How Important Are Labor Market Institutions for Labor Market Performance in Transition Countries?

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December 2009

I Z A

DISCUSSION PAPER SERIES

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ABSTRACT

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This paper offers a first comprehensive study of the relationship between labor market institutions and policies and labor market performance in the countries of Eastern Europe and Central Asia, which in the last two decades experienced radical economic and institutional transformations. Based on a new and unique hand-collected dataset, the paper first documents the evolution of labor market institutions and policies in the transition region. The data show a clear trend towards liberalization of labor markets, especially in the countries of the former Soviet Union, but also substantial differences across the countries studied. Second, the paper takes advantage of the large variation in the key economic and institutional variables to test several predictions concerning the role of institutions and polices in explaining labor market outcomes. The results of our econometric analysis are generally consistent with the view that institutions matter for labor market outcomes, and that deregulation of the labor markets improves their performance. The analysis also suggests several significant interactions between different institutions, which are in line with the idea of reform complementarity and broad reform packages. We also show that there are important advantages of focusing on a broader set of labor market outcomes, and not only on the unemployment rate, which until now has been the main approach in the empirical literature.

JEL Classification: E24, J21, P20

Keywords: labor market institutions, unemployment, transition economies

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1. Introduction

Over the last two decades, the labor economics and macroeconomics literature has seen a lively debate concerning the role of labor market institutions and policies in explaining labor market performance. The initial interest was sparked by the remarkably divergent patterns of unemployment within the group of OECD countries (especially between the US and continental Europe) observed since the 1970s, with the term Eurosclerosis taking hold among some labor economists. In the early 1990s, several theoretical contributions, most notably the seminal work by Layard, Nickell and Jackman (1991), provided essential background for the discussion of the role of institutions and policies in shaping aggregate unemployment. At the same time, greater availability of data, in particular, as regards measurement of institutions, spurred quantitative empirical research with seminal contributions by Scarpetta (1996), Nickell (1997), Elmeskov, Martin, and Scarpetta (1998), as well as by Blanchard and Wolfers (2000), among others. A further impetus for research in this field came from policy recommendations by international organizations such as OECD and IMF which, based on own analyses, advocated systematic institutional deregulation of the labor market as a major means of tackling high unemployment (OECD 1994, 1997; IMF 2003).

The early studies, such as Nickell (1997), focused on the role of particular institutions, thus assuming that a great deal of labor market dynamics in the OECD countries can be attributed to changes in institutions only. This pure institutional approach was challenged by a number of scholars who pointed out that changes in institutions between the 1960s and 1980s were infrequent and rather small to explain the huge divergence between the OECD economies' labor markers, and therefore proposed an explanation based on interactions of institutions with economic shocks (Blanchard and Wolfers 2000; Bertola, Blau and Kahn 2002). While it still remains an open issue whether the model interacting shocks with institutions performs substantially better than the model with pure institutions (see Nickell, Nunziata and Ochel 2005), the attention of labor economists has recently shifted to the idea

that institutions may interact with each other in a systematic manner (Coe and Snower 1997; Belot and van Ours 2001; Bassanini and Duval 2009). The main question in this strand of literature is the complementary nature of labor market institutions and policies, which if shown to hold, would provide a rationale for the implementation of broad reform packages. In addition, a growing number of recent studies have focused on the role of institutional arrangements beyond the labor market, such as the degree of competition on the product market and the development of the financial market (e.g., Amable, Demmou, and Gatti 2007; Fiori et al. 2007).

Despite such an explosion of interest in the role of institutions and policies in shaping labor market outcomes, the available evidence in the literature remains inconclusive and often contradictory. The magnitude and statistical significance of coefficients on institutional variables vary a great deal from specification to specification, suggesting the lack of robustness (see, e.g., the assessment in OECD 2006). As stressed by Blanchard (2006) who summarizes the state of knowledge in the field, there is little doubt that institutions matter, the question is which ones and how. While most of the studies suggest that institutional rigidities are indeed responsible, at least partially, for the poor performance of labor markets, and thus support a deregulatory view of labor market policies (IMF 2003; OECD 2006), several authors are critical of this view (Baccaro and Rei 2007; Howell et al. 2007). Also, the question of reform complementarities has not received a clear answer either. Several studies have reported significant coefficients on interactions of institutional variables (Belot and van Ours 2001; Bassanini and Duval 2009), but the results do not appear to be very robust and in some cases cannot be easily interpreted.

Importantly, the bulk of the available evidence concerning the impact of institutions and policies on labor market performance is based on data from two dozen OECD countries. Only in recent years, some scholars have started looking at the role of labor market

institutions and policies in non-OECD (less developed) economies (Botero et al., 2004; Feldman 2008). To a considerable extent, such interest stemmed from a much larger variation in institutions and labor market policies as well as in labor market outcomes across such an extended (as compared with OECD) list of countries, both in the cross-section and time dimension. For example, Djankov and Ramalho (2009) state: "Developing countries present an exciting venue for studying the impact of regulatory reforms, including of labor reforms. A number of countries, especially in Eastern Europe, have recently undergone significant reforms to make labor regulation more flexible." In addition, data from less developed countries can help reveal whether the previously obtained conclusions for the OECD economies can be generalized to other regions of the world. Unfortunately, the potential of non-OECD countries to contribute to the economics literature in general has not yet been fully realized because of the general lack of availability of data and/or their low quality.

Our paper serves two purposes. Based on a novel and unique hand-collected dataset covering the countries of Eastern Europe and Central Asia over 1995 to 2008, it offers a first comprehensive study of the evolution of labor market institutions and policies in the transition economies. The paper also revisits the existing evidence concerning the role of labor market institutions and policies in shaping labor market outcomes, using the newly constructed dataset. In particular, the paper considers the issue of interactions between institutional variables, and thus provides new evidence on the complementary nature of labor market institutions and policies.

Figure 1 shows the four labor market outcomes analyzed in our study, the employment-to- population ratio, the unemployment rate, youth unemployment and long-term unemployment. Figure 2, on the other hand, presents the labor market institutions and policies that we wish to link to labor market outcomes: employment protection legislation, union density, the tax wedge on labor, the maximum duration of unemployment benefit, the

average replacement ratio and expenditures on active labor market policies. Being the first comprehensive study of its type in the transition region, the paper might be of considerable interest to labor economists who study transition countries. At the same time, it might also be of general relevance in the economic policy debate for at least two reasons. First, the use of new, but largely unexplored data has the potential of providing a robustness check to the results obtained for developed market economies with OECD data. Second, changes in labor market outcomes as well as changes in institutions and policies are more marked over time in transition countries than they are in mature OECD countries providing thus a natural testing ground of the theoretical considerations that link labor market institutions and labor market outcomes. We thus feel that our analysis can contribute in a substantial way to the literature that discusses the long-standing question of whether and how institutions and policies affect outcomes in the labor market.

Our data show a fairly modest level of institutional rigidities in the labor market and a general trend towards liberalization since the mid-1990s in the whole transition region. However, there are important differences across countries. In particular, changes in institutions and policies in Central Europe have been rather modest since the mid-1990s, except for the declining unionization and decreasing expenditures on active labor market policies. In contrast, the countries of the former Soviet Union have considerably liberalized their unemployment protection legislation and reduced the tax wedge on labor during the last 15 years, thus establishing the least stringent regulation of the labor market in the whole transition region. The results of our econometric analysis relating institutions and policies to labor market outcomes are generally consistent with the view that institutions matter and that deregulation of the labor market can improve its performance. There is also evidence that institutions interact with each other, which is consistent with the idea of reform complementarities and which provides support for broad reform packages. The study also

suggests important advantages of focusing on a broader set of labor market outcomes, and not only the unemployment rate, which until now has been the main approach in the empirical literature.

The paper has the following structure. In section 2 we provide a brief overview of the development of labor markets as well as of institutional reforms in transition countries and discuss the hitherto scarce literature linking these two. Section 3 presents the employed data and in doing so discusses the challenges and pitfalls of data collection in the region. The section concludes with a descriptive analysis of the data. Section 4 describes our research strategy and the econometric specifications we use, while section 5 discusses the econometric results. In section 6 we draw some conclusions.

2. The evolution of labor market institutions and outcomes in the transition countries and their reflection in the literature

Several scholars have already attempted to describe the evolution of labor market institutions and policies in the transition countries of Eastern Europe and Central Asia as well as to analyze links between these institutions and policies and the performance of labor markets (e.g., Boeri and Terrel 2002; Cazes 2002; Fialova and Schneider 2009). Besides presenting evidence from this large and important region, several such studies were motivated by the idea that the transition environment provides the researcher with a unique laboratory for hypothesis testing (e.g., Svejnar 1999; Boeri and Lehmann 1999). Indeed, post-communist countries started with pretty similar initial conditions in terms of the performance of their labor markets. The latter were characterized by shortages of labor, no open unemployment, very high levels of unionization, and no unemployment protection.[1] Imposing market forces on the economies shaped by central planning with simultaneous creation, essentially from

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[1] With respect to open unemployment, the former Yugoslavia seems to be the only important exception. For example, Saveska (2000) shows that Macedonia (one of the six states that comprised the Yugoslav Federation) suffered from double-digit unemployment rates as early as in late 1970s.

scratch, of labor market institutions can therefore be regarded as a kind of natural experiment that may be extremely useful in testing economic theories (see, e.g., Muravyev 2008). Moreover, research focusing on the region can benefit from the enormous fluctuations of key economic variables over time and across space, which helps identify the relationship between the variables of interest.

We illustrate this point using data on the dynamics of GDP and unemployment in the transition region, which are presented in Tables 1 and 2. The data show, for example, that the initial recession lasted only a couple of years in Poland with GDP exceeding the pre-transition level already in the mid-1990s while neighboring Ukraine started recovering in 2000 only, after having lost almost 60% of its pre-transition GDP level.[2] Interestingly, despite this difference in the magnitude and length of the transition shock, the unemployment rate in Poland has persistently remained much higher than in Ukraine, 19.0% against 8.6% in 2004, as shown in Table 2. Also, according to these data, the Czech Republic and Slovenia have single digit unemployment rates while in Albania and Slovakia the unemployment has stayed above 10% for the most part of the reported period. Overall, the data show that a few years since the start of market reforms, the experiences of transition countries, including labor market outcomes, revealed great differences, often comparable with the differences between US and Western European labor markets (Rutkowski 1996). One important point that the data in Tables 1 and 2 seem to suggest is that the divergent labor market outcomes in transition countries cannot be attributed to economic shocks only. Institutions and policies, whether taken separately or in interactions, should be seriously considered as candidate explanations for this divergence.

The few existing studies that use data from transition countries have documented a number of trends in the evolution of labor market institutions and policies (see e.g., Svejnar

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[2] While the precision of these estimates may be an issue as the concept of GDP was not used in Eastern Europe and Central Asia before the late 1980s – early 1990s (the output in the economy was measured as Gross Material Product, which excluded services) the general pattern definitely holds.

2004). At the onset of transition, most countries started developing previously missing institutions and policies to ensure an effective functioning of labor markets. At that time, even if substantial unemployment rates were foreseen, the governments, especially in Central Europe, adopted fairly generous unemployment benefits schemes mainly out of political considerations.[3] These were subject to cuts, sometimes dramatic, in the 1990s (Riboud, Sanchez-Paramo, and Silva-Jauregui, 2002) as the governments struggled to keep budget discipline on the background of a considerable and largely unanticipated decline in output (Gomulka 1998). Unionization rates have been in decline throughout the region (Borisov and Clarke 2006; Kohl 2008), although the effectiveness of trade unions in promoting the economic interests of their members may have increased, especially in Central Europe (Rutkowski 1996).[4] The countries of the region introduced a number of tax reforms, e.g., the switch to the flat personal income tax rate has become a common feature of most countries, following the experience of Estonia in 1994. However, the tax burden on labor has remained rather high in Central Europe, though not in most of the other transition countries (World Bank 2007). While active labor market programs have been introduced throughout the region, their share in GDP has been lower than in the old member states of the EU and substantially lower in South-Eastern Europe and the former Soviet Union (World Bank 2005). Importantly, despite these general trends, the variation across countries within the same group has remained considerable. For example, Estonia and Slovenia are often mentioned among the success stories of the economic transition, but they have had perhaps the most dissimilar labor market institutions and policies among the CEE countries in the last 20 years.[5]

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[3] For example, in Poland the strong political position of "Solidarity" allowed the Mazowiecki government in December 1989 to introduce layoffs in labor legislation only in tandem with the introduction of a very generous unemployment benefit system.

[4] Prior to 1989, virtually all trade unions in the Soviet bloc were closely affiliated with and controlled by Communist governments and served nearly exclusively as the transmission belt of the policies of the Communist parties to the workforce. Defending the economic interests of workers was not part of the brief of these trade unions.

[5] In the year 2000, Estonia scored 2.4 on the OECD index of employment protection legislation that ranges from 0 to 6, spent less than 0.1 percent of its GDP on active labor market policies and the average unemployment

Despite the potential benefits from exploring these large variations in labor market outcomes, institutions, and policies in Eastern Europe and Central Asia, relatively little has been done so far. The main reason is the unavailability or the low quality of data, especially from the early stages of the transformation process. As a result, most of the existing studies in the context of transition adopt a partial approach by focusing on particular institutions and policies. For example, Nivorozhkin (2005) studies the effect of ALMP in Russia, Commander and Heitmueller (2007) discuss the role of unemployment insurance in unemployment dynamics of the countries in transition, and Behar (2009) focuses on both tax wedges and unemployment benefits in the new EU member states. Those papers that attempt to evaluate the whole set of the core institutions together (along the lines of Nickell 1997) adopt either a purely descriptive approach or supplement data from a few transition countries with data from the OECD economies or EU member states (see, e.g., Cazes and Nesporova 2003b, Ederveen and Thissen 2007, and Fialová and Schneider 2009). While there are potential benefits of combing data from established market economies with those from transition countries, it may require more careful econometric modeling and estimation than has been done thus far to account for different initial conditions, shocks, and differences in the general institutional environment.

Overall, the evidence concerning the link between institutions, policies, and labor market outcomes in transition countries is very scarce. As in developed market economies, there is some indication that at least some of the labor market institutions matter in the countries of the region. But as stressed in Blanchard (2006), the key question is which ones and how. Looking at specific institutions, several studies suggest that employment protection may indeed affect labor market outcomes in the transition countries (e.g., Cazes and Nesporova 2003a). Active labor market policies seem to matter, too (Rovelli and Bruno

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benefit was only 8 percent of the average wage. The corresponding numbers for Slovenia were 3.3, 0.5 percent and 44 percent, respectively.

2007). The study by Fialova and Schneider (2009) suggests a role played by the tax wedge, but the sample combines transition and OECD countries. The study by Behar (2009) finds some (albeit weak) evidence that tax wedges and the duration of unemployment benefits are associated with poor labor market outcomes. In contrast, Commander and Heitmueller (2007) find no link between the generosity of the unemployment benefits and unemployment rates in transition countries and suggest that the overall link between institutions and unemployment rates is weaker in transition countries than in Western Europe and other OECD countries.

3. Data

This paper is based on a novel and unique hand-collected database of labor market outcomes, institutions and policies in the countries of Eastern Europe and Central Asia assembled by us. To the best of our knowledge, this is the most comprehensive and most up-to-date database of this sort collected for the region. It contains information on key macroeconomic variables (such as GDP growth and inflation), key labor market statistics (the employment-to-population ratio, the unemployment rate, the long-term unemployment rate and the youth unemployment rate), employment protection legislation statistics, which follow the OECD standard (OECD 2004), information about the generosity of the unemployment benefit systems (average replacement ratio and maximum duration of unemployment benefits), about taxation of labor, namely the tax wedge on labor that measures the cumulative effect of the payroll tax paid by employers and income tax paid by employees, as well as key data on trade unions.[6]

The main principle underlying the data collection effort was to achieve maximum compatibility of our data with OECD and EU standards. Therefore, the major sources of data for this paper are the OECD and EUROSTAT databases for the countries that during the

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[6] The list contains the core set of five labor market institutions and policies identified in the previous literature (Eichhorst, Feil, and Braun 2008).

2000s became members of the European Union; World Bank and IMF statistics; as well as national statistical sources. Almost all the required data are easily available from the mentioned sources for Central European countries that joined the EU in 2004. The quality of the data is very high in these cases. As regards countries from South-Eastern Europe and the Commonwealth of Independent States, the availability and quality of data is of a much lower standard. In many instances, we have to rely on secondary sources and estimates provided by World Bank or IMF staff in working papers, policy reports, etc., country reports published by other institutions (e.g., the ILO and national research centers) as well as working papers and articles published in academia. The database we have constructed contains links to the original sources of data so that each number entered can be verified.

The database covers a 14 years period between 1995 and 2008 and thus excludes the very early years of the transition. We opted not to collect data from the first half of the 1990s for two reasons. First, the limited availability and low quality of data in the early years of the transition, especially in the countries of the former USSR, would leave most of the cells in the database empty. For example, Ukraine, the second largest country in the region, did not produce unemployment statistics based on the ILO definition until the mid-1990s. Second, the early 1990s were still the time of the transition shock, with substantial deviations from equilibrium conditions in the economies. Since theory suggests that labor market institutions affect equilibrium unemployment rates, these observations would have been of limited, if any, use in the regression analysis that tries to establish the long-run relationship between labor market institutions and policies on the one hand and labor market outcomes on the other hand.[7] Details about the construction of the database are shown in Appendix II of the paper.

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[7] Standard remedies suggested in previous studies, such as the use of variables controlling for the output gap, and in particular the estimates based on the Hodrick-Prescott filter, may not suffice in the case of a one-time permanent shock such as the transition-induced collapse of output. For example, Beck, Kamps, and Mileva (2007) argue in the case of Russia that estimates based on the Hodrick-Prescott filter represent very rough approximations of the potential output and should be treated with great caution.

We had to drop several countries (Belarus, Tajikistan, Turkmenistan, and Uzbekistan) from the final estimation sample because of severe data problems.[8] For example, Belarus does not collect statistics measuring ILO unemployment; moreover, the wage setting in the country is still heavily influenced by the state via the so-called wage grid not only in the public sector, but also in the private sector. Trade unions remain heavily influenced by the state, too. These particular institutional arrangements simply imply that the standard mode of analysis typical of free market economies cannot be directly applied to these four countries.

We first take advantage of the extensiveness and accuracy of our database to discuss the general trends in the evolution of labor market institutions and polices, as well as employment outcomes, in the region. This has been done before, but most of the analysis provided in previous studies was more fragmentary (in terms of country coverage as well as in terms of time dimension) and less supported by hard numbers compared to our paper.[9] Thus, one of the contributions of our paper is to provide a bigger and cleaner picture of the recent trends in the region.

Because of the small variation over time in a number of key variables (employment protection legislation is probably the best example), we will provide and discuss the key statistics from four years covering mid- and late transition: 1996, 2000, 2004, and 2008. For expositional ease, we also classify the countries into three major groups, which are typical of the literature studying the region: Central Eastern Europe (CEE, embracing the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia), South Eastern Europe (SEE, which includes Albania, Bosnia and Herzegovina, Bulgaria, Macedonia, Montenegro, Romania, and Serbia), and the Commonwealth of Independent States (CIS, which until recently included 12 out of 15 constituent republics of the former

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[8] These are also the countries that have been regarded as extreme laggards in transition from plan to market by the EBRD (see EBRD, various years).
[9] Such previous analyses include Cazes and Nesporova (2003b), Eamets and Masso (2004), World Bank (2005), and Cazes and Nesporova (2006), among others.

USSR, namely Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Ukraine Tajikistan, Turkmenistan, and Uzbekistan with Georgia officially leaving the organization in August 2009). For presentational purposes, most data will be shown in such an aggregated form; whenever essential, however, we will also provide and discuss data from particular countries. Finally, for comparison purposes, we will also provide respective statistics for the US and the old member states of the European Union (the EU-15).

Figures 1 and 2 summarize labor market outcomes and labor market institutions for the mentioned three groups of the transition countries as well as for the EU-15 and the United States. The employment-to-population ratios[10] show some striking patterns between the three regions. The ratio is substantially smaller in SEE than in the other two regions. It is u-shaped for CEE and CIS, indicating an upturn in labor demand in the later part of transition, while in SEE it shows a strong downward trend. Unsurprisingly the highest ratio is found in the U.S., while the EU-15 ratio, demonstrating a monotonically increasing ratio is only slightly higher than in CEE and CIS. The unemployment rates also exhibit interesting patterns even if we average the rates within regions and present roughly a mirror image of the employment-to-population ratios. However, it is noteworthy that unemployment rates are higher in CEE than in CIS even though the employment-to-population ratios hardly differ. The other important feature that should be mentioned is the large drop in the unemployment rate between 2003 and 2007 in CEE and SEE, whereas the unemployment rates drop gently in the CIS, in EU-15 and the U.S.[11] Long-term and youth unemployment rates are far higher in SEE than in the other two regions. The largest drop in both rates between 2003 and 2007 can be observed in

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[10] Since statutory retirement varies across the 5 regions shown in Figure 2, we present the ratios for the population aged between 15 and 59.

[11] Part of this large drop in the unemployment rate in CEE and SEE is caused by the migration possibilities arising after accession of the NMS. However, since labor demand also rises in these countries between 2003 and 2007 (Rutkowski 2007), migration cannot explain the entire drop. Disentangling the various factors causing the fall in unemployment after accession has not been tackled satisfactorily in the literature (see Lehmann 2009).

CEE, which could be partially related to increased migration activities after accession. It is also noteworthy that the long-term unemployment rate in the U.S. is miniscule compared to the other four regions, which is not surprising given the 6 months of benefit duration and the virtual lack of income support of any kind for the long-term unemployed.

Turning to measures representing labor market institutions we can see the far larger changes in these measures for the transition countries (especially from SEE and the CIS) than for mature capitalist economies. For example, the employment protection legislation index shows decline in all the sub-regions (with a considerable fall in the CIS). In two out of the three regions, namely CEE and CIS, labor market have become even slightly less protection friendly than the EU-15, which show a very modest decline over the entire period. We see a monotonically declining union density rate in CEE and a halving of the rate in the CIS, while in SEE it declines from about 50 to roughly 40 percent. In EU-15 and the U.S. density rates hardly move over the entire period. In the chart on the tax wedge two points are apparent: the tax wedge is far lower in the U.S. than in the other four regions, and the wedge fell dramatically after 1999 in the CIS and declined substantially in SEE. In contrast, there is only a mild downward trend in CEE, something we do not observe in the EU-15 at all. On this measure, labor markets in all transition regions became substantially more flexible than labor markets in the EU-15.

The last three charts deal with active and passive labor market policies and should be looked at together. The EU-15 on average spends roughly 1 percent of GDP on ALMP while all transition regions spend only small fractions of this. Especially the CIS spends very little on such policies. The U.S., on the other hand has the shortest maximum duration of benefits combined, however, with a relatively high replacement rate. The EU-15 combines long maximum duration with relatively generous unemployment benefit levels, which might go some way in explaining the relatively large long-term unemployment rates. CEE and SEE

have maximum durations of roughly one year, whereas the CIS exhibits the shortest durations after the U.S. as of 1999. Replacement rates are very non-generous in CEE and the CIS, while SEE has somewhat higher rates.

Overall, Figures 1 and 2 show striking differences across transition regions and over time with regard to labor market outcomes as well as to labor market institutions. It is this variation that we hope to exploit in our econometric analysis.

4. Econometric analysis

Our analysis of the links between labor market outcomes on the one hand and labor market institutions and policies on the other hand draws heavily on the model proposed in the seminal study by Nickell (1997). In that study, labor market outcome variables are explained by a set of variables measuring institutions and policies, as well as by the change in inflation. We proceed in an essentially similar fashion by considering, in the baseline specification, six variables characterizing institutions and policies as well as two macro controls: change in inflation and cumulative growth of GDP in the 3 years before labor market outcomes are measured.[12] We then test the robustness of the results by removing some of the macro controls or replacing them with alternative measures (such as output growth relative to the pre-transition level of 1989)[13] as well as by deleting 1 to 5 percent of influential observations from the estimation sample.

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[12] Change in inflation is the key control variable introduced in Nickell (1997) to account for the deviation of the unemployment rate from its natural level and is used in most subsequent studies. As there are concerns about the appropriateness of this measure in the transition context (Cazes 2002), our baseline specification includes a measure of a recent change in GDP, which aims to better account for macroeconomic shocks to which transition economies were still prone to even after the initial recession of the late 1980s – early 1990s.

[13] We have also considered several additional control variables, such as proxies for enforcement of institutions, which is likely to be sub-optimal in the countries studied. We have attempted to introduce a separate variable measuring enforcement of law based on the data from four waves of the Business Environment and Enterprise Performance Survey (BEEPS), as in Pistor, Raiser, and Gelfer (2000). However, these enforcement measures appear to be too noisy and do not alter the baseline results in any substantial way. As the enforcement of employment protection legislation may be stricter in richer countries that spend more on the judiciary, we have also considered introducing a measure of GDP per capita in the regressions. The results remain qualitatively the same as in the baseline specification, however.

Our results do not necessarily have a causal interpretation as both institutions and policies may be shaped by labor market outcomes, for example, via the mechanism of elections (Blanchard 2006).[14] Nevertheless, we try to avoid a direct manifestation of the endogeneity problem by using lagged (t-1) values of the explanatory variables, which can then be regarded as predetermined. So, while labor market outcomes are measured in 1996, 2000, 2004, and 2008, data on institutions and policies come from 1995, 1999, 2003, and 2007.

Similar to most other studies, we control for omitted factors (including unobserved characteristics of countries) by using random- or fixed-effects specifications of our regression model. These are necessary as the paucity of the degrees of freedom does not allow inclusion of many potentially relevant explanatory variables. The baseline regression equation can then be written in the following way:

$$
\begin{aligned}
LMO_{it} = \alpha + \beta_1 EPL_{it-1} + \beta_2 ALMP_{it-1} + \beta_3 TAX_{it-1} + \beta_4 DENS_{it-1} + \beta_5 BEND_{it-1} + \beta_6 BENF_{it-1} + \\
+ \beta_7 \Delta Inflation_{it-1} + \beta_8 \Delta GDP_{it-1} + \gamma_t + c_i + \varepsilon_{it}
\end{aligned}
\tag{1}
$$

where index i denotes counties and index t denotes time, $t \in \{1996, 2000, 2004, 2008\}$, LMO stands for labor market outcomes (the employment-to-population-ratio - ER, unemployment rate - UR, long-term unemployment rate - $LTUR$, and youth unemployment rate - YUR), EPL measures the strictness of employment protection legislation, $ALMP$ is the expenditure on active labor policies as a percentage of GDP, TAX is the tax wedge on labor, $DENS$ measures union density, $BENF$ stands for the average unemployment benefit replacement rate, $BEND$ stands for the maximum duration of unemployment benefits, $\Delta Inflation$ is the change in inflation between time t and t-1, ΔGDP is the cumulative growth of GDP in years t-3, t-2, and

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[14] We intend to explore the political dimension of labor market reform in transition countries in a separate paper.

t-1, γ is a time effect, c is a country effect and ε is a white noise disturbance. As much of the previous studies, we do not apply logarithmic transformation to the dependent variables in the model.[15]

As can be seen from the specification of equation (1), one substantial difference from the study by Nickell (1997) is that we do not employ three variables measuring the role of trade unions, since we only have reliable data on union density. Union coverage rates as well as data on bargaining type, the other two variables used by Nickell, are generally only available for CEE countries. In addition, including, e.g., data on bargaining type is not only a problem of measurement, but also of how to interpret these data in some less developed transition countries. For example, how would one interpret data on bargaining in a country where trade unions with high membership rates are effectively controlled by the government? It is therefore no surprise that the World Bank did not provide statistics on the coverage rates and bargaining type in the CIS countries (World Bank 2005).[16] At any rate, we believe that we capture the essential aspects of wage setting with our union density variable since it is regarded as the most important of the related factors (Eichhorst, Feil, and Braun 2008).

Besides using a number of additional control variables, we check the robustness of the results by identifying (using Cook's D statistics) and excluding the most influential observations in the models estimated. In particular, we compare the baseline results with those obtained on sub-samples of the original dataset that exclude up to four most influential observations (roughly 5 percent of the total sample of 75 observations at hand). This is important as the data have been assembled from different sources of potentially different reliability, where the accuracy of some sources cannot be verified.

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[15] The regressions with log dependent variables show qualitatively similar results, albeit the fit of the models and the statistical significance of the coefficients worsen somewhat.
[16] This also suggests that the union density measures in the former Soviet Union need to be taken cum grano salis.

As a next step, pairwise interactions of labor market institutions and policies are introduced to the baseline specification. Given the paucity of the degress of freedom, only one such interaction is inserted at a time. As in Bassanini and Duval (2009), the interaction terms are defined in the form of products of deviations of the institutional variables from their sample mean. For example, in the case of the interaction between the tax wedge (*TAX*) and the size of the unemployment benefit (*BENF*), the following specification is estimated:

$$
\begin{aligned}
LMO_{it} = {} & \alpha + \beta_1 EPL_{it-1} + \beta_2 ALMP_{it-1} + \beta_3 TAX_{it-1} + \beta_4 DENS_{it-1} + \beta_5 BEND_{it-1} + \beta_6 BENF_{it-1} + \\
& + \beta_7 (TAX_{it-1} - \overline{TAX})(BENF_{it-1} - \overline{BENF}) + + \beta_8 \Delta Inflation_{it-1} + \beta_9 \Delta GDP_{it-1} + \gamma_t + c_i + \varepsilon_{it}
\end{aligned}
\tag{2}
$$

where $\overline{TAX}$ and $\overline{BENF}$ are the sample means (both over time and across countries) of variables *TAX* and *BENF*, respectively. As shown in Bassanini and Duval (2009), a negative and statistically significant coefficient on the interaction coefficient β_7 of two variables that negatively affect the performance of the labor market (for example, a positive change in the variables *TAX* and *BENF* are supposed to increase unemployment) would be consistent with reform complementarity.[17]

Besides definitions, descriptive statistics of the variables that we use in our regressions are given in Table 3. This table confirms the tremendous variation in the labor market outcomes and institution variables as well as the large differences in the main macro variables such as inflation and GDP growth in the transition countries.[18]

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[17] There are two important extensions of equation (2). First, we might want to apply instrumental variables to the interaction term in order to check for potential spurious correlations between two institutions that might be uncorrelated but where one of the two is a "stand in" for an omitted institution. Second, we also might want to interact one institution with the overall institutional environment as is done in Bassanini and Duval (2009). Finding appropriate instruments for each given interaction term and modeling the interaction of each institution with the overall institutional environment are left to future work.

[18] It is certainly arguable whether changes in labor market institutions in a rich transition country (Slovenia) have the same impact on labor market outcomes as in a very poor country (Kyrgyzstan); in other words, the slope parameters might not be stable across countries that differ greatly in per capita income[18], so one might want to interact GDP per capita with some of the institutions. Relatively large models are however excluded because of a

The control variables are certainly highly correlated with some of the labor market institution measures as Table 4 demonstrates. We see that employment protection legislation is negatively correlated with the employment-to-population ratio but positively correlated with the other three outcome variables. Neither the tax wedge, union density, nor benefit duration show significant raw correlations with labor market outcomes, while the replacement rate and ALMP are weakly correlated with long-term and youth unemployment rates, respectively.

5. Presentation and discussion of econometric results

The random effects and fixed effects estimates of the baseline specification (1) are reported in Table 5. The two estimators give very similar results and since the Hausman test does not reject the consistency of the random effects estimator in the sample being analyzed, we find it sensible to focus on the random effects estimates because of their greater efficiency and because a random effects estimator is meant to capture omitted time-invariant institutions. We shall first discuss the results in Table 5 and then see whether the institutions that significantly determine labor market outcomes in the baseline regressions maintain their predictive power in a series of robustness checks.

According to the results in Table 5, the employment-to-output ratio is affected by labor market institutions even with year dummies included. Employment protection legislation depresses this ratio by a substantial amount as do union density and the tax wedge on labor, while it increases the youth unemployment rate. Also ALMP turn out to be significant in the regression that uses the youth unemployment rate as the dependent variable. In particular, a one percent increase in ALMP expenditures (a very unrealistic scenario given the low levels of ALMP expenditures, averaging just 0.2% of GDP in the sample) will lower

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lack of degrees of freedom and we still might need to experiment to find a more satisfactory model than the one that augments equation (1) with the three control variables inflation, GDP per capita and GDP growth.

youth unemployment by 10 percentage points.[19] Several other coefficients have the expected signs and t-statistics exceeding one in absolute value, but are nevertheless insignificant at the conventional levels. Examples include EPL in the regression with long-term unemployment rate as well as union density in the regression with unemployment rate as the dependent variable. It is also noteworthy that the time dummies pick up the decline of the employment-to-population ratio over the whole period and the spike of unemployment around the turn of the century (cf. Figure 1).

Tables 6 and 7 show the results of estimation of the same baseline model after removing 1 to 5 percent of influential observations in the data. In comparison to the results in Table 5, the estimates in Table 6 (which are obtained after dropping 1 to 2 observations) suggest that ALMP have a broader effect in the labor market, affecting not only youth unemployment, but also long-term unemployment and the overall unemployment rate. The role of the tax wedge in depressing the employment to population ratio also becomes more pronounced. The other variables fail to achieve statistical significance at the conventional levels. However, the results in Table 7 (which are obtained after dropping 4 observations) show significant coefficients on EPL, ALMP, the tax wedge, and union density and are fairly similar to the previous estimates.

When different macroeconomic controls are used, most of the results concerning the role of institutions and policies in explaining labor market performance remain (see Tables A1, A2, A3, and A4 in Appendix I). In particular, EPL and ALMP remain the most influential factors in the models. A new interesting new result (however, not very robust) is the positive association between long-term unemployment and benefit duration (Tables A3 and A4).

Overall, the results show that EPL and ALMP are the two institutions that have a strong impact on labor market performance. We think that the correlations we have presented

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[19] More realistically, raising ALMP by 0.1. % of GDP will lower youth unemployment by 1 percentage point.

can be interpreted as causal effects running from these labor market institutions to labor market outcomes. There are several reasons for this assertion. First, we use a lag structure, regressing labor market outcomes at time t on labor market institutions at time (t-1). Second, labor market institutions evolve relatively slowly even in transition countries and are, therefore, to a great degree predetermined. Third, the level of expenditures on ALMP is very small in all transition countries and the budgetary process predetermines national expenditures on ALMP. Thus, it is hard to believe that changes in labor market outcomes cause substantial changes in expenditures on ALMP at the national level within a year.[20] In summary, our evidence clearly shows that labor market institutions play an important role in explaining labor market outcomes. In particular, employment protection legislation has a negative impact, while expenditures on ALMP have a positive impact on labor market performance. The tax wedge, union density and benefit duration also appear to play some role, confirming the priors that they depress employment and raise unemployment, but these effects are much less well defined and are not as robust to the checks implemented as are EPL and ALMP.

We now turn to the regression analysis that deals with the interactions of institutions. As already mentioned, we introduce one interaction at a time in the regression model which is then estimated using the random-effects estimator. As we have 6 institutional variables, there are 15 possible interactions. Table 8 shows the results of estimating model (2) for the four dependent variables and 15 pair-wise interactions. Note that the table reports only the estimated coefficients on the interactions as well as the associated standard errors, and each estimate comes from a separate regression.[21] The first most interesting result in Table 8 concerns interactions of ALMP with other institutions. Specifically, we find positive and significant coefficients on the interaction of ALMP with the tax wedge (for unemployment

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[20] Lehmann and Kluve (2009) stress that in transition countries the budgetary process causes expenditures at the national level to be predetermined at the beginning of the year. Governments might reallocate ALMP funds across regions due to a rise or fall of unemployment in certain regions, expenditures at the national level are, however, hardly ever affected by changes in labor market outcomes.

[21] These separate regressions are not shown here but available upon request.

and long-term unemployment), positive and significant coefficients on the interaction of ALMP with union density (in all regressions except for the one with employment to population ratio), as well as a positive and significant coefficient on the interaction of ALMP with EPL in the regression with long-term unemployment rate as the dependent variable. Overall, these results may be interpreted as suggesting that active labor market programs are more effective in tackling unemployment in an economy with lower taxes, lower unionization, or lower employment protection.[22]

The second most interesting result in Table 8 concerns the interaction of the tax wedge with benefit duration. This interaction enters the regressions with long-term unemployment and youth unemployment with negative and statistically significant coefficients. These suggest complementarity between policies aimed at reducing the tax wedge and policies aimed at restricting the duration of unemployment benefits. The effect of one measure will be stronger if accompanied by the other one.

We have also checked if these results concerning the interaction terms are robust to changes in the list of macro controls. The results of such robustness checks are reported in Tables A5 and A6 of Appendix I and show that the previously discovered patterns are fairly stable. Overall, there is evidence in our data that institutions and policies interact with each other in shaping labor market outcomes in the manner that is consistent with the idea of reform complementarity.

Our analysis also allows some tentative conclusions about the differential effects of institutions and policies on different labor market outcomes. Perhaps the most interesting result in this regard is that EPL negatively affects the employment-to-population ratio, but does not appear to affect unemployment, except for youth unemployment. If EPL indeed reduces the employment-to-population ratio, but this reduction is only accompanied by an

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[22] We should note that when an increase in a labor market policy measure like ALMP is predicted to improve labor market performance a positive coefficient on the interaction term implies reform complementarity.

increase in youth unemployment, this first of all has the straightforward interpretation that EPL *ceteris paribus* depresses labor demand via the channel of reduced hiring of young workers. But having no impact on the overall unemployment rate it might additionally imply that strong employment protection pushes workers into unprotected informal employment relationships or directly into the informal sector of the economy. By the same token, our results show that higher tax wedges on labor depress the employment-to-population ratio, but there is no corresponding effect on the unemployment rates. So, this seems to suggest that higher taxes on labor further the incidence of informal work in transition countries.

In OECD (2008), higher values of the two mentioned institutions, EPL and taxes on labor, are indeed found to boost informal employment in the Visegrad countries and in Slovenia. While there is strong and unequivocal evidence that taxes on labor have a deleterious effect on formal employment, the evidence on the impact of EPL is more mixed since only where enforcement mechanisms are weak enhanced employment protection makes firms hire workers on an informal basis. So, even though we do not have a reliable measure of informality in our data set, our results produced for the largest set of transition countries to date seem to suggest that more rigid labor market institutions and higher costs on labor encourage informal employment.

Our analysis is only a first attempt at linking labor market outcomes and institutions in transition countries since there are three areas neglected here that need to be addressed in a future research effort. First, our estimation strategy needs to be refined insofar as we need to look at the interactions of shocks and labor market institutions. The second area relates to international migration as a means of mitigating the tension in the labor market. Nickell (1997) proceeded under the assumption that "[d]ifferent European countries are effectively different labor markets with the intercountry movement of labor being very small, mainly because of language and cultural barriers." This may have been true in the 1980s in the EU-

15, but the recent experience of large temporary migration of workers from the new member states to the UK and Ireland has to be interpreted as evidence that migration matters for labor market outcomes in host as well as sender countries. Also, until recently there were millions of foreigners (mostly from Central Asia and Caucasus, but also from Moldova, Belarus and Ukraine) working in Russia, often without permits, and in the mid-2000s, Russia was among the largest destination countries for immigrants. Third, there exists a varying degree of informal employment across transition countries. The informal economy was not insignificant even before the collapse of the iron curtain, but definitely took off in the less developed countries of the region in the 1990s. A dramatic decline in employment-to-population ratios observed in some countries of South-Eastern Europe and of Central Asia might point to a rise in informal employment. For example, Lehmann (2009) moots for Macedonia that a large part of the long-term unemployed are workers who are sporadically employed in the informal economy. Thus informal employment may distort the observed labor market outcomes in the less developed transition countries in a substantial fashion and our future research strategy needs to consider this.

Conclusions

We present a unique data set that covers labor market outcomes, labor market institutions and macroeconomic controls from early to late transition (i.e., from 1995 to 2008) for the majority of transition countries, including countries of Central and Eastern Europe (CEE), South-Eastern Europe (SEE) and most of the successor states of the Soviet Union. Our data set is unique in that we bring together compatible data on the above mentioned items from these three regions. We use these data to investigate the importance of labor market institutions for labor market outcomes in transition countries. Given the large shocks and their tremendous variation across countries and time and given the fact that changes in labor market institutions

over a relatively short span are more pronounced than in mature capitalist economies the pursuit of this research question strikes us as particularly fruitful with the help of the collected data.

The evidence that we present shows the importance of labor market institutions in the determination of labor market outcomes and is in line with the idea that deregulation of the labor markets improves their performance. In our preferred estimations we use the random effects estimator and lag the institutions and policies by one period. Because of this estimation strategy and because labor market evolve slowly over time we think of these correlations as pointing to causal effects that run from institutions to labor market outcomes. Importantly, we find that not all of the institutions and policies matter and when they do, then not to the same extent. In particular, we find a fairly robust negative effect of stricter employment protection and a rather robust positive effect of active labor market policies on labor market outcomes. The tax wedge, unionization, and benefit duration are also correlated with labor market outcomes, albeit to a lesser extent. The analysis also suggests several significant interactions between several institutions, suggesting their complementary nature and implying the need for broad reform packages. We also show that there are important advantages of focusing on a broader set of labor market outcomes, and not only on the unemployment rate, which until now has been the main approach in the empirical literature.

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Table 1. GDP level in percentage of GDP in 1989 (pre-transition).

country	1992	1996	2000	2004	2008
Albania	60.1	85.7	102.4	127.7	161.7
Armenia	47.6	48.8	59.2	92.6	145.2
Azerbaijan	67.9	37.4	51.1	71.7	160.3
Belarus	88.1	65.5	86.5	113.6	163.4
Bosnia & Herzegovina	35.0	32.0	61.7	73.8	92.4
Bulgaria	77.2	72.1	76.4	93.0	118.7
Croatia	67.3	74.0	81.9	98.1	115.6
Czech Republic	84.6	97.1	100.5	113.6	141.0
Estonia	67.4	67.5	88.0	117.6	145.2
Georgia	37.0	26.6	31.8	41.3	56.7
Hungary	82.4	88.5	106.3	125.9	138.5
Kazakhstan	84.0	61.4	69.1	103.1	140.8
Kyrgyzstan	83.9	59.1	72.4	87.3	104.9
Latvia	54.6	50.3	63.0	84.5	110.0
Lithuania	70.6	56.8	68.0	91.8	119.7
Macedonia	79.0	71.8	82.0	84.5	101.7
Moldova	58.1	36.8	34.5	45.2	56.8
Montenegro	60.5	49.3	56.9	62.7	84.5
Poland	88.1	109.6	134.3	150.8	185.6
Romania	75.0	88.1	80.2	101.5	129.7
Russia	78.7	58.0	65.2	82.5	107.9
Serbia	60.5	49.3	52.0	63.2	79.2
Slovakia	77.6	89.1	98.7	117.7	159.8
Slovenia	82.1	95.8	114.5	131.3	160.4
Tajikistan	65.6	38.3	46.1	67.6	89.7
Turkmenistan	90.9	58.6	76.6	143.4	221.3
Ukraine	77.5	40.5	40.7	57.3	69.6
Uzbekistan	89.8	83.8	96.9	117.9	161.5

Source: IMF (World Economic Outlook), World Bank (World Development Indicators), and EBRD.

Table 2. Unemployment rates in the transition countries, %.

country	1992	1996	2000	2004	2008
Albania	26.0	12.0	16.8	14.4	12.7
Armenia	1.8	9.3	11.7	9.6	6.3
Azerbaijan	0.2*	0.9*	12.8	8.4	6.1
Belarus	0.5*	4.0*	2.1*	1.9*	0.8*
Bosnia & Herzegovina	n/a	n/a	16.0	22.0	23.4
Bulgaria	15.3*	13.5	16.3	12.0	5.6
Croatia	15.3*	10.0	16.1	13.8	8.4
Czech Republic	2.6*	3.9	8.8	8.3	4.4
Estonia	3.7	9.9	13.6	9.7	5.5
Georgia	2.3*	2.4*	10.8	12.6	16.5
Hungary	9.8	9.9	6.4	6.1	7.8
Kazakhstan	0.4*	13.0	12.8	8.4	6.6
Kyrgyzstan	0.1*	4.3*	13.9	8.5	11.1
Latvia	2.3*	20.6	14.4	10.4	7.5
Lithuania	3.5*	16.4	16.4	11.4	5.8
Macedonia	26.3*	31.9	32.2	37.2	33.8
Moldova	0.7*	1.5*	8.5	8.1	4.0
Montenegro	n/a	26.1**	26.5**	30.3	14.7
Poland	13.6*	12.3	16.1	19.0	7.1
Romania	8.2*	6.7	7.1	8.0	5.8
Russia	5.2	9.7	9.8	7.8	6.4
Serbia	n/a	26.1**	12.1	18.5	13.6
Slovakia	11.4*	11.3	18.6	18.1	9.5
Slovenia	11.5*	7.3	7.2	6.1	4.4
Tajikistan	0.4*	2.6*	9.3	7.4	2.3*
Turkmenistan	2.4*	1.9*	4.9	2.6*	4.1*
Ukraine	0.4*	7.6	11.6	8.6	6.4
Uzbekistan	0.1*	0.3*	0.4*	0.4*	0.2*

Sources: ILO, IMF, TransMonee database. Observations marked by asterisk (*) represent registered unemployment rate. Data for Tajikistan 2008 refer to 2007. Observations marked by double asterisk (**) are registered unemployment rates for Yugoslavia; data taken from UNECE Economic Survey of Europe 1998 No. 1 and 2001 No. 2. Data for Turkmenistan 1992 refer to 1991, data for 1996 refer to 1997 and data for 2008 refer to 2006. Data for Ukraine 1992 refer to 1993. Data for Uzbekistan 2008 refer to 2006.

Figure 1. Labor market outcomes by region.

Employment to population ratio (15-59), %

Unemployment rate (ILO), %

Long-term unemployment rate, %

Youth unemployment rate, %
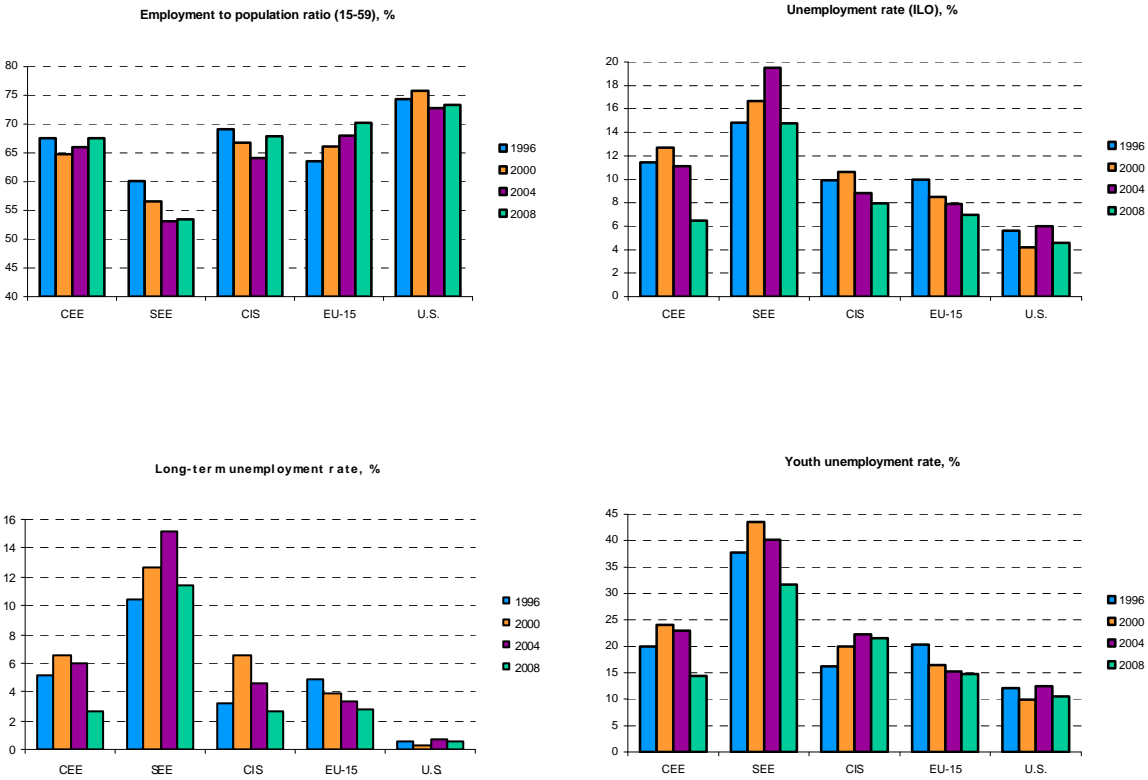
Figure 2. Labor market institutions by region.

Employment protection legislation (OECD methodology)

Union density, %

Tax wedge on labor, %

Expenditures on active labor market policies, % of GDP

Duration of unemployment benefit, months

Average replacement ratio
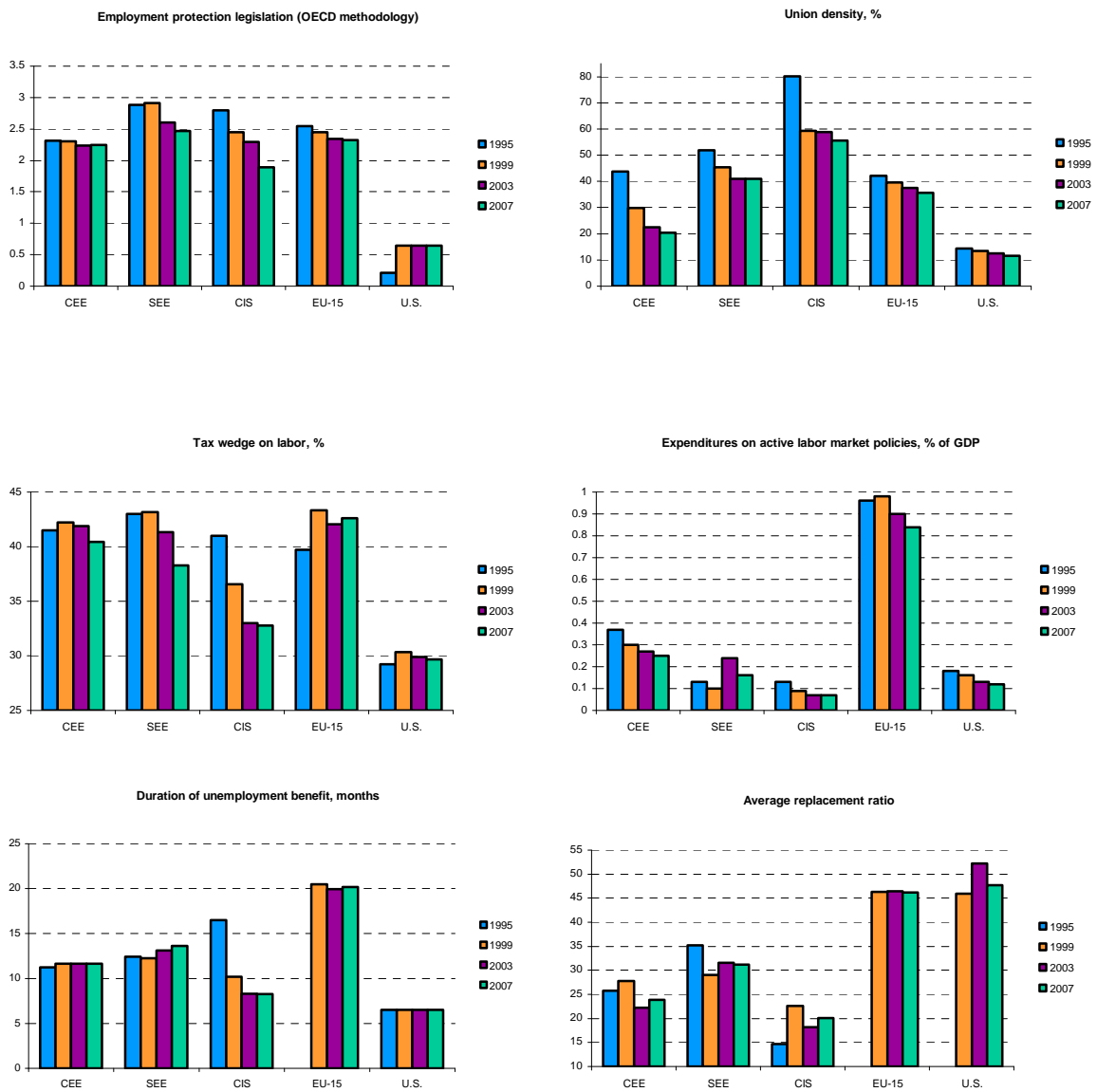
Source: For transition countries: Data Base of IZA Program Area "Labor markets in emerging and transition economies", OECD and Eurostat for other countries.

Table 3. Descriptive statistics and definitions of variables, final estimation sample.

Variable	Short description	Obs	Mean	Std. Dev.	Min	Max
ER	Employment-to-population ratio, %	75	61.92	9.97	33.60	77.60
UR	Unemployment rate (ILO), %	75	12.13	7.15	3.90	37.20
LTUR	Long-term unemployment rate (ILO), %	71	7.62	6.88	0.57	31.77
YUR	Youth unemployment rate (percent unemployed among 15-24 years old)	74	27.33	15.19	7.20	69.50
EPL	Employment protection legislation, overall index (OECD)	75	2.46	0.55	1.52	4.10
DENS	Union density, %	75	40.54	19.51	13.18	94.00
TAX	Tax wedge on labor, %	75	39.63	4.75	23.00	48.27
ALMP	Expenditures on active labor market policies, % GDP	75	0.20	0.18	0.01	0.83
BENF	Unempl. benefit replacement ratio (average benefit to average wage)	75	26.11	10.81	7.00	60.00
BEND	Maximum duration of unemployment benefit, months	75	11.97	5.21	6.00	24.00
ΔInflation	Change in inflation rate, %	75	-6.77	26.01	-110.60	58.07
GDP_{t-1}/GDP_{1989}	GDP level in relation to GDP in 1989	75	0.91	0.31	0.34	1.77
ΔGDP_3Y	Cumulative GDP growth in the three preceding years	75	1.15	0.18	0.76	2.00

Source: Data Base of IZA Program Area "Labor markets in emerging and transition economies."

Table 4. Piecewise correlations of the variables, final estimation sample.

	ER	UR	LTUR	YUR	EPL	DENS	TAX	ALMP	BENF	BEND	ΔInflation	ΔGDP_1989	ΔGDP_3Y
ER	X												
UR	-0.71***	X											
	0.00												
LTUR	-0.78***	0.97***	X										
	0.00	0.00											
YUR	-0.74***	0.81***	0.82***	X									
	0.00	0.00	0.00										
EPL	-0.32***	0.34***	0.35***	0.42***	X								
	0.00	0.00	0.00	0.00									
DENS	-0.25**	0.17	0.20*	0.24**	0.38***	X							
	0.03	0.14	0.09	0.04	0.00								
TAX	0.08	0.15	0.08	-0.09	0.00	-0.27**	X						
	0.48	0.21	0.50	0.46	1.00	0.02							
ALMP	0.09	-0.09	-0.12	-0.19*	-0.07	-0.18	0.33***	X					
	0.46	0.43	0.31	0.10	0.52	0.12	0.00						
BENF	-0.13	0.17	0.20*	0.09	0.14	0.10	0.23*	0.22*	X				
	0.28	0.14	0.09	0.45	0.24	0.40	0.05	0.06					
BEND	-0.09	0.04	0.05	0.09	0.22*	0.12	0.11	0.31**	0.51***	X			
	0.45	0.72	0.66	0.45	0.05	0.30	0.36	0.01	0.00				
ΔInflation	0.00	-0.15	-0.13	-0.17	-0.23**	-0.12	-0.21*	0.05	-0.07	-0.15	X		
	0.98	0.19	0.27	0.14	0.04	0.31	0.07	0.65	0.56	0.19			
GDP$_{t-1}$/GDP$_{1989}$	0.09	-0.24**	-0.21*	-0.23**	-0.29**	-0.55***	0.12	0.20*	-0.07	0.13	0.15	X	
	0.45	0.04	0.09	0.05	0.01	0.00	0.32	0.09	0.53	0.27	0.21		
ΔGDP_3Y	-0.08	-0.22*	-0.14	-0.06	-0.07	-0.18	-0.45***	-0.14	-0.02	-0.14	0.33***	0.31***	X
	0.49	0.06	0.24	0.64	0.53	0.13	0.00	0.24	0.85	0.24	0.00	0.01	

Note: Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%.

Table 5. Labor market performance, institutions and policies: baseline regression results.

	Employment rate		Unemployment rate		Long-term unemployment rate		Youth unemployment rate	
	RE	FE	RE	FE	RE	FE	RE	FE
EPL	-4.263***	-4.166**	1.122	0.882	1.160	0.965	4.316**	3.866*
	(1.443)	(1.473)	(0.946)	(0.965)	(0.907)	(0.940)	(1.834)	(1.912)
ALMP	2.258	2.287	-2.979	-3.138	-1.740	-1.536	-10.792***	-10.408**
	(2.912)	(3.327)	(2.372)	(2.448)	(1.919)	(1.957)	(3.608)	(3.735)
TAX	-0.312*	-0.332*	0.037	0.020	0.047	0.053	0.089	0.159
	(0.167)	(0.179)	(0.151)	(0.147)	(0.122)	(0.116)	(0.302)	(0.324)
DENS	-0.086*	-0.080	0.045	0.047	0.020	0.020	-0.004	-0.014
	(0.051)	(0.056)	(0.030)	(0.032)	(0.030)	(0.029)	(0.054)	(0.064)
BEND	-0.209	-0.230	-0.018	-0.016	0.009	0.017	0.025	-0.102
	(0.200)	(0.210)	(0.132)	(0.161)	(0.112)	(0.123)	(0.215)	(0.263)
BENF	0.050	0.068	0.032	0.013	0.026	-0.004	-0.080	-0.150
	(0.105)	(0.118)	(0.075)	(0.095)	(0.051)	(0.061)	(0.175)	(0.189)
ΔInflation	-0.004	-0.007	-0.000	0.002	0.002	0.005	-0.029	-0.027
	(0.027)	(0.026)	(0.015)	(0.015)	(0.015)	(0.015)	(0.032)	(0.030)
ΔGDP_3Y	-5.407	-5.513	-8.565***	-8.553**	-8.168***	-8.699***	-11.836**	-11.799*
	(3.307)	(3.670)	(2.849)	(3.107)	(1.976)	(2.040)	(5.899)	(6.195)
Y2000	-2.884	-2.647	3.153**	3.065**	2.592**	2.496**	5.834**	5.291**
	(1.910)	(1.908)	(1.382)	(1.385)	(1.165)	(1.132)	(2.510)	(2.490)
Y2004	-5.284**	-4.947**	3.349*	3.117	3.604**	3.385*	4.848*	4.126
	(2.133)	(2.155)	(1.908)	(1.902)	(1.730)	(1.678)	(2.780)	(2.747)
Y2008	-4.740*	-4.395*	0.317	0.053	0.959	0.725	-1.281	-1.920
	(2.565)	(2.540)	(1.919)	(1.829)	(1.778)	(1.666)	(2.900)	(2.822)
Intercept	98.597***	98.823***	14.215	15.918*	9.384	10.806	28.714*	30.731*
	(8.507)	(9.734)	(9.167)	(9.149)	(7.293)	(7.611)	(15.768)	(16.842)
r2	0.38	.38	0.58	.58	0.58	.58	0.61	.62
N	75	75	75	75	71	71	74	74
Spec. tests:								
Breusch-Pagan	67.98 (0.000)		67.49 (0.000)		66.01 (0.000)		51.46 (0.000)	
Hausman	0.39 (1.000)		1.49 (0.999)		1.68 (0.999)		9.93 (0.5363)	

Notes: The results are obtained using the random- (RE) or fixed-effects (FE) estimators with cluster-robust standard errors (clustering by country). Standard errors are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%. R2 refers to the within variation in the data. Breusch and Pagan test for random effects as well as Hausman test are reported at the foot of the table. The first number in these tests is the Chi2 statistics, the second number is the probability level.

Table 6. Labor market performance, institutions and policies: baseline regression results with outliers eliminated.

	Employment rate		Unemployment rate		Long-term unemployment rate		Youth unemployment rate	
	RE	FE	RE	FE	RE	FE	RE	FE
EPL	-4.345***	-4.258**	0.255	0.079	0.223	0.078	5.677***	5.206***
	(1.449)	(1.505)	(0.705)	(0.779)	(0.552)	(0.636)	(1.537)	(1.496)
ALMP	2.798	2.736	-4.633**	-4.342*	-3.182**	-2.762	-11.481***	-11.736***
	(2.753)	(3.100)	(1.928)	(2.327)	(1.597)	(1.851)	(3.194)	(3.167)
TAX	-0.308**	-0.336**	-0.064	-0.061	-0.048	-0.032	-0.452	-0.372
	(0.144)	(0.148)	(0.132)	(0.129)	(0.096)	(0.094)	(0.290)	(0.317)
DENS	-0.031	-0.007	0.030	0.033	0.006	0.007	0.037	0.031
	(0.039)	(0.048)	(0.031)	(0.031)	(0.031)	(0.030)	(0.046)	(0.051)
BEND	-0.141	-0.139	0.020	0.016	0.043	0.045	0.040	-0.051
	(0.186)	(0.193)	(0.103)	(0.121)	(0.070)	(0.072)	(0.191)	(0.227)
BENF	0.009	0.014	0.026	-0.012	0.011	-0.028	-0.013	-0.076
	(0.099)	(0.112)	(0.075)	(0.090)	(0.050)	(0.055)	(0.160)	(0.181)
ΔInflation	-0.015	-0.020	0.005	0.007	0.008	0.010	-0.034	-0.031
	(0.028)	(0.028)	(0.013)	(0.013)	(0.011)	(0.011)	(0.034)	(0.032)
ΔGDP_3Y	-2.983	-2.543	-8.475***	-8.198**	-8.094***	-8.399***	-16.471***	-15.888***
	(2.609)	(3.045)	(2.788)	(3.182)	(2.112)	(2.251)	(5.067)	(5.424)
Y2000	-2.122	-1.642	2.643**	2.579*	2.014*	1.956*	7.447***	6.916**
	(1.784)	(1.730)	(1.331)	(1.305)	(1.068)	(1.028)	(2.615)	(2.567)
Y2004	-4.004*	-3.314	2.155	1.931	2.292	2.108	6.376**	5.693*
	(2.066)	(2.115)	(1.731)	(1.647)	(1.405)	(1.289)	(2.838)	(2.783)
Y2008	-3.477	-2.792	-0.719	-0.898	-0.122	-0.275	-0.904	-1.437
	(2.414)	(2.332)	(1.794)	(1.665)	(1.584)	(1.444)	(2.955)	(2.819)
Intercept	92.457***	91.701***	21.166***	22.225***	16.563***	17.617***	47.262***	47.594***
	(6.852)	(8.100)	(7.298)	(7.200)	(5.250)	(5.448)	(15.965)	(15.898)
r2	0.36	.36	0.59	.59	0.60	.60	0.66	.66
N	74	74	73	73	69	69	73	73
Spec. tests:								
Breusch-Pagan	67.74 (0.000)		72.51 (0.000)		72.48 (0.000)		50.25 (0.000)	
Hausman	1.14 (0.999)		1.56 (0.999)		2.59 (0.995)		2.58 (0.995)	

Notes: The results are obtained using the random- (RE) or fixed-effects (FE) estimators with cluster-robust standard errors (clustering by country). Standard errors are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%. R2 refers to the within variation in the data. Breusch and Pagan test for random effects as well as Hausman test are reported at the foot of the table. The first number in these tests is the Chi2 statistics, the second number is the probability level.

Table 7. Labor market performance, institutions and policies: baseline regression results with outliers eliminated.

	Employment rate		Unemployment rate		Long-term unemployment rate		Youth unemployment rate	
	RE	FE	RE	FE	RE	FE	RE	FE
EPL	-4.517***	-4.478**	0.564	0.360	0.586	0.391	5.649***	5.218***
	(1.611)	(1.713)	(0.746)	(0.760)	(0.545)	(0.600)	(1.331)	(1.416)
ALMP	3.666	3.970	-5.344***	-5.216**	-4.270***	-3.828**	-11.810***	-11.853***
	(2.613)	(3.212)	(1.903)	(2.160)	(1.292)	(1.463)	(2.949)	(3.370)
TAX	-0.329*	-0.366*	-0.150	-0.148	-0.144*	-0.124	-0.432	-0.348
	(0.187)	(0.200)	(0.135)	(0.133)	(0.088)	(0.084)	(0.299)	(0.331)
DENS	-0.098*	-0.090	-0.009	-0.002	-0.038	-0.036	0.051	0.045
	(0.052)	(0.056)	(0.029)	(0.033)	(0.024)	(0.026)	(0.054)	(0.052)
BEND	-0.143	-0.141	0.061	0.030	0.075	0.060	0.205	0.108
	(0.196)	(0.212)	(0.083)	(0.096)	(0.064)	(0.056)	(0.189)	(0.235)
BENF	0.049	0.099	0.024	-0.008	0.026	-0.014	-0.053	-0.110
	(0.106)	(0.119)	(0.072)	(0.091)	(0.054)	(0.057)	(0.160)	(0.185)
ΔInflation	0.011	0.010	0.003	0.003	0.006	0.007	-0.045	-0.040
	(0.026)	(0.026)	(0.013)	(0.013)	(0.012)	(0.011)	(0.050)	(0.046)
ΔGDP_3Y	-7.505*	-9.361**	-8.579***	-8.599**	-8.175***	-8.840***	-16.821***	-16.168***
	(3.905)	(3.856)	(3.150)	(3.574)	(2.593)	(2.681)	(4.680)	(5.235)
Y2000	-4.700***	-4.310**	2.382*	2.259*	1.591	1.445	7.861***	7.334***
	(1.813)	(1.883)	(1.300)	(1.300)	(1.060)	(1.045)	(2.629)	(2.537)
Y2004	-6.933***	-6.139***	1.123	1.042	1.285	1.135	6.465**	5.852*
	(1.841)	(1.981)	(1.553)	(1.558)	(1.255)	(1.183)	(3.036)	(2.843)
Y2008	-6.308***	-5.423**	-1.947	-1.985	-1.473	-1.592	-0.406	-0.913
	(2.274)	(2.195)	(1.739)	(1.676)	(1.473)	(1.340)	(3.096)	(2.863)
Intercept	103.411***	105.239***	26.010***	26.576***	21.608***	22.279***	45.060***	44.484**
	(10.386)	(12.099)	(7.910)	(7.514)	(5.763)	(5.502)	(16.613)	(17.322)
r2	0.45	.45	0.62	.62	0.66	.67	0.66	.66
N	71	71	71	71	67	67	70	70
Spec. tests:								
Breusch-Pagan	39.71 (0.000)		22.70 (0.000)		18.32 (0.000)		37.15 (0.000)	
Hausman	1.39 (0.999)		4.35 (0.958)		10.45 (0.315)		1.48 (0.999)	

Notes: The results are obtained using the random- (RE) or fixed-effects (FE) estimators with cluster-robust standard errors (clustering by country). Standard errors are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%. R2 refers to the within variation in the data. Breusch and Pagan test for random effects as well as Hausman test are reported at the foot of the table. The first number in these tests is the Chi2 statistics, the second number is the probability level.

Table 8. Pairwise interactions between different institutions and policies.

	ER	UR	LTUR	YUR
ALMP_TAX	-1.109	1.602**	1.647**	1.424
	(0.806)	(0.746)	(0.725)	(1.090)
ALMP_DENS	-0.135	0.399**	0.332**	0.609**
	(0.186)	(0.179)	(0.156)	(0.271)
ALMP_BENF	-0.145	-0.119	-0.021	0.067
	(0.331)	(0.276)	(0.210)	(0.535)
ALMP_BEND	-0.563	-0.036	0.037	-0.204
	(0.417)	(0.417)	(0.374)	(0.665)
ALMP_EPL	1.526	5.344	5.556*	6.409
	(4.546)	(3.254)	(3.065)	(4.880)
EPL_TAX	0.094	0.329	0.299	0.375
	(0.224)	(0.200)	(0.192)	(0.352)
EPL_DENS	0.018	0.004	0.002	-0.052
	(0.060)	(0.045)	(0.032)	(0.094)
EPL_BENF	-0.106	-0.003	-0.005	0.102
	(0.071)	(0.090)	(0.085)	(0.177)
EPL_BEND	0.042	-0.121	-0.098	-0.383
	(0.122)	(0.147)	(0.148)	(0.351)
TAX_DENS	0.000	0.004	0.008	-0.008
	(0.006)	(0.006)	(0.006)	(0.009)
TAX_BENF	0.019	-0.016	-0.007	-0.022
	(0.016)	(0.014)	(0.012)	(0.027)
TAX_BEND	-0.003	-0.040	-0.045*	-0.121***
	(0.036)	(0.026)	(0.024)	(0.037)
DENS_BENF	-0.003	-0.001	0.002	0.003
	(0.004)	(0.003)	(0.003)	(0.006)
DENS_BEND	-0.007	-0.003	-0.002	-0.011
	(0.005)	(0.005)	(0.005)	(0.013)
BENF_BEND	-0.011	-0.000	-0.000	0.019
	(0.013)	(0.009)	(0.007)	(0.015)

Notes: Each coefficient in the table is taken from a separate regression (the baseline specification augmented with a single interaction). The results are obtained using the random-effects estimators with cluster-robust standard errors (clustering by country). Standard errors for the coefficient on the interaction terms are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%.

Appendix I. Robustness checks.

Table A1. Additional estimates with change in inflation as the only macro control variable.

	Employment rate		Unemployment rate		Long-term unemployment rate		Youth unemployment rate	
	RE	FE	RE	FE	RE	FE	RE	FE
EPL	-4.487***	-4.369***	0.845	0.567	1.166	0.931	3.947**	3.444
	(1.464)	(1.500)	(1.093)	(1.143)	(0.934)	(0.973)	(1.907)	(2.002)
ALMP	2.413	2.493	-2.705	-2.819	-1.759	-1.613	-10.528***	-9.996**
	(3.015)	(3.420)	(2.532)	(2.626)	(1.969)	(1.933)	(4.003)	(4.100)
TAX	-0.215	-0.233	0.194	0.173	0.163	0.167	0.288	0.372
	(0.162)	(0.185)	(0.139)	(0.134)	(0.127)	(0.122)	(0.234)	(0.265)
DENS	-0.070	-0.063	0.070*	0.074*	0.037	0.036	0.032	0.021
	(0.057)	(0.062)	(0.037)	(0.037)	(0.037)	(0.034)	(0.058)	(0.059)
BEND	-0.178	-0.210	0.029	0.015	0.043	0.041	0.108	-0.059
	(0.195)	(0.205)	(0.136)	(0.178)	(0.117)	(0.139)	(0.211)	(0.262)
BENF	0.007	0.017	-0.027	-0.066	0.011	-0.023	-0.161	-0.259
	(0.098)	(0.117)	(0.068)	(0.085)	(0.055)	(0.066)	(0.163)	(0.170)
ΔInflation	-0.007	-0.010	-0.006	-0.003	-0.004	-0.001	-0.037	-0.034
	(0.027)	(0.026)	(0.015)	(0.014)	(0.015)	(0.014)	(0.034)	(0.030)
Y2000	-2.984	-2.728	3.050**	2.939**	2.608**	2.447**	5.727**	5.085**
	(1.972)	(1.976)	(1.421)	(1.408)	(1.168)	(1.118)	(2.479)	(2.421)
Y2004	-5.627**	-5.283**	2.919	2.597	3.387*	3.058*	4.265	3.382
	(2.235)	(2.318)	(2.063)	(2.052)	(1.815)	(1.765)	(2.744)	(2.674)
Y2008	-5.344**	-4.977*	-0.522	-0.850	0.449	0.083	-2.475	-3.222
	(2.575)	(2.601)	(2.031)	(1.939)	(1.827)	(1.713)	(2.853)	(2.753)
Intercept	89.391***	89.662***	-0.957	1.705	-5.353	-3.896	8.132	11.168
	(4.886)	(6.338)	(8.594)	(9.208)	(7.781)	(8.430)	(12.347)	(14.371)
r2	0.35	.35	0.49	.49	0.45	.45	0.56	.57
N	75	75	75	75	71	71	74	74

Notes: The results are obtained using the random- (RE) or fixed-effects (FE) estimators with cluster-robust standard errors (clustering by country). Standard errors are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%. R2 refers to the within variation in the data.

Table A2. Additional estimates with change in inflation and GDP_{t-1}/GDP_{1989} as macro-controls.

	Employment rate		Unemployment rate		Long-term unemployment rate		Youth unemployment rate	
	RE	FE	RE	FE	RE	FE	RE	FE
EPL	-4.509***	-4.392***	0.916	0.677	1.201	1.014	4.184**	3.598*
	(1.501)	(1.537)	(1.075)	(1.078)	(0.939)	(0.941)	(1.883)	(1.922)
ALMP	2.527	2.604	-3.041	-3.343	-2.036	-2.033	-11.210***	-10.724**
	(2.992)	(3.529)	(2.435)	(2.647)	(1.943)	(2.021)	(3.933)	(4.277)
TAX	-0.218	-0.234	0.203	0.177	0.188	0.196	0.299	0.378
	(0.166)	(0.189)	(0.144)	(0.143)	(0.130)	(0.126)	(0.243)	(0.281)
DENS	-0.065	-0.060	0.053	0.060	0.021	0.022	0.000	0.001
	(0.056)	(0.061)	(0.034)	(0.038)	(0.032)	(0.033)	(0.062)	(0.067)
BEND	-0.179	-0.210	0.029	0.012	0.049	0.047	0.119	-0.062
	(0.194)	(0.206)	(0.123)	(0.166)	(0.106)	(0.128)	(0.209)	(0.262)
BENF	0.005	0.014	-0.021	-0.050	-0.001	-0.034	-0.139	-0.238
	(0.102)	(0.119)	(0.072)	(0.093)	(0.053)	(0.066)	(0.166)	(0.191)
ΔInflation	-0.007	-0.010	-0.007	-0.005	-0.005	-0.003	-0.040	-0.037
	(0.028)	(0.027)	(0.015)	(0.015)	(0.015)	(0.014)	(0.034)	(0.031)
GDP_{t-1}/GDP_{1989}	1.093	0.781	-3.783	-3.678	-4.129	-4.612	-6.929	-5.044
	(4.973)	(5.683)	(3.379)	(4.337)	(3.015)	(3.846)	(6.300)	(7.646)
Y2000	-3.005	-2.761	3.144**	3.095**	2.781**	2.719**	5.939**	5.287**
	(2.047)	(2.084)	(1.400)	(1.425)	(1.174)	(1.119)	(2.438)	(2.400)
Y2004	-5.824**	-5.452*	3.611	3.395	4.193**	4.079**	5.627*	4.469
	(2.565)	(2.758)	(2.197)	(2.310)	(1.989)	(1.905)	(3.266)	(3.431)
Y2008	-5.837	-5.356	1.196	0.936	2.298	2.281	0.732	-0.793
	(3.965)	(4.274)	(2.758)	(2.993)	(2.598)	(2.647)	(4.570)	(4.933)
Intercept	88.667***	89.150***	1.735	4.119	-2.638	-1.147	12.521	14.485
	(6.166)	(7.710)	(8.785)	(9.720)	(8.041)	(9.160)	(12.707)	(15.079)
r2	0.35	.35	0.49	.5	0.46	.47	0.57	.58
N	75	75	75	75	71	71	74	74

Notes: The results are obtained using the random- (RE) or fixed-effects (FE) estimators with cluster-robust standard errors (clustering by country). Standard errors are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%. R2 refers to the within variation in the data.

Table A3. Additional estimates with change in inflation as the only macro-control, outliers removed.

	Employment rate		Unemployment rate		Long-term unemployment rate		Youth unemployment rate	
	RE	FE	RE	FE	RE	FE	RE	FE
EPL	-4.363***	-4.015**	-0.363	-0.620	0.551	0.278	3.294*	2.777
	(1.631)	(1.720)	(1.075)	(1.229)	(0.673)	(0.724)	(1.898)	(2.160)
ALMP	5.984*	7.183*	-4.746**	-4.447*	-4.135***	-3.629**	-11.141**	-10.816**
	(3.480)	(3.700)	(2.035)	(2.457)	(1.421)	(1.580)	(4.615)	(4.853)
TAX	-0.246	-0.279	0.076	0.076	-0.017	0.009	0.300	0.390
	(0.166)	(0.188)	(0.112)	(0.123)	(0.088)	(0.101)	(0.237)	(0.271)
DENS	-0.085	-0.080	0.043	0.052	-0.011	-0.007	0.057	0.044
	(0.058)	(0.064)	(0.041)	(0.044)	(0.041)	(0.037)	(0.064)	(0.060)
BEND	-0.094	-0.125	0.093	0.053	0.122**	0.088*	0.277	0.091
	(0.191)	(0.214)	(0.101)	(0.140)	(0.062)	(0.051)	(0.231)	(0.291)
BENF	-0.020	-0.013	-0.038	-0.086	0.009	-0.044	-0.197	-0.296*
	(0.091)	(0.112)	(0.065)	(0.077)	(0.054)	(0.059)	(0.153)	(0.164)
ΔInflation	0.012	0.011	-0.002	-0.002	0.002	0.003	-0.027	-0.021
	(0.024)	(0.023)	(0.014)	(0.014)	(0.011)	(0.010)	(0.044)	(0.036)
Y2000	-4.770**	-4.432**	2.713*	2.754*	1.849*	1.614*	6.067**	5.230*
	(1.925)	(1.994)	(1.537)	(1.534)	(1.008)	(0.913)	(2.692)	(2.573)
Y2004	-8.027***	-7.736***	1.688	1.582	1.231	0.981	4.173	3.212
	(1.925)	(2.111)	(1.989)	(1.998)	(1.456)	(1.341)	(2.956)	(2.713)
Y2008	-7.748***	-7.400***	-1.776	-1.709	-1.675	-1.878	-2.124	-3.000
	(2.389)	(2.435)	(2.106)	(2.123)	(1.797)	(1.630)	(3.016)	(2.783)
Intercept	92.264***	92.332***	8.218	9.535	5.751	6.310	6.949	10.007
	(5.210)	(7.201)	(6.746)	(7.640)	(4.949)	(5.659)	(13.288)	(15.157)
r2	0.42	.43	0.49	.5	0.46	.47	0.55	.57
N	71	71	71	71	67	67	70	70

Notes: The results are obtained using the random- (RE) or fixed-effects (FE) estimators with cluster-robust standard errors (clustering by country). Standard errors are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%. R2 refers to the within variation in the data.

Table A4. Additional estimates with change in inflation and GDP$_{t-1}$/GDP$_{1989}$ as macro-controls, outliers removed.

	Employment rate		Unemployment rate		Long-term unemployment rate		Youth unemployment rate	
	RE	FE	RE	FE	RE	FE	RE	FE
EPL	-4.399***	-4.068**	-0.243	-0.438	0.548	0.296	3.408*	2.872
	(1.690)	(1.800)	(1.035)	(1.130)	(0.649)	(0.678)	(1.853)	(2.090)
ALMP	6.150*	7.361*	-5.152***	-5.144**	-4.310***	-4.028**	-12.185***	-12.009**
	(3.416)	(3.761)	(1.915)	(2.329)	(1.286)	(1.515)	(4.345)	(4.957)
TAX	-0.249	-0.279	0.081	0.075	0.006	0.045	0.312	0.389
	(0.169)	(0.194)	(0.121)	(0.132)	(0.100)	(0.120)	(0.250)	(0.291)
DENS	-0.079	-0.075	0.024	0.032	-0.023	-0.018	0.022	0.019
	(0.059)	(0.067)	(0.038)	(0.042)	(0.035)	(0.034)	(0.066)	(0.067)
BEND	-0.094	-0.123	0.088	0.046	0.125**	0.090	0.274	0.083
	(0.190)	(0.214)	(0.086)	(0.122)	(0.059)	(0.053)	(0.229)	(0.293)
BENF	-0.023	-0.018	-0.031	-0.067	-0.001	-0.058	-0.181	-0.272
	(0.095)	(0.118)	(0.072)	(0.090)	(0.052)	(0.057)	(0.156)	(0.184)
ΔInflation	0.013	0.011	-0.004	-0.005	0.001	0.000	-0.029	-0.022
	(0.024)	(0.024)	(0.014)	(0.014)	(0.011)	(0.011)	(0.045)	(0.038)
GDP$_{t-1}$/GDP$_{1989}$	1.213	1.119	-4.299	-4.714	-3.377	-4.983	-7.028	-5.865
	(5.053)	(6.023)	(3.455)	(4.372)	(2.951)	(4.066)	(6.548)	(7.983)
Y2000	-4.770**	-4.459**	2.758*	2.847*	1.959*	1.925*	6.097**	5.341**
	(1.941)	(2.015)	(1.531)	(1.568)	(1.041)	(1.017)	(2.647)	(2.567)
Y2004	-8.229***	-7.961***	2.414	2.479	1.884	2.133	5.350	4.336
	(2.073)	(2.234)	(2.147)	(2.355)	(1.780)	(1.968)	(3.361)	(3.464)
Y2008	-8.277**	-7.925**	0.145	0.481	-0.155	0.600	0.929	-0.311
	(3.492)	(3.730)	(2.928)	(3.348)	(2.818)	(3.314)	(4.665)	(5.083)
Intercept	91.423***	91.580***	11.456*	13.006*	7.991*	9.204*	12.362	14.683
	(6.982)	(9.244)	(6.662)	(7.171)	(4.638)	(4.878)	(13.349)	(15.310)
r2	0.43	.43	0.51	.51	0.48	.5	0.56	.57
N	71	71	71	71	67	67	70	70

Notes: The results are obtained using the random- (RE) or fixed-effects (FE) estimators with cluster-robust standard errors (clustering by country). Standard errors are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%. R2 refers to the within variation in the data.

Table A5. Additional estimates: pairwise interactions between different institutions and policies.

	ER	UR	LTUR	YUR
ALMP_TAX	-1.322	1.078	1.371*	0.776
	(0.824)	(0.862)	(0.767)	(1.208)
ALMP_DENS	-0.141	0.379**	0.344**	0.586**
	(0.216)	(0.176)	(0.142)	(0.252)
ALMP_BENF	-0.121	-0.181	-0.162	-0.015
	(0.362)	(0.252)	(0.224)	(0.510)
ALMP_BEND	-0.577	-0.209	-0.080	-0.391
	(0.422)	(0.426)	(0.397)	(0.713)
EPL_ALMP	2.333	5.696*	5.709*	6.813
	(4.884)	(3.389)	(3.285)	(4.568)
EPL_TAX	0.105	0.331	0.279	0.352
	(0.240)	(0.224)	(0.217)	(0.368)
EPL_DENS	0.016	0.001	-0.008	-0.051
	(0.057)	(0.058)	(0.046)	(0.116)
EPL_BENF	-0.113	-0.016	-0.036	0.077
	(0.074)	(0.092)	(0.085)	(0.178)
EPL_BEND	0.095	-0.063	-0.060	-0.293
	(0.131)	(0.141)	(0.134)	(0.323)
TAX_DENS	0.001	0.004	0.009	-0.007
	(0.006)	(0.006)	(0.006)	(0.009)
TAX_BENF	0.022	-0.009	-0.005	-0.011
	(0.016)	(0.011)	(0.011)	(0.023)
TAX_BEND	-0.009	-0.050*	-0.051**	-0.133***
	(0.037)	(0.028)	(0.025)	(0.046)
DENS_BENF	-0.003	-0.002	0.001	0.002
	(0.004)	(0.003)	(0.003)	(0.006)
DENS_BEND	-0.006	-0.002	-0.000	-0.010
	(0.005)	(0.006)	(0.005)	(0.013)
BENF_BEND	-0.005	0.006	0.002	0.028**
	(0.013)	(0.008)	(0.007)	(0.013)

Notes: Each coefficient in the table is taken from a separate regression (the baseline specification augmented with a single interaction). The results are obtained using the random-effects estimators with cluster-robust standard errors (clustering by country). Standard errors for the coefficient on the interaction terms are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%.

Table A6. Additional estimates: pairwise interactions between different institutions and policies.

	ER	UR	LTUR	YUR
ALMP_TAX	-1.496	1.412	1.545**	1.233
	(0.938)	(0.860)	(0.768)	(1.233)
ALMP_DENS	-0.143	0.383**	0.339**	0.572**
	(0.216)	(0.175)	(0.143)	(0.238)
ALMP_BENF	-0.058	-0.242	-0.181	-0.229
	(0.374)	(0.248)	(0.220)	(0.552)
ALMP_BEND	-0.303	-0.166	-0.065	-0.630
	(0.408)	(0.438)	(0.401)	(0.735)
EPL_ALMP	2.732	5.858	5.975*	2.942
	(4.988)	(3.508)	(3.414)	(5.660)
EPL_TAX	0.101	0.333	0.293	0.339
	(0.244)	(0.227)	(0.219)	(0.364)
EPL_DENS	0.017	0.001	-0.008	-0.049
	(0.058)	(0.057)	(0.045)	(0.112)
EPL_BENF	-0.112	-0.019	-0.033	0.065
	(0.076)	(0.095)	(0.089)	(0.186)
EPL_BEND	0.103	-0.062	-0.056	-0.336
	(0.131)	(0.141)	(0.135)	(0.315)
TAX_DENS	0.001	0.005	0.010	-0.005
	(0.006)	(0.007)	(0.006)	(0.010)
TAX_BENF	0.025	-0.012	-0.006	-0.017
	(0.019)	(0.013)	(0.011)	(0.027)
TAX_BEND	-0.011	-0.046	-0.049**	-0.125***
	(0.036)	(0.028)	(0.025)	(0.047)
DENS_BENF	-0.003	-0.002	0.002	0.003
	(0.004)	(0.003)	(0.003)	(0.006)
DENS_BEND	-0.006	-0.003	-0.001	-0.012
	(0.005)	(0.005)	(0.005)	(0.012)
BENF_BEND	-0.004	0.003	-0.001	0.023
	(0.013)	(0.008)	(0.007)	(0.015)

Notes: Each coefficient in the table is taken from a separate regression (the baseline specification augmented with a single interaction). The results are obtained using the random-effects estimators with cluster-robust standard errors (clustering by country). Standard errors for the coefficient on the interaction terms are reported in parentheses. Asterisks denote significance levels: *** - significant at 1%, ** - significant at 5% and * - significant at 10%.

Appendix II. Details about the construction of the database.[23]

The database of IZA Program Area "Labor markets in emerging and transition economies" is a new hand-collected dataset that provides essential information about the evolution of labor markets in the countries of Central Europe and Central Asia. It includes 27 countries of the region and spans 14 years, 1995-2008. The database contains how many 4 variables characterizing labor market outcomes and 6 variables describing labor market institutions. There are 71 observations with complete data on these 10 variables, corresponding to 23 countries. The details about the variables included in the database are shown below.

I. Labor market outcomes:

- Employment to population ratio (ER): number of employed as per cent of population aged 15-59.[24]

- Unemployment rate (UR) – number of unemployed as per cent of labor force; based on labor force surveys and ILO methodology.

- Long-term unemployment rate (LTUR) – number of people which have been unemployed for 12 months or more as per cent of labor force

- Youth unemployment rate (YUR) – number of people aged 15-24 years as per cent of labor force from this age group; based on labor force surveys.

II. Labor market institutions and policies:

- Employment protection legislation (EPL) index is based on version 2 of the OECD (2004) indicator and is a weighted average of 18 cardinal summary indicators of EPL strictness which can be gathered in three main areas: (i) employment protection of regular workers against individual dismissal; (ii) specific requirements for collective dismissals; (iii) regulation of temporary forms of employment.

- Active labor market policies (ALMP) – expenditures on active measures of labor market policies and public employment services as per cent of the country's GDP.

- Tax wedge on labor (TAX) is defined as the difference between the salary costs of a single "average worker" to their employer and the amount of net income ("take-home-

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[23] We would like to acknowledge advice from and contributions by Irina Denisova, Diana Digol, Raul Eamets, Martin Guzi, Roman Mogilevsky, Aleksei Oshchepkov, Norberto Pignatti, and Anzelika Zaiceva during our work on assembling the database.
[24] This age bracket has been chosen in view of the varying statutory retirement age across the countries of the region.

pay") that the worker receives. The taxes included are personal income taxes, compulsory social security contributions paid by both employees and employers, as well as payroll taxes for the few countries that have them; no consumption taxes are included.

- Union density (DENS) measures trade union density based on surveys, wherever possible. Where such data were not available, trade union membership and density were calculated using administrative data adjusted for non-active and self-employed members.[25]

- Average unemployment benefit (BENF) – the average benefit as percentage of the average wage. This deviates from the estimates typically used by the OECD because OECD replacement rates are not very meaningful in the transition countries due to the caps on the size of the benefit in many countries.[26]

- Maximum duration of unemployment benefits (BEND) – defined as the period for which a person aged 40 years who has been employed for 22 years prior to unemployment receives unemployment benefits, wherever possible.

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[25] A caveat concerning the quality of the union density data is due. There is a measurement problem in at least some of the selected countries. The World Bank notes, for instance, that "Armenia provides an example of the difficulty of interpreting union density figures in the CIS, with 75 percent union density by official estimates, but 80 percent of workers claiming to "have nothing in common" with trade unions, and half of those claiming to be totally uninformed about unions." For that reason the World Bank (2005) did not provide any statistics on the coverage rates in the CIS countries. Whenever possible we therefore examined alternative estimates of unionization, especially in the CIS countries.

[26] In most countries of the region, the size of the unemployment benefit is related to past earnings. The rate may be as high as 100% (like in Croatia at the end of the 1990s and in Ukraine in the mid-2000s). The problem is that there is an upper cap on the size of the benefit, which often implies, de facto, a flat rate benefit. For example, in the early 2000s the benefit replacement rate in Croatia was 100% of average salary in the last three months of employment, but the maximum was restricted to 900 Kn. Compared to the average wage of 3600 Kn, the amount is far less than the 100% replacement rate. Similarly, unemployed in Russia can get 75% of their average wage in the last three months of employment, but there is a cap of 4900 RUR (or 110 Euro) as of mid-2009. Relative to the average wage in the economy (17441 RUR as of 1st quarter 2009), the unemployment benefit is very low. The minimum benefit is almost negligible, amounting to 850 RUR only. It is essential that the minimum and maximum amounts of unemployment benefits are not set in a law, but are subject to government discretion.