8	4,601	0.47	INA	8.6	0.15	0.01
Georgia	4	3,586	0.37	7.6	13.2	0.16	0.01
FSU - Central Asia	58	4,046	0.41	INA	8.4-a	0.23-a	INA
Kazakhstan	15	8,318	0.85	INA	8.4	0.20	INA
Kyrgistan	5	2,088	0.21	INA	8.3	0.34	INA
Mongolia	3	2,175	0.22	INA	INA	INA	INA
Tajikistan	7	1,388	0.14	INA	INA	INA	INA
Turkmenistan	5	8,098	0.83	INA	INA	INA	INA
Uzbekistan	24	1,920	0.20	INA	INA	INA	INA
CEE-FSU Total	405	9,450	0.96	9.2-a	9.7-a	0.66-a	0.22-a

Source: Data assembled by authors using mainly the IMF, World Bank and ILO web sites, statistical yearbooks and other country sources. Population in column [1] in millions. Unemployment rates in columns [4] and [5] in percentages.

a - Average and totals for included countries. Average in columns [4] and [5] weighted by column [1]. Averages in columns [6] and [7] weighted by unemployment in 2004-05. INA - Information not available.

Table 2. Relative Income and Income Growth of CEE-FSU Countries, 1990 to 2006

	Constant	Relative Income 1990	Relative Income 1995	Relative Income 2000	CEE-FSU Regional Dummy	Asia Regional Dummy	Adj. R2	Std. Error	Mean Dep. Var.	Number Countries
Panel A. Relative Income Regressions										
Relative Income 1995	0.004 (0.2)	1.033 (85.0)			-0.314 (9.4)	0.129 (3.4)	0.982	0.148	0.998	138
Relative Income 2000	-0.016 (1.0)		1.006 (102.5)		0.052 (1.9)	0.004 (0.1)	0.987	0.126	1.000	141
Relative Income 2006	0.008 (0.5)			0.942 (108.9)	0.199 (7.8)	0.077 (2.7)	0.988	0.1128	1.000	140
Relative Income 2006	0.006 (0.2)	0.974 (46.6)			-0.041 (0.7)	0.197 (3.0)	0.941	0.255	1.001	137
Panel B. Income Growth Regressions										
Income Growth 1990 - 95	3.669 (2.1)				-34.965 (9.2)	22.384 (5.2)	0.491	16.83	0.254	138
Income Growth 1995 - 00	8.025 (6.3)				10.899 (3.9)	6.747 (2.1)	0.099	12.55	10.943	141
Income Growth 2000 - 06	13.856 (7.4)				36.863 (9.0)	12.935 (2.8)	0.366	18.28	22.190	140
Income Growth 1990 - 06	28.419 (7.2)				-6.455 (0.7)	56.549 (5.8)	0.202	38.22	34.718	137

Source: Data assembled by the authors, primarily from World Development Indicators. Sample includes 150 countries with populations of 1.0 million or more persons in 1999. In parenthesis beneath each coefficient is the absolute value of its t ratio.

Table 3. Employment Change Results for CEE-FSU Countries

	Constant	%DRGDP 2 Yr. Avg.	D2001	Adj. R2	Std. Error	D.W.	Av. Emp. Growth	Years
Czech Republic	-1.3992 (3.30)	0.3866 (2.93)	0.4149 (0.77)	0.527	0.830	2.18	0.080	95-06
Hungary	-3.7875 (6.78)	1.2647 (7.46)	-1.3400 (2.12)	0.823	1.033	2.19	-0.302	93-05
Poland	-7.6188 (3.95)	1.3218 (3.83)	2.8020 (2.78)	0.505	1.542	1.09	-0.259	93-06
Romania	-0.2651 (0.46)	0.1253 (0.91)	-0.3888 (0.35)	-0.119	1.405	3.02	-0.097	95-01, 03-06
Slovakia	-3.9094 (3.05)	0.8603 (3.35)	1.5835 (2.01)	0.546	1.365	2.48	0.744	95-06
Bulgaria	-1.0139 (0.91)	-0.2450 (0.83)	4.1740 (1.78)	0.116	2.938	1.53	0.337	94-06
Croatia	-0.2809 (0.11)	0.1830 (0.26)	0.9499 (0.39)	-0.240	3.070	2.19	0.980	97-00, 02-06
Macedonia	-4.3965 (0.92)	1.4830 (1.28)	-1.1612 (0.30)	-0.026	5.387	2.83	-0.222	97-04
Slovenia	-3.9686 (0.67)	1.1084 (0.82)	1.2616 (0.82)	-0.105	2.312	2.91	1.081	94-06
Georgia	4.8929 (1.86)	-1.2168 (2.42)	2.1264 (0.86)	0.369	2.886	1.98	-0.659	98-05
Estonia	-6.2780 (5.76)	0.8714 (3.12)	1.2691 (0.87)	0.753	1.620	1.67	-0.317	95-06
Latvia	-3.8141 (2.17)	0.7018 (2.07)	0.3744 (0.21)	0.486	1.896	2.06	1.049	96-06
Lithuania	-2.4765 (2.07)	-0.1005 (0.39)	4.4214 (2.53)	0.401	2.266	2.22	-0.786	95-06

Table 4. Unemployment Rate Results, Sample of 150 Large Countries

	Constant	CEE-FSU Dummy	ES Asia Dummy	Per-Capita Income	Adj. R2	Std. Error	Mean TUR	Sample Size
Panel A. Unemployment Rates During 1994-1996								
Small Sample	10.664 (12.9)	2.074 (1.3)	-6.684 (4.0)		0.211	5.467	9.809	73
Small Sample	13.203 (9.6)	0.930 (0.5)	-7.492 (4.3)	-0.180 (2.3)	0.238	5.376	9.871	71
Large Sample	10.907 (11.5)	2.959 (1.6)	-7.023 (3.5)		0.168	6.769	10.244	83
Large Sample	13.023 (8.9)	2.089 (1.1)	-7.615 (3.7)	-0.169 (1.9)	0.181	6.741	10.309	81
Large Sample -a	9.792 (15.3)	1.233 (0.9)	-5.908 (4.5)		0.226	4.438	8.893	78
Large Sample -a	10.481 (10.2)	0.790 (0.6)	-6.027 (4.3)	-0.053 (0.9)	0.201	4.493	8.927	76
Panel B. Unemployment Rates During 2004-2006								
Small Sample	8.945 (11.8)	2.690 (1.9)	-3.734 (2.3)		0.116	5.165	9.012	79
Small Sample	11.675 (9.8)	1.180 (0.9)	-4.398 (2.7)	-0.156 (2.9)	0.173	4.901	8.931	77
Large Sample	8.637 (12.0)	3.744 (2.8)	-3.158 (2.1)		0.136	5.296	8.983	92
Large Sample	10.329 (10.4)	1.868 (1.5)	-3.750 (2.6)	-0.109 (2.2)	0.136	4.788	8.667	88
Large Sample -b	8.067 (17.1)	2.157 (2.4)	-2.587 (2.7)		0.150	3.397	8.086	88
Large Sample -b	9.376 (14.1)	1.215 (1.4)	-3.084 (3.2)	-0.083 (2.6)	0.186	3.145	7.987	85

Source: Unemployment rates from ILO and OECD websites and Statistical Yearbooks.

Unemployment rates are mainly three year averages for 1994-1996 and 2004-2006. Income is per-capita real GDP-PPP from the World Bank: 1995 in Panel A and 2006 in Panel B. Absolute values of t ratios appear beneath the coefficients.

a - Excludes Algeria, Armenia, Botswana, Lesotho and Macedonia.

b - Excludes Bosnia, Botswana, Macedonia and South Africa.

Table 5. Ratios of Registered Unemployment/Total Unemployment in CEE-FSU Countries

	Constant	TUR	Trend 1990	Adj. R2	Std. Error	Avg. RegU/ TU	Years
Czech Republic	0.4737 (7.95)	0.00298 (0.22)	0.05080 (8.27)	0.941	0.059	1.027	93-06
Hungary	2.0024 (12.25)	-0.06752 (5.01)	-0.00956 (1.56)	0.757	0.058	1.363	92-06
Poland	1.2721 (10.04)	-0.01086 (1.07)	-0.00878 (1.27)	0.263	0.092	1.019	92-06
Romania	1.7002 (3.29)	-0.02734 (0.39)	-0.03888 (2.91)	0.362	0.180	1.076	94-06
Slovakia	1.2095 (9.34)	0.00587 (0.57)	-0.02520 (3.53)	0.519	0.087	1.034	93-06
Bulgaria	0.5851 (2.80)	-0.00056 (0.06)	-0.04148 (5.21)	0.802	0.085	1.012	93-06
Croatia	1.9889 (11.71)	-0.04024 (3.07)	-0.00547 (0.63)	0.512	0.086	1.399	96-06
Serbia	1.6336 (19.65)	-0.05248 (6.11)	0.05309 (7.30)	0.824	0.053	1.446	95-06
Slovenia	3.5540 (10.94)	-0.19671 (5.88)	-0.05093 (5.37)	0.732	0.060	1.647	93-05
Georgia	1.0923 (7.38)	-0.02724 (2.29)	-0.03808 (4.09)	0.794	0.067	0.309	97-05
Estonia	-0.2856 (2.12)	0.03931 (3.67)	0.02911 (5.10)	0.725	0.076	0.424	94-05
Latvia	0.8393 (2.81)	-0.02888 (2.47)	0.01712 (1.34)	0.934	0.046	0.653	95-06
Lithuania	-0.6357 (2.96)	0.02873 (3.07)	0.07875 (9.02)	0.916	0.069	0.625	94-06
Moldova	0.4309 (4.78)	-0.01922 (2.82)	-0.00533 (1.61)	0.431	0.019	0.204	98-06
Russia	0.1486 (1.47)	0.00213 (0.22)	0.00703 (1.24)	-0.027	0.085	0.235	92-05
Ukraine	-0.3607 (6.68)	0.02423 (5.23)	0.04557 (17.59)	0.967	0.031	0.383	95-06

Table 6. Reciprocity Rate Results in CEE-FSU Countries

	Constant	TUR	Trend 1990	Adj. R2	Std. Error	Avg. Recip. Rate	Years
Czech Republic	0.3725 (6.68)	0.00644 (0.45)	-0.00007 (0.01)	-0.131	0.055	0.414	93-05
Hungary	0.6173 (1.64)	-0.00108 (0.04)	-0.01269 (0.81)	0.065	0.098	0.482	93-05
Poland	0.7531 (3.52)		-0.04451 (2.35)	0.602	0.135	0.275	95-05 (4 Obs.)
Romania	1.0324 (2.23)	0.00012 (0.00)	-0.03385 (2.22)	0.227	0.160	0.695	94-04
Slovakia	0.4438 (5.68)	-0.00333 (0.46)	-0.01532 (2.79)	0.651	0.047	0.240	93-05
Bulgaria	0.3250 (3.10)	-0.00180 (0.39)	-0.00427 (1.07)	-0.065	0.042	0.253	93-05
Croatia	0.3778 (5.86)	-0.15000 (2.55)	0.00805 (1.87)	0.344	0.032	0.272	96-05
Macedonia	0.1028 (1.27)	0.00240 (0.89)	-0.00265 (1.14)	-0.064	0.018	0.155	95-04
Serbia	0.0233 (0.93)	-0.01242 (4.57)	0.02087 (4.57)	0.850	0.012	0.096	98-05
Slovenia	0.7605 (2.55)	-0.01982 (0.65)	-0.02205 (2.54)	0.574	0.055	0.399	93-05
Georgia	0.1058 (2.04)	-0.00514 (1.51)	-0.00028 (0.08)	0.062	0.019	0.016	97-03
Estonia	0.1424 (1.47)	0.01301 (1.49)	0.00087 (0.20)	0.031	0.051	0.285	94-05
Latvia	0.1757 (1.03)	-0.00844 (1.26)	0.01746 (2.41)	0.916	0.026	0.251	95-05
Lithuania	0.0395 (0.83)	0.00273 (1.26)	0.00202 (1.11)	-0.034	0.013	0.100	95-05
Moldova	0.4526 (3.32)	-0.01200 (1.17)	-0.02008 (4.02)	0.691	0.029	0.093	98-06
Russia	0.2550 (2.21)	-0.00376 (0.39)	-0.00039 (0.07)	-0.182	0.076	0.216	93-05
Ukraine	-0.2430 (5.56)	0.00699 (0.79)	0.03573 (3.73)	0.932	0.024	0.146	95-01

Chart 1. Unemployment Rates in Central CEE Countries

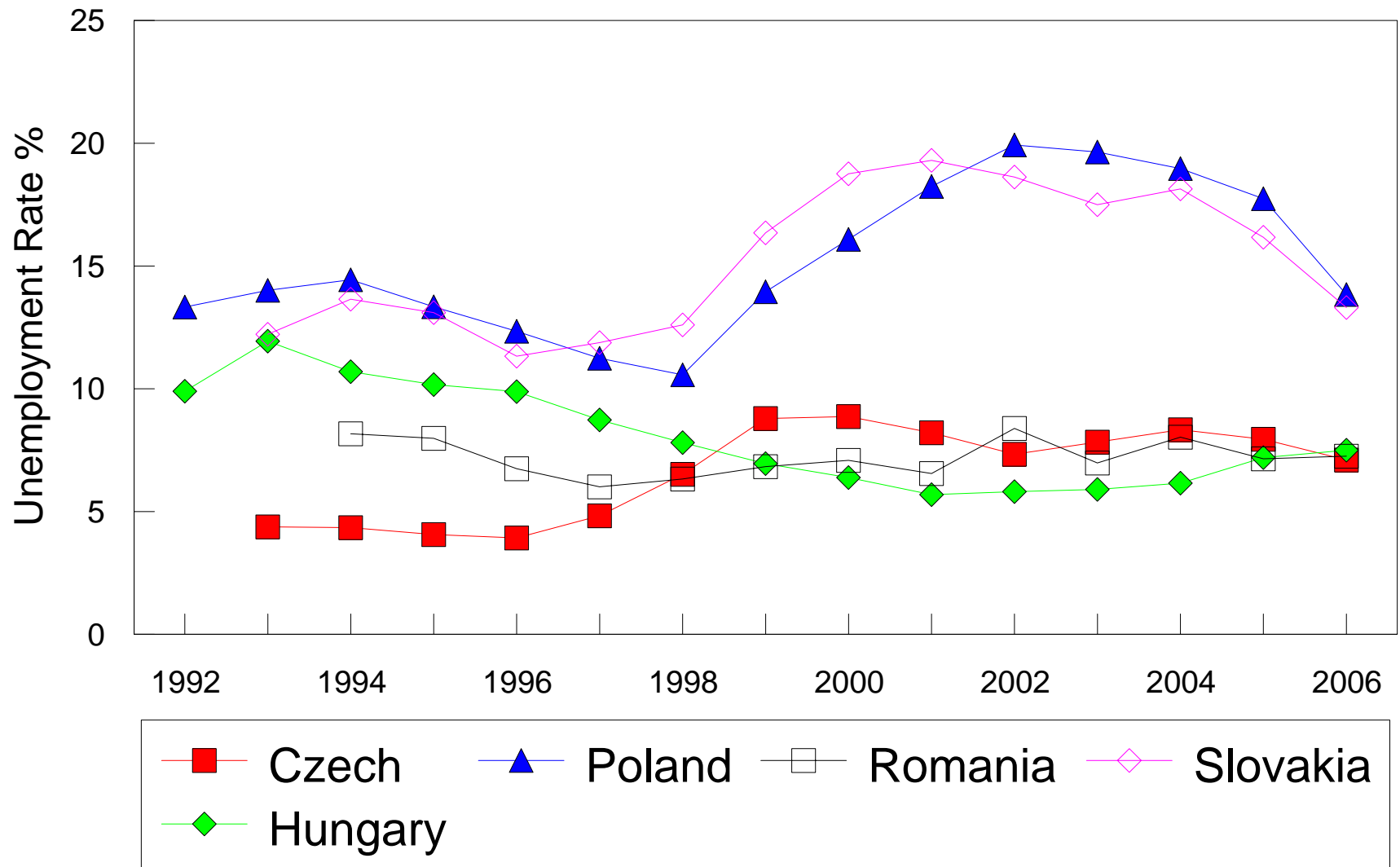


Chart 2. Unemployment Rates in Southern CEE Countries

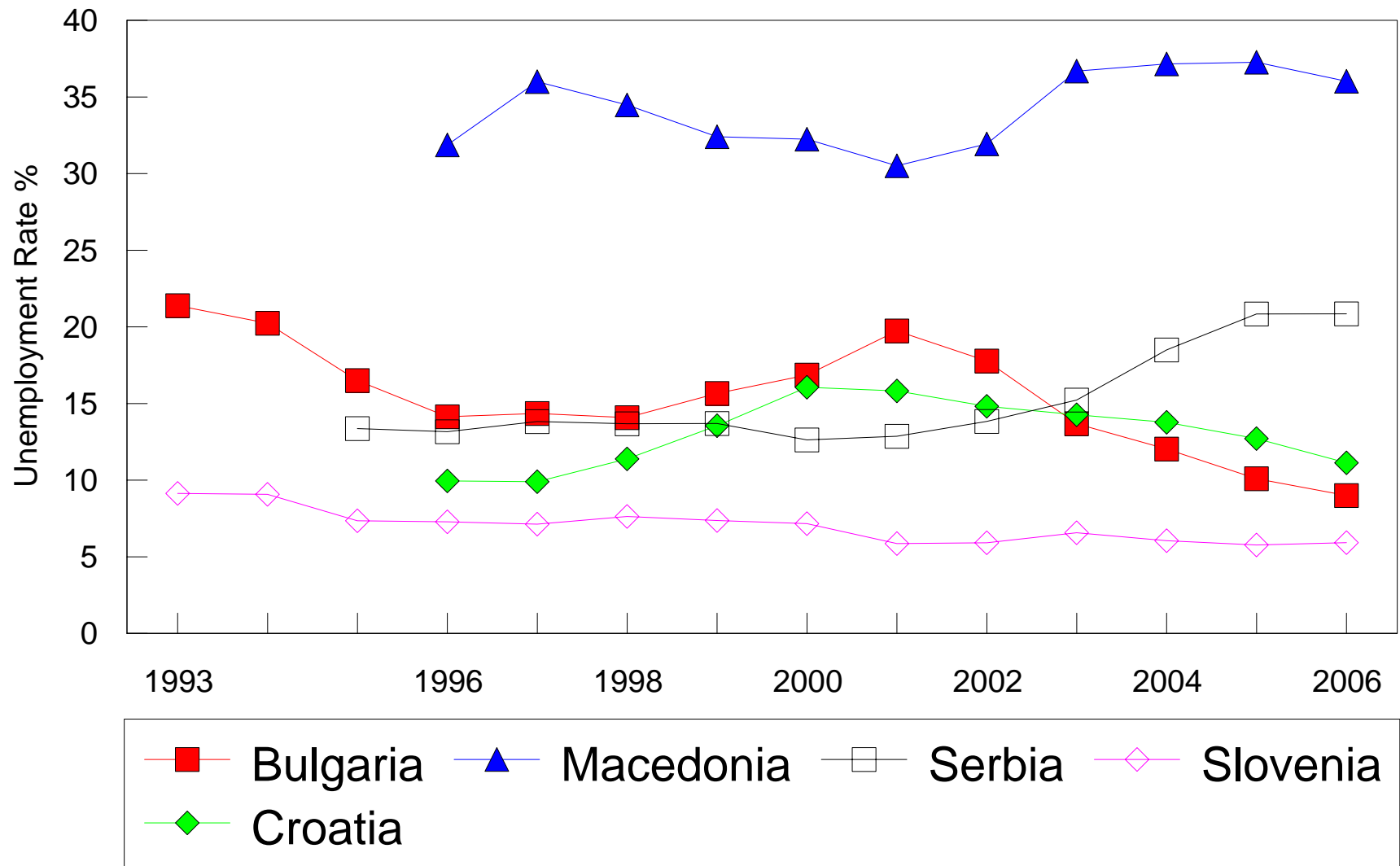
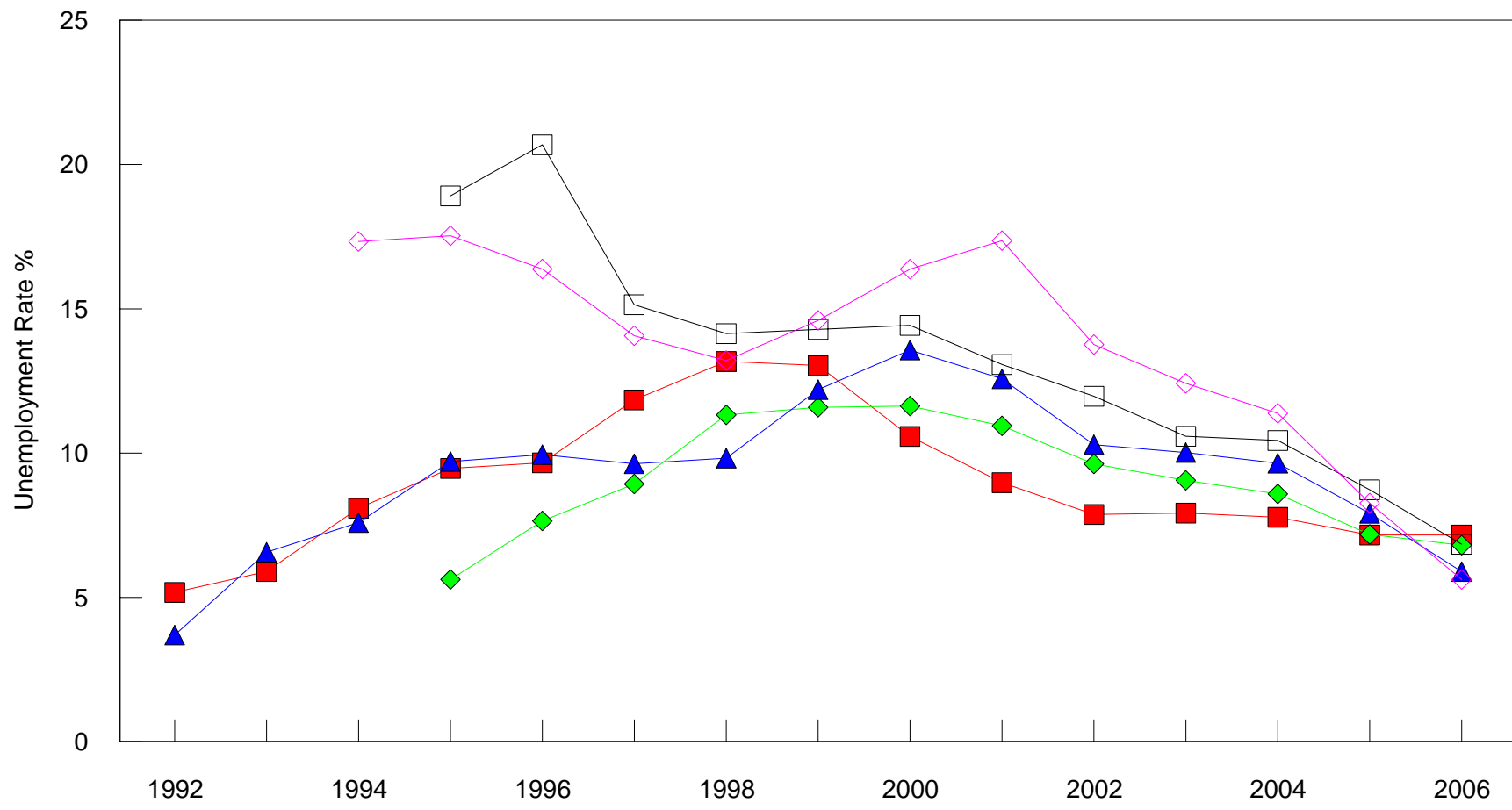


Chart 3. Unemployment Rates in Russia, Ukraine and the Baltics



■ Russia ▲ Estonia □ Latvia ◇ Lithuania
◆ Ukraine