

Preliminary
Comments Welcome
Do not Circulate

The Significance of Labor and Enterprise Institutions in Transition

Theo Eicher

University of Washington

Ifo Institute of Economic Research

Till Schreiber

University of Washington

June 7, 2005

1. Introduction

Starting with the seminal papers by Hall and Jones (1999) and Acemoglu et al. (2001), economists have focused great attention on the importance of institutions to explain differences in levels of development, given by standards of living across countries. The literature has since evolved to examine how institutions may have impacted the economic performance of transition countries. Transition countries are of particular interest in the study of economic institutions since they experienced rapid institutional and economic change.

Eicher and Schreiber (2004) and Beck and Laeven (2005) have shown that the experience of the transition economies after the destruction of the Iron Curtain can also be used as a natural experiment to establish the importance of institutions for economic growth. Beck and Laeven show in a cross section that the change in institutions matters for economic growth between 1992 and 2002. Eicher and Schreiber show that change in enterprise institutions away from central planning towards high-level OECD standards has statistically and economically significant effects on growth rates in panel regressions. This implies that ongoing reform is just as crucial as initial conditions.

The identification of the dynamic effects of institutions is limited by the availability of data and Eicher/Schreiber and Beck/Laeven focus exclusively on enterprise institutions as they related to enterprise reform and political institutions as they relate to the openness of the political regime (as instruments). Arguably the most important aspect of transition is the human dimension, where massive contingents of labor have to be relocated within the economy to minimize both the output gap and

unemployment. On the other hand one might argue that any change in enterprise institutions is absolutely worthless if it is not supported by institutional change that affects the key factor of production: labor.

Labor market institutions are particularly important as catalysts or obstacles in this reallocation process. Depending on the specific transition country, institutional reform programs have aimed at removing trade barriers, revamping the tax system, restructuring government spending, spurring financial liberalization, privatizing state-owned enterprises, or some combination of these (Forteza and Rama 2001). However, reforms were adopted in piece meal fashion, conditioned on each countries specific socio-economic-political situation. Given the mixed results of reforms, some have argued that key supports to institutional change, such as institutions allowing for the relaxation of labor market rigidities, may have limited the economic impact of valuable enterprise reforms.

We will examine the influence of labor market institutions on economic performance and juxtapose the effects of enterprise and labor institutions in influencing economic growth in transition economies. If labor costs are restricted and cannot respond to incentives, supply and demand, it is only natural to assume that enterprise reforms cannot exert their (full) on the economy. This slows not only the labor reallocation process, but also distorts investment and international competitiveness to undermine the entire enterprise reform. Most fundamentally, however, the success of enterprise reforms seems fundamentally undermined when reallocation of labor away from the state-run firms to dynamic new private firms is stifled by inappropriate old or new labor market institutions during transition. While the depth and duration of the transition contractions

was unexpected in all former communist economies, it has also been suggested that such difficulties in shifting labor between sectors due to labor market imperfections may have been the leading cause. (Atkeson and Kehoe, 1996)¹

Fortza and Rama (2001) also point out that labor market institutions also affect transition in political rather than just economic fashion. Transitions and restructuring create winners and losers and the resistance by losers can only be overcome with appropriate compensation (Alesina and Drazen, 1991, and Fernández and Rodrik, 1991)

Our measures of the labor market are sufficiently broad to identify both economic and political effects of labor market institution reform. We extend our previous work on enterprise institutions in the transition process by including a large number of broad proxies for labor market institutions. We are interested in identifying the individual effect of labor market institutions on growth, as well as their relative importance compared to other institutions – specifically those that affect enterprise regulations.

We cast a wide net to include as many proxies for labor market institutions as possible. Hence we commence by presenting cross-country evidence for a wide array of labor institution indicators and compare their significance to the impact of enterprise institutions on growth. The initial exercise is limited to cross section analysis since most labor market indicators are not available in time series format. The results are surprisingly unambiguous in that in all but one of these regressions enterprise institutions are highly significant whereas labor market characteristics never achieve a 10 percent

¹ Other reasons for the slow adjustment have been explored: tight macroeconomic policies (Bhaduri, Kaski and Levcik, 1993; Rosati, 1994); credit crunch (Calvo and Coricelli, 1992); disorganization among suppliers, producers and consumers (Blanchard and Kremer, 1997; Roland and Verdier, 1999); switch from controlled to uncontrolled monopolistic structure (Li, 1999; Blanchard, 1997);

significance level. This might indicate that in the early stages of transition the fortunes of the economy – as measured by economic growth – were determined largely by enterprise reform and not labor market reforms.

Then we proceed to panel analysis and introduce two variables that have both a time and cross sectional dimension. The minimum wages as a fraction of average wages, is thought to reflect restrictions on hiring - in particular for less educated workers. In addition we utilize the size of the unofficial (shadow) economy which has been identified by Lemieux et al. (1994), Friedman et al. (2000), Eilat and Zinnes (2000, 2002), Johnson et al. (1997), Forteza and Rama (2002) as a good measure of labor market institutional quality. The shadow economy is thought to closely reflect the burden of labor market regulation, the unemployment rate, the degree of unionization, and the degree of competitiveness. In countries with better direct data on labor market institutions, these measures are highly correlated with the size of the shadow economy.

In section 2 we first provide an overview of the data, then in section 3 we present the results from cross-sectional regressions. Next, in section 4, we analyze the relative importance of enterprise institutions, the size of the shadow economy, and the percentage of the minimum wage of average wages for the growth experience in the panel of transition economies from 1991 – 1997. We can show that economic institutional change has larger effects on growth than the size of the shadow economy or minimum wages even when controlling for country fixed effects. Section 5 includes a robustness check as to the degree of correlation of enterprise institutions and the size of the shadow economy. It is shown that our index of enterprise institutions does not have much explanatory power for the size of the shadow economy. This arguably supports the work cited above

that the size of the shadow economy likely reflects other institutional factors including labor market characteristics. Section 6 concludes.

2. Data

Following Eicher and Schreiber (2004), we construct a composite index that reflects enterprise institutions using eight EBRD reform indicators (EBRD 2000, 2001, 2002). This data includes 26 transition countries in Central and Eastern Europe, as well as the Former Soviet Union from 1991 – 2001. The enterprise institutions index is an average of institutional progress towards high-level OECD standards of eight individual indices: Price liberalization, foreign exchange and trade liberalization, small and large scale privatization, enterprise reform, competition policy reform, banking sector reform, and reform of non-banking financial institutions. The index is normalized to lie between 0 and 1, where 0 means complete central planning, and 1 symbolizes enterprise institutions that have advanced to OECD quality levels.

As our measure of the shadow economy we use data from Eilat and Zinnes (2000). They derive estimates for the size of the shadow economy relative to official GDP by using the electricity approach. Changes in electricity consumption are compared to changes in official GDP, and discrepancies are then attributed to changes in the share of the unofficial or shadow economy. Perhaps the shadow economy is the crudest indicator of labor market inflexibility, but it is at the same time also the best one available in time series. The link between the shadow economy, employment and institutions is, however, quite close. Boeri and Garibaldi (2002) propose, for example, a matching model of the labor market where shadow employment when firms and workers are

overburdened regulations. The shadow economy thus allows firm to escape from excessive labor taxation, onerous and inappropriate regulation, and corruption in government institutions. Also, in the presence of foreign exchange restrictions, the avoids the vagaries of currency instability.

World Bank (2003) provides four labor market indicators: Flexibility-of-firing, flexibility-of-firing, conditions-of-employment, and employment-law. These lie between 0 (least restricted) and 1 (most restricted). We also use social security and pension contributions as percentages of total wages, and the size of the minimum wage in percent of average wages from the World Bank.² Finally we employ data for the employment ratio in 1991 from the UNICEF TRANSMONEE database. Purchasing power parity per capita GDP is obtained from the WDI database. Table 1 shows descriptive statistics of the data for our cross-sectional analysis:

3. Institutional Determinants of Income: Cross-Sectional Evidence

Fortza and Rama (2001) find that labor market reforms and institutions affect the success of reforms, but probably more for political than economic reasons. We would like to examine the evidence whether labor market institutions or enterprise institutions (or perhaps both together) affected economic performance in transition economies. Eicher and Schreiber (2004) have shown that enterprise reforms *caused* differences in growth and income in transition countries after 1991. Using independence prior to 1988 as an instrument for early enterprise institutions in 1991, they find that a move 10 percent

² The data can be found at:

<http://lnweb18.worldbank.org/eca/eca.nsf/Sectors/ECSPE/84BCF033AC636F0885256A940073F4E7?OpenDocument>

closer to advanced-level OECD standards in 1991 increases income by roughly 38 percent in 2001.

Here we seek to examine the robustness of our results in Eicher Schreiber (2004) with respect to the inclusion of various labor market indicators. There are several problems involved in examining both labor and enterprise institutions. Estimates on labor market institutions exist only in cross sections or in small samples in panel data. The most comprehensive study (Feldmann 2005) uses pooled OLS with an unbalanced panel of 12 countries over a maximum of 4 years. One might think that the advantage of the individual country or small sample approach is that the quality of data is high and comparable. However, just like the data on output, labor market data must be consumed with skepticism on transition economies. Here we take a completely different approach. We consider broader proxies for labor market institutions in order to obtain panel data from 1991-1997 the crucial years of transition, or we examine one cross section, but only with data that cover the lion share of countries. We introduce four indices from World Bank (2004) to capture regulation, social security and pension contributions, the early employment ratio, the size of the shadow economy in 1991, and the size of the minimum wage in percent of average wages in 1991.

The results presented in table 2 are not promising. None of the labor market variables, with the exception of the early employment ratio, are significant at the 10 percent level once we control for enterprise institutions. Enterprise institutions remain, however, are highly significant in all regressions at just about the exact same level as we found in Eicher Schreiber (2004). The estimated effect of economic institutional change

(moving 10 percent closer to OECD standards) is still shown to increase of income by 31 to 48 percent over 10 years.

These results seem to indicate that labor market institutions were not as important for the growth experience in transition countries as broadly defined enterprise institutions. We also construct a composite labor market indicator which is normalized to lie between 0 (least restrictive) and 1 (most restrictive).³ Using this index along with the composite enterprise institutions index confirms again that labor market never manage statistical significance at the ten percent level, even when their effect is aggregated into one index variables.

The final approach we can explore is factor analysis. Instead of calculating a simple average index, we seek to ascertain the weights of five different labor market indices in a composite index endogenously via factor loading. The factor analysis is performed by using five labor market variables: the flexibility index that includes both hiring and firing, an employment index that includes both employment law and conditions of employments, social security contributions, the size of the shadow economy, and the employment ratio.⁴

The rotated factor loadings in Table 3 indicate that factor 1 represents restrictive labor market regulations whereas factor 2 indicates the generosity of the welfare state

³ We include the flexibility indices for hiring and firing, the employment index for employment law and conditions of employment, social security contributions, the size of the shadow economy, and the employment ratio. We do not include pension contributions in this index as this would lead to a loss of 5 out of 21 observations. To ensure that all indices conform to 0 being the most restrictive and 1 being the least restrictive we transformed the flexibility index, the employment index, and the size of the shadow economy according to the following simple equation: $(\text{original index} - 1) * (-1)$. Since we only have 16 observations for the size of the minimum wage as percentage of average wages we replace it in the index by the overall mean of the available observations for the five missing countries for which all other indices are available.

⁴ Again we leave out the size of pensions contributions and this time also the size of the minimum wage since these are available for a smaller number of countries only.

(high social security contributions) and the attractiveness of the shadow economy. Introducing both these factors in our cross-country regressions does not lead to statistically significant coefficient estimates whereas again the coefficient on enterprise institutions stays highly significant. It may be possible that the cross section is simply too short a snapshot to capture the diverse experiences in transition countries, their various levels of initial starting points, their differential speeds of reform and economic development. Hence we conjecture that panel evidence has a much better chance to identify the impact of labor market regulations on growth in transition economies. The only downside to the approach is the fact that few labor indicators are available on a time series basis in transition economies.

4. Institutional Determinants of Growth: Panel Evidence

In order to execute a full fledged panel analysis that allows us the opportunity to analyze a broad cross section of transition economies, we examine the time series data for the size of the shadow economy, and for the size of the minimum relative to average wages. We now introduce both our composite index of enterprise institutions and these additional two variables into a fixed effects panel regression which estimates

$$\hat{Y}_{i,t} = \alpha + \beta I_{i,t} + \gamma \ln Y_{i,t-1} + \delta SE_{i,t} + \lambda MW_{i,t} + \eta_i + \varepsilon_{i,t} \quad (1)$$

where $\hat{Y}_{i,t}$ is growth in country i at time t , I is the enterprise institutions index described above, Y is the income level, SE is the size of the shadow economy as a fraction of official GDP, MW is the minimum wage as a fraction of average wages, α is a constant, and η_i captures country-specific fixed effects.

The regression in equation (1) is estimated using the system-GMM estimator from Blundell and Bond (1998). The results are presented in Table 4. Column 1 replicates the results from Eicher and Schreiber (2004) for the shorter time span 1991 – 1997. It shows that economic or enterprise institutions are highly significant and cause large growth effects even after controlling for lagged GDP and country fixed effects.

Introducing the size of the shadow economy into the regression as an additional explanatory variable hardly changes the estimate on enterprise institutions. Column 2 now indicates that our first proxy for labor market institutions exerts a statistically significant effect on output. Specifically, a reduction of the shadow economy (as a share of the official economy) by ten percent increases economic growth by 0.86 percent. Here we have evidence that labor reforms may well jointly determine the growth fortunes of the economy, although the enterprise institutions have an effect that is about 4 times as large in terms of their effect on output.⁵ A change of economic (or enterprise) institutions ten percent closer to advanced-level OECD standards is shown to increase economic growth by 3.6 percent per annum, even when we control for the size of the shadow economy (as a proxy for labor market institutions). Furthermore, the coefficient on enterprise institutions is still significant at the one percent level. Hence enterprise institutions are not only economically but also statistically more significant in the determination of economic growth in transition countries. In column 3 we introduce the size of the minimum wage as a percentage of average wages in the regression along with the index of enterprise institutions. The minimum wage is not significant, in fact the

⁵ The size of the unofficial economy, according to varying estimates, ranges from roughly 8 ~ 30 percent for most advanced level OECD countries (see Schneider and Enste 2000). It reaches, yet rarely exceeds, the size of official GDP in developing countries in our sample. So both measures normally include values between 0 and 1 and their estimated coefficients can thus be readily compared.

point estimate is remarkably close to zero. Enterprise institutions again remain highly significant.

Finally, column 4 reports how enterprise and labor market intuitions fare when all three indices are included in one panel regression. Again, enterprise institutions retain their large point estimate which is significant at the one percent level. The size of the minimum wage is not statistically significant and the size of in the informal economy remains marginally significant with a point estimate that is largely unchanged. In all regressions in table 4, a Sargan test of overidentifying restrictions does not reject the null hypotheses of correct specification of the GMM instruments at any usually employed levels of significance, suggesting that the system-GMM approach is valid.

The results presented in table 4 again confirm our preliminary finding from the cross section. Specifically, although we find evidence that labor market institutions (when included via the size of the shadow economy) have an impact on growth, it is enterprise reform that really drove economic growth across transition economies. Labor market characteristics do not seem to have much additional explanatory power for differences in growth in our panel once we control for enterprise institutions.

5. Robustness: Interdependence of Enterprise and Labor Market Institutions

In this section we show that our composite index of enterprise is not correlated with the size of the shadow economy. We also provide additional evidence that the shadow economy is mainly influenced not by enterprise reform but largely by labor market institutions.

The two columns of Table 5 show a regression of the *change* in the size of the shadow economy from 1991 – 1997 on initial enterprise institutions in 1991 and the (log) level of GDP per capita at PPP in 1991. The first column shows OLS results, the second column the results of an instrumental variables regression with independence prior to 1989 as an instrument for enterprise institutions in 1991. Here we use the same argument as in Eicher and Schreiber (2004), which can also be found in Beck and Laeven (2005) that early institutions at the time of the destruction of the Iron Curtain likely influenced early institutional change. Countries that were independent prior to 1989 did not have to create completely new national institutions but could instead reconstruct their economic and political systems with those already in place. This argues for a significant and positive effect of a dummy variable of independence prior to 1989 on early institutions.

Our first stage results confirm this hypothesis; the coefficient on the independence dummy is highly significant; a substantial amount of variation in early institutions can be explained. Enterprise institutions have the correct sign (better enterprise institutions lead to a smaller shadow economy), but are not statistically significant at the ten percent level in either the OLS or the IV regression.

Table 6 shows cross-country regressions of the *level* of the shadow economy in 1997 on early enterprise institutions. Here we examine two different starting points 1991 and 1993. Again enterprise institutions are not significant in the OLS or in the IV regression, indicating that the two measures are hardly correlated for the countries in our sample.

Table 7 present the results from panel regressions. In column 1, we regress the change in the size of the shadow economy on enterprise institutions, the lagged level of

the size of the shadow economy, and country fixed effects.⁶ In column 2, we regress the size of the shadow economy on enterprise institutions, the lagged level of GDP per capita, and country fixed effects. We again estimate these dynamic panel regressions with the system-GMM estimator to avoid the bias from fixed effects OLS regressions.

When controlling for country fixed effects and using lagged levels and first differences as instruments, enterprise institutions are again only moderately significant in explaining changes in the size of the shadow economy. A move ten percent closer to OECD standards in enterprise institutions will reduce the size of the shadow economy as a fraction of official GDP by roughly 1.9 percent (column 1 in table 3). This effect however is only significant at the ten percent level. In a regression of the level of the shadow economy on the other hand, enterprise institutions are now not significant and have the wrong (positive) sign when controlling for the size of official GDP and country fixed effects.

All these regressions lead us to conclude that the size of the shadow economy is influenced mainly by factors other than our index of enterprise institutions. Thus it can be introduced in growth regressions alongside enterprise institutions as a proxy for different institutions for which no time series data is available.

6. Conclusion

We have shown that the main result of Eicher and Schreiber (2004) is robust to inclusion of labor market institutions and characteristics. Economic or enterprise institutions are significant, statistically and economically, in explaining differences in growth and

⁶ To ensure stationarity of the level of the size of the shadow economy we subtract common time means for each year for each country. This is the technique used in Eicher and Schreiber 2004 and Bond, Hoeffler, and Temple 2001.

income in our panel of transition that uses the eleven years after the destruction of the Iron Curtain as a natural institutional experiment. When enterprise institutions, the size of the shadow economy, and the size of the minimum wage relative to average wages are included in fixed-effects panel regressions with growth as the dependent variable, enterprise institutions are highly significant. A ten percent move closer towards advanced-level OECD standard enterprise institutions increases growth by 3.6 percent per annum and is significant at the one percent level. A decrease in the size of the shadow economy by ten percent (measured as the fraction of official GDP) on the other hand increases the official GDP growth rate by only 0.8 percent and is less significant statistically.

These results provide a step towards a closer understanding of the importance of institutions for economic growth and development. More basic enterprise institutions such as the design of goods and financial markets may be more important for developing countries than labor market regulations.

References:

- Acemoglu, D., S. Johnson, and J. Robinson (2001). "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review*, vol. 91, no. 5 (December), pp. 1369 – 1401.
- Atkeson, Andrew and Patrick J. Kehoe. 1996. "Social Insurance and Transition." *International Economic Review*. May, 37:2, pp. 377–402.
- Bhaduri, Amit, K. Kaski and Friedrich Levick. 1993. "Transition from the Command to the Market System: What Went Wrong and What to do for Now?" Mimeo, Vienna Institute for Comparative Economic Studies.
- Blanchard, Olivier J. 1977. *The Economics of Post-Communist Transition*. Oxford: Clarendon Press.
- Blanchard, Olivier J. and Michael Kremer. 1997. "Disorganization." *Quarterly Journal of Economics*. 112:4, pp. 1091–126.
- Beck, Thorsten, and Luc Laeven (2005). "Institution Building and Growth in Transition Economies" Working Paper.
- Boeri, Tito and Peitro Garibaldi "Shadow Activity and Unemployment in a Depressed Labor Market" (2002) CEPR working paper.
- Blundell, Richard, and Stephen Bond (1998). "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models". *Journal of Econometrics*, vol. 87, no. 1, pp. 115 – 43.
- Bond, Stephen (2002). "Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice." *Institute for Fiscal Studies cemmap working paper CWP 09/02*.
- Bond, S., A. Hoeffler, and J. Temple (2001). "GMM Estimation of Empirical Growth Models." *CEPR Discussion Paper No. 3048*.
- Calvo, Guillermo A. and Fabrizio Coricelli. 1994. "Capital Market Imperfections and Output Response in Previously Centrally Planned Economies," in *Building Sound Finance in Emerging Market Economies*. G. Caprio, D. Folkerts-Landau and T. Lane, eds. Washington, D.C.: IMF, pp. 257–94.
- Eicher, Theo, and Till Schreiber (2004). "Effects of Institutional Change on Economic Growth: Time Series Evidence from Natural Experiments", Working Paper.
- Eilat, Yair, and Clifford Zinnes (2000). "The Evolution of the Shadow Economy in Transition Countries: Consequences for Economic Growth and Donor Assistance", *CAER Discussion Paper No. 83*.
- Eilat, Yair, and Clifford Zinnes (2002). "The Shadow Economy in Transition Countries: Friend or Foe? A Policy Perspective", *World Development*, vol. 30, no. 7, pp. 1233 – 1254.
- European Bank for Reconstruction and Development (2000 – 2002). *Transition Report*. London: European Bank for Reconstruction and Development.
- Forteza, Alvaro, and Martín Rama (2002). "Labor Market "Rigidity" and the Success of Economic Reforms Across More Than One Hundred Countries", World Bank Policy, Research working paper ; no. WPS 2521.

- Friedman, E., S. Johnson, D. Kaufmann, and P. Zoido-Lobaton (2000). "Dodging the Grabbing Hand: The Determinants of Unofficial Activity in 69 Countries." *Journal of Public Economics*, vol. 76, pp. 459 – 493.
- Hall, Robert, and Charles Jones (1999). "Why Do Some Countries Produce So Much More Output Per Worker Than Others?", *Quarterly Journal of Economics*, vol. 114, no. 1, pp. 83 – 116.
- Johnson, S., D. Kaufmann, and A. Shleifer (1997). "The Unofficial Economy in Transition". *Brookings Paper on Economic Activity*, No. 2, pp. 159 – 239.
- Lemieux, T., B. Fortin, P. Frechette (1994). "The Effect of Taxes on Labor Supply in the Underground Economy", *American Economic Review*, vol. 84, no. 1, pp. 231 – 254.
- Li, Wei. 1999. "A Tale of Two Reforms." *RAND Journal of Economics*. 30:1, pp. 120–36.
- Rosati, Dariusz. 1994. "Output Decline During Transition from Plan to Market." *Economics of Transition*. 2:4, pp. 419–42. *Transition Economies: Performance and Challenges* 27
- Roland, Gerard and T. Verdier. 1999. "Transition and the Output Fall." *Economics of Transition*. 7:1, pp. 1–28.
- Schneider, Friedrich, and Dominik Enste (2000). "Shadow Economies: Size, Causes, and Consequences", *Journal of Economic Literature*, vol. 38, no. 1, pp. 77 – 144.
- World Bank (2003). "*Doing Business in 2004: Understanding Regulation*". Oxford University Press.

Table 2: Effects of Different Institutions on Income

| Dependent variable is log GDP at PPP in 2001 | | | | | | | | | | | | | | | | |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|------------|---------------------|---------------------|---------------------|---------------------|
| Institutions Index 1991 | 3.608*** (0.629) | 3.501*** (0.637) | 3.287*** (0.638) | 3.379*** (0.648) | 3.406*** (0.666) | 3.588*** (0.642) | 3.440*** (0.633) | 4.047*** (1.245) | 4.803*** (0.863) | 3.667*** (0.643) | 3.690*** (0.859) | Add | 3.178*** (0.752) | 3.728*** (0.859) | 3.405*** (0.699) | 3.661*** (0.896) |
| Flexibility to fire | | 0.331 (0.569) | | 0.315 (0.562) | | | | | | | | | | | | |
| Flexibility to hire | | | -0.305 (0.686) | -0.287 (0.684) | | | | | | | | | | | | |
| Employment Conditions | | | | | 1.331 (0.815) | | | | | | | | | | | |
| Employment Law | | | | | | 0.801 (0.880) | | | | | | | | | | |
| Social Security % of gross wages | | | | | | | 0.869 (1.176) | | | | | | | | | |
| Pensions Contrib % of gross wages | | | | | | | | 1.034 (3.326) | | | | | | | | |
| Employment Ratio | | | | | | | | | 5.042** (2.331) | | | | | | | |
| Shadow Economy % of GDP | | | | | | | | | | -0.841 (1.078) | | | | | | |
| Minimum Wages % of average wages | | | | | | | | | | | -0.253 (1.308) | | | | | |
| Shadow Economy | | | | | | | | | | | | Add | | | | |
| labor indices (avg. of all above) | | | | | | | | | | | | | 3.239 (2.281) | | | |
| Factor Analysis Factor 1 (regulation) | | | | | | | | | | | | | | -0.084 (0.150) | | -0.099 (0.145) |
| Factor Analysis Factor 2 (welfare) | | | | | | | | | | | | | | | 0.248 (0.213) | 0.263 (0.227) |
| R² | 0.49 | 0.55 | 0.55 | 0.56 | 0.59 | 0.56 | 0.48 | 0.52 | 0.62 | 0.50 | 0.49 | | 0.57 | 0.57 | 0.58 | 0.59 |
| N | 25 | 22 | 22 | 22 | 22 | 22 | 24 | 18 | 22 | 24 | 16 | 21 | | 17 | 17 | 17 |

Superscripts **/**/* denote 10, 5, and 1 percent significance levels. White-Standard Errors in parentheses. A constant (not reported) was included in all regressions.

Table 3: Common Factor Analysis of labor market variables

| | Factor 1 | Factor 2 |
|---|-----------------|-----------------|
| Eigenvalue | 1.510 | 0.176 |
| Flexibility index loading (0 most restrictive, 1 least restrictive) | 0.813 | -0.078 |
| Employment index loading (0 most restrictive, 1 least restrictive) | 0.642 | 0.174 |
| Social Security contributions loading | 0.568 | 0.225 |
| Shadow economy 1991 loading | 0.009 | -0.335 |
| Employment ratio 1991 loading | -0.336 | -0.116 |

**Table 4
Different Institutions and Growth – Panel Evidence**

| | Dependent variable: Growth of GDP per capita | | | |
|-----------------------------------|---|---------------------|---------------------|---------------------|
| | 1991 – 1997 | 1991 – 1997 | 1991 – 1997 | 1991 – 1997 |
| Enterprise institutions | 0.346*** (0.054) | 0.361*** (0.051) | 0.324*** (0.034) | 0.338*** (0.079) |
| Size of the Shadow Economy | ---- | -0.084* (0.045) | ---- | -0.110* (0.059) |
| Minimum Wage (% of avg.) | ---- | ---- | -0.01 (0.164) | -0.037 (0.183) |
| GDP_{t-1} | -0.058** (0.025) | -0.086** (0.035) | -0.065* (0.034) | -0.104* (0.056) |
| N | 166 | 159 | 137 | 105 |

Superscripts */**/*** denote 10, 5, 1 percent significance levels. Standard Errors in parentheses.

Table 5
Enterprise institutions and the Size of the Shadow Economy

| Dependent variable: Change in the size of the shadow economy 1991 – 1997 | | | | |
|--|----------|--|----------------------------------|--|
| | OLS | | IV (Instrument: Independence) | |
| Inst | -0.538 | | -1.443 | |
| Index₁₉₉₁ | (0.539) | | (0.998) | |
| Log(Y_{1991}) | -0.430** | | -0.292 | |
| | (0.203) | | (0.252) | |
| R² | 0.302 | | --- | |
| R² first stage | --- | | 0.394 | |
| N | 21 | | 21 | |

Superscripts */**/** denote 10, 5, and 1 percent significance levels. White-Standard Errors in parentheses. A constant (not reported) was included in all regressions.

Table 6
Enterprise institutions and the Size of the Shadow Economy

| Dependent variable: Size of the Shadow Economy, 1997 | | | | |
|--|----------|---------|----------------------------------|---------|
| | OLS | | IV (Instrument: Independence) | |
| Inst | -0.306 | | -1.701 | |
| Index₁₉₉₁ | (0.608) | | (1.248) | |
| Log(Y_{1991}) | -0.517** | | -0.304 | |
| | (0.193) | | (0.280) | |
| Inst | | -0.371 | | -1.751 |
| Index₁₉₉₃ | | (0.642) | | (1.336) |
| Log(Y_{1993}) | | -0.26 | | 0.049 |
| | | (-0.25) | | (0.362) |
| R² | 0.313 | 0.195 | --- | --- |
| R² first stage | --- | --- | 0.394 | 0.576 |
| N | 21 | 24 | 21 | 24 |

Superscripts */**/** denote 10, 5, and 1 percent significance levels. White-Standard Errors in parentheses. A constant (not reported) was included in all regressions.

Table 7
Influence of Enterprise Institutions on the Shadow Economy
(System-GMM)

| | Change in the Size of the Shadow Economy | Size of the Shadow Economy |
|---|---|--------------------------------|
| Econ. Inst. Index | -0.191* (0.111) | 0.166 (0.216) |
| Lagged Size of Shadow Economy | -0.093 (0.065) | --- |
| Lagged level of GDP per capita | --- | -0.476*** (0.094) |
| N | 168 (24 countries, 7 years) | 168 (24 countries, 7 years) |

Superscripts */**/** denote 10, 5, and 1 percent significance levels.
Standard Errors in parentheses.