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Economic Inequality
in Central, East and Southeast Europe

The wiiw Balkan Observatory

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About

Shortly after the end of the Kosovo war, the last of the Yugoslav dissolution wars, the Balkan Reconstruction Observatory was set up jointly by the Hellenic Observatory, the Centre for the Study of Global Governance, both institutes at the London School of Economics (LSE), and the Vienna Institute for International Economic Studies (wiiw). A brainstorming meeting on Reconstruction and Regional Co-operation in the Balkans was held in Vouliagmeni on 8-10 July 1999, covering the issues of security, democratisation, economic reconstruction and the role of civil society. It was attended by academics and policy makers from all the countries in the region, from a number of EU countries, from the European Commission, the USA and Russia. Based on ideas and discussions generated at this meeting, a policy paper on Balkan Reconstruction and European Integration was the product of a collaborative effort by the two LSE institutes and the wiiw. The paper was presented at a follow-up meeting on Reconstruction and Integration in Southeast Europe in Vienna on 12-13 November 1999, which focused on the economic aspects of the process of reconstruction in the Balkans. It is this policy paper that became the very first Working Paper of the wiiw Balkan Observatory Working Papers series. The Working Papers are published online at www.balkan-observatory.net, the internet portal of the wiiw Balkan Observatory. It is a portal for research and communication in relation to economic developments in Southeast Europe maintained by the wiiw since 1999. Since 2000 it also serves as a forum for the Global Development Network Southeast Europe (GDN-SEE) project, which is based on an initiative by The World Bank with financial support from the Austrian Ministry of Finance and the Oesterreichische Nationalbank. The purpose of the GDN-SEE project is the creation of research networks throughout Southeast Europe in order to enhance the economic research capacity in Southeast Europe, to build new research capacities by mobilising young researchers, to promote knowledge transfer into the region, to facilitate networking between researchers within the region, and to assist in securing knowledge transfer from researchers to policy makers. The wiiw Balkan Observatory Working Papers series is one way to achieve these objectives.

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Economic Inequality in Central, East and Southeast Europe

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The article analyses the issue of economic inequality in the transition economies of Central, East and Southeast Europe. It consists of a literature review and a descriptive analysis as well as an econometric modelling exercise. In the first part we point at the fact that the rise in income inequality was triggered by the magnitude of transitional output loss and a reduction of formal employment. Rising wage inequality was at the core of total income dispersion, while government transfers had a redistributional function only in Central and Southeast European countries contrary to the Commonwealth of Independent States (CIS). In the econometric analysis it is found that for instance public utilities infrastructure liberalisation has increased inequality in transition, while price and trade liberalisation has decreased it. A high share of employment in industry and high government expenditures are connected with less inequality.

1. Introduction

There exists an enormous amount of economic literature on the general topic of inequality. A large variety of aspects of social and economic inequality have been looked at in great detail – such as for instance: inequality and growth (e. g. Kuznets 1955, Ravallion 2001, Benabou 1996, Deininger / Squire 1998, Alesina / Rodrik 1994, or Aghion et al. 1999), inequality and trade liberalisation (e. g. Milanovic / Squire 2005, Bhatta 2002), inequality and demog-

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raphy (e. g. Lam 1986, or Chu / Jiang 1997), inequality and health (e. g. Anand et al. 2005), inequality and migration (e. g. Black et al. 2005, Davies / Wooton 1992, Stark 2006), inequality and human capital (e. g. Chiu 1998), inequality and technological change (e. g. Acemoglu 2002), inequality and government policies (e. g. Davies 1986, Lambert 1993, Benedict / Shaw 1995). These contributions highlight different notions of inequality (e. g. functional versus personal income distribution) as well as a number of explanatory factors mutually related to inequality. In addition there exists a wide literature on the measurement and explanation of personal income distributions based on survey data (see Deaton 1997 for an overview). A more recent overview on general inequality issues is presented by Atkinson / Bourguignon (2000).

When looking specifically into the literature on inequality with a focus on transition economics it can be stated that one of the main papers in this field was Branko Milanovic's *Explaining the Increase in Inequality During Transition* (Milanovic 1999). He finds that the most important factors driving overall inequality upwards are to be found in the field of changing labour market outcomes. However, some authors argued that pre-transition Gini coefficients were not correctly measured and did not properly consider the inequality in a shortage economy. In any case, although severe changes in income and welfare distributions occurred in the region, it does not appear that inequality in transition economies increased that dramatically as it was predicted by some authors at the beginning of transformation. Przeworski (1991) expected a convergence of the transition economies to the extremely high level of inequality observed in Latin America.

Although a rise in inequality can be observed in the whole region (see table 1),[1] the situation differs from country to country, depending on the institutional heritages as well as the transition policies chosen. While the Gini coefficients reported for the Central European countries except Poland remained, although rising, in the rather low range of Sweden and Austria, the Baltic States, Bulgaria, Romania as well as Poland reached the level of Great Britain, being one of the Western European countries with the highest level of inequality. The Western Balkan countries except Macedonia share a level of inequality comparable to the one of Austria, whereas Russia's rising Gini coefficient as well as those of the CIS countries show a fast growing asymmetry in the distribution of income and wealth during transition.

We shall analyse the determinants of inequality in Central, East and Southeast Europe starting with factors influencing the changing distribution of wages, being at the core of economic inequality. Thereupon a broader view of the situation of income inequality of households shall be given.

The situation of wage disparities was shaped by enormous and still ongoing changes in the labour markets of the Eastern European countries, driven by transitional recessions and by enormous structural and sectoral shifts in the period of recovery from the mid

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1   Table 1 presents Gini coefficients based on disposable income. It shall be noted that a wide range of Gini estimates based on different income or consumtion definitions exists.

1990s onwards. The way in which these changes were driven as well as accompanied by macro-economic policies (monetary and fiscal policies – on the revenue as well as on the expenditure side) affected the situation of the labour force. Furthermore structural policies, e. g. in the field of trade and foreign direct investment (FDI), influenced the transition paths in the region. Direct impacts on distributional outcomes are resulting from country-specific modifications of labour market regulations, ranging nowadays from the almost non-existence of collective agreements in the Baltic states to Continental European-oriented labour market policies e. g. in Slovenia and the Czech Republic. Along with the liberalisation of labour market regulations socio-demographic factors (e. g. gender, ethnicity, education) regain importance in describing the emerging picture of wage distribution.

The broader view on income and wealth inequality as a whole directs the attention to structural policies in the field of privatisation as well as changes in the field of social transfer systems. Furthermore the privatisation of (formerly) public services in the field of pensions and reduced public expenditure in health care, education and other fields change the structure of provision of these services and are expected to influence future developments in income distribution.

The research is structured as follows. Chapter 2 provides a descriptive analysis and a literature review. In chapter 3 we estimate an econometric model explaining inequality in transition countries using a general to specific approach. A conclusion is provided in chapter 4.

2. Descriptive Analysis and Literature Review

In this chapter we give an overview of the ongoing discussion on the development of income inequality in the transition countries and analyse the possible reasons for the observed increase of inequality.

2.1 Income Distribution in the Era of Socialism

To qualify the changes in income inequality during the period of accelerated transition as well as the recent situation it seems appropriate to take a look at the dispersion of earnings at the point of departure in the 1980s. Generally spoken in the post World War II period earnings dispersion fell until the beginning of the 1980s in the Soviet Union and Central Europe. From that time on slight increases were reported for Hungary as well as the Soviet Union (Atkinson / Micklewright 1992).

Decile ratios[2] in the Soviet Union of monthly earnings had always been much higher compared to other COMECON countries. One reason was that average monthly earn-

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2   Ratio of the relative wage of the individual who receives higher earnings than 90 percent of all individuals but less than the richest ten percent and the relative wage of the individual with earnings higher than those of the lowest ten percent and below the richest 90 percent of all individuals.

ings differed between highly developed Soviet republics and economically backward ones. In 1989 average earnings in Estonia came up to 104 percent compared to Russia, while in Azerbaijan they made up only 69 percent. Earnings decile ratios at the end of the 1980s in the Czech Republic as well as in Hungary were with about 2.5 in line with those in Germany, in Poland (2.8) somewhat lower than in France and in Russia (3.4) comparable to Britain at that time (Flemming / Micklewright 1999).

The picture of household incomes per capita reveals that fiscal instruments had a dampening influence on inequality in most of the socialist countries. In the mid-1980s Gini coefficients for the individual distribution of per capita income were in Czechoslovakia and Hungary with 0.20 and 0.21 somewhat lower than those for Finland and Sweden, followed by Russia and Poland. Other Scandinavian and Benelux countries as well as Germany all had Gini coefficients below 0.30, while the USA was the OECD country with the largest income dispersion of 0.37. Within the Soviet Union the western republics of Ukraine, Belarus and Moldova had Gini coefficients of about 0.24, which were somewhat lower than those for Russia and the Baltic republics (0.27). Dispersion of per capita household incomes of most of the Central Asian republics as well as the Caucasian republics was only somewhat higher compared to Russia (except Armenia which had the same low level Gini coefficient as Moldova). However we have to keep in mind that the quality of the household surveys performed in Soviet republics was reported to be lower than in other COMECON states since a sample bias towards families of persons working in state enterprises and collective farms resulted in a reduction of variances (Atkinson / Micklewright 1992, Flemming / Micklewright 1999, World Bank 2000).

Throughout the article we try to use net-income-based Gini coefficients (as well as other inequality measures) instead of consumption-based measures. Income-based coefficients have the advantage that they are more easily available on a comparable basis. Consumption-based Gini coefficients report somewhat higher inequality levels compared to income-based ones for Central European countries, since non-reported income is revealed in consumption figures. In some CIS countries like Armenia, Georgia or Tajikistan the consumption-based Gini coefficients are considerably lower than the income-based ones. One important reason for this is that wages as a component of total income fell by large during transition in CIS countries. Since income from self-employment and other sources of non-wage income are prone to volatility as well as errors in measurement, consumption- and income- based Gini coefficients vary by large (World Bank 2000). An in-depth overview on methodological issues as well as pitfalls when working with inequality measures of transition countries is given by Flemming / Micklewright (1999).

2.2 Recent Picture of Income Inequality in the Region

In the following the recent situation of inequality in Central, East and Southeast Europe as well as its development since 1990 will be analysed taking into account the profound political, economic as well as social transition having occurred in Eastern Europe from the breakdown of the communist regimes onwards.

Although a rise in inequality can be observed in the whole region, the situation differs from country to country, depending on the institutional heritages as well as the transition policies chosen. Looking at the development of average inequality in the three main country groups of the formerly socialist region analysed here, we see that in all of these the liberalisation of markets led to a sudden rise in income dispersion (see figure 1). The change was most dramatic in the CIS region, with Russia experiencing the strongest increases after the break-up of the Soviet Union.

Figure 1: Development of Inequality in CE and Baltics, SEE and CIS, 1989–2003 (left scale: unweighted averages of Gini coefficients; income based)
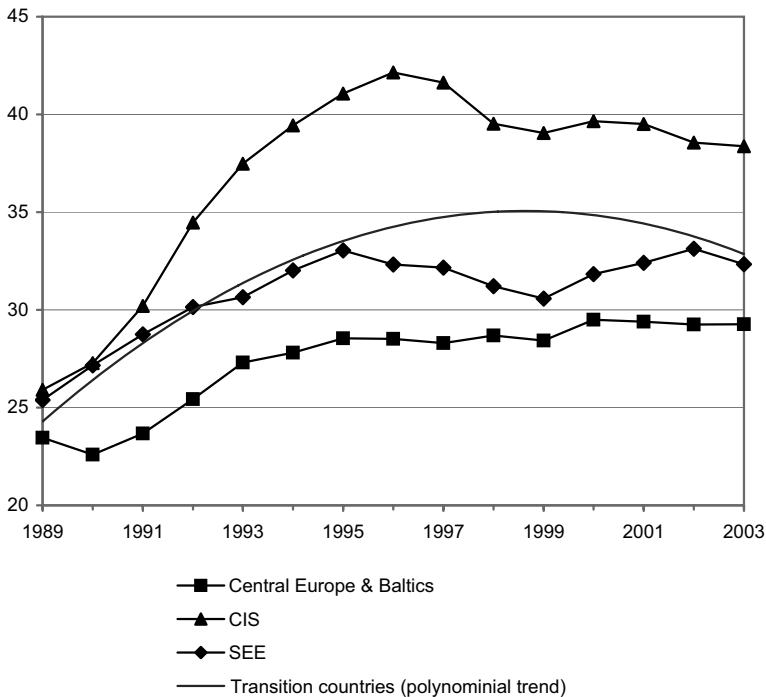
Source: UNU-WIDER: World Inequality Database Version 2.0b, own calculations

Table 1 (p. 160) reveals the large divergence of inequality development within the country group. While Belarus and Ukraine remained quite equal, the Caucasus region as well as Central Asian CIS countries experienced rising dispersion although the situation is rather mixed. In the region as a whole the strong rise in income inequality continued until 1996. The subsequent reduction up to 1999 was followed by a halt in the aftermath of the Rouble crisis, but after 2000 when GDP growth revived the situation of inequality improved too.

In the Central European region the Czech Republic experienced only a slight rise and Slovenia even a reduction in inequality, therefore their Gini coefficients are low even when

Table 1: Income Inequality in Transition Countries, Gini Indices (income-based)

	1990	2003		1990	2003
Czech Republic	19.7	22.8	Armenia	26.9	35.9
Hungary	20.3	25.2	Azerbaijan	34.5	37.3[3]
Poland	26.8	35.2	Belarus	23.3	23.8
Slovak Republic	18.0	25.5	Georgia	29.1	46.6
Slovenia	26.5	22.1	Kazakhstan	29.7	n. a.
Central Europe	22.3	26.2	Kyrgyz Republic	30.8	35.2
Estonia	24.0	35.0	Moldova	26.7	41.1
Latvia	24.0	35.9	Russia	25.9	41.2
Lithuania	24.8	32.4	Tajikistan	33.4	47.0[4]
Baltics	24.3	34.4	Turkmenistan	30.8	.
Albania	.	28.1[1]	Ukraine	24.0	32.7
Bulgaria	23.7	32.2	Uzbekistan	31.5	48.1
Bosnia and Herzegovina	32.9	26.2[1]	CIS	28.6	38.9
Croatia	27.6	29.0			
Macedonia	34.9	35.2			
Romania	22.7	35.2			
Serbia and Montenegro	31.7	30.0[2]			
SEE	28.9	31.3			

1 Consumption-based due to lack of data; 2 Estimate; 3 2001; 4 1999.

Source: UNU-Wider World Inequality Database Version 2.0b

compared to Scandinavian countries. Hungary and the Slovak Republic, where the development in employment was less favourable, were affected by stronger but still modest increases, in contrast to Poland, where a high share of self-employed, who work still by large in the agricultural sector, raises Gini coefficients. Yet a large part of the increase in the average inequality of the country group in figure 1 is due to the fast rise in the Baltic states, which after gaining their national sovereignty adopted a quite liberal approach in restructuring their economy. Although the first jump in the Gini index in the first half of the 1990s was followed by a rather stable development, we see a gradual but continuous rise of inequality up to 2003 in the group of countries that have joined the EU in 2004. A similar picture can be observed in the South East European countries. While Bulgaria and Romania also in part due to large agricultural sectors experienced a remarkable rise, in the Western Balkan region a considerable stability can be found.

    In the following we are going to analyse the macroeconomic development that influenced the inequality outcomes in the region. Furthermore we take a look at specific changes in the structure of labour markets. The overall inequality development of household in-

comes per capita which is illustrated by the Gini indices presented above is shaped by tax and transfer policies differing from country to country as well as by further structural policies discussed below.

2.3 The Process of Transition

Following the fall of the communist regimes in Central Europe in 1989 as well as the break-up of the Soviet Union in 1991 in all of the countries sooner or later a series of reforms with the aim to transform the economic systems from socialist planning to market regulation were introduced. These comprised the liberalisation of internal markets as well as of external trade and financial markets and the retreat of state influence from the production sphere via hardening the budget constraints of state-owned enterprises as well as their privatisation.

Although the political and economic process of transition always comprised a bundle of different and sometimes conflicting policies varying from country to country the problems to be coped with were quite similar. The way in which politicians, advisers and analysts thought about the modes of transition policy to be optimally chosen diverged in particularly with respect to the speed and depth of reforms to be taken at least in the period of early transition. The proponents of »shock therapy« argued for fast liberalisation and privatisation relying on market forces to establish nominal stability, which should subsequently foster growth via private investment.

Those who advocated a gradualist approach pointed out that the adaptability of market-agents (entrepreneurs as well as employees) is limited. The conversion of institutional capacities from a communist to a market economy, being necessary to guarantee sustainable growth, would take time. Therefore a fast break-up of existing market structures should be avoided since this would lead to a substantial loss of output, jobs and thereby welfare in the short to medium run (Jeffries 2002, Gabrisch / Hölscher 2006). The ex-post analysis of more than a decade of transition shows that apart from the speed chosen concerning the liberalisation of prices, markets and property rights the building up of proper institutions establishing a market economy was of crucial importance especially for the achieved outcomes in income inequality.

2.4 Loss in Output

Independently of the transition policies implemented, however, in all Central, East and South East European countries the liberalisation of markets, triggering a massive reallocation of resources, led to a severe recession at least in the first half of the 1990s. However the magnitude of output losses and the time period of GDP decline varied considerably. Looking at figure 2 (p. 162) we can see that in Central European countries GDP growth already recovered between 1994 and 1995. This is except for Poland, which could experience an upswing as early as 1992. For the Baltic states being highly integrated in the production system of the Soviet Union before 1991, the break-up of the USSR and the reorientation towards Northern and Western European markets led to a fall of GDP by almost 50 percent

Figure 2: Development of GDP in Transition Countries (index: 1990 = 100)
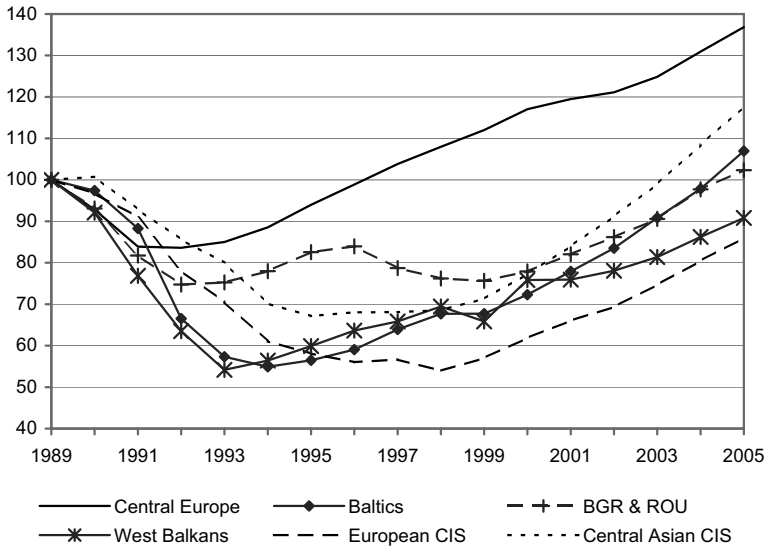
Source: EBRD database, own calculations

although the recovery already started in 1995/1996. In some of the CIS countries like Russia, Ukraine and Moldova yet the bottom of output decline was not reached until the end of the 1990s with output losses of 45 percent on average. In the region of South East Europe, Bulgaria as well as Romania experienced an early recovery, which was yet followed by a further period of recession between 1994 and 1998. All republics of former Yugoslavia obviously suffered severely from the effects of the Balkan wars either directly or indirectly via the break up of trade and production linkages and subsequently (and partly still existing) investment barriers. The initial output loss of almost 55 percent in the region as a whole was followed by a growth performance which was insufficient to reach the former level of GDP per capita.

In most of the Central European countries, however, the pre-transition level of GDP per capita was reached by the turn of the century, in Bulgaria, Romania as well as Croatia only by about 2005. In the CIS output still stagnated in the second phase of the 1990s with weighted average yearly GDP growth rates of 1.5 percent in European states as well as 2.8 percent in the Central Asian region. From 2000 onwards a remarkable rebound of growth had been recorded. After the overcoming of the effects of the Russian Rouble crisis in 1998, supported by the rise in fuel prices as well as those for e.g. metals, average yearly growth rates jumped to 6.5 percent (2000 to 2005) in European CIS countries as well as to 8.8 percent in those of Central Asia. However, only a few of the CIS countries managed to reach the GDP levels of 1990 again, especially Russia and Ukraine still lag behind.

Some authors yet claim that when comparing the pre- and post-communist output figures especially of CIS countries one tends to overstate the welfare reductions having tak-

Figure 3: Changes in GDP per Capita in Transition Countries, in % of 1990
(GDP measured in constant 2000 international $ PPP)

■ change 1990 - lowest level in transition period ☐ change 1990-2004
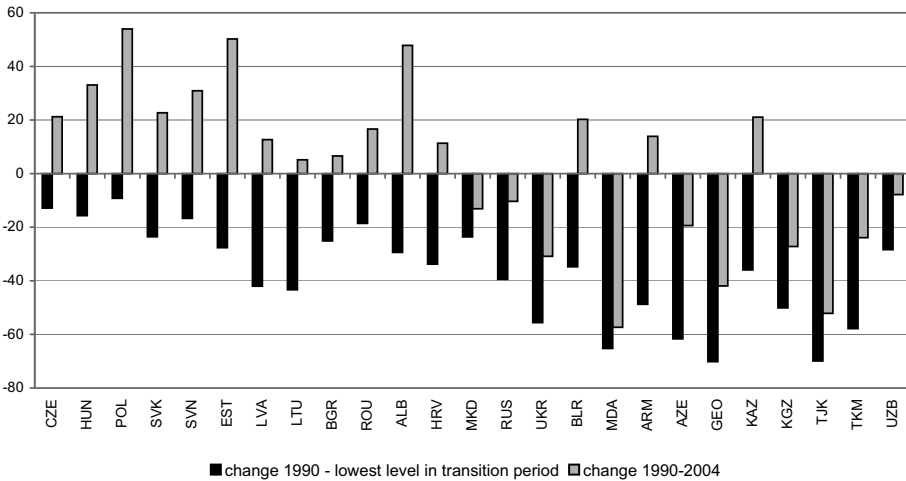
Sources: World Development Indicators 2006, TransMONEE database 2007

en place. One of the greatest problems hereby is that part of the economic activity report-ed for pre-transition periods had a negative value added if inputs and outputs were priced at world market levels. The adjustment of official data could therefore lead to a reduction of measured output losses by 30 percent to 50 percent (Havrylyshyn 2006). Nevertheless it is far from debatable that the break-up of the socialist system in Eastern Europe was fol-lowed by severe reductions of average welfare in the region. Using official data we can see in figure 3[3] the stronger severance but also difference in magnitude of the drop in GDP per capita within countries in the CIS region compared to Central Europe. Moreover the di-verging growth performance in the second half of the 1990s and thereafter resulted in a wid-ening of the welfare gap between countries (see figure 4, p. 164).

Not very surprisingly a strong correlation between output loss in the early phase of transition and the rise of inequality measures as the change of Gini coefficient is found in the literature. Although some authors claim that this points to the correlation that the fast-er the liberalisation the lower the inequality outcome in transition, this is far from conclu-sive. Some countries like the Baltic states have transformed quite swiftly into liberal mar-ket economies accompanied by fast rising inequality. Belarus on the other hand is one of the states in the region with the least will to transform and still experiences, like some other CIS countries, relatively low levels of inequality (Grün / Klasen 2001).

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3   The explanation of country codes can be found in the appendix.

Figure 4: Development of GDP per Capita in Transition Countries
(in constant 2000 international $ PPP)

■ 1990   □ lowest level in transition period   ▨ 2004
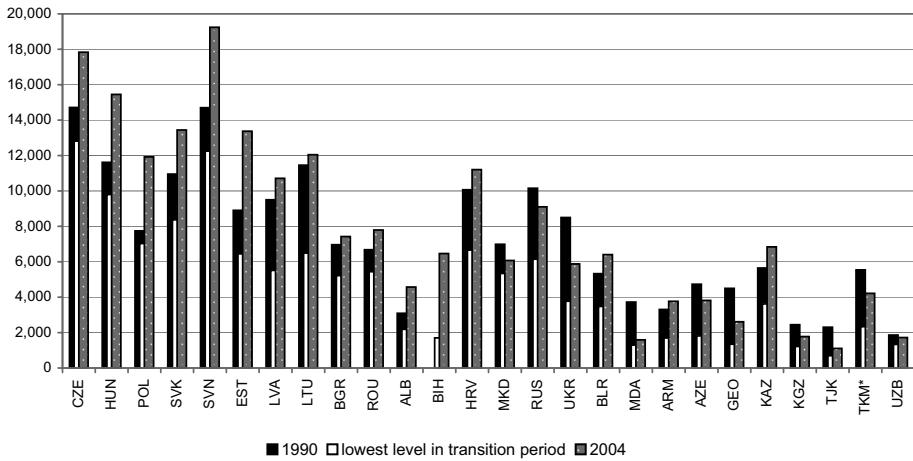
Note: *Turkmenistan, last column: 2001

Sources: World Development Indicators 2006, TransMONEE database 2007

2.5 Reduction of Employment

The transition crisis described above was accompanied by a massive reduction of employment and substantial underutilisation of labour in general (see table 2). As a consequence open unemployment, which did not exist as a mass phenomenon in the socialist era, rose, coupled with the emergence of different types of informal economic activity. In particular in the CIS the sharp and persistent fall in labour demand of enterprises forced workers to move into low-productivity jobs in the service sector or subsistence agriculture, since in many of these countries social protection is lacking and the status of unemployment is not an affordable option. Moreover the prevalence of low-productivity jobs in unrestructured enterprises in CIS countries can be seen as a further type of underemployment.

In the whole region a reduction of formerly high employment to population ratios took place (see table 2), more rapidly in the Central European countries, while in the CIS the prolonged process of enterprise restructuring resulted in a delayed fall of employment rates later on. In the whole region not only the demand but also labour supply was reduced, e. g. of elderly persons taking advantage of early retirement schemes particularly in Central European countries as well as women, who had high employment rates compared to Western Europe in socialist times, but with reduced job opportunities their share in the labour force shrank (World Bank 2005a). While men more often tried to prevent long-lasting stances of unemployment by moving into self-employment, especially low educated women were likely to drop out of the work force. However differences between male and female employment rates did not increase enormously and declined in the phase of output recovery (Heyns 2005).

Table 2: Labour Markets in Central, East and Southeast Europe in Transition

	Employment rates			Unemployment rates		
	1989	lowest level in transition	2005	1996	2000	2005
Czech Republic	86.9	70.4	70.4	3.9	8.8	7.9
Hungary	83.0	56.5	61.2	9.9	6.4	7.2
Poland	74.7	54.8	55.8	11.5	16.0	18.5
Slovakia	79.6	59.8	60.4	11.3	18.8	16.2
Slovenia	74.5	62.6	72.9	7.3	7.2	5.8
Central Europe[7]	78.3		59.8			
Estonia	87.9	68.7	70.5	9.9	13.6	10.7
Latvia	85.0[1]	64.1	70.1	20.7	14.4	n. a.
Lithuania	83.9	63.5	67.0	16.4	16.4	8.3
Baltics[7]	85.1		68.7			
Bulgaria	81.5	54.7	59.4	14.1	16.9	10.1
Romania	77.4	65.0	65.4	6.7	7.1	7.2
Albania	75.0	47.9	48.8	12.4	16.8	14.3[4]
Bosnia and Herzegovina	.	.	44.0[2]	.	16.1[5]	23.8[2]
Croatia	.	55.6	55.6	10.0	17.0	12.3
Macedonia	.	39.9	39.9	31.9	32.2	37.3
Serbia and Montenegro	.	50.8	47.0[2]	17.7	17.1	.
Western Balkan[7]	.		47.6			
Belarus	84.2	67.0	67.0	4.0	2.1	1.5[4]
Moldova	81.0	54.0	54.5	.	8.5	7.3
Russia	83.6	63.0	69.8	9.7	10.6	7.2
Ukraine	83.2	65.3	67.0	7.6	11.7	7.2
Armenia	76.1	52.0	52.3	9.3	11.7	8.2[4]
Azerbaijan	68.8	68.8	70.5	.	12.8[5]	.
Georgia	82.0	57.4	65.1	.	10.3	12.6[2]
European CIS[7]	82.9		68.6			
Kazakhstan	82.6	67.1	74.0	.	10.4[5]	8.1
Kyrgyzstan	74.3	60.9	60.9	.	13.9[6]	8.5[2]
Tajikistan	72.5	52.1	55.5	.	9.3[6]	7.4[2]
Turkmenistan	77.9	72.0	82.0[3]	.	7.7[5]	.
Uzbekistan	72.0	63.7	63.9	0.3	0.4	0.3[4]
Asian CIS[7]	76.5		67.2			

1 1990; 2 2004; 3 2003; 4 Registered unemployment rate – national methodology; 5 2001; 6 1999; 7 Weighted averages.

Sources: TransMONEE Database 2007, wiiw Database

Although a rebound of growth took place in the Central European States and the Baltics in the mid 1990s this was not accompanied by a rise in employment figures for a longer time (see table 2). Strong productivity growth led to further falling or stagnant employment rates until about 2005 in general, with the exception of Hungary and Slovenia. In Russia, Ukraine and Belarus improvements from 2000 onwards are visible. Although an improvement took also place in low-income CIS countries, labour markets there still resemble in many respects those in low-income countries in other world regions with a dominant informal sector and widely spread underemployment (World Bank 2005a).

2.6 Changing Structures of Employment

The fall of labour demand as well as the liberalisation of labour market regulations were accompanied by the emergence of all kinds of less regulated forms of employment, be it in the form of temporary contracts, part-time work or self-employment in the sphere of the formal economy. The elimination of legal restrictions on private business activity and ownership gave rise to self-employment throughout former socialist countries. The magnitude and reasons for that were very different, however. In Central European countries except for Poland and Western Balkan states it is mainly the emergence of small-scale entrepreneurial activities that led to a rise of the shares of self-employment in 2004 by between 12 percent in the Slovak Republic and 19 percent in the Czech Republic, a level comparable with Western European countries (15 percent). In Poland and Romania the large small-scale farming sector is mirrored by a share of self-employment of about 29 percent and 46 percent, respectively, at that time.

Contrary to Central Europe the severe recession in the CIS resulted in a much deeper collapse of jobs and wages in the formal sector, which forced employees to move into small-scale farming or petty trade. These activities were often done in parallel to formal, low-paying or non-paying jobs. The latter was common in the CIS since in the course of delayed enterprise restructuring personnel was not laid off but instead just the payment of salaries suspended. A similar type of coping of enterprises with financial difficulties were wage arrears that concerned a large part of employees in the private but also in the public sector up to the turn of the century (World Bank 2000 and 2005a).

From figure 5 we can see that increases in inequality measures and differences in inequality levels between countries were shaped by the changing structure of functional income distribution. The higher the share of wage earnings in countries of the region, the lower is the income dispersion in general. In addition between 1995 and 2002 the correlation of the share of compensation of employees in GDP and the Gini index has become more pronounced.

Irrespective of the concrete liberalisation of labour market regulations, in most of the countries especially low-skilled workers were affected by firm closures or by reductions of the labour force in the course of enterprise restructuring, the chance to find a job in the formal sector was pretty low. The effect was that many of these had to move into informal jobs, thereby reducing their wage costs by avoiding the tax wedge. In the Central European countries and the Baltics the informal sector is estimated to comprise between 15 percent and 35 percent of the work force, which is twice as large as in the economically advanced

*Figure 5: Correlation of Functional Distribution and Inequality in Transition Countries;
CE & Baltics, SEE and CIS (left scale: Gini coefficient; lower scale:
compensation of employees, in percent of GDP)*

+ 1995   ◆ 2002

y = -0.54x + 57.45   y = -0.39x + 48.47
$R^2 = 0.17$ $R^2 = 0.26$
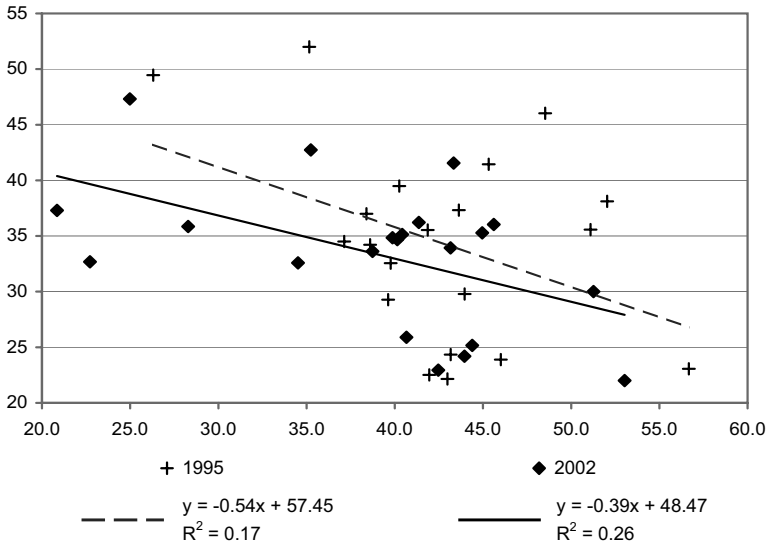
*Sources: AMECO database, CIS STAT database, UNU-WIDER: World Inequality Database
Version 2.0b*

EU-15 region. Estimations for the South European countries range between 25 percent and 35 percent. Figures for the CIS countries where 35 percent to 55 percent of the labour force are expected to work in the informal sector reflect that a large part of the population had to recourse to subsistence agriculture to make a living (World Bank 2005a).

2.7 Rising Disparities in Labour Earnings

The situation of wage disparities was shaped by the enormous and still ongoing changes in the labour markets of the Eastern European countries, driven by transitional recessions and by outstanding sectoral and structural shifts in the period of recovery from the mid 1990s onwards. Along with the liberalisation of labour market regulations, factors like e.g. the educational attainment level, ethnicity or gender of the individual employees regained importance in describing the emerging picture of wage distribution.

As a result wage disparities rose above the average OECD level in most of the countries in the region. In the early phase of transition reported concentration coefficients[4] for wages

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4   The concentration coefficient of wages measures how evenly they are distributed in relation to total income inequality. Negative values indicate that wages are reducing income inequality, positive values that wage inequality raises overall inequality.

have risen from 0.23 (in the late 1980s) to about 0.32 (in 1995) in Hungary, Poland, Slovenia and Bulgaria and from 0.25 to 0.50 in the countries of the former Soviet Union (World Bank 2000). The disparities have also risen thereafter. While in the Czech Republic and Slovenia in 2002 the ratio of wages of the 9th decile to the 1st decile is with 3.5 the same as that of the OECD average, figures for Hungary and Poland are in between four and five. Bulgaria, Romania as well as Lithuania and Estonia range between five and six like the Ukraine and Belarus. Almost all other CIS countries have much higher disparities with decile ratios between seven and 14 and Russia exceeding a ratio of ten (World Bank 2005a).

Wage decompression has had the largest impact on the increase of total income inequality in Central, East and South East Europe, which is underlined in the literature (Milanovic 1999, Mitra / Yemtsov 2006). Inequality not only rose between population groups reliant on their status in the labour market. Independently of the speed of reforms, labour earnings disparities rose in all transition countries (World Bank 2000).

In countries where the shares of employees in total employment fell by large like in the low-income CIS this was a major driving force since incomes derived from self-employment are more unequally distributed. Looking at the data for CIS countries in the years 1998 to 2003 a turnaround can be detected, since a rise in the number of wage earners and the end of widespread wage arrears reduced income inequality (World Bank 2005c).

One of the most important factors that was driving the rise in wage inequalities in the Central European states is to be found in the increase in wage premiums to education especially in the emerging private sector (World Bank 2000). As a result returns to education nowadays tend to exceed those to be found in OECD countries, whereby the speed of reforms within countries has positively influenced the existing premium differences (Fleisher et al. 2004; Tonin 2006). For low-skilled workers not only did the probability of getting unemployed rise dramatically, but moreover many of those left the labour force completely. Therefore the activity rates of low-skilled fell by large, especially when compared to the situation in the EU-15 (Landesmann / Vidovic 2006). In addition absolute income levels worsened substantially, whereas highly educated employees often experienced real wage growth early after the rebound of output growth. In the CIS where labour turnover in general and the growth of private sector employment was low, the rise in returns to education was more reluctant and set in only later (World Bank 2005a).

Although self-employment rose in total in all East European countries, its share in total income changed only slightly in the transition period in Central European countries, since here private economic activity could evolve already throughout the 1980s. Milanovic (1999) reports a rise from 20 percent at the end of the 1980s to 24 percent in 1995 on average. However in former Soviet Union Republics where private entrepreneurs could start their business only later on the average share of income derived from self-employment rose dramatically in the same period from nine to 25 percentage points. The concentration of incomes derived from self-employment rose only in some of the Central European countries, being only a negligible source of rising inequality, whereas especially in Russia as well as in other CIS countries concentration coefficients roughly tripled from 0.17 to 0.50 (Milanovic 1999).

2.8 The Role of Labour Market Institutions

The institutional setting of wage bargaining changed dramatically in the countries of Central, East and South East Europe. In the socialist era most workers in the region were automatically members of a union. In most transition countries union density and coverage rates of collective agreements declined substantially, although there are clear variations between countries. In CIS countries official density rates are reported to have remained high, between 55 percent and 90 percent of the work force in the early 2000s, although these figures tend to be inflated (Crowley 2005, World Bank 2005a).

In Central European countries and the Baltics density rates as well as coverage rates, which amounted to 85 percent and 90 percent in 1989, dropped to about 30 percent and 50 percent on average although individual countries like e. g. Lithuania with a coverage rate of about 12 percent and Slovenia were it amounts to more than 90 percent experienced substantially different developments. In general collective bargaining coverage in Central and Eastern European member states of the EU nowadays is poor compared to Western Europe, with collective bargaining taking place mainly at the company level with only a minor role for industry or sector organisations. Extension mechanisms are reported to be weak, poorly enforced or non-existent (Lawrence / Ishikawa 2005).

Since the impact of union activity as well as collective agreements on inequality outcomes is not always clear we tried to look at the relationship with respect to new EU member states as well as Croatia, Bulgaria and Romania (see figures 6 and 7, p. 170). An extension to additional Southeast European countries and the CIS was not possible due to data availability.

We find a strongly negative linear correlation between union density and inequality in the countries of the 2004 EU accession round, which is reduced when the sample is extended by Bulgaria, Romania and Croatia (see figure 6). The correlation between coverage rates of collective agreements and inequality is as striking. Removing Slovenia from the sample even aggravates the negative correlation and raises the fit of the regression line (R^2). When Bulgaria, Romania and Croatia are excluded the results remain very similar (see figure 7).

2.9 Regional Dimension of Wage Inequality

Wide regional variations characterise the recent situation in labour markets in the CEE region. This is not only due to transitional recessions hitting regions at different magnitudes. In part it is routed in the planning mode of industrial production having prevailed in the command economies. Concentration of production and specialisation of regions on a handful of industries and products brought along disparities in regional production structures and value added, which, however, was not mirrored by differences in living standards, since redistribution via price and wage controls equalised incomes. With the liberalisation of prices and markets combined with the reduction of state intervention and subsidies an unbalanced adjustment process set in. Regions which were specialised in heavy industry or agricultural production or were oriented towards the Soviet market were hit hardest. In

Figure 6: Correlation of Union Density and Inequality in Transition Countries, 2001
(left scale: Gini coefficient; lower scale: union density)

Central Europe, Baltics & BGR, ROU, HRV

$y = -0.15x + 36.16$
$R^2 = 0.47$
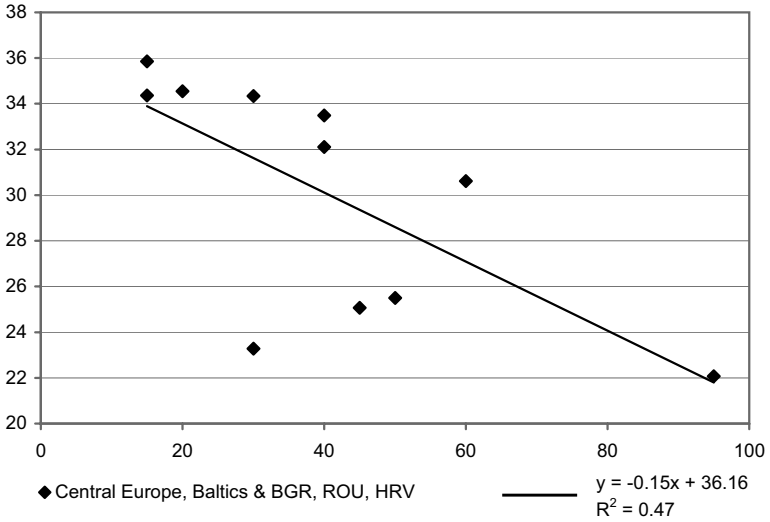
Sources: Schroeder (2004), UNU-WIDER: World Inequality Database Version 2.0b

Figure 7: Correlation of Coverage Rate of Collective Agreements in Transition Countries, 2001 (left scale: Gini coefficient; lower scale: coverage rate of collective agreements)

Central Europe   Central Europe & BGR, ROU, HRV

$y = -0.53x + 43.28$ $y = -0.16x + 35.12$
$R^2 = 0.81$ $R^2 = 0.15$
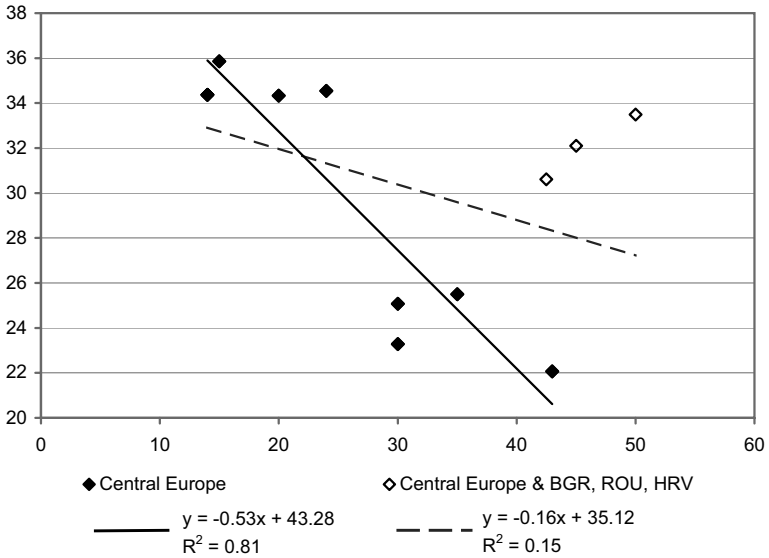
Sources: Schroeder (2004), UNU-WIDER: World Inequality Database Version 2.0b

contrast capitals and other metropolitan areas, which benefited from the growth in service sectors, could cope more easily with the ongoing transitions.

Furthermore those regions which where specialised in the production of consumer goods or in sectors which attracted FDI already early in transition and had the advantage of geographical proximity to western markets were better off. As a result regional disparities rose concerning employment and unemployment rates and to a lesser extent also wage rates of employees (Tonin 2006, Mitra / Yemtsov 2006).

2.10 Gender Inequality

Surprisingly wage differences narrowed between women and men during the 1990s. One reason for this was that although high participation rates of both women and men were fostered in the socialist era, women were underrepresented in heavy industry and other sectors, which were highly rewarded in COMECON countries. With the liberalisation of labour markets those skills acquired above-average by women, like business qualifications or the command of foreign languages, turned out to pay off better than before. Sectoral employment shifts from industry to services favoured women, who prevailed in these sectors already in communist times. Another reason already mentioned above was that especially low-skilled women dropped out of the labour force more likely than men, so that the ratio of average wages of women and men increased. As a consequence gender wage gaps narrowed (Heyns 2005). Although the reduction of earnings differences in transition made up only for a part of the gender wage gap, we have to conclude that it has contributed negatively to the general rise in income inequality in the region.

2.11 General Income Inequality and Wealth Inequality

The broader view on income and wealth inequality as a whole directs the attention to structural policies in the field of privatisation as well as changes in the field of social transfer systems. Different country experiences in the change of ownership of firms as well as land and real estate led to different outcomes in wealth (as well as wage) distribution. Furthermore the privatisation of (formerly) public services in the field of pensions, health care, education and other fields changes the structure of provision of these services and is expected to have an influence on the future development of income distribution.

2.11.1 Transfers and Tax Policy

Government taxes and transfers have influenced the distribution of incomes in Central and Eastern European countries by large throughout transition. In Central European countries social transfers have dampened the rise in income inequality in general. Throughout the 1990s public social spending as a share of GDP remained relatively stable at levels comparable to Western European states. At the end of the 1990s the ratio of public expenditure to GDP amounted to 13.5 percent on social protection, five percent on education and five percent on health expenses (Klugman et al. 2002). In addition better targeting of social trans-

fers had a reducing effect on total inequality. For the early period of transition Milanovic (1999) concludes that this was mostly due to the introduction of unemployment benefits, whereas in some countries the flattening of the pension schemes but also the possibility to leave the workforce via early retirement may have curbed the increase in inequality (World Bank 2000). Analysing data of the Luxembourg Income Study (LIS) database on Central European countries as well as Romania and Estonia, Cerami (2003) states that poverty rates, measured as 60 percent of average income, would have doubled from about 15 percent to almost 30 percent on average given the absence of social transfers.

In CIS countries the picture looks quite different. The fall in government revenues and subsequently expenditures to below 30 percent of GDP caused not only an absolute but also a relative reduction of social expenditure to GDP. At the end of the 1990s 7.5 percent of GDP were spent on social protection, about four percent on education and 3.5 percent on health in CIS countries on average, with much lower rates for most low-income CIS countries (Klugman et al. 2002). Subsequently the impact of transfers to reduce increased income inequality in the post Soviet region has been marginal, in some countries especially in Russia the rising concentration of pensions had even an aggravating effect on income dispersion (World Bank 2000). Cerami (2003) reports that total social transfers reduced the inequality of incomes measured by the Gini index by only 14 percent in Russia in 2000.

Information on the influence of changing tax structures on income inequality is less easily available. In all of the Central and East European countries at the beginning of the transition the tax systems relied heavily on direct taxation, so that tax revenues were reduced by large with the fall in output figures. A stabilisation of revenues was obtained with the introduction of value added taxes throughout the region, which made up a much larger share in total tax revenues of Central European countries at the end of the 1990s compared to Western Europe (Leibrecht / Römisch 2002). Although we know that indirect taxes have a regressive effect, it does not influence the dispersion of disposable income but only welfare levels. The effect of the value added tax on welfare differences of income groups, however, as far as we have seen is not considered in the literature on income inequality.

In the field of direct taxation in Central European countries, the Baltics as well as Bulgaria, Romania and Croatia a shift of the tax burden from enterprises towards individuals can be found. Furthermore many of the countries lowered the income tax rates of upper income brackets, thereby reducing the redistributional effect of their tax systems. Estonia was the first country to introduce a flat income tax system, followed by Lithuania and Latvia, after 2000 also by Russia, Ukraine, the Slovak Republic, Georgia, Romania, Bulgaria and the Czech Republic. Since the shift towards a flat tax system is most often combined with the broadening of the tax base and an increase of the basic allowance, it is not that clear-cut in advance how it changes the post-tax distribution especially between low and medium income earners, but high income earners are certainly better off. Furthermore the change in the distributional impact of the income tax can be of small magnitude compared to that of an overall change of the revenue structure of the government (Keen et al. 2006). For the development of tax systems in Central and Eastern Europe in total, we can conclude that the redistributive effect has been reduced by the above described modifications. This can

also be seen when looking at the progression of the tax wedge in the Central European and Baltic countries. While social contributions and taxes result in a burden of almost 40 percent for low wage earners (50 percent of the average wage in manufacturing) in these countries, in the EU-15 the burden is with 35 percent in 2003 somewhat lower and the distributional effect of total labour taxation substantially higher (World Bank 2005b).

2.11.2 Privatisation and Wealth Inequality

The transition of the communist countries towards market economies implied a large-scale transfer of formerly publicly owned assets into private hands. The privatisation of small-scale enterprises, which started first, was finished by and large in the mid-1990s, while in general in the second half of the decade the privatisation of medium- and large-scale enterprises set in, coupled with the opening up towards foreign direct investors.

Privatisation was executed in different ways ranging from voucher-based privatisation towards the sale of enterprises at market value to strategic (also foreign) investors. Voucher privatisation was used as primary method in the Czech Republic, Russia, Latvia, Lithuania and most of the low-income CIS countries and should allow for a fast change of property rights and guarantee a broadly based ownership of assets throughout the population, which was often only achieved in the beginning of transition. The sale to outsiders was done predominantly in Hungary and Estonia, while in Poland, the Slovak Republic, Slovenia, Macedonia and Croatia as well as Ukraine and Uzbekistan the buyouts to the management and employees was the primary method chosen (World Bank 2000).

In the literature no clear evidence has been found concerning possible correlations between the privatisation methods chosen and effects on inequality. Rather a clear difference can be seen between Central European and former Soviet Union countries. The former succeeded in building up quite well functioning institutions shaping the interplay of market agents parallel to privatisation, which ended up in rather similar structures of ownership. In the latter the retreat of state influence led to a fast consolidation of property rights when assets changed hands from workers to managers or outside owners after privatisation. Furthermore the so-called loans-for-shares programme in Russia transferred the ownership of the mining sector to banks below the market value. All in all this brought along a dramatic rise in wealth inequality with the emergence of large business groups owned by a handful of entrepreneurs, which are known as oligarchs today (Guriev / Rachinsky 2006).

Apart from enterprises also housing and land changed into private hands in the course of transition. At the end of the 1990s the share of housing owned by private persons ranges between 60 percent in Russia and about 95 percent in Lithuania. The magnitude of private ownership is in general much higher compared to Western European countries. Most researchers argue that housing privatisation appears to have had a progressive distributional impact even in CIS countries (World Bank 2000). However, Yemtsov (2007) points out that the redistributional effect of housing privatisation has been overestimated in previous analyses. He argues that housing has been a usual fringe benefit prior to transition with those employees higher in the social hierarchy living in flats that realised higher market values after privatisation, when real estate prices began to rise and differentiate. He concludes that

the give-away of former state owned real estate below market value has entrenched or even aggravated the pre-transition divergence in housing wealth. Including imputed rents in the analysis would therefore worsen the picture of income inequality in the region.

However we should point out that since no comprehensive data exist on household wealth holdings in general it is not possible to assess in detail the magnitude of wealth inequalities resulting from the reallocation of property rights in the course of privatisation as well as the resulting effects they have on income inequalities in the region.

3. Econometric Model

In the following we estimate an econometric model in order to analyse the determinants of inequality in transition countries with respect to a set of explanatory variables, which are also prominent in the existing literature. They reflect transitional and structural change as well as public policy. However it has to be said that many of the variables tend to be overlapping across these groups and cannot be assigned strictly to one of them. In our econometric analysis we do not test an existing theoretical model on purpose, as there is no clear theoretical framework to assess how inequality might change in transition, although Milanovic (1999) is one such approach. Nevertheless we try to start with as many variables as possible and apply a general to specific (GETS) approach. The general model to be estimated is:

$$(1) \quad y_{it} = \beta x_{it}^{'} + \varepsilon_{it},$$

where y_{it} is the level of the Gini index for country i in year t and $x_{it}^{'}$ is a vector of explanatory variables. The error term is ε_{it}. The actual choice of explanatory variables was driven by several factors. First, we wanted to use as many indicators of the descriptive part as possible. These are indicators such as employment, unemployment, structure of employment (e. g. share of employment in industry), government transfers and privatisation. Second, our choice was limited by the availability of these indicators across time and countries. Therefore we were not able to make use of e. g. unionisation data, which exist only as snap shots for a few countries in a few years. Finally, after collecting a considerable amount of potential explanatory variables we had to weed out those which were highly correlated with others in order to get rid of multicollinearity. In this stage we had to sort out for instance GDP per capita data, as it is highly correlated with a number of other variables. The variables that survived this purification process are described in the following paragraph. All the data finally used were transferred in logs.[5]

We defined our sample to include data for 28 transition economies[6] for the period of 1989 to 2003, due to data availability. Our chosen indicator for income inequality is the

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5   Three of the variables used, namely inflation, real interest rate and change in labour productivity in industry, show also negative values. Therefore these variables were added to 100 before being logarithmised.

6   This includes eight countries from Central and Eastern Europe (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia), seven countries from Southeast Europe

Gini index, taken from the WIDER database (for a detailed description of all the variables and their sources see Appendix). For almost all the transition economies data are only available up to the year 2003.

With regard to transitional change variables we found the following European Bank for Recovery and Development (EBRD) indicators on: large-scale privatisation, small-scale privatisation, price liberalisation, trade and foreign exchange system and infrastructure reform. We expect these five liberalisation indicators to be rather positively correlated with inequality. This is based on the idea of a trade-off between efficiency and equity during the process of reallocation of resources in transition. However, it is theoretically possible that reallocation can coexist with different distributions.

To the next group of four variables we attribute the label public policy. From the EBRD database we have general government expenditure (in percent of GDP) as well as subsidies and current transfers (in percent of GDP). From the World Development Indicators (WDI) 2007 database we took data on inflation and real interest rates. In the case of the two government expenditure variables we clearly expect a negative correlation with the Gini coefficient. For the monetary policy indicators inflation and real interest rate it is rather ambiguous. Here one could assume various effects on inequality.

In the field of structural change we have found variables such as: change in labour productivity in industry (from the EBRD), manufacturing value added (in percent of GDP), employment in industry (in percent of total employment). The first indicator can be assumed to be associated with a rise in inequality given the efficiency-equity trade-off, while the latter two (both are from the WDI 2007) rather can be expected to have equalising effects since employees in industry tend to have a higher degree of trade union density than in the other sectors. We also included the WDI variable: exports of goods and services (in percent of GDP). If one believes globalisation to increase inequality then a high trade share should be related to a high Gini index, though one might believe that transition economies' workforce might actually gain from more trade openness given the countries' relatively stronger labour intensity. We also included the employment rate (ratio between the total number of employed and the population aged 15 to 59 years) as provided by the TransMONEE 2007 Database of the UNICEF-IRC. Here one would expect a negative relationship with regard to inequality. The last two variables from this group are again from the EBRD database: unemployment (in percent of total labour force) and non-performing loans (in percent of total loans). The first should be related with more inequality, while the latter might be assumed to be correlated negatively with the Gini index, as financial crises tend to hurt owners of income from capital in the first place.

The set of variables presented above appears to be exhaustive enough to estimate an econometric model explaining a great part of inequality in transition countries using a GETS approach. With respect to finding the right specification to estimate the determinants of in-

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(Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia and Montenegro), twelve former Soviet Union countries (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tadjikistan, Turkmenistan, Ukraine, Uzbekistan) and Mongolia.

equality in transition we have to acknowledge that most probably the large dataset at hand suffers from most of the possible shortcomings a panel data set in levels can have. We assume the data to be suffering from non-stationarity, endogeneity, heteroskedasticity and autocorrelation. The Im-Pesaran-Shin panel unit root test shows that the Gini variable and most of the explanatory variables are not integrated of order one, but a few (e. g. the non-performing loans variable) are. In any cases many of the variables appear to be near-non-stationary. The Wooldridge test for serial correlation and a likelihood-ratio test for heteroskedasticity seem to confirm our initial doubts about autocorrelation and heteroskedasticity in the panel. This is probably the reason why, to our knowledge, nobody so far has tried to estimate a similarly large inequality explaining macroeconomic model on level panel data in a proper way. Others try to overcome problems by estimating e. g. the change of inequality instead of the level (Lopez 2003) or confine themselves to a limited set of variables (e. g. Jäntti / Jenkins 2001). One exception is Ivaschenko (2003) who also analysed a panel data set of transition economies (24 countries over the period 1989 to 1998). Using a simple fixed effects model, he tries to explain the Gini coefficient using eight variables. His focus is on the per capita GDP variable.

However, in our analysis we have to control for heteroskedasticity and autocorrelation. This is the reason why a simple fixed or random effects model is not appropriate, but a Generalised Least Squares (GLS) model. In the GLS specification we allow the autocorrelation to be panel-specific. Here one might think of country-specific business or transition process cycles. This gives the model a touch of fixed effects. In any case we are not only interested in the within content (as in Ivaschenko 2003) but also in the in-between information. Theoretically it would be also possible to use GLS with country dummy variables (GLSDV). However in this case the coefficient of the autocorrelation process would have had to be common to all the panels, which does not seem to make sense. In our GLS approach to estimate from general to specific we start with all the explanatory variables described above and eliminate step-wise the least significant variable of each estimation.

Table 3 shows the results for the specification, where all the estimated coefficients are at least significant at the ten percent significance level. In fact, out of the original set of 16 explanatory variables ten remain significant at the one percent level and two at the five percent level. The pseudo-R^2 of the model is at 61 percent. Due to many holes in the dataset the number of countries in the present regression has shrunk to 18 countries[7] with an average of 6.8 years[8] per country. This makes a total of 122 observations in our regression.

As expected the infrastructure reform index shows to be positively correlated with the Gini coefficient as it is probably related a lot to labour shedding and a loss of egalitarian wage structures, existing in former times in large public utility companies. Commerciali-

[7] The sample includes now still all the eight countries from Central and Eastern Europe (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia), only four countries from Southeast Europe (Albania, Bulgaria, Croatia, Macedonia) and only six former Soviet Union countries (Azerbaijan, Georgia, Kyrgyz Republic, Moldova, Russian Federation, Ukraine).

[8] The sample includes now only data from the maximum period of 1993 to 2003.

Table 3: GLS Panel Estimator of Inequality[1]

Independent variables	Coefficients	Standard errors	z-statistics	P-values
Price liberalisation	-0.244	0.102	-2.400	0.016
Infrastructure reform	0.094	0.038	2.510	0.012
Trade and foreign exchange system	-0.230	0.085	-2.720	0.007
Exports of goods and services	-0.138	0.038	-3.620	0.000
Employment in industry	-0.179	0.040	-4.440	0.000
Change of productivity in industry	-0.220	0.058	-3.770	0.000
Unemployment	0.080	0.024	3.370	0.001
Employment	0.203	0.078	2.600	0.009
General government expenditures	-0.156	0.050	-3.150	0.002
Real interest rate	0.155	0.053	2.910	0.004
Inflation	0.152	0.040	3.740	0.000
Non-performing loans	-0.034	0.010	-3.310	0.001
Constant	4.380	0.714	6.130	0.000
Pseudo-R^2	0.613			
Number of observations	122			
Number of countries	18			
Average observation per country	6.778			

1 Specification: Hederoskedasticity and panel-specific AR(1) autocorrelation assumed.

sation in the sensitive sectors of electricity, railways, roads, telecommunications, water and wastewater has led to an increase in inequality. Rather unexpectedly we find the price liberalisation indicator to be negatively correlated with inequality. Probably this is related to the elimination of inefficient monopolies and a general opening of the transition economies to new business. It can be assumed that giving up price regulation has also reduced the possibilities for rent seeking of a few monopolists.

Also contrary to what one might believe following the globalisation critique, we find a negative coefficient of the trade and foreign exchange liberalisation indicator. This is also one of the bigger coefficients. The interpretation is as follows. A one per cent increase in the trade and foreign exchange system liberalisation index leads *ceteris paribus* to a decrease of the Gini coefficient of 0.23 percent. Thus it seems that globalisation has left the average transition country with less inequality. This is most probably due to the relatively more labour intensive structure of the transition economies' industry as compared to its western trade partners. Also the coefficient of the share of exports of goods and services in GDP is negatively correlated with the Gini coefficient. Export-based growth seems to be a strong job creator. This could also be a proxy for small countries, which might tend to be more egalitarian for a number of reasons.

Employment in industry is negatively correlated with the Gini index. Our interpretation is that all the three sub-sectors of the overall industry sector, namely: mining and quarrying, manufacturing, and electricity, gas and water supply, display a high level of trade union density and might thereby contribute to more equity. From the plain data we can observe that those countries which were able to preserve a large industry share in their economy during the transition, such as e. g. Slovenia, the Czech and the Slovak Republic, tend to have relatively low and stable levels of economic inequality. This is probably because also the wage structure within the industry was preserved or at least changed only slowly. The coefficient of the change in productivity in industry variable has a negative sign too. This seems to suggest that workers in industry can profit from the improved economic development in the transition countries via wage increases.

Another variable that behaved as expected is the unemployment rate. It stands for an increase in inequality. However, contrary to what might be expected we find the employment rate to be positively correlated with inequality too. This might be explained by the fact that especially some of the rather unequal former Soviet Union countries did not provide a decent level of social benefits (e. g. unemployment benefits and early retirement pensions) for those persons of working age who fell victim of the tremendous labour shake-out at the beginning of transition. These have to accept any type of work to survive (including subsistence farming), which explains the high employment rates in some of those countries.

General government expenditures behaved as expected. They had a dampening effect on inequality in transition. High real interest rates were found to go together with high inequality. Low real interest rates are likely to favour non-financial investment, thereby creating new job opportunities, while high real interest rates increase the incomes of capital owners.

The coefficient of the inflation rate variable turns out to be positive. This might be explained by the fact that persons with high income have more bargaining power and possibilities to adapt to an increasing price level. Finally, the share of non-performing loans in total loans is also a crisis indicator, which represents those years in the second half of the 1990s when several transition economies passed through a banking crisis. It appears that the respective coefficient is negatively correlated with the Gini index. This supports our assumption that the financial crisis of the late 1990s did rather hurt the rich capital owners.

Most of our results seem to support the descriptive analysis in the previous part of the paper. This is especially true when it comes to indicators like for instance structure of employment (i. e. share of employment in industry) and level of unemployment.

Moreover the GLS model appears to be rather robust to adding or deleting single variables from the sample. We did also test the chosen specification for sub-samples. Table 4 presents the equivalent model for the sub-sample of the CEE-8 countries (i. e. the Central European and Baltic countries). Half of the coefficients become insignificant (significance level of less than ten percent). These are the coefficients of price liberalisation, infrastructure reform, trade and foreign exchange system, exports of goods and services, employment and non-performing loans. This is probably the case because for these variables the CEE-8 countries show less of a diversity. It is important to note that the coefficients of the two industry indicators, unemployment, general government expenditures, the real interest rate

Table 4: GLS Panel Estimator of Inequality, CEE-8 Subsample[1]

Independent variables	Coefficients	Standard errors	z-statistics	P-values
Price liberalisation	-0.075	0.212	-0.360	0.723
Infrastructure reform	-0.063	0.045	-1.400	0.161
Trade and foreign exchange system	0.116	0.207	0.560	0.573
Exports of goods and services	-0.051	0.051	-1.000	0.317
Employment in industry	-0.628	0.088	-7.120	0.000
Change of productivity in industry	-0.405	0.093	-4.380	0.000
Unemployment	0.056	0.023	2.420	0.016
Employment	0.130	0.116	1.120	0.262
General government expenditures	-0.229	0.059	-3.860	0.000
Real interest rate	0.306	0.130	2.360	0.018
Inflation	0.236	0.111	2.120	0.034
Non-performing loans	-0.019	0.013	-1.450	0.147
Constant	5.288	1.382	3.830	0.000
Pseudo-R^2	0.639			
Number of observations	74			
Number of countries	8			
Average observation per country	9.250			

  1 Specification: Heteroskedasticity and panel-specific AR(1) autocorrelation assumed.

and the inflation variable remain significant at the five percentage level and do not change their signs. Thus, in general our previous results are being confirmed, with the exception that mainly the liberalisation and trade openness indicators do not show up significantly which might be explained that due to the common EU-accession process especially these indicators appear streamlined across this region. This does not mean that they had no impact on inequality in transition, on the contrary. This mainly shows the divide between the CEE-8 and the remaining sample, which is obviously also true for the variables employment and non-performing loans.

In order to remedy the possible deficiencies concerning the non-stationarity or near-non-stationarity of the estimated and explanatory variables as described above, we suggest to use the alternative specification of the Generalised Method of Moments (GMM) dynamic panel estimator which is based on Arellano / Bover (1995) and Blundell / Bond (1998).[9] Apart from the explanatory variables described above we introduce on the right hand side of the equation also the lagged variable of the left hand side (i. e. the lagged Gini coefficient) fol-

9   Here we use the Stata software command xtabond2 (Roodman 2006).

lowing the logic of the model used. Though the Gini indicator is not a unit root it seems to be near-non-stationary, which is the reason for its lagged inclusion. Thus, equation (1) is augmented by $y_{i,t-1}$ in the following way:

$$(2) \quad y_{it} = \alpha y_{i,t-1} + \beta x_{it}' + \varepsilon_{it}.$$

Moreover this set of right hand side variables is also used as basis for the »GMM-style« instrument set. Here we employ for each time period all available lags of the specified variables in levels dated t-1 or earlier as well as the contemporaneous first differences as instruments. Finally we estimate the regression assuming heteroskedasticity and autocorrelation within the panels. Here we re-run the GETS approach, starting with the full data set. As for the results only the coefficients of the levels are being reported (see table 5).

Table 5: Arellano-Bover GMM Dynamic Panel Estimator of Inequality[1]

Independent variables	Coefficients	Standard errors	z-statistics	P-values
Inequality (t-1)	0.859	0.038	22.780	0.000
Trade and foreign exchange system	-0.035	0.021	-1.650	0.098
Manufacturing value added	-0.075	0.024	-3.060	0.002
Change of productivity in industry	-0.069	0.040	-1.710	0.088
General government expenditures	-0.045	0.020	-2.240	0.025
Non-performing loans	0.010	0.005	2.250	0.025
Constant	1.220	0.284	4.290	0.000
Pseudo-R^2	0.942			
Number of observations	162			
Number of countries	23			
Average observation per country	7.040			

1 Specification: Heteroskedasticity and panel-specific AR(1) autocorrelation assumed; all explanatory variables used as endogenous GMM instrument in lags and first differences.

These results are mainly confirming the general outcome of our previous GLS results. However, several variables were lost in the GETS process (i. e. price liberalisation, infrastructure reform, exports of goods and services, employment in industry, unemployment, employment, real interest rate and inflation). This is mainly due to the quite demanding framework of the GMM model, including the lag of the dependent variable as an explanatory variable. Most of the remaining coefficients have lost a bit in significance too. Especially the trade and foreign exchange system and the change of productivity in industry coefficients are only at the brink of significance at the ten percent level. Nevertheless there is also an additional variable which appears to be significant at the one percentage level in this setting. Manufacturing value added enters the regression with a negative coefficient. It seems to re-

place the employment in industry variable one would believe. However they are not that heavily correlated (0.56). Our interpretation is that it is not only important how many persons are employed in industry but also how much they earn as a share in GDP. Also, general government expenditures as well as non-performing loans remain significant at the five percent level. Interestingly enough, the sign of the latter changes as compared to the initial GLS model. Thus we might assess the variable non-performing loans less robust. However, maybe it has to be seen rather as a pre-crises indicator.

We have also checked this specification for robustness. Unfortunately it seems that the relationship is not extremely robust and multicollinearity could still be a problem. We therefore prefer the more robust GLS specification of table 3. However, even this minimalist GMM model confirms our main stories about trade liberalisation, a prosperous and strong industry and high general government expenditures to fight inequality in transition.

4. Conclusion

The analysis of income developments in Central, East and Southeast Europe has shown that the severe transitional recession at the beginning of the 1990s not only had a direct impact on average per capita welfare, but also on income distribution. Stronger output losses were likely to raise income inequality. The reduction of employment was accompanied by an increase in open unemployment in Central and South East Europe, whereas in most CIS countries informal activities spread in agriculture and services (eg. petty trade). The expected correlation between the share of compensation in GDP and the level of inequality in countries has been confirmed. The main reason for the increase in total inequality to be found in the literature especially in Central European countries is the decompression of wage structures. Wage dispersion has risen especially by educational attainment levels as well as by region by large. One reason for rising wage inequality can be found in the changing institutional setting of wage bargaining. We found a negative correlation between coverage rates of collective agreements and the Gini coefficient as well as for union density and the Gini for new EU member states. State transfers had a dampening effect on total inequality in Central and South East Europe during transition in general, while in the CIS the fall in total transfers as a share in GDP and the reduced progression of transfers increased total inequality. No clear evidence is available on how different methods of privatisation have influenced the picture of inequality, except that those countries which managed not only to transfer former state property into private hands but also to build up functioning institutions establishing a market economy ended up with relatively lower inequality measures.

Our econometric analysis of the determinants of inequality in transition shows an eclectic picture. In our preferred GLS setting, several transitional change-related indicators prove to be significant. An inequality enhancing factor is public utilities infrastructure liberalisation. On the other hand trade and foreign exchange liberalisation, as well as price liberalisation, show to be negatively correlated with inequality. Thus one might conclude that different types of liberalisation and privatisation are influencing inequality in transi-

tion to the extent that they are either increasing unemployment and wage disparities or on the contrary offering new job and business opportunities especially for the lower income population. Among the structural change related variables we find exports of goods and services, employment in industry, change of productivity in industry and non-performing loans to be negatively related to inequality. The coefficient of unemployment and employment has a positive sign. It appears that transition countries which preserved a prosperous industry and were able to be competitive on foreign markets did also preserve a rather egalitarian society. The puzzle of both high unemployment and high employment rates increasing inequality can be solved by the fact that some of the rather unequal former Soviet Union countries did not provide a decent level of social benefits, which left a big mass of working poor, especially in subsistence farming. In the field of public policy high real interest rates and inflation are inequality increasing, while general government expenditures have a dampening effect on inequality. It seems that in transition both a balanced monetary policy combining low real interest rates and low rates of inflation as well as an active stance towards public expenditures prove to be successful in fighting inequality. In general the preferred specification proves to be rather robust and even more restrictive models show that the combination of trade liberalisation as well as a large and dynamic industry together with a strong state are related to less inequality in transition.

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Appendix

List of variables

Inequality

Gini   The Gini coefficients for the respective countries and years were taken from different surveys. Only surveys that analysed income and in a very few cases consumption were used. Missing values of up to three years were interpolated. Source: United Nations University – World Institute for Development Economics Research (UNU-WIDER) World Inequality Database Version 2.0b (WIID 2b).

Transitional change

Large-scale privatisation   The EBRD Large-scale privatisation indicator is one of the EBRD's overall transition indicators. It ranges from 1 (little private ownership) to 4.33 (standards and performances typical of advanced industrial economies: more than 75 percent of enterprise assets in private ownership with effective corporate governance.). Source: The European Bank for Reconstruction and Development (EBRD).

Small-scale privatisation   The EBRD small-scale privatisation indicator is one of the EBRD's overall transition indicators. It ranges from 1 (little progress) to 4.33 (standards and performances typical of advanced industrial economies: no state ownership of small enterprises; effective tradability of land). Source: The European Bank for Reconstruction and Development (EBRD).

Price liberalisation   The EBRD price liberalisation indicator is one of the EBRD's overall transition indicators. It ranges from 1 (most prices formally controlled by the government)

to 4.33 (standards and performance typical of advanced industrial economies: complete price liberalisation with no price control outside housing, transport and natural monopolies). Source: The European Bank for Reconstruction and Development (EBRD).

Trade and foreign exchange system   The EBRD Trade and foreign exchange system indicator is one of the EBRD's overall transition indicators. It ranges from 1 (widespread import and/or export controls or very limited legitimate access to foreign exchange) to 4.33 (standards and performance norms of advanced industrial economies: removal of most tariff barriers; membership in WTO). Source: The European Bank for Reconstruction and Development (EBRD).

Infrastructure reform   The EBRD Infrastructure reform indicator is one of the EBRD's infrastructure transition indicators. The ratings are calculated as the average of five infrastructure reform indicators covering electric power, railways, roads, telecommunications, water and waste water. Source: The European Bank for Reconstruction and Development (EBRD).

Public policy

General government expenditure   General government expenditure is calculated in percent of GDP. Data for the general government, including local government and extra-budgetary funds, incorporated where available. Data for most countries are from IMF country reports. Budget balance data can differ from official estimates due to different budgetary accounting, in particular with respect to privatisation revenues and foreign lending. Source: The European Bank for Reconstruction and Development (EBRD).

Subsidies and current transfers   Budgetary subsidies and current transfers are calculated in percent of GDP. Budgetary transfers to enterprises and households are excluding social transfers. Source: The European Bank for Reconstruction and Development (EBRD).

Real interest rate   Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. Source: World Development Indicators 2007 (WDI 2007).

Inflation   Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used. Source: World Development Indicators 2007 (WDI 2007).

Structural change

Labour productivity in industry   The change in labour productivity in industry in percent is provided. Labour productivity is calculated as the ratio of industrial production to industrial employment. Changes in productivity are calculated on the basis of annual averages. Source: The European Bank for Reconstruction and Development (EBRD).

Manufacturing value added   Manufacturing value added is calculated as a share in GDP. Manufacturing refers to industries belonging to ISIC divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3: World Development Indicators 2007 (WDI 2007).

Employment in industry   Employment in industry is calculated as a share of total employment. Employees are people who work for a public or private employer and receive remuneration in wages, salary, commission, tips, piece rates, or pay in kind. Industry corresponds to divisions 2–5 (ISIC revision 2) or tabulation categories C–F (ISIC revision 3) and includes mining and quarrying (including oil production), manufacturing, construction, and public utilities (electricity, gas, and water) . Source: World Development Indicators 2007 (WDI 2007).

Exports of goods and services   Exports of goods and services are calculated in percent of GDP. Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude labor and property income (formerly called factor services) as well as transfer payments. Source: World Development Indicators 2007 (WDI 2007).

Employment   The employment rate is calculated as the ratio between the total number of employed and the population aged 15 to 59 years. Source: TransMONEE 2007 Database (UNICEF-IRC, 2007).

Unemployment   Unemployment is calculated using end-year unemployment data as a share of total labour force. For most countries, data reflect official employment records from the labour registries. In many countries, small enterprises are not recorded by official data. A number of countries have moved towards ILO-consistent labour force surveys in recording changes in labour force, employment and unemployment. Where available these data are presented. Source: The European Bank for Reconstruction and Development (EBRD).

Non-performing loans   Non-performing loans are calculated in per cent of total loans. Non-performing loans include sub-standard, doubtful and loss classification categories of loans, but excludes loans transferred to a state rehabilitation agency or consolidation bank, end-of-year. Source: The European Bank for Reconstruction and Development (EBRD).

Country Codes and Abbreviations of Regions Used

Region	Country name	ISO ALPHA-3 code
CE	Czech Republic	CZE
CE	Hungary	HUN
CE	Poland	POL
CE	Slovakia	SVK
CE	Slovenia	SVN
Baltics	Estonia	EST
Baltics	Latvia	LVA
Baltics	Lithuania	LTU
SEE	Bulgaria	BGR
SEE	Romania	ROU
SEE – Western Balkan	Albania	ALB
SEE – Western Balkan	Bosnia and Herzegovina	BIH
SEE – Western Balkan	Croatia	HRV
SEE – Western Balkan	Macedonia	MKD
SEE – Western Balkan	Serbia and Montenegro	SCG
SEE – Western Balkan	Montenegro	MNE
SEE – Western Balkan	Serbia	SRB
CIS	Armenia	ARM
CIS	Azerbaijan	AZE
CIS	Belarus	BLR
CIS	Georgia	GEO
CIS	Kazakhstan	KAZ
CIS	Kyrgyzstan	KGZ
CIS	Republic of Moldova	MDA
CIS	Russian Federation	RUS
CIS	Tajikistan	TJK
CIS	Turkmenistan	TKM
CIS	Ukraine	UKR
CIS	Uzbekistan	UZB

Abbreviations of Regions Used

CE: Central Europe, SEE: South East Europe, CIS: Commonwealth of Independent States