CASE Network Reports

The Development Gap Between the CIS and EU

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Abstract

Current report aims to identify major existing gaps in the five socio-economic dimensions (economic, human, openness, environmental, and institutional) and to reveal those gaps which could potentially hinder social and economic integration of neighbor states with the EU. To achieve this, the authors aim to assess the existing trends in the size of the gaps across countries and problem areas, taking into consideration the specific origin of the gap between EU15/EU12, on the one hand, and FSU republics, EU candidates and West Balkan countries, on the other hand.

The paper is structured as follows:

1. A review of literature on the determinants of growth and development and the analysis of the catching up process between countries or groups of countries.
2. An analysis of the historic roots and origins of the development gap, and its evolvement over time.
3. A review of literature sources, draft analysis of primary statistical data, and qualitative explanations of gaps and divergences in selected development issues across the following socio-economic dimensions:
    - level of economic development and convergence rates based on real GDP (application of methodology testing β and σ convergence to the set of countries analyzed);
    - quality of life and its components (poverty, inequality, health status and health care, access to fresh water and sanitation facilities, subjective perceptions of well-being);
    - human capital and labor market development, including level of education and public spending on education, its accessibility and quality, main differences in labor market development (employment participation rates and levels of unemployment, new jobs creation and labor protection legislation);
    - innovation potential, including R&D, information and communication technologies, and institutional environment;
    - openness and trade potential, including trade in goods and services, FDI stocks, trade regime and performance in logistics and infrastructure;

- environmental performance in terms of environmental stresses, efforts aimed at their reduction, and institutional capacity;
- business climate, political institutions, and other institutional indicators (econometric analysis).

4. A test econometric analysis of development gaps across selected dimensions by using a Principal Components Method (PCM). The results are further presented in the form of ranks of countries analyzed reflecting their distances from EU15 in respective aggregate averages.

Special attention is paid to gender-related development issues. Respective issues in human capital and labor market study, as well as variables included into PCM analysis were supplemented with relative gender data. Several conclusions finalize the report.

I. INTRODUCTION[1]

Following the UN approach to monitoring development processes, in this Work-Package we attempt to assess the development gap[2] across five dimensions: (i) economic, (ii) human, (iii) openness, (iv) environmental, and (v) institutional. In each dimension we specify the key sub-themes:

- in economic dimension: (i) Production level, (ii) Economic growth, (iii) openness and infrastructure, (iv) innovation potential;
- in human dimension: (i) Poverty, (ii) Human security, (iii) Education, (iv) Health (v) Equity/social exclusion (vi) Welfare and quality of life;
- in openness dimension: (i) International trade in goods and services; (ii) Foreign direct investments; (iii) Trade policy; (iv) Infrastructure and logistics;
- in environmental dimension: (i) State of environmental systems, (ii) Reduction of environmental stresses, (iii) Institutional capacity to respond to environmental challenges;
- in institutional dimension: (i) Governance, (ii) Democracy, civil society and public participation, (iii) business environment.

Major tasks of Work-Package 1:

1. to describe the major existing gaps in the four socio-economic dimensions and their origin as well as to assess the scope of the development lag;
2. to identify those existing gaps which could potentially hinder social and economic integration of neighbor states with the EU, and the most urgent problems to be solved in National Development Strategies;
3. to highlight the existing trends in the size of the gaps across problem areas between EU15/EU12, on the one hand, and FSU republics, EU candidates and West Balkan countries, on the other hand.

[1] The earlier version of this report was published in 2007 in CASE Network Reports No. 74

[2] Following Webster dictionary, we define a gap as a 'conspicuous difference or imbalance, a disparity'.

Geographical dimension of analysis

The geographical scope of the analysis includes transition countries located to the East and South-East of the EU borders which have not acquired a status of an EU Member. These include groups of countries on different stages of cooperation with the EU: candidates to EU membership, potential candidates (West Balkan countries), the six Eastern European countries participating in European Neighborhood Policy (ENP) – Eastern European Neighbors (EEN), Russia with a status of a strategic partner in the "Common European Economic Space", and other CIS countries not participating in EEN.

The region analyzed is large and economically diversified. Its subgroups of countries differ in their levels of economic development, institutions, industrial structure, and progress achieved in market-oriented reforms. According to World Bank country classification (2007) all six EENs are included into the group of lower-middle income countries, with Russia belonging to upper-middle-income group. Among transition countries which have recently (both in 2004 and 2007) become members of the EU (NMS), only Slovenia belongs to the group of high-income economies.

The overall geopolitical taxonomy of the region's countries with respect to per capita income looks as follows:

Country group	High-income economies	Upper-middle-income economies	Lower-middle-income economies	Low-income economies
EU15	EU15 (39409)			
NMS (EU 12 excluding Malta and Cyprus)	Slovenia (18890)	Czech Republic (12680), Estonia (11410), Hungary (10950), Latvia (8100), Lithuania (7870), Poland (8190), Romania (4850), Slovak Republic (9870), Bulgaria (3990)		
Candidates		Croatia (9330), Turkey (5400)	Macedonia, FYR (3060)	
Other West Balkans			Albania (2960), Bosnia & Herzegovina (2980), Serbia & Montenegro (3910)	

Country group	High-income economies	Upper-middle-income economies	Lower-middle-income economies	Low-income economies
EEN			Armenia (1930), Azerbaijan (1850), Belarus (3380), Georgia (1560), Moldova (1100), Ukraine (1950)	
Other CIS		Russian Federation (5780)	Kazakhstan (3790) Turkmenistan	Kyrgyz Republic (490), Tajikistan (390), Uzbekistan (610)

Notes: Shown in brackets: GNI per capita (2006), Atlas method (current US$), from World Development Indicators database, World Bank, 2007. Turkmenistan is not included in our further analysis due to a lack of reliable country data. In further analysis, in some cases (notably in calculating the rates of income convergence) we include Armenia, Azerbaijan, Georgia, Kyrgyzstan, and Moldova into the group of CIS low-income countries; and Belarus, Russia, and Ukraine into the group of CIS middle-income countries, according to the previous World Bank classification.

The table implies that West Balkans, as well as Kazakhstan, are very close to EEN countries. Croatia, Turkey and Russia surpass EENs in terms of per capita income. The rest are low-income CIS countries that belong to the group of the Region's poorest. Thus, geopolitical location could serve as a good predictor of the level of economic development. The groups' summary figures, indicating their positions in population and per capita income relative to the Region's totals, are presented below:

Geopolitical groups	Average GNI per capita, Atlas method (current US$), 2006[3]	Population (2006), million people	Population 2006 (countries under analysis=100)	GNI 2006 (countries under analysis=100)
NMS (EU 12 excluding Malta and Cyprus)	8 217	102.0	21.8	35.1
Candidates	5 560	79.4	17.0	18.5
West Balkans	3 390	14.5	3.1	2.1
EEN (6 countries)	2 046	76.1	16.2	6.5
Other CIS upper-middle income (Russia)	5 780	142.4	30.4	34.5
Other CIS (Central Asian excl. Turkmenistan)	1 476	53.7	11.5	3.3

[3] GNI per capita (formerly GNP per capita) is the gross national income converted to U.S. dollars using the World Bank Atlas method, divided by midyear population.

Major results and structure of the report

1. A brief review of literature on the evolution of notions of development and well-being, the determinants of growth and development, and the analysis of the catching up process between countries or groups of countries.
2. An analysis of the historic roots and origins of the development gap, and its evolvement over time.
3. A review of literature sources, draft analysis of primary statistical data, and qualitative explanations of gaps and divergences in selected development issues across the following socio-economic dimensions:
    - level of economic development and convergence rates based on real GDP (application of methodology testing convergence trends (Barro & Sala-i-Martin 2001) to the set of countries analyzed);
    - quality of life and its components (poverty, inequality, health status and health care, access to fresh water and sanitation facilities, subjective perceptions of well-being);
    - human capital and labor market development, including level of education and public spending on education, its accessibility and quality, main differences in labor market development (employment participation rates and levels of unemployment, new jobs creation and labor protection legislation);
    - innovation potential, including R&D, information and communication technologies, and institutional environment;
    - openness and trade potential, including: trade in merchandise and services, its structure and concentration; FDI stocks; trade regime (tariff and non-tariff barriers); performance in logistics and development of infrastructure;
    - environmental performance in terms of environmental stresses, efforts aimed at their reduction, and institutional capacity;
    - business climate, political institutions, and other institutional indicators (econometric analysis).
4. An econometric analysis of development gaps across selected dimensions by using a Principal Components Method (PCM). The results were further presented in the form of ranks of countries analyzed reflecting their distances from EU15 in respective aggregate averages.

5. Special attention was paid to gender-related development issues. Respective issues in human capital and labor market study, as well as variables included into PCM analysis were supplemented with relative gender data.

Sources of statistical and other data

Current analysis is based on the extensive body of literature describing and analyzing differences in levels of economic and institutional development, production structure, and progress in market-oriented reforms among countries of the region. A large portion of comparative worldwide and regional studies is provided by World Bank reports and background papers. Another important source of information, as well as of appropriate methods of analysis are comparative studies on human development across regions and subregions provided by UNDP. Research provided by global and European centers on various aspects of transition process (CEPS and other European networks, World Economic Forum, CATO institute, etc.) has also proved to be of high value.

In order to ensure comparability, most of raw statistical data were provided by online databases supported by international organizations: the World Bank World Development Indicators database, UNICEF, UNCTAD, UNESCO, ITU, EBRD, IFC and IMF databases, a number of statistical data collections supported by the UN Statistics Division, including the database of Millenium Development Goals Indicators, etc.

Current research would hardly be possible without an extensive use of:

- a wide set of composite indices measuring various aspects of institutional development (World Economic Forum's Global Executive Opinion Survey, the World Bank/IFC Enterprise Survey, the World Bank's Cost of Doing Business survey, The Freedom House "Freedom in the World" ratings, and other indices provided by international NGOs);
- a widely known and often referred to UNDP approach to measuring human development, including Human Development Index (HDI) and Human Poverty Index (HPI);
- UN sustainable development indicators and underlying methodology;
- comprehensive environmental indicator sets permitting cross-national comparisons, produced by Yale Center for Environmental Law and Policy and Columbia University (Esty et al. 2005);
- the Knowledge Assessment Methodology (KAM) developed by the World Bank that measures a country's ability to generate, adopt and diffuse knowledge;

- a dataset of World Values Survey, the most comprehensive and wide-ranging survey of human values ever undertaken.

Despite this substantial background of research and at first glance abundant body of statistical information, we faced a serious problem of comparable data availability for our primary research object – EENs, Russia, FSU and West Balkan countries. This is due to the following reasons.

First, in the majority of FSU countries, statistical reporting formats and methods of data collection are still not adapted completely to uniform international standards, resulting in incomparability of datasets. Thus often seemingly available data could not be incorporated into our database, with the result that the datasets used are patchy and incomplete.

The existing incomparability of datasets between EUROSTAT and other databases (e.g. TransMONEE database) did not allow in most cases to use the extensive EUROSTAT data system with its well developed integrated indicators' structure for our comparative research, as we initially planned to.

Second, omissions of data for several countries, especially those that recently underwent war conflicts, in many regular statistical datasets (e.g. WDI) often could not be compensated by data provided by other international organizations in view of their incomparability (e.g. difference by several percentage points). Thus, in some cases we had to refer to expert assessments (from special publications or interviews).

Data omission is the main reason why several important variables are missing from the aggregate PCM analysis. In some cases, in order to avoid the exclusion of a country from this analysis of the specific variable, we had to fill in the missing data from other sources, but only when we were able to check the respective data on comparability. In cases when the relevant data were not available (which was most often the case with Central Asian CIS countries or West Balkans), we calculated final average ratings omitting the missing dimension for this specific country.

Third, a lack of comparable time series of data for several countries (e.g. some of EENs or republics of former Yugoslavia) did not allow us to provide a sound statistical background for trends in the evolvement of specific gaps in the course of transition. Thus, in some cases, we were forced to rely on more aggregate indicators available or on anecdotal examples.

Methods tested

Aiming to produce a more or less clear picture of most vivid and critical existing differences in countries' development, based on sets of indicators available, we

involved a variety of methods tested by other researchers.

The methods used include: (1) a descriptive comparative analysis of the raw data indicators, (2) correlation analysis between the available variables, (3) econometric analysis of composite indicators characterizing specific dimensions, (4) analysis of β and σ convergence between per capita income in selected country groups, and (5) methods of factor analysis (PCM: Principal Components Method). All of methodologies mentioned above have certain advantages and deficiencies (e.g. in terms of data coverage or difficulties of results interpretation).

PCM allows mapping from the space of raw indicators (which are often highly correlated with each other) into a space of principal components (which are orthogonal to each other). To come up with a measure of a gap along each of the dimensions, we estimated the first two principal components based on the variables that characterize the dimension. The first two components in the majority of cases explain the main variation in the raw indicators. There are two major advantages of the method of generating composite indices as compared to some others. The first one is that it does not assume any exogenous pre-selection of the raw indicators to base the composite indices on. The second one is the endogeneity of the weights attributed to the raw indicators in the composite indices.

The principal components, being the weighted sums of the raw indicators, allow to reduce the dimensionality of analysis. Application of PCM is also justified in our case since it makes the discussion of inter-country variation more tractable by allowing to identify the clusters of countries based on the distance from the EU along the chosen dimensions. The components are then used to measure distances from the EU15 average which, in turn, are converted into rankings of countries in terms of their closeness to the EU. As a result, the ratings along the nine dimensions characterize the EU-average gap for each of the neighboring countries.

To measure the overall gap in development between the EU15 and each of EENs, the principal component method was applied to the full set of the raw indicators that characterize various dimension of countries' development. An obtained composite index is further used to group the neighboring countries according to their aggregate closeness to the EU in the plane of the first two components. The magnitudes of the countries' distances based on the first two components allowed to determine relative distances of a specific country from the EU15 and to cluster their positions on the grounds of their distances to the EU15.

Across the report, we use averages for EU15 as a base for comparisons assuming that this group of countries (despite being quite heterogeneous) still provides a more homogenous background than it would be if we used the EU27 group. Another point is that we can provide additional comparisons on relative positions of

NMS, which are very divergent in many instances and display quite manifold characteristics across specified dimensions.

However, the methods we employ for calculation of country group averages differ depending on the research goals. In PCM analysis, EU15 averages are calculated as population weighted averages. Throughout the Section V, where a descriptive comparative analysis prevails, we use country group *medians* that reflect values considered to be "the most representative" for the distribution, identifying the most likely cases — the middle outcomes, in which half of the outcomes are 'better' and half are 'worse'. Since our primary goal is to highlight the gaps (differences) between country groups, rather than to understand the proportion of economic activity relevant to a particular issue, we use medians as best reflecting the diversity of country experience, rather than weighted averages that take into account the relative importance of each item. Besides, using weighted averages in most of our cases (small country groups with dominating leaders) would have produced results heavily biased towards the largest 'outliers', while the median average treats all countries equally.

The report is organized as follows: a historical background is followed by the analysis of convergence trends in per capita incomes under transition, an exploration of most important differences (gaps) between countries across specific dimensions of development (quality of life, human capital, innovation, environment, openness, and institutions), with an application of PCM for measuring development gaps in different dimensions concluding the report. We finalize the current intermediate report with a brief summary of results of our data analysis.

II. LITERATURE REVIEW

The period since the Word War II is usually considered as the "development era". This notion was related to the end of colonialism, when the old dichotomy of mother country/colony was transformed into the one of developed/underdeveloped country (Beusekom and Hodgson 2000). It was during this period that the new branch of economic science – development economics – has shaped. Development economists are primarily interested in ways of promoting stable and sustainable growth in poor countries and areas, by promoting self reliance and education in some of the lowest income countries in the world. However, dealing with economic aspects of the development process in low-income countries, development economics still could not encompass all the issues covered by the development area. Thus, development studies, merging economic issues with social and political ones, have emerged as inter- and multi-disciplinary field covering a broad specter of development issues.

The notion of development still does not have a single meaning. It has been transformed and expanded in the course of several decades. In spite of the fact that in empirical literature development gap is often measured as the income gap, while economic growth is considered as the main tool to decrease the gap, the meaning of development is much more broader. By the 1990s, there has been a growing consensus that development must combine income expansion, social development, environmental protection and regeneration, or in other words sustainable development (Taylor and Pieper 1996, Soubottina 2004).

In particular, Amartya Sen (1999) argued that economic development is not an end in itself but a means to higher purposes, namely expanding human freedom. For Sen, freedom (not development) is the ultimate goal of economic life as well as the most efficient means of realizing general welfare. Overcoming deprivations is central to development. Unfreedoms include hunger, famine, ignorance, an unsustainable economic life, unemployment, barriers to economic fulfillment by women or minority communities, premature death, violation of political freedom and basic liberties, threats to the environment, and limited access to health, sanitation, or clean water. Freedom of exchange, labour contract, social opportunities, and protective security are not just ends or constituent components of development but also important means to development and freedom (Nafziger, 2005).

A growing number of scholars is also sharing the viewpoint that well-being (in a broad sense of the word) matters as the ultimate goal of development. Fuelled by increasing concerns about environmental degradation, increasing inequality and perceived higher risk exposure, the concept for measuring the progress of societies by GDP/GNP changes is increasingly being questioned. This debate has significantly affected the development discourse (e.g. McGillivray & Shorrocks 2007). Some argue that the concept of "well-being" and "happiness" do not bring any added value to the challenges in poor and middle-income countries, since development here is mainly about reducing poverty and not about what some would label "well-being". However, empirical evidence seems to suggest that at least at low-income levels, there is a strong correlation between income levels and subjective well-being (Inglehart 2000).

Proponents of the "well-being" agenda are generally not arguing against the fact that raising income is one of, or maybe *the* major condition for improving "well-being". However, they argue that one needs to go beyond a sole focus on poverty as men and women in the developing world are not solely defined by their poverty status, but are primarily concerned about their well-being like people in the developed world (Gough, McGregor and Camfield, 2006). Even with low income levels, some people in the developing world can still achieve very high self-reported levels of well-being. Moreover, reported levels of well-being still vary enormously for countries with similar levels of income. For example, ex-socialist societies score dramatically lower than other low- or middle-income countries (Inglehart 2000). Clearly, non-economic aspects do matter.

Still, the question remains, how much importance should we attribute to subjective *vs* objective perceptions of 'well-being'? When analyzing people's welfare, mainstream economists mostly tend to discard subjective interpersonal comparisons based on individuals' views on their welfare, well-being or happiness[4]. In the mainstream paradigm, it is assumed instead that the economist knows the answer on the basis of objective data on incomes and prices' (Ravallion and Lokshin, 1999). However, it has been argued from Scitovsky (1976) onwards that subjective perceptions do matter, and that they could quite often run counter to some standard theoretical expectations concerning the relation between economic growth/income and well-being: 'economic growth alone – rapid or otherwise – does not automatically raise subjective well-being, even though the cross-sectional relation between well-being and income is positive' (Easterlin, 2002).

There is a growing body of academic literature devoted to the issue of catching up process, the determinants of growth and development. It is possible to divide

[4] Ferrer-i-Carbonell & Van Praag (2001) provide a useful discussion on measuring subjective welfare (economic concept) and subjective well-being (broader life satisfaction).

empirical literature on these topics into two major streams. The *first stream* of papers aims at analyzing the factors behind differences in growth and income, while the *second stream* focuses on assessing the catching up process between countries or groups of countries. Taking into account that the development gap is the focal point of the research, the second stream of literature will be considered in more detail in this review, while literature on growth determinants will be tackled more briefly.

A great deal of empirical research has been devoted to the identification of factors explaining the difference in growth rates by running regressions of the observed GDP growth on a country characteristics. This dimension of the research was heavily influenced by works of Barro (1991, 1996), Dollar (1992), Edwards (1993), Barro and Sala-i-Martin (1995), who provide historical and theoretical framework for growth and convergence and empirical basis for explaining long-term growth. These works demonstrate, in particular, that rule of law, smaller government consumption, longer life expectancy, more schooling, lower fertility rates and improvements of terms of trade correlate positively with economic growth[5]. Additionally, the hypothesis that countries with lower initial level of real GDP per capita tend to grow faster is also supported (Dawson 1998). Recent theories in development economics revolve around questions about what variables or inputs correlate with or affect economic growth the most: elementary, secondary, or higher education, government policy stability, low tariffs, fair court systems, available infrastructure, availability of medical care, prenatal care and clean water, ease of entry and exit into trade, or equality of income distribution (see e.g. Mavrotas and Shorrocks, 2007).

In other words, central to many of these studies are those issues which comprise the subject of 'new institutional economics' – a discipline that attempts to extend conventional economics by focusing on the social and legal norms and rules underlying economic activity. According to Douglass North (1997), the institutional framework of a society provides the incentive structure that directs economic (and political) activity. A number of recent empirical studies have shed light upon the institutional foundations of successful economic growth and have made clear the importance of the institutional matrix. Stable political structures, well-specified and enforced property rights, and low-cost enforcement of contracts (typically through the rule of law) have resulted in the low transaction costs underlying the success of the developed economies (North 1997).

[5] Empirical studies were criticized by some scholars due to lack of robustness (see, for instance Levine and Renelt 1992); this criticism, however, was considered "too strong" and for a substantial number of variables the relationship to growth was considered to be robust (Sala-i-Martin 1997).

The works of institutional economists have inspired a renewed interest to growth regressions, but the focus now was mostly on international comparisons of the impact of institutions on economic development. With the elaboration of a new World Bank dataset of governance indicators, Kaufmann and Kraay (2003), Kaufman, Kraay & Mastruzzi (2003) analyzed the relationship between income and different indicators of governance and confirmed a positive impact of institutions on the economic performance.

Among many other concepts/aspects of institutional economics, social capital[6] has received probably the most attention as a crucial variable influencing economic performance (Knack and Keefer, 1997; Dasgupta and Serageldin, 1999). Particularly, the widely divergent and often disappointing results in the transition from a centrally planned to a market economy have been explained by variations in the stock of social capital (Stiglitz 1999). Scholars that specifically analyzed the impact of social capital upon economic performance under transition found that extended trust – that is, trust in persons other than relatives and close friends – is not related to growth in transition economies, as distinct from the countries with a fully evolved market economy where this correlation does exist. On the other hand, it has been posited that both civic participation and trust in public institutions have independent positive effects on growth, with civic engagement benefiting economic performance not just by improving the performance of the state, but also by facilitating bilateral exchange (Raiser et al. 2001).

Still, actual knowledge about what factors affect economic growth remains largely unproven. However, recent advances in econometrics and more accurate measurements in many countries are creating new knowledge by compensating for the effects of variables to determine probable causes out of merely correlational statistics.

The focus of the second stream of research is predominantly on convergence in economic development among countries. In general, literature on convergence is closely related to research on economic growth which is considered one of the main driving forces behind convergence. Basically, there are two main questions the development economists are trying to answer regarding convergence. The first question is whether there is a tendency among less developed countries (with a lower GDP per capita) to grow faster compared to more developed ones, or, more exactly, to grow more rapidly the greater is the gap between its initial per capita income level and its own long-run per capita income level. This phenomenon is

[6] Following Putnam (1993), social capital is defined as a cultural phenomenon, denoting the extent of civic mindedness of members of a society, the existence of social norms promoting collective action and the degree of trust in public institutions.

called conditional or β -convergence; it implies that a country or a region is converging to its own steady state (Mankiw et al. 1992).

The second question arises if the income difference between the countries considered tends to decline over time. This phenomenon is called σ -convergence, or absolute convergence; it implies that all countries or regions are converging to a common steady state potential level of income. An implication of this hypothesis is that, in the long run, countries or regions should not only grow at the same rate, but also reach the same income per capita. Conditional convergence is necessary, but not sufficient for σ -convergence because income difference between countries may expand while less developed countries would grow faster (Barro and Sala-i-Martin 1992).

Absolute convergence tends to show up empirically among the more similarly situated economies, like the developed economies of Europe. Dissimilar economies – like the industrialized economies and the underdeveloped economies of the world – tend to demonstrate economic growth patterns more consistent with conditional convergence (Barro and Sala-i-Martin 2001).

Unfortunately, there is no consensus among economists on the issue of convergence. For instance, several authors claim that convergence does not apply to the poorest countries (Dowrick and Nguyen, 1989, Baumol, 1994). Ben-David (2000), after analyzing per capita income levels throughout the world over the period of 1960-1985, shows that these levels have been diverging across countries – or at any rate, they would not have converged, if weighted by population. The study, however, finds convincing evidence of convergence among those countries that have opened up to international trade. Some empirical studies reveal that income level convergence is present within homogeneous groups of countries (Baumol et al. 1994).

Summarizing literature findings, Sachs and Warner (1995b) offer three major lines of explanation for the absence of convergence. Firstly, rich countries tend to grow richer due to increasing returns to scale because of productive technology. Secondly, convergence is a fact of life, but only among richer countries having sound human capital for using modern technology. Thirdly, poor countries have so low long-term potential income that this leads to slower growth.

These pessimistic views are not, however, shared by the authors themselves who demonstrate that convergent growth can be achieved virtually by all countries that follow a reasonable set of political and economic policies. In particular, important ingredients are: civil peace, adherence to political and civil rights, and open economy without trade quotas, export monopolies and limitations on currencies convertibility (Sachs and Warner 1995a).

In sum, there is still room for further empirical research on factors leading to convergence and divergence in economic development among different groups of countries.

Among a substantial body of literature on economic convergence, there is a great deal of research devoted to convergence among European countries which are grouped by different characteristics. The main part of this work was accomplished after 2000 when authors started using panel data for their studies. Empirical work on these issues is considered below.

Fisher, Sahay and Vegh (1998) presented three different measures of distance from Brussels to CEE countries: income gaps, relative macroeconomic performance, and adoption of market-based systems. They showed that macroeconomic performance in CEE countries was impressive bringing them close to Maastricht criteria. Structural transformation has also been rapid in CEE, but privatization and financial sector reform lagged behind. However, income gaps were still large and it may take about 30 years for CEE to catch up with low-income EU countries.

Kocenda (2001) considered macroeconomic data (real output, money aggregates, consumer prices indexes, nominal and interest rates) from eleven CEE countries for the period of 1991-1998. The author grouped the countries considered into several categories: leading countries towards joining EU, the second-round group, the Baltic and Balkan groups. In general, the author found evidence of convergence in macroeconomic fundamentals among the CEE countries in general, but the strength of convergence differs between particular variables and groups of countries. The strongest convergence was observed among the countries that subsequently joined the EU in 2004 (Czech Republic, Estonia, Hungary, Poland, and Slovenia) and in the group of countries – original members of CEFTA (the Czech Republic, Slovakia, Hungary, Poland, and Slovenia).

Haynes and Husan (2002a) analyzed the development of the former Eastern bloc countries in comparison with three Western countries (Italy, Spain and Austria) throughout the 20th century and demonstrated that there was a long-term development problem with the Eastern Europe countries and Russia dating back to 17-18th centuries. In addition to this, series of shifts from market to state and back to market in CEE countries imposed huge costs on the population.

According to the estimates of Economist Intelligence Unit (2003), based on cross-section regression model that allows long-term forecasting of GDP per capita growth based on initial conditions, institutional and policy environment under different scenarios, EU membership factor may contribute 1 percentage point to average long term growth. This growth in the new member states would halve the convergence time from a century to 50 years.

The issues of convergence of new member states with the EU15 and advanced OECD countries have been also analyzed in the works of Martín, Velázquez, and Funck (2002), Matkowsky and Prychniak (2004)[7], Caselli and Tenreyro (2004)[8], Lenain and Rawdanowicz (2004)[9], Varblane and Vahter (2005)[10]. All these papers in different forms either found some convergence or prospects (in several papers rather distant) to converge between the new member/acceding states and the old members of EU. In most papers, the analysis took into account the experience of convergence within EU15. The driving forces behind the convergence were found to be: pre-accession harmonization process, sectoral reallocation, high level of human capital, effective competition on goods and factor markets, and the capacity of new members to tap international technological spillovers, particularly through foreign direct investment.

Among the most recent research, Anos-Casero, Malouche and Varoudakis (2005) prepared a comprehensive analysis of the EU neighborhood countries' readiness to leverage the ENP initiative to promote faster economic and social convergence with the EU. The authors consider progress across the broad set of indicators related to macroeconomic stability, human capital, regulatory framework for doing business, trade policy reforms, financial sector reforms, key infrastructure services and, finally, governance. All these factors were chosen as key ones for closing the development gap.

Proceeding from the analysis of these indicators, the authors construct aggregated indicators of "convergence readiness" and split the countries into several clusters according to their relative ability to take advantage of the EU single market for catching up process. The authors show that the income gap between the EU neighborhood countries and the EU15 is still wide and will require a long time to be narrowed. However, the main focus of this work is that in order to speed up the convergence, greater private investment, better business environment, regulation and governance, liberalizing infrastructure, and finance should be provided in the EU neighborhood countries.

Alho, Kaitila and Widgrén (2005) analyze economic convergence of the EU's new member states towards the incumbent EU countries using Balassa-Samuelson framework to build dynamic, general equilibrium model. They demonstrate that the speed of convergence crucially depends on the speed of capital accumulation in the new member countries and that there is a significant uncertainty related to the speed of convergence. The authors also show that the fears of adverse effects

[7] EU-10, except Malta and Cyprus, with EU15.
[8] Western Europe with Eastern Europe.
[9] Czech Republic, Hungary, Poland and Slovak Republic with OECD and EU15.
[10] EU15 with EU-10 and Bulgaria and Romania.

resulting from a relocation of EU15 manufacturing to the NMS are not well founded.

In sum, the research accumulated up to date demonstrates that the issue of closing the income gaps both between the EU15 and NMS and between EU-27 countries and their Eastern neighbors will be on the agenda for at least several future decades; however, this process can be accelerated by closing gaps not only in economic growth and productivity, but also in governance, institutions and infrastructure in the countries lagging behind.

III. ORIGINS OF THE DEVELOPMENT GAP

A development gap between present CIS countries (and Eastern Europe in general) and Western Europe was in place at least since the 13th century[11]. It became quickly widening mostly in the course of the Industrial Revolution, starting from the 19th century. However, the reasons for inability to catch up within almost two centuries were rooted deeply in history.

By the beginning of the 19th century, before the Industrial Revolution, most of FSU countries became parts of the Russian Empire. Since then, despite multiple territorial and border changes, these countries have been developing under a direct impact of Russian (later Soviet) institutions and largely shared a common economic history.

The USSR launched a large-scale forced industrialization in 1930s-60s, but despite desperate attempts failed to overcome the development gap: between late 1920s and late 1960s, the main goal of modernization was military superiority rather than development *per se*. Although successful in fighting illiteracy and creation of modern industries, the Soviet economic policy generated massive distortions and inefficiencies. The latter caused the gap widening again in 1960s because of the USSR's failure to meet the challenges of post-industrialization.

Following the USSR breakdown at the end of 1991 and the emergence of post-Soviet countries, a profound economic and political crisis, accompanied by armed conflicts in some territories, severely damaged physical and human capital of the respective countries contributing to a deepening of the development gap during the first years of transition.

III.1. Some theoretical reasons

Following North (1991), we consider persistent development gap as caused primarily by institutional factors. Institutional gap, in turn, was most probably

[11] Author is grateful to Gennadi Poberezny for his kind help in data mining.

primarily related to the abundance of natural resources, initially arable land. Among other important factors discussed in the literature we also consider a lack of traditions of urban self-governing, and remoteness from the sea.

There are at least four factors tending to impede the development of resource-abundant countries and therefore make the resource abundance a "mixed blessing" (or a "resource curse").

1. Macroeconomics. Export of resources or raw materials tends to appreciate the domestic currency comparing to foreign ones, and in this way make domestic production of more sophisticated goods and services non-competitive at the world market, or even at the domestic market (so called "Dutch disease" in the narrow meaning, Sachs & Warner 2001). This factor was hardly important in the case of Russia, since its historically inherited extent of foreign trade was relatively small[12].
2. Policies. Rents stemming from natural resources allow the authorities to postpone the necessary reforms, neglect important components of development, such as education and governance, etc. (Gylfason 2001). This factor seems to be particularly relevant to the case in question.
3. Political economy. Natural resources are sources of rents. On the one hand, they feed the rent seeking aspirations and respective interests, which, in turn, tend to divert human and financial resources from productive activities (Murphy et al. 2003). On the other hand, competition for rents not only results in dissipation of rents themselves, but also brings overall insecurity. Prevention of such a competition may need an authoritarian arbiter to be in place, which brings about all of the failings of authoritarianism (Dubrovskiy et al. 2007).
4. Institutions. Property rights are needed to protect the renewable natural resources from devastating exploitation that can lead to their exhaustion (Demsetz 1967). However, the rights over natural resources are inherently somewhat weaker than the ones established over the outputs of various kinds, including fixed assets and other capital goods.

Property rights under feudalism become eventually legitimized by protection against plundering. This was the case in the medieval Western Europe, as well as in the Kievan Rus'. But this reason lost its force after the Tartar-Mongol invasion (mid 13th century) onward. Instead, in the Muscovite Rus' the abundant lands were granted to aristocrats along with titles as a reward for their service to a Tsar. Tsar's

[12] In 1850 Russian exports per capita were 23 times lower than in Great Britain, and 2.7 times lower than in Spain. Twenty years after it has increased almost 4.5 times, but still remained 4.4 times less than in Germany.

discretionary power therefore became the only source of legitimacy for land ownership.

In the case of arable land, there was at least one more important factor. The landlords needed labor to cultivate their land, and serfdom was a means to make this labor cheaper. But in Western Europe it could be partly substituted by a sort of "cartel" of landowners that were almost exclusive employers of those times. When labor became scarce because of wars and epidemic diseases, such a cartel took the form of legal wage limitations in agriculture – which, however, stimulated the urbanization. On the other hand, under land abundance the peasants had an alternative of resettling to the virgin lands, thus in Russia serfdom had no alternative.

In Western Europe, cities served as shelters for the peasants escaped from serfdom and the region has inherited an ancient liberal democratic tradition of self-governing city-states. Competition for military superiority characteristic for Western Europe could be won only by technological progress, so the "arms race" between states, duchies, and cities became a powerful engine for development. New weapons' production required advanced technologies that were mostly developed in the cities.

In the agrarian land-abundant empires (like the Russian one), the cities were rather military and administrative centers representing very strong central authorities. Their citizens did not enjoy more freedoms than other populace, and never constituted a sizable part of the whole population. Until the invention of firearms, there were no effective means of fighting the nomads, hence technical advance did not make much difference. For these reasons, the agrarian empires of the past, although often richer and far more advanced in arts and science than medieval Western European countries, nonetheless failed to develop modern institutions that later on allowed Western Europe to outperform them in the long run.

Finally, several scholars (Mellinger et al. 1999) emphasize proximity to the sea coast as an important factor of economic, and especially institutional, development. They associate proximity to the sea with better conditions for trade, due to lower cost of sea transport, and its lesser vulnerability to plundering, extortion and other kinds of trade barriers. In this sense, Western Europe is a unique geographic region with none of the cities located in more than 300 kilometers from the sea coast (Gaidar 2005a) and plentiful of rivers providing convenient ways to sea ports. Ancient Russian self-governing cities-states of Pskov and Novgorod were in this sense similar to their Western European counterparts and trade partners. Unlike these, most of the territory of Muscovite Rus' but sub-polar regions had difficult access to sea, hence needed to lean on land trade.

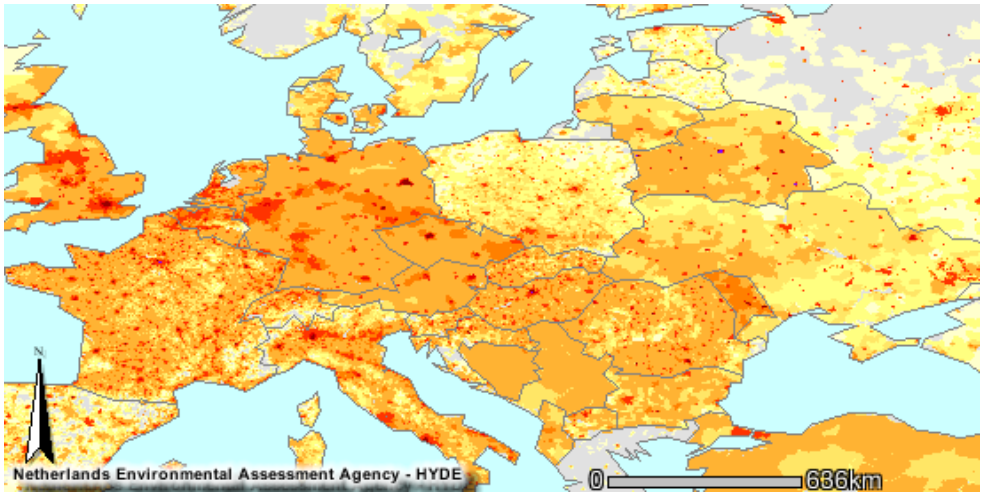
III.2. History of the development gap

Before the Industrial Revolution economic growth was very slow worldwide. Due to this reason the countries that had modernized earlier have outperformed the others in the beginning of 19th century. At the same time, industrialization gave a chance to many other countries to catch up. Therefore, history of the development gap may be divided in two periods: before and after the Industrial Revolution.

Why the industrialization was delayed

Although initially the Kievan Rus' of IX-XIII centuries had been rather following the European path, later on land abundance, plundering by the Tartars and Mongols, and then exposure to Genghis Khan's empire (succeeded by the "Golden Horde") institutions turned it to a different path for almost three centuries. The defeat of the Horde provided the Muscovite Rus' with unlimited access to virgin fertile lands, which resulted in institutional and technological stagnation and even regress. In particular, serfdom that was rather uncommon in the Kievan Rus' became much more severe compared to Western Europe.

Figure 3.1. Population density in Europe by 1700



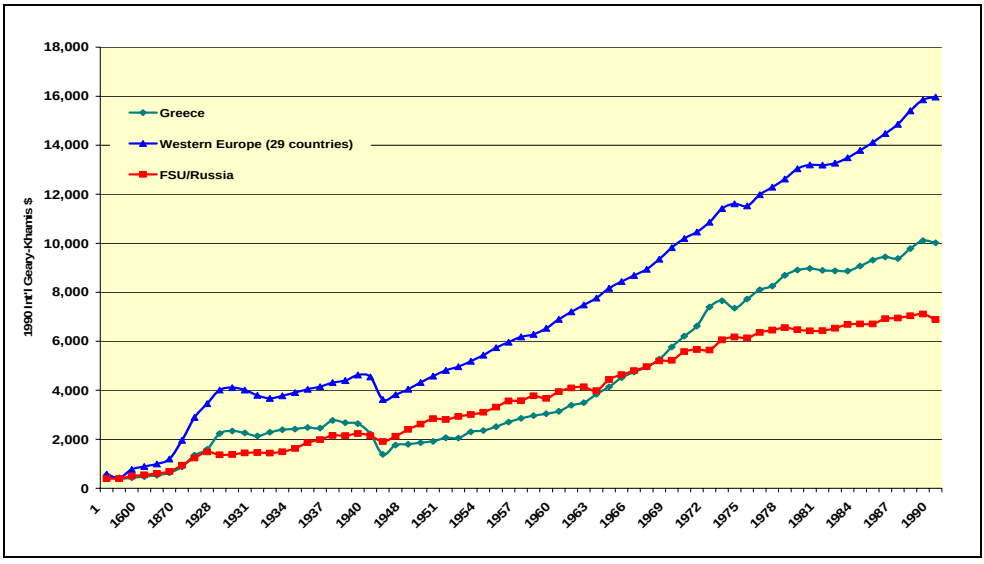
Source: HYDE.

Unlike competition for overseas colonies among Western European countries, the Russian type of expansion to the East did not require any advance over other European states, since they did not compete over there. On the contrary, Russian expansion to the West and South did require some technological advance, because

here Russia had to fight against the Europeans, primarily Swedes and Poles, and the Ottoman Empire. Still, despite Peter the Great's attempt of institutional and technological catch-up in the beginning of the 18th century, by the beginning of Industrial Revolution, the Russian Empire remained mostly agrarian. It remained such for quite a long period of time with less than one percent of urban population compared to fifteen percent in the Western Europe, and 5.65 per cent in the Eastern Europe[13] by 1720.

Authoritarianism was an essential part of any agrarian empire, and Russia was not an exception, remaining an absolute monarchy until the early 20th century. Serfdom that lasted until 1861 made labor mobility close to zero. Instead, modern industries were run mostly by the state that, in its turn, was also using mostly forced labor. At the same time, the bureaucracy and other institutions of rational rule were largely formal, while the actual rules remained inherited from the patrimonial state (Volkov 2000). The rule of law and other institutions needed for complex transactions going beyond simple bazaar exchange remained weak, so the financial markets were non-existing. Therefore, not only the industrialization did not start, but the most necessary preconditions for a "market capitalist" kind of industrialization were missed along with driving forces for it.

Figure 3.2. GDP per capita in Russia (FSU) compared to Europe and Greece



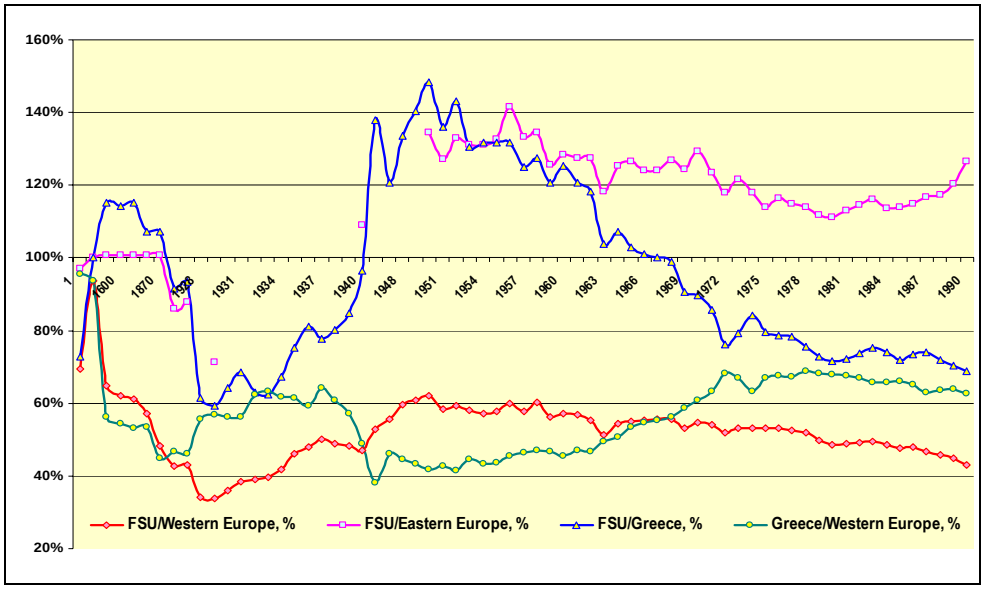
Source: Maddison (2003).

[13] Here, and further on in the current section the region defined as "Eastern Europe" for the purposes of historic comparisons includes seven countries as defined by Maddison (2003): Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and Yugoslavia.

By this time the Russian Empire was already one of the largest in the world by its territory having, however, very little density of population even in its most developed European part (Fig. 3.1), abundant with virgin lands, having a severe serfdom and with very weak incentives for entrepreneurship. Examples of bourgeois revolutions that took place in France and other European countries worked as a warning against liberation that could potentially be subversive to privileges of aristocracy.

The population remained mostly rural, with less than one percent living in towns – compared to a 25 per cent of urban population in Western Europe, and about 10 per cent in Eastern Europe (1820). The Russian Empire managed to reach a 15 per cent level of urbanization (the Western European level of 1700) only by the turn of the 19th century. The quality of Russian towns was also strikingly different: there was nothing in place comparable to the freedoms of Western cities and towns.

Figure 3.3. GDP per capita in Russia (FSU) relative to ones of Western Europe, Eastern Europe, and Greece



Source: Maddison (2003)

As long as modern institutions did not emerge from the grassroots, their establishing through reforms was the only way to catch up. In the late 17th century Peter's the Great attempt of changing the societal norms by a forceful imposition of Western-like legislation and bureaucratic rule in order to catch up with the most developed Western European countries was a turning point in the institutional his-

tory of Russia. Still, contrary to the reforms' purposes, this attempt had not really destroyed the patrimonial traditions. Instead, the increased gap between the natural and formal law made almost everyone a lawbreaker. This, in turn, has created vested interests in the further excessive complication and toughening of legislation; increasing the scope of bureaucratic discretion; preservation and amplification of ambiguity and contradictions of legislation, etc.

These distortions resulted in traditions of low respect for and abeyance of law. The law enforcement became to a large extent an instrument for exercising power rather than maintaining the law and order in their Western meaning; bureaucrats in the respective positions were rather powerful state executives endowed with vast political and economic power; vertical (hierarchical) bargaining was widespread as a substitute to the impracticable formal rules, etc. This institutional legacy in fact created a background for a limited capacity of law enforcement and implementation, that complicated introduction of any new formal rules.

Generally, and apart of the abovementioned specifics, the formal institutions in Russia of the early 19th century were to some extent comparable to the Western European patterns of one or two centuries before. Absolutism in polity, serfdom and strong estate privileges in social relationships, and weak civil rights were as much restrictive for economic and social development as they were in Western Europe at the respective times.

As a result, the Industrial Revolution became delayed in Russia. Consequently, between 1820 and 1870 average annual growth rates in Russia constituted only 64 per cent of those in the Western Europe, so the initial gap grew wider (Maddison 2003).

Modernization in the Russian Empire

Alexander II has launched a series of genuine liberal reforms that appeared to be successful and sustainable. Serfdom was abolished, civil and property rights strengthened due to the court reform, and local self-governance established. Still, most of the privileges for nobility were preserved, and peasant communities remained collectively responsible for tax collection, which made them an instrument restricting labor migration. Land reform was largely incomplete, so peasants had to buy out their land plots. All those reasons still prevented rapid urbanization and industrialization. Probably as a result of these reforms, the growth rates speeded up by half – but so did the ones in Western Europe, therefore the gap kept widening. Only in a few decades, by the end of 19th century, the Alexander II reforms yielded their fruits in terms of economic development.

The first catch-up jump occurred only in the years of 1890-1913. During this period growth rates were for the first time in history even slightly higher than the ones in the Western Europe; the share of urban population almost quadrupled. While in 1890 per capita production of iron and steel in Russia was only 11 per cent of the one in Western Europe, just in ten years it reached 26 per cent (Fig. 3.4). The industrialization began. Literacy rate that had doubled in previous 40 years from 7.4 to 15 per cent, doubled once again in 21 years from 1890 to 1911, still remaining, however, twice as low as in Great Britain[14] of 1840 (Fig. 3.5). During this period the Empire became a constitutional monarchy, launched the ambitious Stolypin land reform that was to create a sort of "open end" in Siberia. Nevertheless, Russia still remained mostly agrarian country with agrarian sector dominating the economy, while most of Western European countries were already industrialized.

Figure 3.4. Annual production of iron and steel in Russia/FSU and the rest of Europe

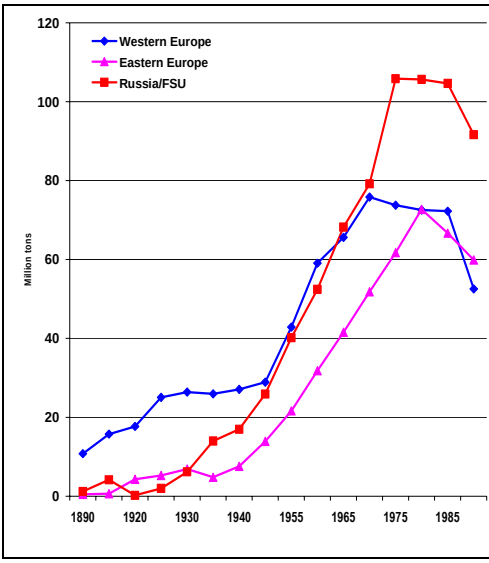
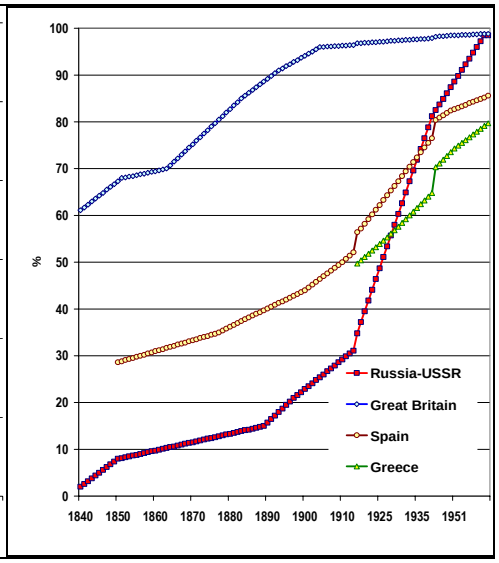


Figure 3.5. Literacy rate in Russia/FSU and selected Western European countries



Source: Mitchell (2003)

The institutional gap remained almost as wide as it was a hundred years before. Constitutional restrictions on monarchy were weak and often fake with tsar's power remaining basically unconstrained. Estate privileges and various restrictions on the freedom of migration remained in force. Quality of state governance re-

[14] Great Britain was chosen as a convenient basis for comparisons, since it was a leader of Industrial Revolution, and also since its borders remained mostly unchanged during the whole period under consideration.

mained poor relatively to the growing needs. Rampant corruption and favoritism along with remaining privileges and vertical mobility restrictions restrained the development of entrepreneurship. Hence, in general, the Russian Empire was again at least one step behind the Western Europe.

Revolution of 1917 and pre-WW2 industrialization

Although most of Western European countries suffered a lot from the First World War of 1913-1918 and complementing revolutions, the Civil War of 1918-1922 that followed the Russian revolution of 1917 and communist experiments of the new government became really devastating. The former Empire lost important territories (among them, Finland, Poland, Baltic countries, Bessarabia, Western Belarus and a part of Western Ukraine); by 1921 virtually all of industry and most of agriculture were in ruins, and the Communist regime was unable to substitute deliberately destroyed market institutions with any other viable system able to provide work incentives and allocate resources.

As a result, it was at this time that the gap in wealth has hit its lowest point for the whole period between 1820 and 1990 (Fig. 3.3). Per capita iron and steel production fell twenty times compared to 1900 and constituted only 1.1 per cent of the Western European level; per capita energy consumption fell by two-thirds, accounting for just 3.8 per cent of that in Western Europe. At the same time, the peasants' communes were destroyed, while millions of the former peasants went to the army and then settled in the cities, so the urbanization went up. However, both countryside and cities suffered from starvation.

A short period of NEP ("New Economic Policy") that led to a quick economic recovery and an improvement in living standards only proved the potential of the major driving force of catching-up. A shade of liberalization by introduction of market institutions, at least in small and medium-size business, resulted in GDP in 1928 approaching the one of 1913 (while in per capita terms it was still 7 per cent less). At the same time, in Western European countries per capita GDP was 19 per cent higher than in 1913 (Fig. 3.2). Thus, the gap still retained: even after recovery the USSR reached only about one-third of the Western European average. To compare, during the same time period Greece[15] has caught up and already reached well above one-half – the level that the USSR did not hit even at the peak of pre-war industrialization (Fig. 3.2. and 3.3).

[15] Greece was chosen as a benchmark due to its relatively low starting point and some cultural similarities (Orthodox Christian religion) to Russia. It is the only EU15 country that had the GDP per capita lower than the one of Russia in 1820.

Further modernization required either abandonment of the Communist ideology and introduction of modern market institutions, or radical mobilization in line with this ideology and complete abandonment of economic freedoms. Soviet authorities have chosen the latter. In the 1930s, the catch-up was based on huge forced savings, and largely forced labor (Olson 2000). Abundance of human and natural resources other than land became its main engine. Rapid industrialization occurred at the expense of devastation of agriculture and huge human costs: the traditional Russian village was destroyed and replaced by collective and state farms which proved to be highly inefficient. Thus Communist ideology and central planning combined with totalitarian management appeared to some extent effective in catching-up development and recovery: within a historically short period of twelve to fifteen years, an economically backward country created a large industrial sector and acquired new technologies that changed it from an agrarian to an industrial economy.

Fighting illiteracy appeared arguably the most successful modernization effort with literacy rate reaching 60 per cent in 1930 (and increasing by 133 per cent within 20 years of 1919-1939) (Fig. 3.5). Higher education expanded rapidly, with enrollment tripled in 1929 comparing to 1913, and once again tripled by 1939 – probably, to some extent, at the expense of its quality.

While the USSR was moving forward very quickly, the whole of Western Europe suffered from the Great Depression of 1930[s]. This, undoubtedly, contributed to Soviet catching-up efforts (see Fig. 3.3). By 1940 the USSR has reached the level of one-half of Western European per capita GDP, while producing 63 per cent of the European level of steel and iron per capita (Fig. 3.4). Hence, this was a period of quick catch-up growth, although based mostly on forceful mobilization.

Post-war industrialization: the peak of success

The Second World War was extremely devastating for the USSR: its losses exceeded 52 per cent of total human losses borne by all war participants. However, due to extraordinary population losses the fall in per capita GDP was relatively small: it has dropped twice as less as in Western Europe (Fig. 3.2).

The Soviet postwar economic recovery period saw a partial repetition of the process of primitive accumulation which had been attempted during the first two five-year plans of 1928–37. Living standards were forced down; millions of peasants were conscripted, cajoled, or driven by economic necessity into abandoning the land for work in industry and construction; the slave labor sector was considerably expanded (e.g. by German POW) – all so that ‘capital’ and labor power could be concentrated in core sectors of mining, iron and steel, construction, and machine-building (Flitzer 2002).

A severe resource mobilization brought about substantial results: in 1950 the gap hit its lowest point with the USSR being only 37.9 per cent less that Western Europe in per capita GDP (Fig. 3.3). During 1950s the development gap remained pretty stable in relative terms (with the USSR having per capita GDP around 60 per cent of the Western European one), although widening respectively in absolute terms. The 1950s were also a period of rapid industrial growth in both the USSR and the Western Europe. Still, average growth rate for 1946-1962 (the longest period of continuous growth) constituted just about 4.25 per cent, while for Germany and Italy the averages for the period of continuous growth (1946-1973) were 6.4 per cent and 5.5 per cent respectively.

Unlike the market economies, "socialist industrialization" prioritized heavy ("basic") industries that were understood mostly in terms of the "coal and ore era" and "strengthening the defense capacity of the nation". These industries were reconstructed in the first instance, so by 1950 the production of iron and steel per capita in the USSR constituted about 90 per cent of the Western European average, about the same proportion as ten years before (Fig. 3.4).

Even more importantly, the Soviet Union's postwar experience was visibly different from the rest of Europe not in the rate of economic recovery but in the lack of institutional response. Where other societies experienced radical reforms or were reconstituted, the USSR witnessed the rejuvenated reign of Stalinism (Harrison 2006). The lack of institutional reforms in turn prevented modernization and inhibited the quality of economic growth.

Soviet postwar growth occurred mainly at the expense of efficiency. Already in 1950, the USSR's energy consumption per 1 dollar of GDP outpaced Western European one by 27 per cent. While in Western Europe energy intensity has been permanently and almost evenly declining at least since 1930 (earlier data not available), in the USSR it was steeply increasing until 1970 and then nearly stabilized at the level exceeding the Western European average of 1930 (Fig. 3.6). The same was true for many other components of development. For example, while having 23 inhabitants per physician (compared to 30 in Greece or 72 in the UK) in 1990, the USSR still had infant mortality three times as high, and life expectancy at birth constituting 65/74 years (male/female) compared to 75/80 in Greece and 72/78 in the UK respectively.

After 1960s: the decay

Since the late 1950s, a relative GDP per capita gap began steadily widening again (meaning an even faster increase in the gap in absolute terms) (Fig. 3.3). Since then, a smoothed trend of differences in the growth rates was permanently

negative. Ironically, this change in trend coincided in time with the enunciation of a well-known Khrushchev's slogan "Catch up and overtake the advanced capitalist countries!" (1957) that for a long time remained an ever-present factor in the economic and social history of the USSR.

In general, the Soviet Union was still pursuing the industrialization, while the Western countries already became post-industrial. The USSR did outperform the West in per capita production of iron and steel (Fig. 3.4) – but it was not an indicator of modernity any more. Consumption of other materials, like aluminum or plastics, became indicative of technological progress. And here the USSR failed to catch up despite its wasteful technologies and material-intensive economy.

Figure 3.6. Per capita energy consumption, tons of oil equivalent

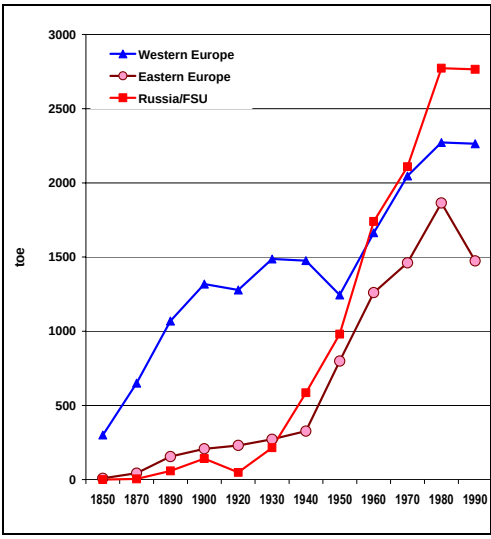
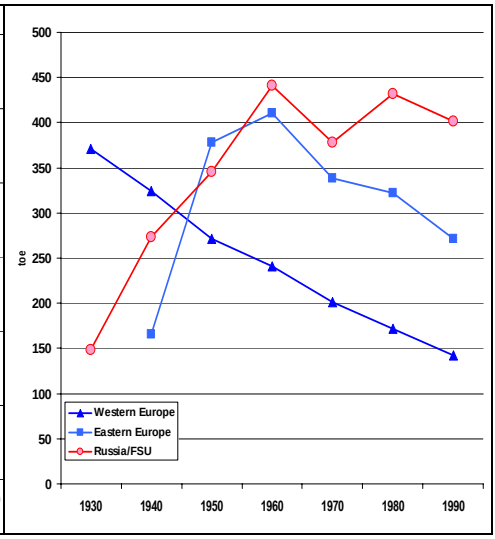


Figure 3.7. Energy consumption per unit of GDP, tons of oil equivalent



Sources: Woytinsky & Woytinsky (1953); Mitchell (2003); BP (2004)

Energy consumption per capita had also "caught up" and remained roughly similar to the Western European one during the 1960^{s}, indicative of low energy efficiency of the economy and wasteful resource consumption (Fig. 3.6). But then its growth slowed down in the West due to the energy price shock of the mid-1970^{s}, and it even declined during 1980^{s}. On the contrary, the USSR saw a 31.5 per cent increase in per capita energy consumption during 1970^{s} (Fig. 3.6).

Unlike Western Europe, where industrialization was largely driven by technological progress that increased agricultural productivity and by doing this released the excess labor, in the USSR industrialization was achieved by plundering the agrarian sector that remained gravely inefficient. Its inefficiency was further

largely aggravated by collectivization. As a result, the USSR had to become a net importer of foodstuffs, mostly grain and meat. Remaining in fact an agrarian empire by its culture and institutions, it became dependent on agricultural imports.

Figure 3.8. Railroad mileage per 1 mile^2

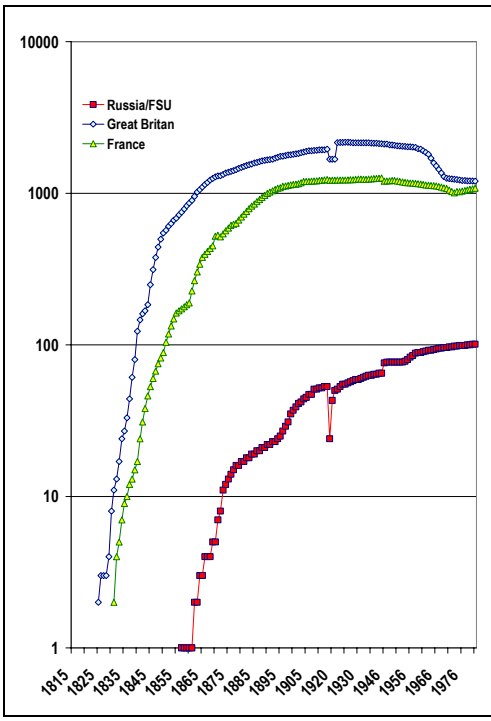
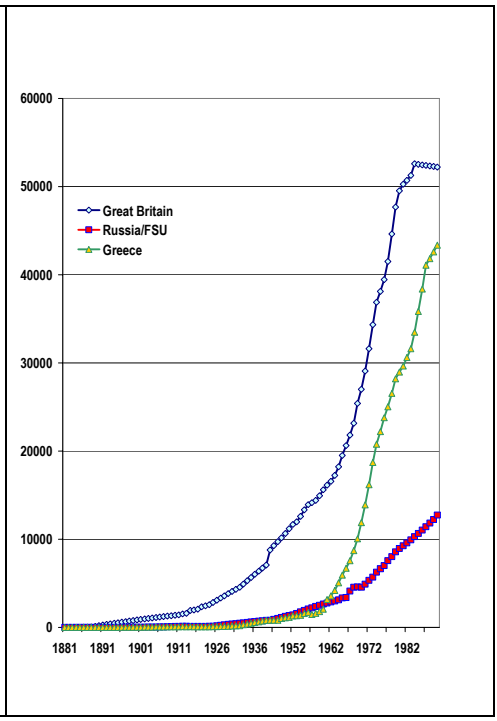


Figure 3.9. Number of telephones per capita



Source: Mitchell (2003)

The USSR has never managed to catch up in infrastructure. Poor quality of roads in Russia is notorious. But even being the world's leader by railroad mileage, it still has been lagging far behind the European countries in the density of railway network (Fig. 3.8). This was, of course, partly due to a low density of population and extremely large territory of permafrost. However, in terms of telephone lines per capita it was lagging far behind as well (Fig. 3.9).

Rapid urbanization continued, although at somewhat slower pace, with the USSR lagging behind the Western Europe. Massive migration was driven mostly by a huge wealth gap between cities and countryside that appeared due to rapid industrialization. It was accompanied by a scarcity of entertainment opportunities, undersupply of goods and services, poor quality of basic public goods, and weakness of social security in the countryside.

What the communist regime could be praised for is the development of human capital. Education was the only but important sphere where the USSR has managed to catch up completely, and in many cases even outperform Western European countries. Already in 1960 the USSR has reached a literacy rate of almost 100 per cent; still. it has been lagging behind in terms of university enrollment, as well as, perhaps, in its quality (at least regarding humanities). However, despite formally high human capital, the real quality of labor force was rather poor due to weak incentives. Widespread absenteeism, petty theft, weak technological discipline, and other deficiencies as well as total mismanagement resulted in excessive actual labor cost and poor quality of goods and services. The few exemptions were limited mostly to tightly closed military plants and research divisions.

Also, in terms of "human development" as defined by Welzel & Inglehart (2001), the USSR lagged behind noticeably. These authors argue that human development can be best measured in terms of the opportunities for self-realization or the variety of choice that a society provides to its members. In the USSR the people were given very little choice that was often deliberately restricted. In addition to low incomes and a complete absence of democratic freedoms (factors considered by Welzel and Inglehart), the choice of goods and services was poor by any means. The people were restricted in choosing their occupations, since private entrepreneurship was prohibited as such; voluntary unemployment or self-employment was subject to criminal prosecution; and those who changed their jobs too often were penalized. During a long period of time large categories of soviet citizens were deprived of any choice at all, as peasants under Stalin times. Besides, there were informal quotas limiting access to high education for Jews, children of the dissidents, victims of purges, and some other categories. Art, literature, education, and science were placed under a strict ideological scrutiny; censorship was pervasive and strictly enforced.

Although formally democratic, the USSR was a totalitarian state. Market institutions were, at most, non-existing, with trading, private property, and entrepreneurship being outlawed and condemned by most of the public. No formal estate privileges were in place, but *de facto* the communist *nomenklatura* enjoyed tightly restricted privileged access not only to the goods and services in short supply, but also to the potential sources of rents.

Social capital in the USSR took a very much specific form of the so-called *blat* (Ledeneva 1998). The reputation-based interpersonal networks of informal reciprocal exchange with favors of access to scarce goods and services penetrated the whole Soviet society.

Remarkably, by the end of the 1980[s] the relative GDP per capita gap became as wide as it was in 1913 (Figure 3.3). By that time the idea of 'overtaking' was

clearly an illusion, and catch-up itself was failing, with the result that the gap between the West and the East in Europe was growing again. Moreover, the fact that 'the success' that had been obtained was based on an massive consumption squeeze meant that for ordinary citizens, even though the per capita income figures might *prima facie* suggest progress, their own patterns of consumption remained far behind of what, in societies increasingly penetrated by images of the West, they aspired to (Haynes & Husan 2002b).

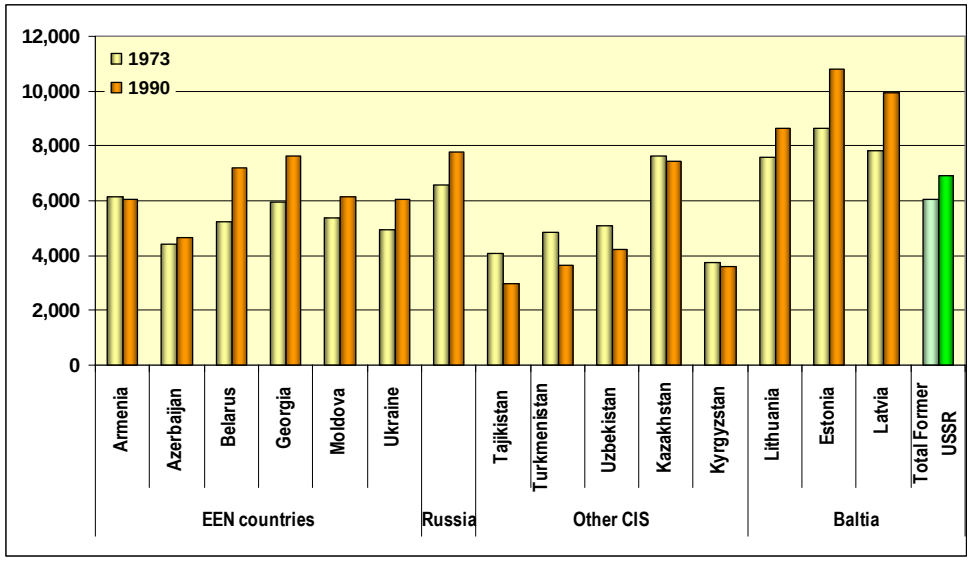
III.3. Differences between Soviet republics

Since the beginning of the Industrial Revolution most of the territories of the present EEN countries were subject to the Russian Empire's and later Soviet institutional environment. They were modernized under prevailing influence of Russian/Soviet policies, and the origin of development gap in these countries was associated mostly with these patterns. However, these countries and territories varied in maturing and intensity of this influence.

While Eastern edges of present Belarus and Ukraine were directly exposed to the Russian both formal and informal institutions, in the Caucasus part of the Empire, as well as in non-Slavic-Orthodox peripheries traditional establishments remained largely intact, although of course influenced by the Russian institutions. Such parts, although sometimes better developed than the parent state was, were treated as a sort of "colonies", while Ukraine and Belarus considered as "sisters" parts of its mainland. This tradition, although weakened, remained during the Soviet times and became the main reason behind persisting differences in the development performance, despite some deliberate policies of "equalization" conducted by Soviet authorities.

While most of the territories were under the Soviet system for seventy years, the Western parts of Ukraine and Belarus, and the whole Moldova but the Transnistria, lived under the Soviets for only 50 years or so, which seems to explain a great deal of their later economic performance under transition. In particular, as was clearly demonstrated by Fischer and Sahay, the size of the development gap was directly related to the time squandered during the socialist experiment (Fischer and Sahay 2000). Certainly, the socialist system in the Soviet Union differed under Stalin and Khrushchev, both of which differed from Hungarian socialism or from the Polish socialism of Gomulka, Gierek and Jaruzelski (Kornai 2000). The same was true, albeit to a somewhat lesser extent, for the republics of the FSU.

Figure 3.10. Per capita GDP in FSU Republics (1990 International Geary-Khamis dollars)



Source: Maddison (2003).

The USSR was not homogeneous: significant spatial differences in various dimensions of development were inherited from previous times. But despite several decades of deliberate policies aimed at equalization and unification of standards, the differences aggravated (Fig. 3.10). In 1973, the ratio of maximal to minimal GDP per capita for all Soviet republics was 2.3 times, by 1990 it has increased by a half, to 3.6 times – with Estonia and Latvia being the leaders, and Tajikistan and Kyrgyzstan the laggards. However, the six republics that are currently EEN did not vary that much. Still, the difference between the richest (Armenia) and the poorest (Azerbaijan) constituted 1.4 times in 1973, while the one between Georgia and again Azerbaijan increased to 1.6 by 1990. Notably, during this period the growth rates of republics were quite different, from 37 per cent for Belarus and 15 per cent for Moldova to -1 per cent for Armenia (in the latter case due to the war with Azerbaijan and earthquake in Spitak).

These differences largely reflected the variety of historically inherited institutional patterns. The Baltic countries managed to preserve some of their European institutional memory at least at the informal level. They were a sort of "mini-Europe" within the former USSR. These cultural features helped them in further building of independent states and later joining the EU. The Western Ukraine has quite similar institutional history, with even least maturity under the Russian and Soviet institutions. It has preserved to some degree the traditions of civil society and labor morale.

Most of Ukrainian countryside was historically organized as individual farms rather than villages, so the peasants were more individualistic than their Russian and Belarusian counterparts. The South-Eastern Ukraine was inhabited by Cossacks, and later on by the settlers of different kinds – mostly serfs moved by their landlords, but also free farmers and entrepreneurs. Moldova has a lot in common with Romania sharing the same language and mostly same history until the mid-19th century.

In the Caucasus the blat networks got mixed with remaining clan networks and other remnants of patrimonial societal structures, and became especially strong. This resulted in a large shadow economy and high corruption during Soviet times. Besides, under the conditions of strong protectionism, Georgia and Azerbaijan practically held the monopoly for supplying the whole of the former USSR with subtropical fruits, flowers and tea.

Significant differences in development (although, in this dimension, steadily diminishing), may be well characterized by infant mortality rates, which are widely used as an indirect indicator of the quality of medical service and infrastructure. In 1985 - 1990, the gap between the best performer among the EEN countries, Belarus', and the worst performer, Azerbaijan, constituted as much as 5.2 times (16.2 vs. 85 per 1,000 births), while in Belarus infant mortality rate was "just" twice as high as in, say, Belgium (8.3 per 1,000 births, typical for Western Europe). The worst performers were catching up both in Western Europe and the USSR. But while, for instance, Greece has caught up completely, in the USSR the worst performers have not managed to, while the best performers have almost stagnated for at least the last twenty years of Soviet period at levels twice exceeding those of the EU. While the best achievement among the Soviet republics was a two-thirds reduction during the 20 years between 1970 and 1990 (from 130 to 80 per 1,000 births in Kyrgyz Republic), Greece reduced mortality rate more than five times (from 54.4 to a European average of 10.7 during the same period).

IV. ECONOMIC DEVELOPMENT GAP: MEASURING CONVERGENCE OF PER CAPITA INCOME

Do EEN countries tend to catch up with the EU in terms of per capita income during the transition from planned to market economy? One of the possible ways to answer this question is to test for the convergence of per capita incomes between the EEN countries and EU. In addition, specifics of the analyzed period should be taken into account, including the depth of the adaptation recession and reforms progress in post-communist countries of the region.

The analysis is organized as follows: (1) analysis of properties of the data used; (2) analysis of β and σ convergence of per capita income in low and middle income CIS, EU candidates and West Balkan countries; (3) empirical explanations of per capita GDP convergence, including its relationship with market reforms, FDI inflow, and initial level of development; (4) conclusions about the speed of catching up and the ways of bridging the development gap between the countries of the region.

IV.1. The data

For the purposes of this analysis, the data on GDP per capita in constant 2000 Euro were used. The whole set of 54 analyzed countries is subdivided into groups identified above (see Introduction): EEN, Russia, other CIS, EU15, NMS, candidates, and other West Balkans[16]. The number of observations for each country is 17 (1989–2005).

[16] In addition to these groups, Cyprus and Malta are included into the sample of countries. In this chapter, 'Candidates' and 'other West Balkans' are considered as separate groups because of the differences that may influence the results.

Choice of real GDP data instead of GDP measured in PPP terms was made due to the following reasons: (1) data are available for the whole analyzed period for all countries, which gives us a balanced panel with 17 annual observations for each object. PPP data are available for the whole period only for EU15, while for other countries/regions it is far more restricted (for instance, data for Serbia and Montenegro are available only since 2000); (2) if we find that real GDP and GDP (PPP) are closely correlated, we could argue that real GDP is as appropriate for measuring development gap as GDP (PPP). Indeed, the correlation coefficient for these two measures of GDP is close to 1 (0.963). Moreover, cointegration analysis presented in the appendix to the current section proves the existence of the short- and long-run relationships between the two variables, which allows us to use real GDP for further analysis instead of PPP-based GDP. Finally, the goal of this section is not to measure the gap, but to answer the question whether this gap widens or closes.

IV.2. Testing for convergence between per capita income in low and middle income countries of CIS, and European and Balkan countries

The two concepts of convergence are distinguished: β and σ convergence (Barro & Sala-i-Martin 2001). The first one applies if countries with lower incomes tend to grow faster than richer ones. In other words, the higher the initial level of GDP per capita, the lower its average growth rate in the long run. The second concept applies if cross-sectional dispersion tends to decline over time. β convergence tends to generate σ convergence.

β convergence

The simplest way to test the hypothesis of β convergence is to estimate regression

$$\Delta y_i^{aver} = a + b \cdot y_i^{initial} + \varepsilon_i, \quad (1)$$

where Δy_i^{aver} is average growth rate of per capita GDP for a certain period (say, for 10 years), $y_i^{initial}$ is level of GDP per capita in the initial period, *a* and *b* are regression coefficients (small letters represent natural logarithms). But the empirical evidence of β convergence is controversial: for instance, R. Barro (1991) found

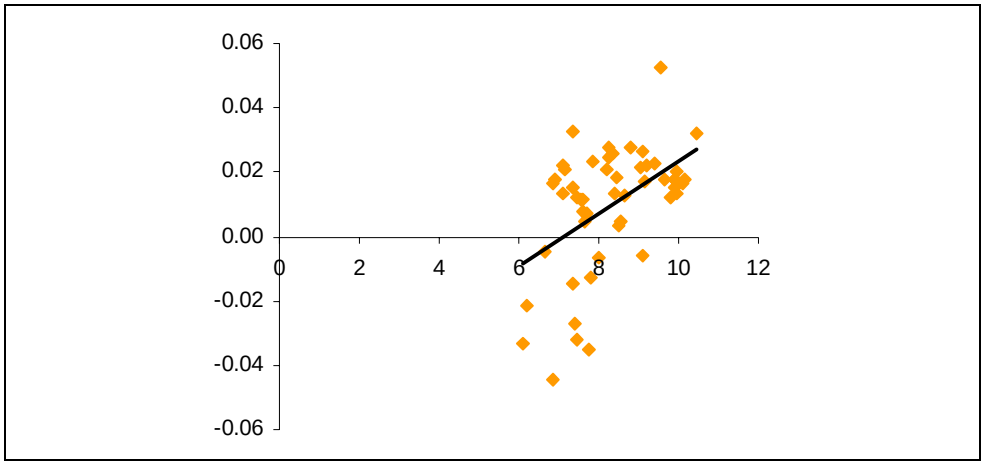
no significant relationship between starting levels of per capita income and long-run growth, but he showed that long-run growth is negatively related to initial level of GDP when several proxies of human capital are included into the equation. Thus, equation (1) may not reveal convergence even in case of its presence.

Hypothesis of presence of β convergence was tested for the full set of 54 countries[17] for the period of 1989–2005. Hence, the following regression was estimated:

$$\Delta y_{1990-2005} = \underset{(-2.394)}{-0.049} + \underset{(3.287)}{0.007} \cdot y_{1989}, \qquad (2)$$

where y is GDP per capita in constant 2000 Euro, t-statistics are in parentheses. The results of this estimation show that there is no evidence of convergence among considered countries; moreover, they diverge in terms of GDP per capita. This is supported by the Figure 4.1 demonstrating that the higher the initial per capita income, the higher its average growth rate.

Figure 4.1. Testing for β convergence (full sample)



Note. OX axis: log of GDP per capita in 1989; OY axis: average (per capita) growth rate for 1990–2005 (first logarithmic differences)

However, the analyzed set of countries includes 27 post-communist economies. All of them faced adaptation (or transition) recession, followed by a period of recovery growth (Gaidar 2005b) and (in some cases) by a certain long-run growth path. Adaptation recession is not related to long-run growth, because it has re-

[17] At this stage, all 54 countries were included into convergence analysis in order to capture more observations (cross-sections).

sulted from distortions inherited by these countries from the period of socialism (De Melo et al. 1997). Thus, it looks reasonable to exclude periods of adaptation recession from the consideration, and re-estimate the regression (2).

Table 4.1. Last year of adaptation recession in post-communist economies

	Last year of adaptation recession	Cumulative decline, %
Albania	1992	40.0
Armenia	1993	54.4
Azerbaijan	1996	66.0
Belarus	1995	36.8
Bosnia and Herzegovina	1993	59.2
Bulgaria	1993	29.7
Croatia	1993	38.8
Czech Republic	1993	12.7
Estonia	1993	33.7
Georgia	1994	72.9
Hungary	1993	16.9
Kazakhstan	1995	37.2
Kyrgyzstan	1995	49.3
Latvia	1993	43.8
Lithuania	1994	46.2
Macedonia	1995	31.6
Moldova	1996	66.4
Poland	1991	18.4
Romania	1992	23.9
Russia	1996	44.1
Serbia and Montenegro	1993	59.4
Slovakia	1992	22.0
Slovenia	1992	20.2
Tajikistan	1996	65.4
Turkmenistan	1997	56.7
Ukraine	1998	60.2
Uzbekistan	1996	

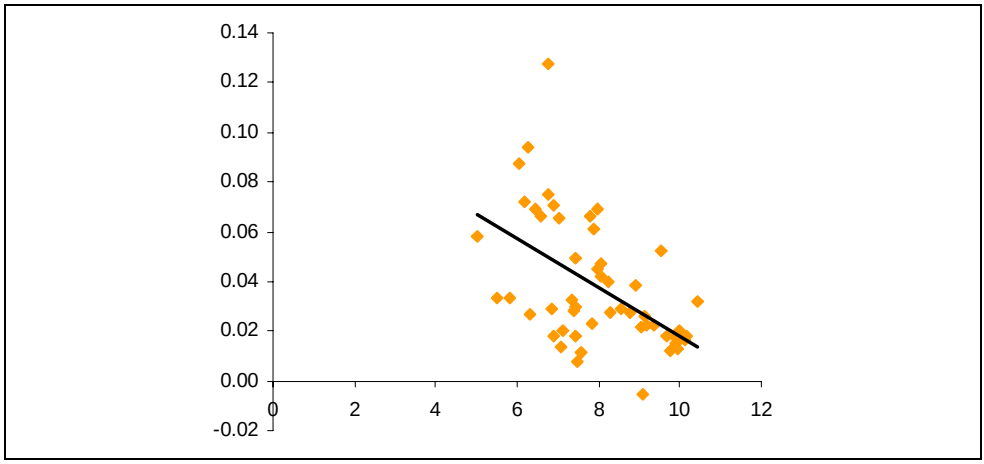
Note. The last year of adaptation recession is defined as the last year of sustainable (equal to or more than 2 years) decline of per capita GDP.

Average growth rates were calculated for these countries for the period starting from the year following those presented in Table 4.1. Additionally, GDP per capita in the last year of adaptation recession was taken as an initial one. For the rest of the countries, averages were calculated for the whole sample (1990–2005), and initial GDP was that of 1989. As a result, the following regression was estimated:

$$\Delta y_{aver} = \underset{(5.939)}{0.123} - \underset{(-4.670)}{0.011} \cdot y_{initial}. \quad (3)$$

The new results differ from the previous ones dramatically: the convergence is revealed. The lower the initial level of GDP per capita, the faster its subsequent growth is. The results are shown at Figure 4.2.

Figure 4.2. Testing for β convergence (taking into account adaptation recession in post-communist economies)



Note. OX axis: log of GDP per capita in the initial year; OY axis: average (per capita) growth rate for the selected period (first logarithmic differences).

σ convergence

This type of convergence can be revealed basing on the formula proposed in Kaitila (2004):

$$\frac{\sigma_t(Y_i, Y_j)}{mean_t(Y_i, Y_j)} \cdot 100, \qquad (4)$$

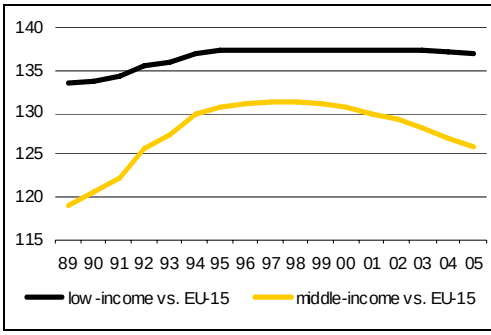
where σ_t is standard deviation, Y_i, Y_j are real per capita GDP in groups of countries i and j. We calculated standard deviations for the following pairs of the countries' groups[18]:

CIS (low or middle income countries) vs.:

- NMS (excluding Cyprus and Malta);
- Candidate countries;
- Other West Balkans;
- EU15.

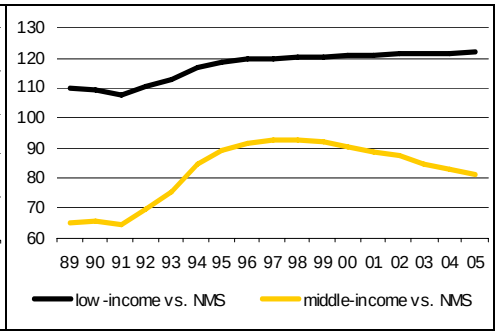
[18] See Introduction for details on country groups composition.

Figure 4.3. σ convergence between EU15 and low and middle income CIS countries



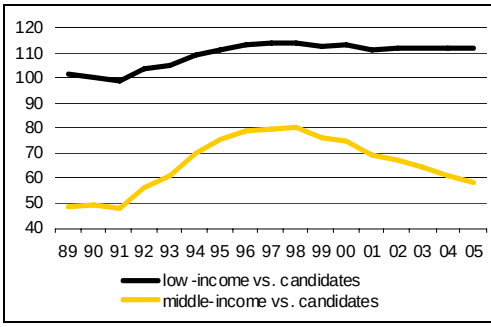
Source: own calculations

Figure 4.4. σ convergence between NMS and low and middle income CIS countries



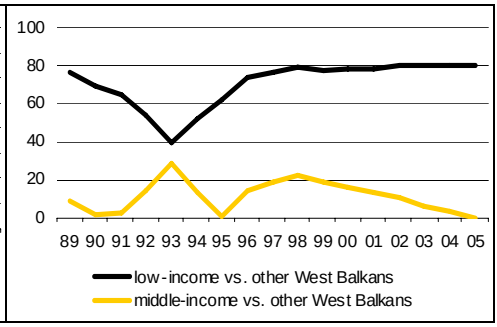
Source: own calculations

Figure 4.5. σ convergence between the candidates and low and middle income CIS countries



Source: own calculations

Figure 4.6. σ convergence between the other West Balkans and low and middle income CIS countries



Source: own calculations

The results are presented at Figures 4.3–4.6. In all cases of middle-income CIS countries they support a theoretical expectation that β convergence tends to generate σ convergence. Low-income countries (Kyrgyzstan, Tajikistan, and Uzbekistan) do not tend to catch up with NMS and Balkan countries in terms of real per capita GDP.

IV.3. Empirical explanations of per capita GDP convergence

Initial level of income and convergence speed

Findings presented in the previous section could be shown in a simple way based on the following approach. First, we leave in the sample the following

groups: CIS (both EEN and others), NMS, candidates, and other West Balkans (29 countries). Second, we divide these countries into four groups based on the level of GDP per capita (see Introduction): low income[19], low-middle income[20], upper-middle income[21], and high income[22] ones. Later, we distinguish geopolitical groups within low-middle and upper-middle income groups[23] to identify differences in convergence profiles determined by geopolitics. Further, we compare the average level of GDP per capita in each of these groups with the average per capita GDP in the EU15 over the period of 1989–2005. Further, basing on the results from the previous section, we concentrate on the post-1998[24] part of the sample in order to consider post-recession period. For this purpose, the following index is calculated:

$$ratio_t^i = \frac{GDPPC_t^i / GDPPC_{1989}^i}{GDPPC_t^{EU-15} / GDPPC_{1989}^{EU-15}} \cdot 100, \quad (5)$$

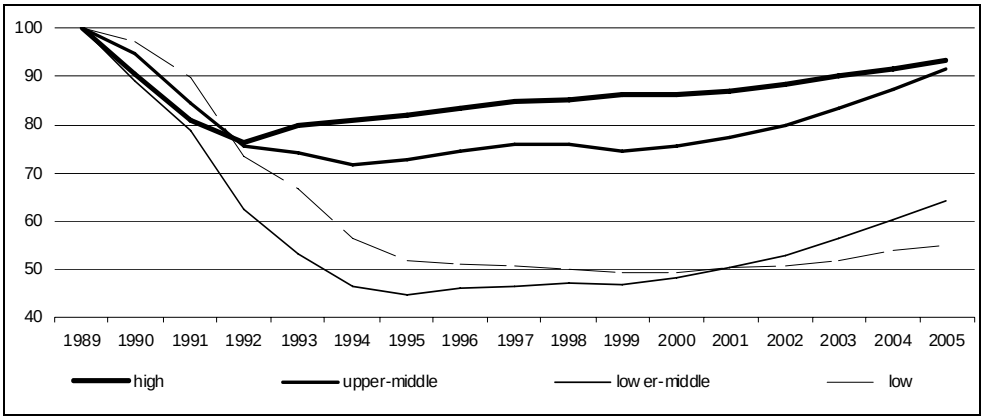
where *GDPPC* is per capita GDP, *i* denotes a group of countries, *t* denotes period of time. If this index for a country group *i* increases over time, GDP per capita in this group grows faster than in EU15, or catches up with the EU level. Further, according to the concept of β convergence, the poorest countries should catch up fastest.

Figure 4.7 shows that the differences between per capita GDP of EU15 and those of the analyzed income groups of countries have not decreased compared to 1989 in any of the groups. The ratio of average per capita income for the groups of high-income countries (represented by Slovenia alone) to average EU15 income increased quite slowly after a short period of decline. Other groups of countries demonstrate similar profiles: growing ratios of per capita income after a certain period of decline. As a result of this decline, none of the groups reached the level of 1989 by 2005. Additionally, the poorer the group of countries was, the deeper (or longer) this decline was[25]. In the phase of growth, profiles for two groups of

[19] Kyrgyzstan, Tajikistan, and Uzbekistan.
[20] Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Macedonia, Moldova, Serbia and Montenegro, Turkmenistan, and Ukraine.
[21] Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovak Republic, Turkey.
[22] Slovenia.
[23] High income group contains only one country, low income group includes only other CIS countries.
[24] The last year of adaptation recession throughout the sample, see Table 4.4.
[25] However, depth of recession in lower-middle income countries was greater than in low income ones, as the low-middle group includes several countries that were involved in military conflicts in the early 1990s.

middle income countries were almost parallel to each other (and steeper than the high-income profile). As a result, countries with low middle per capita income achieved less progress compared to the 1989 level than upper-middle income countries. The poorest group of countries shows the smallest speed of convergence. From this point of view, the idea of β convergence does not find empirical support, though in general middle-income countries catch up with EU15 and high-income countries.

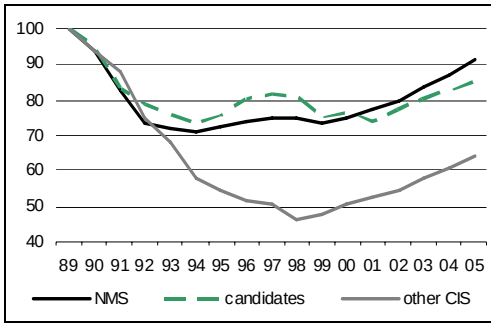
Figure 4.7. Ratio of the average per capita income in the analyzed groups of countries to that of EU15 depending on the level of per capita income (index, 1989 = 100)



Source: own estimates

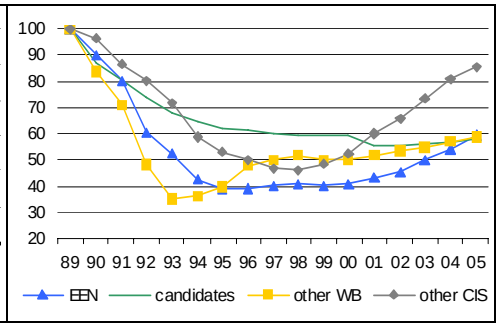
Figures 4.8 and 4.9 represent countries from the two middle income groups divided according to the geopolitical principle. For upper-middle income countries (Figure 4.8), it is evident that catching-up progress in other CIS (in fact, in Russia) was significantly lower than that of NMS or the candidates' one. However, it was due to a deeper decline in Russia, while convergence speed is approximately equal for all sub-groups in this sample. Among lower-middle income countries (Figure 4.9), other CIS made the most significant progress in their catching-up with EU15. However, this group is represented by Kazakhstan and Turkmenistan, both rich in terms of natural resources which may partially explain their catching-up progress. All other groups arrived to similar results, but with different speed. The least 'rapid' was Macedonia (the only country in the group of candidates). Other West Balkans (WB) had a good start after recession, but later the speed of convergence declined. The EEN group started to catch up after 2000, when the last repercussion of the 1998–1999 financial crisis in Ukraine and Moldova faded out.

Figure 4.8. Ratio of the average per capita income in the countries with upper-middle income and EU15 (index, 1989 = 100)



Source: own calculations

Figure 4.9. Ratio of the average per capita income in countries with low-middle income and EU15 (index, 1989 = 100)

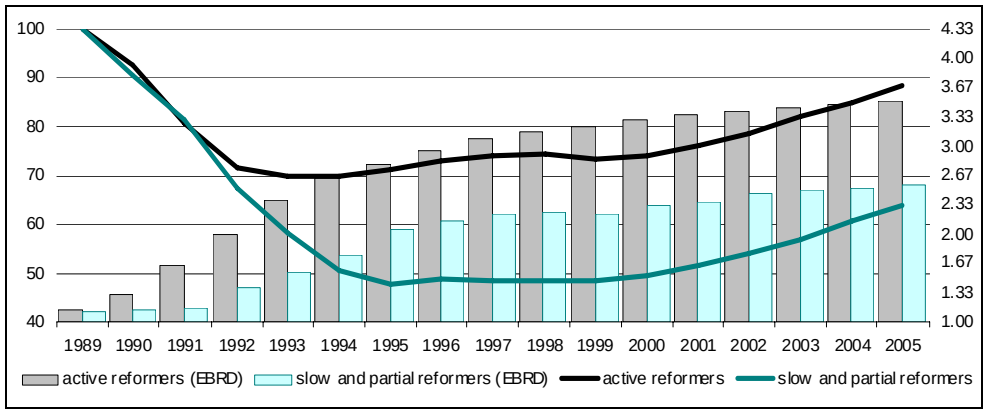


Source: own calculations

Determinants of catching up

The following explanations can be found for the output behavior in the mentioned groups of countries. First, 'rich' (i.e. middle income) and 'poor' countries have different geographical location and different initial conditions (structural distortions). Low-income countries are Central Asian and Caucasus CIS countries which had poor initial conditions and were situated 'far from Brussels'. That meant deeper and/or longer output decline and less likelihood of fast and comprehensive reforms compared to the countries of CEE region (Fischer & Sahay 2000).

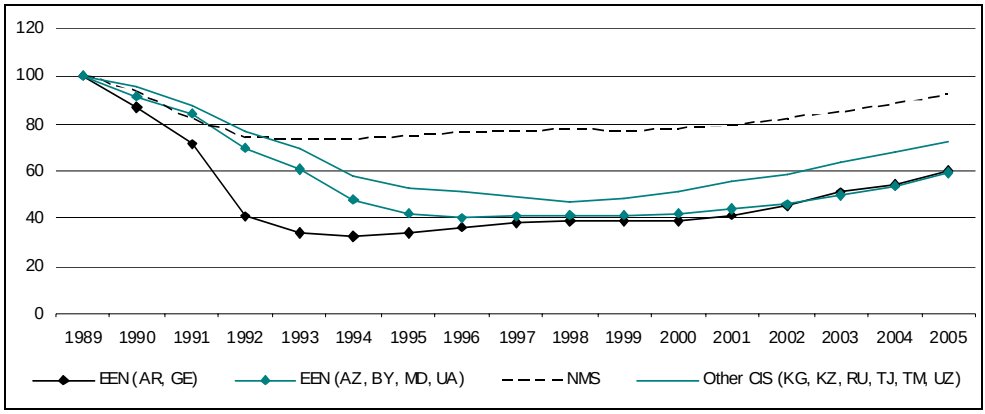
Figure 4.10. EBRD Reform Index values (bars) and a ratio of the average per capita income in active and partial reformers to that of EU15 average (index, 1989 = 100) (lines)



Source: EBRD, own calculations

Since the set of countries analyzed includes 27 transition economies, we should take into account different speed of reforms as a determinant of catching-up speed. We subdivided these 27 countries into two groups (a first group of 'active reformers' with EBRD reform index[26] of 3 and above, and a second group of 'slow and partial reformers' with EBRD reform index less than 3)[27], and compared average per capita GDP in each of these groups to its average level of EU15 as it was done before. The results are presented at Figures 4.10–4.11. According to these figures, the main problem of slow reformers was a deeper and a longer recession, while their recovery growth had almost the same speed as that in the group of active reformers[28].

Figure 4.11. Ratio of the average per capita income in active and partial reformers (sub-groups: NMS, EEN, and other CIS) and EU15 (index, 1989 = 100)



Source: own estimates.

Active reformers started catching up in 1994 (catching up 'record' covers 11 years), while partial reformers commenced this process only in 2000 (6 years of catching up). In 1994, average EBRD reform index for the group of active reformers amounted to 2.63 (which is close to EBRD rank "3–"); in 2000, this index in the group of partial reformers was equal to 2.34 (2+). Thus, per capita GDP in

[26] Simple average of 9 EBRD transition indicators. See Falcetti et al (2006).

[27] Active reformers: Armenia, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia. Slow and partial reformers: Albania, Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Macedonia, Moldova, Russia, Serbia and Montenegro, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

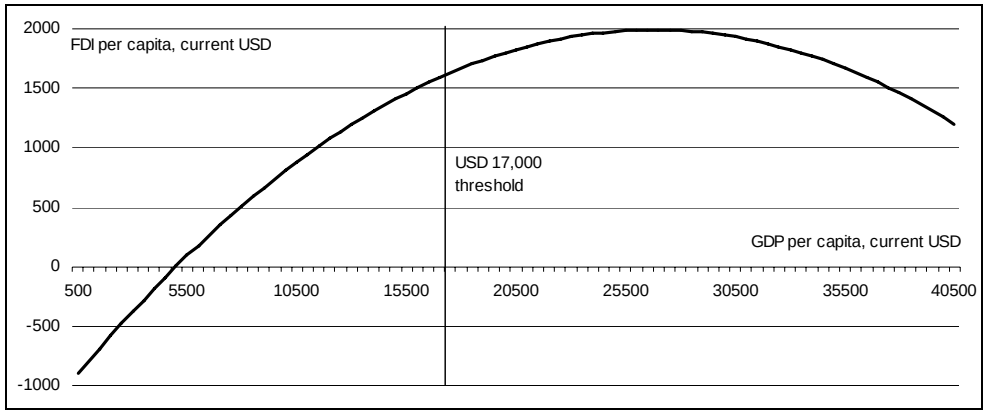
[28] Differences within each of these groups (Figure 4.11) were caused either by war conflicts (observed in Armenia and Georgia in the group of active reformers and in Azerbaijan in the slow reformers' group) or by a dominance of resource-rich countries in a subgroup 'other CIS'.

these groups of countries started to converge with the EU15 level of per capita GDP after a certain set of reforms had been implemented. As partial reformers have made little progress in market reforms since 2000, it is likely that the current GDP growth in the groups of countries analyzed is determined by different factors: structural reforms in active reformers and favorable external environment in countries that implemented partial reforms (Falcetti et al. 2006).

Second, a slow speed of catching-up of the poorest countries could be explained via different types of 'poverty traps'. Poverty trap means that production function of an economy demonstrates diminishing returns to capital when the capital stock is low, increasing returns in the middle of the range of capital stock, and constant or diminishing returns when capital stock is high (Barro & Sala-i-Martin 2001). Thus, poor countries' production functions demonstrate diminishing returns on capital, which makes investment into these countries unattractive and brings such countries into a kind of a 'trap'. In order to make a decision about investment, an investor should expect certain returns on capital. In poor countries returns on inputs are low, making investment is unattractive and brings these countries to a 'vicious circle' (Easterly 2001, 2002).

These theoretical statements have empirical support. FDI inflow can be considered as an indicator of a country's attractiveness for capital (in other words, as an implicit measure of returns on capital). According to the concepts of poverty traps and vicious circles, the poor countries should face smallest inflows of FDI per capita, middle income should get the largest inflows of FDI per capita, and high income countries – some medium inflows. This means some sort of an inverse U-shaped relationship demonstrated at Figure 4.12.

Figure 4.12. Inverse U-shaped relationship between FDI per capita and GDP per capita



Source: own estimates

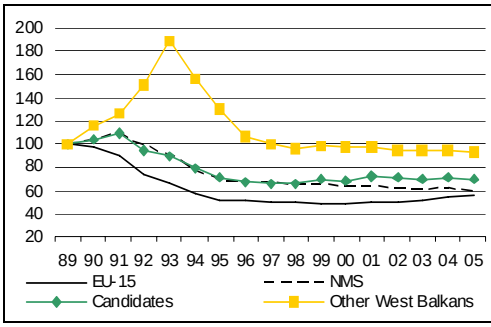
This relationship has been estimated on the basis of the data on 50 economies[29] for 17 years (unbalanced sample). The following regression has been estimated:

$$FDIpc_{i,t} = \underset{(-3.04)}{-1014.69} + \underset{(3.78)}{0.22} \cdot GDPpc_{i,t} - \underset{(-2.84)}{0.0000042} \cdot GDPpc_{i,t}^2 + \alpha_i + \alpha_t + \varepsilon_{i,t}, \quad (6)$$

where *pc* denotes per capita indicators, *t*-statistics in parentheses are heteroskedasticity consistent, α_i and α_t are individual and period effects (both specified as fixed effects).

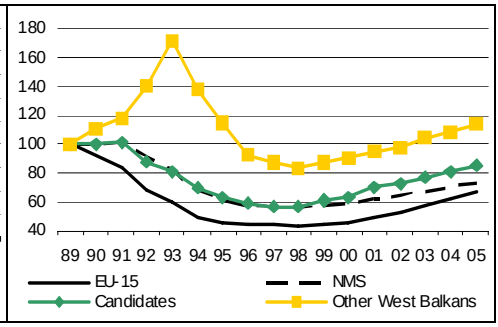
Additional empirical support can be provided with the analyses of fixed individual effects. These estimates are inconsistent, so usually they are not considered in the literature. But in our case they can provide a very clear evidence of a lower (compared to middle income countries) inflow of FDI to the rich economies. In all countries with per capita GDP in 2005 above USD 17,000 fixed effects (or dummies) were negative[30], i.e. they have lower-than-average starting point of per capita FDI inflow. All other countries have positive fixed effects and higher-than-average inflow of FDI per capita.

Figure 4.13: Ratio of the average per capita incomes index: CIS low income countries vs. others (1989 = 100)



Source: own calculations

Figure 4.14: Ratio of the average per capita incomes index: CIS middle income countries vs. others (1989 = 100)



Source: own calculations

Finally, a hypothesis about the presence of convergence in terms of real per capita GDP (after the period of adaptation recession) is supported for all of the abovementioned pairs of the countries' groups (see Figures 4.13–4.14). For these

[29] There is no data on FDI for Serbia, Turkmenistan, and Uzbekistan. Luxemburg has been excluded as an outlier (in 2005, per capita FDI in Luxemburg amounted to USD 240,608

[30] With the two exceptions: Belgium (positive dummy, per capita GDP in 2005 is USD 35,498) and Libya (negative dummy, per capita GDP in 2005 is USD 6,618).

figures, ratios of average per capita GDP for the groups of countries are calculated based on the formula similar to (6):

$$ratio_t^i = \frac{GDPPC_t^i / GDPPC_{1989}^i}{GDPPC_t^j / GDPPC_{1989}^j} \cdot 100. \quad (7)$$

IV.4. Conclusions

In this section, an economic dimension of development gap between EU and EEN countries has been analyzed. For this purpose, convergence of per capita GDP has been tested. The two concepts of convergence have been tested: β convergence (do low-income countries tend to grow faster than richer ones) and σ convergence (does dispersion of per capita income tends to decline over time). Both of these hypotheses have been supported by empirical data.

Convergence testing has been made on the basis of the data on real GDP per capita in the analyzed countries for the period of 1989–2005. This indicator has been analyzed instead of commonly used GDP measured by PPP. Such a 'replacement' appeared to be possible because cointegration exists between these two variables. It was necessary for the following reasons: (1) the concept of PPP can hardly be applied to developing countries or transition economies, because their economic structures differ substantially from those of developed countries; (2) data on GDP (PPP) for most of the analyzed countries are available only for a limited time sample, which reduces reliability of the results.

The least progress in filling the development gap with EU15 has been shown by the low income CIS economies, while NMS demonstrated a higher degree of catching up with EU15. In general, in the analyzed period countries with higher per capita income caught up faster than lower income ones. This fact has been explained by the impact of adaptation recession in 27 of analyzed countries (transition economies): for the post-recession sample we observed an evidence of β convergence between these countries. Another explanation relates to the 'poverty trap' concept, according to which poor countries have low attractiveness to investors because of the low level of returns to capital. This concept has also been empirically supported: per capita FDI inflows to the poor countries are lower than to the middle-income countries.

Market reforms have appeared to be another important determinant of closing the gap between the EU and the rest of countries of the region. A split of the sam-

ple into 'active reformers' and 'slow and partial reformers' demonstrated a clear positive relationship between the reform progress and the progress in catching up. Thus we can conclude that promotion of comprehensive market reforms is still very topical for most of the region's economies, where some progress in catching up could be attributed mostly to the favorable performance of the world commodity markets.

IV.5. Appendix: Real GDP vs. GDP PPP

We tested both the long run and short run relationships between these two measures of income. In order to test the long-run relationship, we used Pedroni cointegration test (Pedroni 1997, 1999). For testing the short-run relationship, an error correction model was used[31].

Long-run relationship

First, we implemented unit root tests in order to determine the order of integration of the variables. According to the tests, both of the variables are *I*(1), i.e. their levels contain unit root, while first differences are stationary[32] (Table A.1).

Second, we implemented Pedroni test for cointegration. Within this test, 7 statistics were calculated for the two alternative hypotheses: common autoregressive coefficients (4 statistics) and individual autoregressive coefficients (3 statistics). For the panel variance statistic (*v*-Statistic), large positive values imply that the null hypothesis of no cointegration is rejected, while for other six statistics large negative values imply that the null hypothesis is rejected (Pedroni 1997). Finally, the literature on panel cointegration argues that the most reliable statistics (especially in the case of a short panel) are panel and group *ADF*-statistics (Kelly & Mavrotas 2003; Kappler 2004), and *v*-Statistics (Bénassy-Quéré et al. 2005). In accordance with these statistics and non-parametric *PP*-statistics, the null hypothesis about the absence of cointegration is rejected at 1 per cent significance level (see Table A.2).

[31] A similar technique is used in Pelipas & Chubrik (2007).
[32] According to Choi *Z*-statistics (Philips-Perron test), the level of GDP (PPP) is stationary, but two other tests show its non-stationarity.

Table A4.1. Unit root tests[33]

	Levels			First differences		
	Statistic	**Probability**	**Number of observations**	**Statistic**	**Probability**	**Number of observations**
y (log of real GDP per capita):						
Im, Pesaran and Shin *W*-statistics	-0.31	0.38	829	-7.05	0.00	781
ADF – Choi *Z*-statistics	1.55	0.94	839	-5.59	0.00	781
PP – Choi *Z*-statistics	0.05	0.52	857	-7.90	0.00	803
yppp (log of GDP PPP per capita)						
Im, Pesaran and Shin *W*-stat	-1.27	0.10	756	-9.16	0.00	709
ADF – Choi *Z*-statistics	-0.82	0.21	756	-8.29	0.00	709
PP – Choi *Z*-statistics	-6.76	0.00	786	-12.13	0.00	732

Note. Specifications: unit root rests for levels of the variables include trend and intercept, for the first differences – intercept. Lag length was selected basing on modified Akaike information criteria. Probabilities are computed assuming asymptotic normality.

Table A4.2: Pedroni cointegration test[34]

	Statistic	**Probability**	**Weighted statistic**	**Probability**
H_a: common AR coefficients (within-dimension)				
Panel *v*-Statistic	37.26	0.00	16.06	0.00
Panel ρ-Statistic	7.47	0.00	8.04	0.00
Panel *PP*-Statistic	-7.48	0.00	-4.75	0.00
Panel *ADF*-Statistic	-6.82	0.00	-4.62	0.00
H_a: individual AR coefficients (between-dimension)				
Group ρ-Statistic	9.92	0.00	--	--
Group *PP*-Statistic	-3.88	0.00	--	--
Group *ADF*-Statistic	-5.54	0.00	--	--

Note. H_0: no cointegration. Specification: individual intercept and individual trends, automatic lag selection based on the Akaike information criteria. Number of observations: 918 (54 cross-sections, unbalanced panel).

Taking into account the results of Pedroni cointegration test, we built the model of long-run relationship between the variables similar to Engle-Granger approach for time-series analyses:

$$yppp_{i,t} = \alpha_i + \beta_i T_i + b_{LR} \cdot y_{i,t} + \varepsilon_{i,t}, \quad (1)$$

[33] Calculations were made in EViews 5.1, unless otherwise indicated.
[34] Calculations were made in EViews 6 beta.

where α_i are individual intercepts (individual effects), T_i are individual trends, $\varepsilon_{i,t}$ is the error term which would be used in the error correction model as the error correction mechanism ($ECM_{i,t}$). Estimation of this model shows a very strong relationship between the two variables (all coefficients are highly significant):

$$yppp_{i,t} = \underset{(6.67)}{0.47} + \underset{(115.00)}{1.00} \cdot y_{i,t} + \alpha_i + \beta_i T_i + \varepsilon_{i,t}, \quad (2)$$

where α_i are estimated as fixed effects (heteroskedasticity-consistent *t*-statistics are in parentheses).

Error correction model

Further, we implemented unit root tests for the error term from (2) in order to include it in the error correction model for revealing the short-run relationship. All tests show that $ECM_{i,t}$ is stationary (Table A.3).

Table A4.3. Unit root tests for error correction mechanism

	Statistic	**Probability**	**Exogenous variables**	**Number of observations**
y (log of real GDP per capita):				
Im, Pesaran and Shin *W*-statistics	-8.79	0.00	intercept	716
ADF – Choi *Z*-statistics	-17.54	0.00	none	718
PP – Choi *Z*-statistics	-19.90	0.00	none	732

Note. Im, Pesaran and Shin test can be calculated only with exogenous variables (intercept or trend and intercept). Lag length was selected basing on modified Akaike information criteria. Probabilities are computed assuming asymptotic normality.

Stationarity of the error correction mechanism is another proof of the long-run relationship between the real and PPP-based GDP per capita, and it allows us to build up the error correction model:

$$\Delta yppp_{i,t} = \alpha_i + \beta_t + b_{SR} \cdot \Delta y_{i,t} + \gamma \cdot ECM_{i,t-1} + v_{i,t}, \quad (3)$$

where Δ is difference operator, βt are period dummies (period effects), $v_{i,t}$ is the error term. Estimation of this model shows that the relationship between the analyzed variables exists both in the short and the long run (all coefficients are highly

significant; coefficient at the error correction mechanism is negative and less than 1 in absolute value):

$$\Delta ypppp_{i,t} = \underset{(49.10)}{0.02} + \underset{(98.28)}{0.98} \cdot \Delta y_{i,t} - \underset{(-3.94)}{0.41} \cdot ECM_{i,t-1} + \alpha_i + \beta_t + v_{i,t}, \qquad (4)$$

where α_i and β_t are estimated as fixed effects (heteroskedasticity-consistent *t*-statistics are in parentheses).

Thus, econometric analysis demonstrates that there exist both short- and long-run relationships between per capita GDP measured in PPP and real per capita GDP measured in constant 2000 Euro. This allows us to use real GDP as an appropriate measure to estimate economic development gap between the CIS and rest of the region.

V. GAPS IN SPECIFIC DIMENSIONS

Economic growth is a necessary but insufficient condition for economic development. Per capita GDP is used by many developmental economists as an approximation of general national well-being. However, this and similar measures have long been criticized as not measuring economic growth well enough. Nowadays it is not questionable that GDP per se is a narrow measure of economic development and does not take into account its complex multi-dimensional context, important non-economic aspects such as income inequality and poverty, access to healthcare and education, the environment, freedom, or social justice. Economists have long argued that development occurs with the reduction and elimination of poverty, inequality, and unemployment within a growing economy (Seers 1969).; with producing more 'life sustaining' necessities such as food, shelter, and healthcare and broadening their distribution, raising standards of living and individual self esteem, expanding economic and social choice and reducing fear (Todaro 2000).

The concept of sustainable development advanced by the UN in the course of the past two decades encompasses, along with economic and social pillars, environmental sustainability implying economic growth together with the protection of environmental quality, each reinforcing the other. The essence of this form of development is a stable relationship between human activities and the natural world, which does not diminish the prospects for future generations to enjoy a quality of life at least as good as our own (Mintzer 1992).

A compelling body of research links primary, secondary and higher education to development and economic growth. This research recognizes people as a type of economic asset – "human capital" – and shows that increased investment in health, skills, and knowledge provides future returns to the society not just by raising labor productivity, but by equipping citizens with the skills and attitudes for economic and civic success in an increasingly knowledge-based economy (Schweke 2004).

Further on, knowledge and information are decisive elements in all modes of development. However, a new development paradigm has emerged assigning technology and information a causal role in the social order, known as "Global

village", "information society" or "knowledge society". This notion implies that "information generation, processing, and transmission are transformed into the fundamental sources of productivity and power", with knowledge becoming crucial not only for economic growth but also for empowering and developing all sectors of society (Castells 1996).

Countries' development potential is also dependent on their openness to world economy (lack of trade barriers, ease of entry and exit into trade, available infrastructure, etc.), on the quality of life of their citizens (including availability of medical care, prenatal care and clean water, equality of income distribution and the scale of poverty). The notion of social capital preservation is also an integral part of this concept.

Following this very schematically presented overview of specific dimensions of development, we arranged our examination of major differences (gaps) between the analyzed countries and country groups across specific dimensions which in general follow the underlying logic of the sustainable development concept.

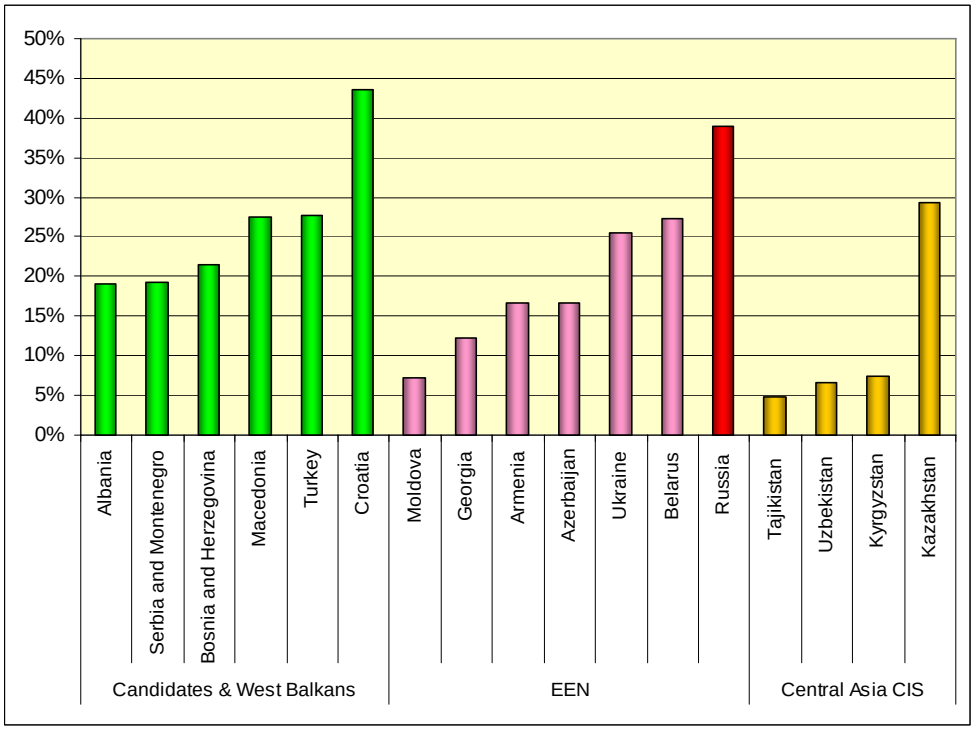
V.1. Quality of life: Income, poverty, and health

Income and poverty

Major trends in per capita income convergence between the EU15, EU12, the candidates' group, EEN and Russia have been explored in the preceding section. This analysis, however, left aside major income differentials existing between individual countries within the groups analyzed (Fig. Q.1). These differentials are impressive indeed with their amplitude growing while moving eastwards from EU15. Even within the NMS group, the country with the highest income, Slovenia, has an income less than two-thirds of the Western European average.

With acquiring independence and under economic transition, differentials of GDP per capita among EEN have widened considerably with none of the countries reaching even a half of the EU27 average (Fig. Q.1). EEN countries also differ greatly when compared to Russia. Within the CIS, the two countries with the second highest incomes, Kazakhstan and Belarus, still have incomes only about two-thirds that of Russia, while Russian GDP per capita is eight times that of Tajikistan.

Figure Q.1. GDP (PPP) per capita as per cent of EU27 average (2005)

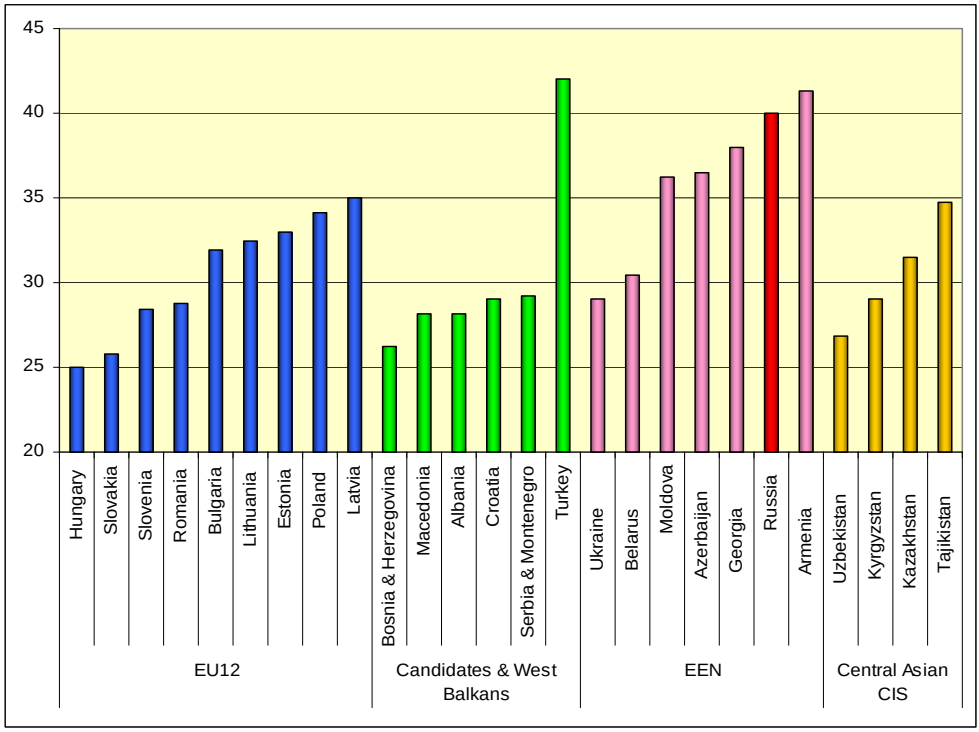


Sources: WEO database, EBRD, EUROSTAT

Process of transition has also brought about radical changes in income distribution within transition economies (Fig. Q.2). When assessing **income inequality** within FSU and candidate countries, we should account for the fact that under socialism an attempt was undertaken to equalize incomes among both social groups and geographic regions, which was accomplished through a massive and elaborate system of subsidies, transfers, and controlled prices. Initially rather egalitarian, these societies faced an abrupt increase in income inequality which radically changed relative positions of large layers of society. This process was closely associated with a sharp increase of **poverty** rates (Fig. Q.3).

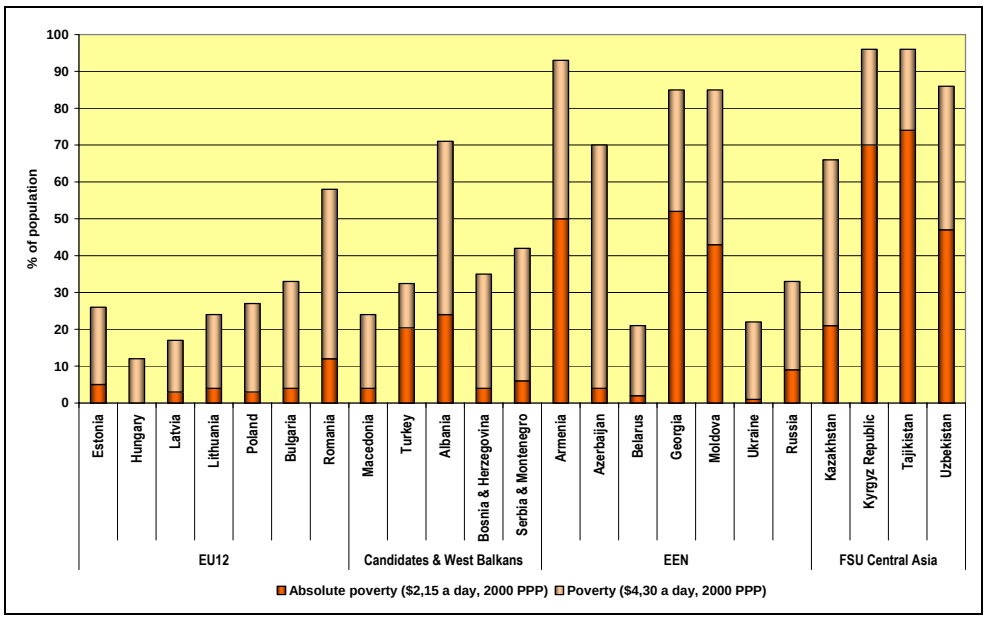
Directly comparing poverty levels between the EU15 countries and EENs is a methodologically difficult, if not impossible, task. National poverty lines are basically useless, reflecting radically different approaches to poverty definitions. International poverty indicators (like population below $2 a day) are not easy to employ because relevant population numbers in Western Europe are vanishingly small.

Figure Q.2. Distribution of family income: Gini index (1996-2003)



Source: World Bank (2005a)

Figure Q.3. Poverty levels (2000-2003)



Sources: UNDP (2006); World Bank (2005a)

Overall, for the EU15 countries, poverty levels are mostly low and confined to a few pockets. On the other hand, in FSU, despite a considerable decline since 1998, even better-off countries, such as Kazakhstan and Russia, have $2 a day poverty headcounts of 10–20 percent, and half of Georgia's people are poor by this measure. The middle-income quartet of Kazakhstan, Russia, Turkey, and Ukraine accounts for more than a half of the region's poor people.

Interrelations between income inequality and the spread of poverty under transition are analyzed in detail in extensive literature, including the role and importance of such factors as speed and comprehensiveness of social and economic reforms, as well as the role of initial conditions.

Here we should merely specify that: (1) initial lagging behind in overall conditions of households' living standards was translated into a spread of poverty under transition; (2) economic growth of late 1990s and in the beginning of the XXI century was not necessarily translated into respective poverty reduction in Russia and most of EEN, and (3) high inequality and low living standards were accompanied by a growth of unemployment and the spread of shadow (unregistered) unemployment that adversely affected the quality of life not only in the majority of FSU countries, but also in the West Balkans and to a lesser extent in some candidate countries. In several countries a deterioration of everyday life conditions was additionally aggravated by military and ethnic conflicts, the resulting refugees' and internally displaced persons' (IDP) mobility, etc.

Significant gaps in life quality become evident when looking at intensive **migration flows** across the region. Transition contributed to a rapid divergence of factors stimulating international migrations. This assumption stands in line with the widely accepted basic pull-and-push model, explaining these flows (Smith 1997). Initially mostly egalitarian socio-economic environment characteristic for FSU countries was rapidly transformed into a quite diverse one from the viewpoint of poverty and unemployment rates, real wages' growth and their purchasing capacity (see Table Q.1), poor health and education prospects, etc. in low-income countries, as compared to prospects of higher living standards in middle-income CIS countries (or transition countries to the West of the FSU border). Among sound factors that pushed migrations were also conflicts and insecurity, violence, poor governance and corruption, ethnic, religion and gender discrimination, etc.

Leaving aside huge flows of refugees and IDPs connected with war and ethnic conflicts, the dominant pushing factors in most of EEN countries were related to low income level in the home country, as well as low employment opportunities. The scale of outflow from candidate states and West Balkans is considerably lower (excluding Albania).

The volume of remittances could serve as an indicator of scale and intensity of the process. Thus, migrants' funds represent over 20 percent of GDP in Moldova and Bosnia and Herzegovina, and over 10 percent in Albania, Armenia, and Tajikistan. For Albania and Bosnia, the contribution of remittances is almost as large as that of exports. The EU and the resource-rich CIS are the main sources of remittances, with the EU accounting for three-quarters of the total and the better-off CIS countries accounting for 10 percent (Quillin 2006).

Table Q.1. Gross Average Monthly Wages, 2003-04 ($US, PPP-adjusted)

	EU15=100	EU10=100	Russia =100
Croatia	59.9	138.1	278.8
Albania	17.2	39.7	80.1
Bosnia and Herzegovina	60.2	138.8	280.1
Armenia	9.5	22.0	44.3
Azerbaijan	17.8	41.1	83.0
Belarus	19.4	44.8	90.5
Georgia	7.1	16.5	33.2
Moldova	8.1	18.7	37.7
Ukraine	n.a.	n.a.	n.a.
Russia	21.5	49.5	100.0
Kazakhstan	18.8	43.4	87.6
Kyrgyzstan	9.4	21.6	43.5
Tajikistan	2.5	5.8	11.7

Source: UNECE Statistical Database

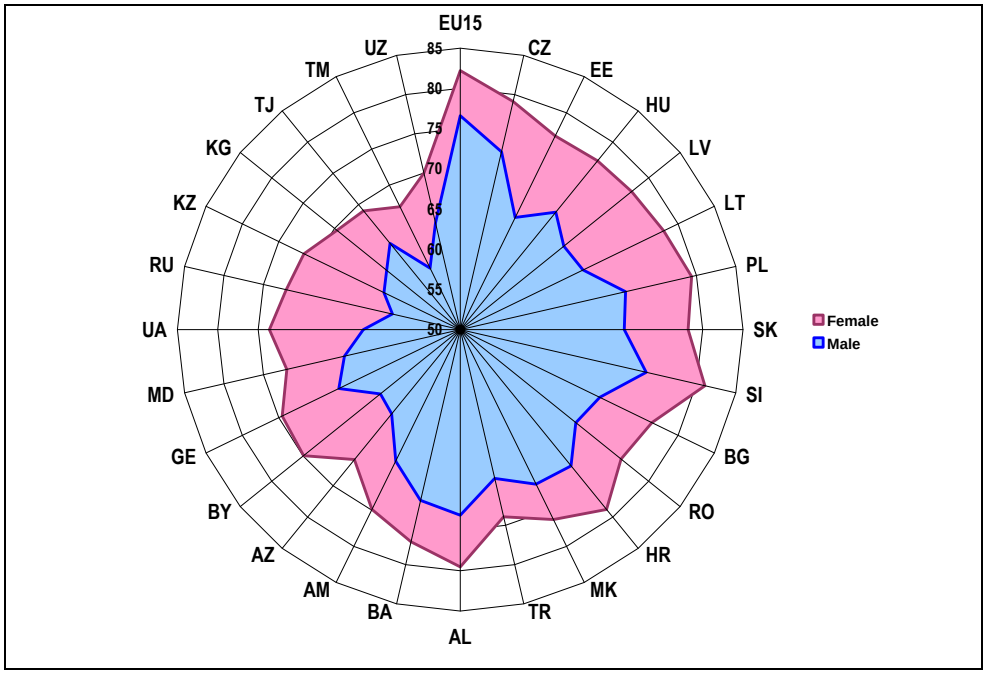
In CEE and CIS, remittances play a significant role in poverty reduction: for some countries, remittances spurred a significant portion of total consumption. E.g., in Moldova or Albania, every fifth dollar spent in 2003 came from remittances. Additionally, the results of the analysis conducted by León-Ledesma and Piracha (2001) for 11 transition economies of Eastern Europe during 1990–99 show support for the view that remittances have a positive impact on productivity and employment, both directly and indirectly through their effect on investment.

Health

Growing poverty and inequality (which are in most cases related to reforms' inconsistency) seriously affect not only the everyday life of population, but the course of future development as well. Huge gaps between country groups analyzed and the developed world are evident in most of the spheres related to social development: demographic trends, health care, access to fresh water, sanitation, other infrastructural and environmental aspects.

Throughout the 20th century, national indicators of **life expectancy** were closely associated with GDP per capita, although this relationship does not explain the trends in transition countries, especially EEN: in the course of a single decade, the gap in average life expectancy dividing EENs and the EU15 has increased by three years, exceeding 10 years. Furthermore, the situation looks striking if we compare the respective data on male life expectancy. At present, male life expectancy at birth in EENs is, on average, 12 years lower and female life expectancy - 7 years lower as compared to most of the EU15. The average difference in life expectancy between the Central Asian countries and Western Europe is respectively 11 and 10 years (Fig. Q.4).

Figure Q.4. Life expectancy at birth (2005)



Sources: UNDP (2007); Eurostat

Infant mortality rates, albeit declining, still remain very high in the broader EU neighborhood, well above EU member countries average rates: on average, about 30 infants per 1000 live births die in the EEN regional bloc, while for EU countries the corresponding figures are at least three times lower (Fig. Q.5).

Death rates related to pregnancy and childbirth in the CIS region are estimated to be at least twice as high as those in Western Europe. In 2000, the maternal mortality rate adjusted per 100,000 live births averaged 15 in EU25 (24.5 in EU10, and 9.1 in EU15). At the same time, in EU candidate countries this rate

amounted to 39.8, while in CIS countries (excluding Russia) it was almost five times as high compared to EU25 – 69.1.

There is also sound statistical evidence on the spread of dangerous infectious **diseases**, especially tuberculosis, that has become a serious problem in Russia and many EEN countries, where TB incidence has been growing at an annual rate of 5 percent during the last decade (Fig. Q.6). An alarming increase in multi-drug resistant tuberculosis rates in some FSU countries, an increase in HIV infection and the dramatic situation of TB in prisons pose additional threats to TB control in the region (UN Millennium Project 2005).

Figure Q.5. Infant mortality rate, per 1000 births

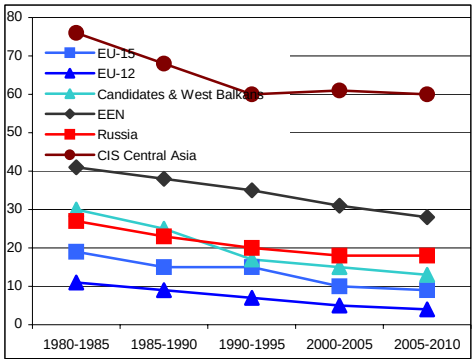
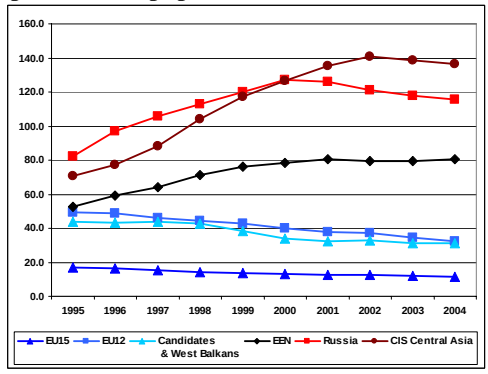


Figure Q.6. Incidence of tuberculosis, per 100,000 population



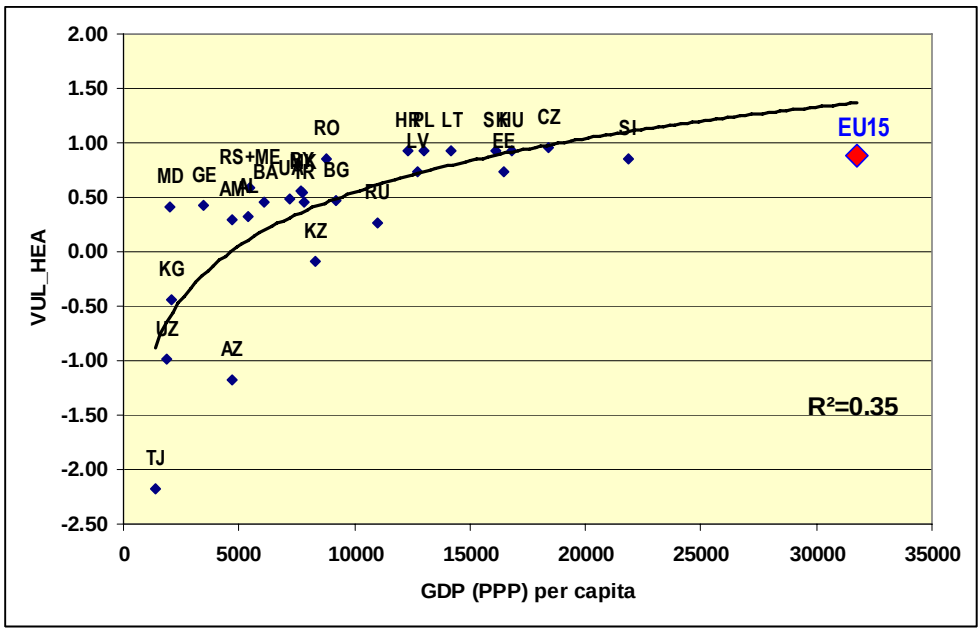
Sources: UNDP (2006); WHO (2006)

To illustrate relative positions of countries analyzed vis-à-vis EU15 averages in terms of several health- and disease-related variables simultaneously, we could use a composite indicator 'Environmental Health', one of 21 underlying indicators for Environmental Sustainability Index (see Section IV.C), integrating the following variables: 'Death rate from intestinal infectious diseases', 'Child death rate from respiratory diseases', and 'Children under five mortality rate per 1,000 live births'. This indicator, plotted against GDP (PPP) per capita (Fig. Q.7), demonstrates positive correlation to per capita income, indicating at the same time that all of the EENs perform significantly worse in terms of environment-related diseases compared not only to EU15, but to NMS as well.

A direct impact of **lifestyle** factors on human health is becoming considerable, noticeably affecting differences in life quality between European countries. The major risk factors contributing to the health gap include excess consumption of alcohol, smoking, obesity, lack of physical exercise and poor diet. Most of these factors are significantly more prevalent in Russia/EEN (especially in lower income

countries) compared to Western Europe. Cigarette smoking is the single most prevalent cause of disease and death. CIS countries have one of the highest rates of smoking among males (ranging from 50 to 60 percent compared to below 40 percent in EU15), that could be explained by a widespread consumption of low-grade (high nicotine and tar) cigarettes and psychological stresses affecting men more than women. Increasing psycho-social problems (e.g. leading to stresses and cardiovascular diseases) were also brought on by the drastic changes under economic transition and reduction in social safety nets in the past 15 years.

Figure Q.7. Regression of 'Environmental Health' on GDP (PPP) per capita



Source: Esty et al. (2005), WEO Database

Thus, notwithstanding an improvement in some indicators, we can observe a considerable gap between the EU15 and EEN/CIS countries in human health, especially within low-income households. There is ample anecdotal evidence on lower life expectancy in these households, their exposure to dangerous diseases, etc. Hence, the visible gap in health status between the analyzed country groups could be just a top of an iceberg. Significantly larger health gaps are most probably hidden inside intra-country inequalities in CEE and moreover in CIS countries, with their magnitude greatly exceeding that in Western Europe.

Major factors affecting the growing gap in human health between the EU and EEN/CIS countries are numerous and could be summarized as follows:

1. Deterioration of health care services as a result of poor financing:
   - Low government health expenditures in EEN/CIS – both as shares of GDP and of shrinking total government expenditures (Fig. Q.8). Low priority is given to health in profiles of government spending and insufficient public resources are allocated to this purpose.
   - Strikingly low absolute per capita figures of total health expenditures in EEN/CIS, differing by an order of magnitude from the EU averages (Fig. Q.9).
   - Misallocation of resources due to irrational structure of financing (e.g. preservation of a large number of outdated health care networks financed at a fraction of required support).
   - Delays or failure in introducing social security principles; underdeveloped health insurance systems; limited and inequitable health risk protection and coverage. In the reforms of health insurance systems, Russia/EEN are lagging well behind NMS.

Figure Q.8. Total expenditure on health, per cent of GDP

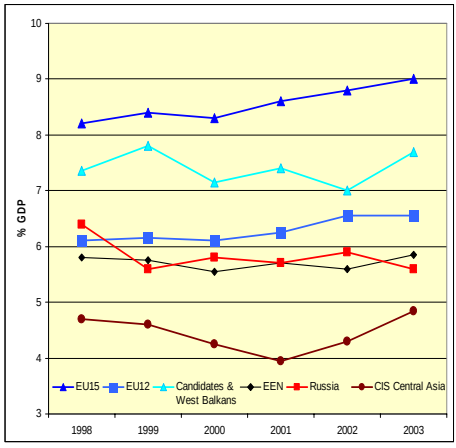
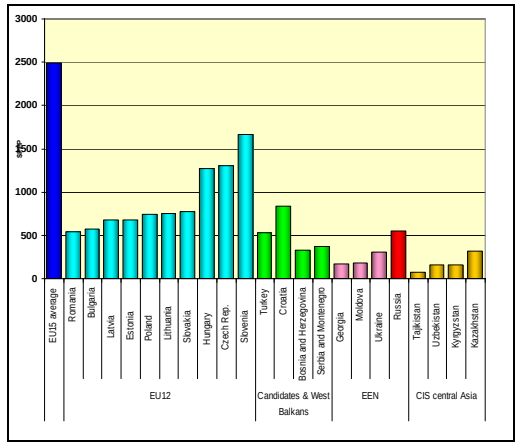


Figure Q.9. Per capita total expenditures on health (2003), $ PPP



Source: WHO (2006)

2. Sound differences in the accessibility of health care services for population (especially low income population):
   - Shrinking availability of numbers and quality of services within public sector due to deterioration of health infrastructure.
   - Rapid 'marketization' of health services and growth of out-of-pocket payments stimulating escalation of health care costs for population. The structure of financing of medical services varies by

country groups: poorer countries have larger (up to 50 – 80 percent) shares of private, out of pocket and informal financing, thus placing additional burden on poorer households. As a result, in most EEN countries health financing has become less equitable.

3. Rapid growth of demand for health care protection in EEN and other CIS countries was connected with a growth of elderly population and prevailing demographic trends, as well as the expansion of health risks of different origin, including an increase of number of low income, poor and unemployed population, psychological problems of adaptation to transition, etc.

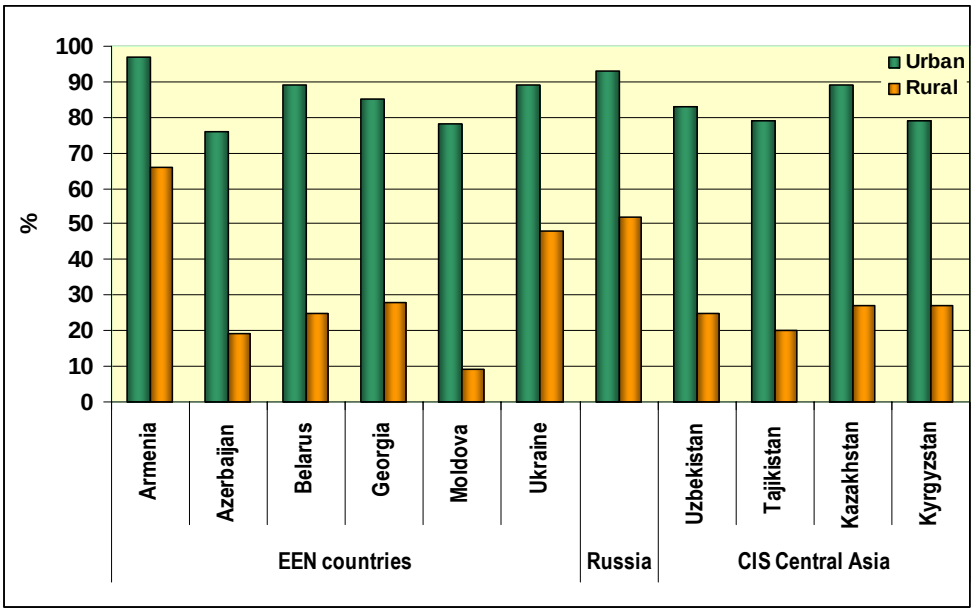
Water supply and sanitation

The two human development issues closely related to human health are access to water supply sources and sanitation. Treated generally as a problem of developing world, access to improved water supply[35] remains one of the serious issues not only for low-income Central Asian CIS, but for some of the NMS as well (e.g. in Romania percent of households with water connection failed to improve during the last decade and amounts to 49 percent of households only, with particularly dramatic situation in rural areas, where it equals merely 13 percent). While in EU25 the gap between the two countries with the best and worst rates in terms of water access has decreased from 23 to about 20 percentage points between 1990 and 2004, within the CIS a similar gap (between Armenia and Tajikistan) has grown from 50 to 52 percentage points – with the disparity between the two groups of countries increasing accordingly.

For CIS countries, a huge discrepancy between rural and urban areas in terms of water supply remains typical (Fig. Q.10). Within this country group, the proportion of households with water supply in urban areas exceeds one in rural areas 2.7 times (in EU15 this gap is only 1 percentage point, and in NMS – 11 percentage points). Among CIS, only two countries (Armenia and Russia) can satisfy rural households' water demand by more than 50 percent, while in five out of 11 countries this rate is under 25 percent (Azerbaijan, Belarus, Moldova, Tajikistan, Uzbekistan). A very poor situation is in Moldova, where rural households with improved water supply accounted for merely 9 percent of the total (WHO/UNICEF).

[35] Access to an improved water source refers to the percentage of households with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, or rainwater collection. Reasonable access is defined as the availability of at least 20 liters a person a day from a source within 1 km of the dwelling.

Figure Q.10. Percent of CIS households having permanent water connection (2004)



Source: WHO/UNICEF.

In EU10 countries, access to sanitation averages about 70 percent, while among EEN this rate accounts for only 59 percent. Moreover, in the course of 1990-2004 access of CIS population to sanitation remained unchanged, despite some improvements in buildings' coverage. During the same time, in EU15 access to sanitation improved, reaching almost 100 per cent, and the gap with CIS countries increased. The disparities in sanitation access between urban and rural areas in the CIS are even larger compared to water supply gap: in Belarus this gap is fourfold, in Georgia – 8.5 times, in Kazakhstan –19.5 times, etc. (UNDP 2006).

Measuring Quality of Life

One of the aims of social science research is to develop a comprehensive measure of quality of life in nations that is analogous to GDP in development economics. For that purpose, a multitude of multi-dimensional indexes have been proposed (see Booysen 2002). In addition to economic performance, these also acknowledge the nation's success in matters like education, health and social equality. The most well-known indicator of this type is the Human Development Index developed by UNDP. In this approach, quality of life is measured by input – the degree to which society provides conditions deemed beneficial ('presumed'

quality of life). The basic problem, however, is that one never knows to what extent the conditions provided are really good for people, or at least perceived as such. An alternative is to measure quality of life in nations by output – subjective perceptions of life quality, commonly referred to by terms such as 'subjective well-being', 'life satisfaction' and 'happiness' in a narrow sense of the word. These subjective indicators would reflect 'apparent' quality of life, considering how well people actually flourish in the country (Veenhoven 1996).

Leaving aside many controversial issues, theoretical and methodological, related to subjective (vis-à-vis objective) measurements of well-being (see Easterlin 2002), we tend to admit that subjective perceptions and assessments of life quality are probably no less important than objective ones. People most often compare their present situation with that of others, with their own situation in the past or with their expectations for the future, thus introducing "a relative explanation" in their assessments. Importantly, in post-socialist countries both these factors – first, a dramatic break with past income and consumption habits, rights and guarantees, and, second, a significant rise in inequality and uncertainty, accompanied with the emergence of narrow groups of *nouveaux riche* on the top, and broad groups of very poor on the bottom – could have played an important role in subjective assessments of personal welfare and/or well-being (Franičević 2003).

Figure Q.11. Satisfaction with one's life

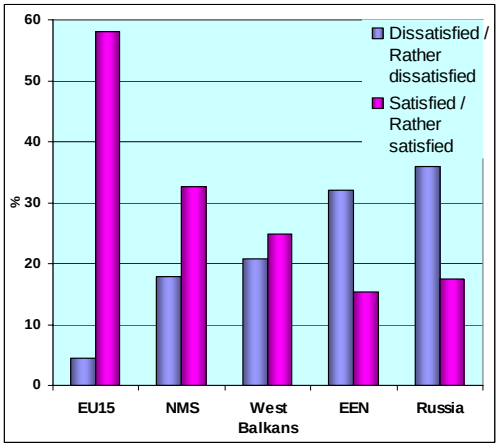
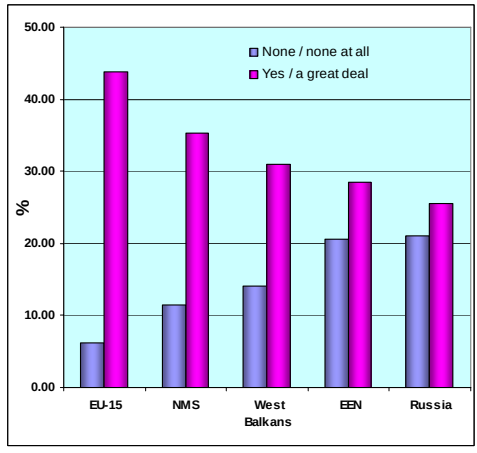


Figure Q.12. Free choice and control over one's life



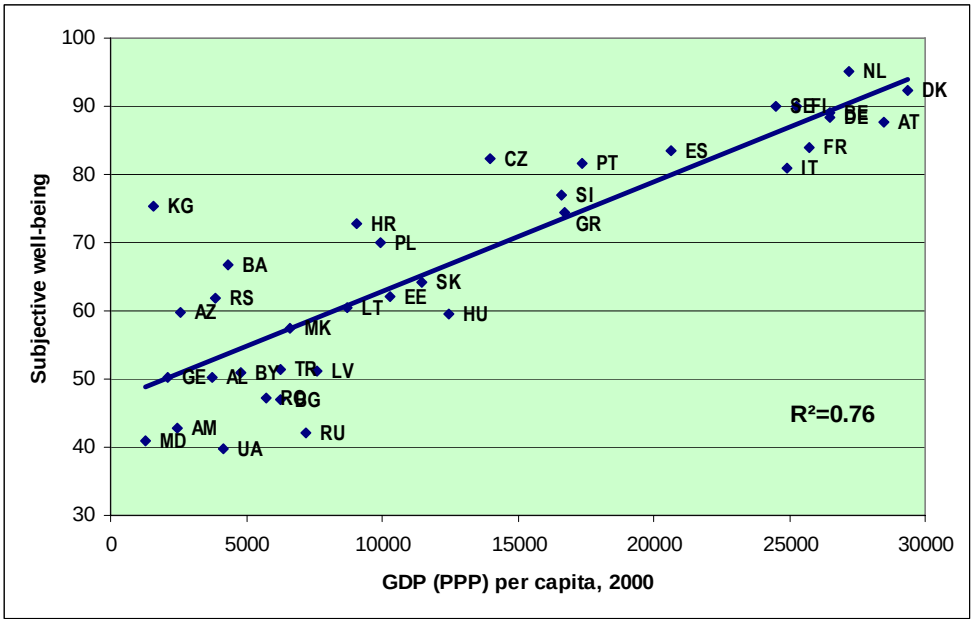
Source: World Values Survey.

The 'relative dimension' in subjective assessments of well-being could also prove crucial for formulating EU policies towards West Balkans/EENs. Perceptions do matter a great deal, creating a window for actors' interpretation of the environment. Thus, a perception of a more successful neighbor as a model for one's

own country's future development could contribute to an evolvement of a sort of 'national idea' that can bring down disappointment with the reforms' results, enhance optimism, and prove material in shaping forward-looking expectations in the societies.

For a brief illustration of subjective measures of personal welfare, we used the data on "overall satisfaction with life as a whole" and "freedom of choice and control over peoples' lives" based on latest available series of World Values Survey for the analyzed groups of countries (Figs. Q.11 and Q.12). As could be expected, they demonstrate a significant disparity in the percentage of satisfied with their lives between the EU15 and EEN/Russia, with the shares of dissatisfied and 'unable to control their lives' growing with the distance "from Brussels".

Figure Q.13. Regression of 'Subjective well-being' on per capita GDP (PPP), 2000



Sources: World Values Survey, WEO database.

Fig. Q.13 demonstrates cross-national differences in 'subjective well-being', measured as a mean of percent 'Happy' and percent 'Satisfied with life as a whole', based on the latest available World Values Survey data for 1999-2004. The high correlation with per capita incomes is striking, once again implying that objective and subjective well-being indicators measure basically the same phenomena, albeit from slightly different angles.

The regression illustrates an important phenomenon, characteristic primarily of EEN/Russia – that of a lower subjective well-being compared to what could be

expected judging by per capita incomes. This discrepancy between absolute measures of well-being, on the one hand, and subjective perceptions, on the other, could reflect societal trends not captured by income or poverty scores – a widespread pessimism, collapsing expectations, people's perception of inequality as not only about income, but also about wealth distribution, social exclusion, perceptions of being on the loosing side of reforms, and, last but not least, a low level of trust in political and public institutions, widespread corruption and state capture.

V. 2. Human capital: Education and labor market

Human capital is usually defined as the knowledge, skills, and experience of people that make them economically productive. Human capital can be increased by investing in education, health care, and job training. This notion is closely related to the concept of sustainability: in conventional economic terms sustainable development might be translated as development that preserves or enhances initial capital endowments – including natural resources and human capital, i.e. the stock of skills and knowledge (Etkins 1999).

The conventional approach to measuring the quality of human capital usually includes indicators such as people's educational attainment and their potential of integration to the knowledge economy reflected in lifelong learning. However, the availability of comparable indicators across the selected country groups limits our analysis to:

1. gross enrollment figures at various education levels (output side), and
2. volumes of financial resources allocated to education (input side).

Outputs: Enrollment ratios

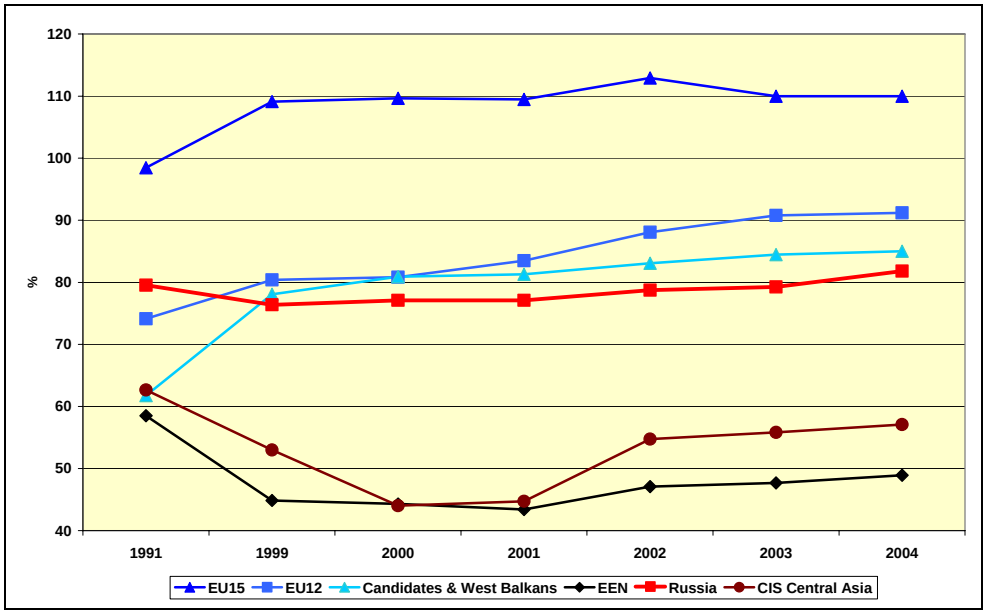
The level of human capital development inherited from the socialist past in all transition countries was generally considered high relative to other countries at similar levels of economic development. By 1990 in CIS, as well as in CEE countries the adult literacy rate was above 98 percent. During the socialist period, post-communist states had high enrollment rates and it was widely accepted that basic education was of high quality. Girls had equal access to education at all levels.

Despite a decline in the quality of life in the 1990s, in many countries (especially in CIS), adult literacy was not radically impacted. As of 2004 adult literacy stood at about the same level as pre-1990. Moreover, in worse-performing coun-

tries it improved noticeably: between 1990 and 2004, Albania raised its adult literacy rate from 77 to 98.7 percent, while Turkey increased this rate 77.9 to 87.4 percent. This improvement occurred equally for both genders in all countries except Turkey, that still stands out as having the lowest female literacy rate in the region (80 per cent), on a par with Rwanda or Madagascar (UNDP 2006).

The universal primary and secondary education system in all countries analyzed was retained from the socialist period and remained virtually free of charge. However, during the first decade of transition, upper secondary enrollments in these countries have been following two divergent paths: in CEE and West Balkans, after a brief decline in the late 1980s and early 1990s, they were steadily increasing to figures exceeding 80 percent by 2000 (Fig. H.1). On the other hand, virtually all CIS countries (except Russia) demonstrated a marked decline in secondary enrollments until 2001, with enrollment figures in some lower-income EENs, where education system was disrupted by war and civil unrest (Azerbaijan, Georgia, and Moldova), falling well below 40 percent in mid-1990s. As a result, the gap between the two country groups in secondary education expanded: in 1989 the average fulltime school expectancy for the whole of CEE/FSU region was 11.21 years; by 1997 it declined to 10.57 years. In contrast, the fulltime school expectancy for OECD countries in 1998 averaged 15.4 years (Berryman 2000).

Figure H.1. Secondary education enrolments (median gross rates, percent of population aged 15-18), 1991–2004

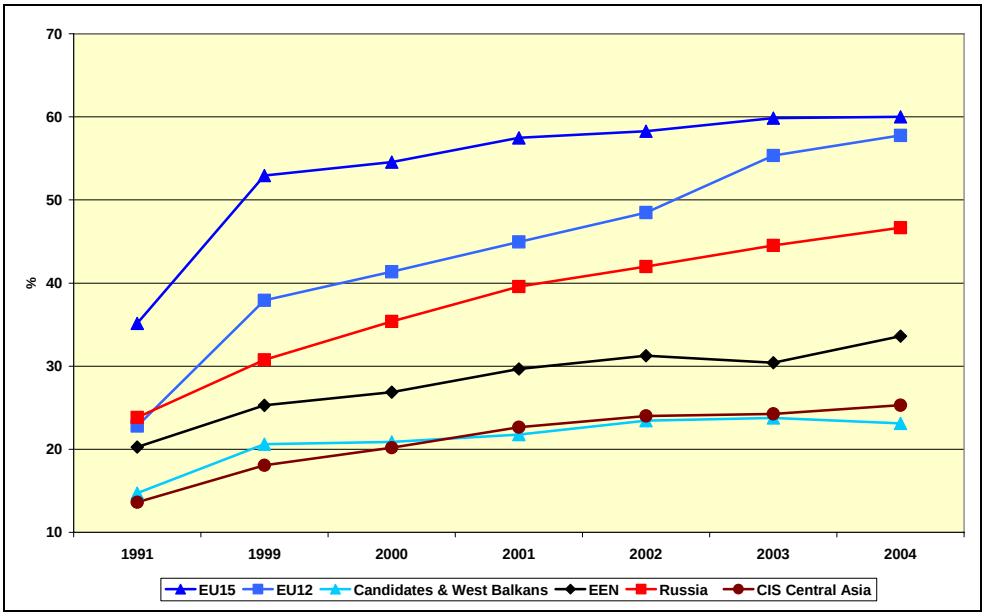


Sources: World Development Indicators database; UNICEF (2006).

After 2001, the EU15/EEN education gap was reduced somewhat: the attainment of positive economic growth rates in CIS countries was followed by a noticeable recovery in secondary enrollments: in Russia they reached 82 per cent, in Belarus – 78 per cent, etc. In lower-income EEN, however, they still remain at about half the Western European level. At the same time, NMS and West Balkans recently witnessed a rapid growth in enrollment ratios, with only a few countries (e.g. Albania and Bosnia) exhibiting relatively low secondary enrolment.

The reduction of enrollment gaps with the low-income CIS countries could also be observed across gender. Gender differences in enrollment existing at the secondary level appear to be continuing to shrink. In countries like Armenia and Moldova, where formal labor market opportunities are limited and migration, especially of young men, is common, girls tend to stay longer at school. At the same time in low-income Central Asian republics female enrollment in secondary school is lower because of lifestyles and cultural relations.

Figure H.2. Higher education enrolments (median gross rates, percent of population aged 19-24), 1991–2004



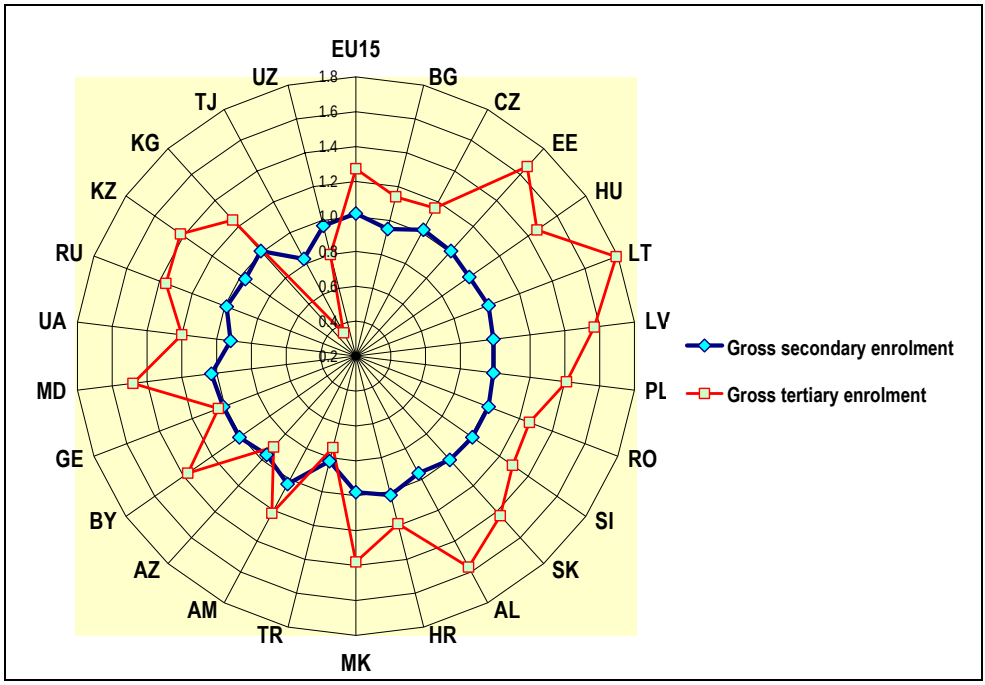
Sources: World Development Indicators database; UNICEF (2006)

During the past decade, higher (tertiary) education programs were the fastest growing education sector not only in EU (and particularly in NMS), but in Russia and (to a somewhat lesser extent) in EEN countries as well (Fig. H.2). Despite the fact that the EU/Russia tertiary enrolment gap that existed in the early 1990s has remained and even a bit increased, the growth of the number of students pursuing

higher education in Russia has been spectacular. After a heavy crisis of the early 1990s caused by a sharp (almost 3 times) reduction of government financing and the fall of youth's interest in higher education, the situation changed in 1995 when the decline was replaced by a fast growth.

This change was caused by an adaptation of population to new market conditions and the development of paid education (both in private and in state-owned higher educational institutions). In 1995, the quota of paid admission was 15 per cent, and the number of students studying on a paid basis did not exceed 9 per cent; in 2003 the quota reached 40 per cent, while enrolment surpassed 54 per cent. Between 1997 and 2003, the number of students in Russian universities increased almost twice and reached 6 million. Russia has even surpassed OECD countries in terms of the share of young people pursuing higher education (leading to the equivalent of bachelor or master degrees). In OECD countries, in 2003 every second young person began tertiary education, while in Russia this proportion reached 61 per cent. Graduation rates are also at or above OECD standards – 87, 29 and 33 per cent for upper secondary, tertiary type B and tertiary type A education, respectively (UNESCO/OECD 2005).

Figure H.3. Gross secondary and tertiary enrolment ratios by gender (proportions of female ratios to male ratios), 2005



Source: UNDP Human Development Report 2007/2008

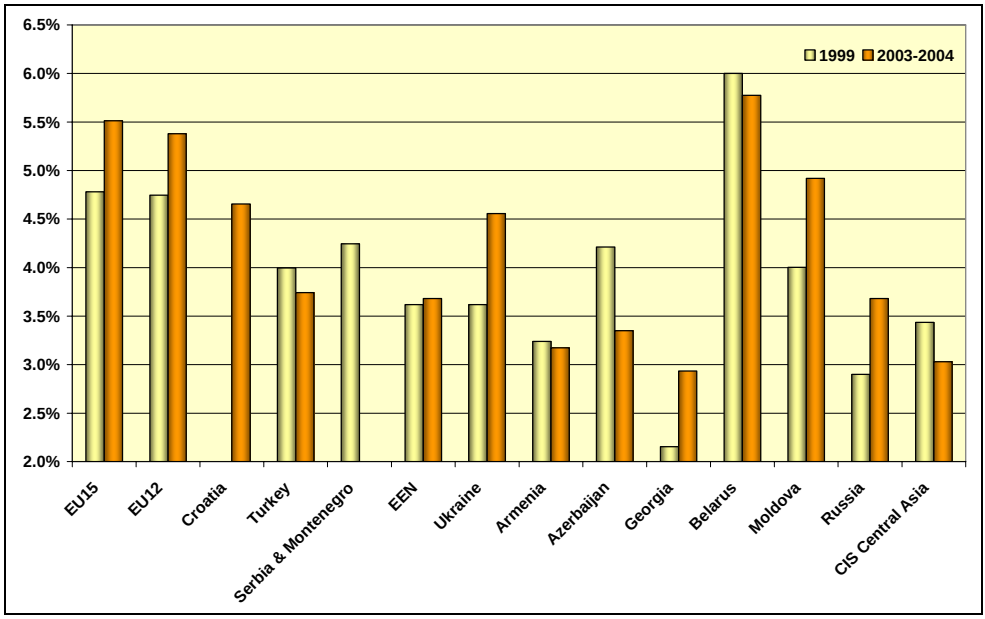
In terms of gender differences, tertiary enrolment contrasts secondary one, where, as was mentioned above, gender disparities across the region's countries are not particularly striking. As regards post-secondary education, there is a distinct borderline between a vast majority of EU-25, CIS and West Balkan/candidate countries characterized by a "reverse gender gap", with women outperforming men, on the one hand, and the four Muslim states (Turkey, Tajikistan, Uzbekistan and to a lesser degree Azerbaijan,) having a traditional gender pattern of tertiary enrolment (Fig. H.3).

Inputs: Education expenditures

When assessing the nation's human capital from the input side, financial resources provided by the state for this purpose come to the forefront. Differences in public spending on education (relative to GDP) across countries reflect variation in government efforts to increase national stocks of human capital (Fig. H.4).

Overall, compared to EU15 and NMS countries, considerably fewer public resources are available to education in general, and particularly higher education in EEN/Russia. Post-Soviet education is habitually perceived as both one of the world's largest education systems in terms of scale and coverage, and one of the worst afflicted by a shortage of funds (Kuzminov 2004).

Figure H.4. Public expenditures on education as per cent of GDP



Source: UNESCO Institute for Statistics Data Centre.

During the period from 1990 to 2002-04, when EU25 countries increased their share of public spending on education as a percentage GDP by more than one percentage point, CIS countries on average saw a decline in this share of roughly 2 percentage points to below 4 percent. Against a backdrop of EU25 spending patterns on education, only Belarus maintained government spending on education at high enough levels (5.8 per cent percent in 2004); by contrast, Georgia with 2.9 percent and Kazakhstan with 2.4 percent are among the worst performers (UNDP 2006). Although this trend (albeit on a lesser scale) is also characteristic for EU candidates and West Balkans, the CIS results are particularly striking in view of their lower GDP and thus a reduced spending on education in absolute terms. Even in higher-income EEN countries, public spending on education per student is an order of magnitude lower compared to EU15 (Kastouéva-Jean 2006).

The ratio of expenditure per student to per capita GDP in Russia is about 27 per cent compared to 34 per cent in France and 42 per cent in Germany. Middle-income countries usually maintain this ratio at much higher levels than affluent countries: around 50 per cent of GDP per capita for medium professional education, and between 100 per cent and 150 per cent of per capita GDP per bachelor-type students. This enables such countries to reduce, if only partially, the gap in absolute financing between them and richer countries and to compensate for quality differences. In Russia, however, this indicator is even lower than in developed countries, with all the ensuing consequences (UNDP 2004).

Another dividing line between the country groups analyzed along this dimension lies in a substantial growth of **private spending** on education in many FSU countries. This trend can hardly be associated with a similar worldwide tendency since differences between countries in public and private spending shares are significant and do not seem to correlate with a country's average income.

Although comparable data on household spending on education in CIS and the EU are not available, anecdotal evidence demonstrates that this spending in EENs is already comparable to government expenditures allocated for this purpose. According to the official data, overall volume of paid education services in Russia increased more than five-fold (in constant prices) during the period of 1995-2005 (HSE 2006), while the proportion of "budget" (i.e. government-financed) places in higher education institutions declined during the same period from about 90 per cent to 44 per cent (Gerasimova 2005). Russian household survey data also demonstrate that the cost of education for families is becoming substantial: in 2003, households invested Euro 2.17 billion in compulsory (primary & secondary) education (compared to budget expenditures of Euro 7.5 billion), and Euro 2 billion in higher education (with budget expenditures of Euro 1.43 billion) (Kuzminov 2004). This is in stark contrast with the situation prevailing both in EU15 and

NMS, where household expenditures on education generally do not exceed 10-15 percent of total education expenditures (OECD 2006).

Private costs of education vary across EEN countries. Not surprisingly, those countries that are under the greatest fiscal pressure seem to be shifting costs to families more than those that are less fiscally constrained. Unfortunately, these are the same countries that tend to have higher levels of family poverty. In Georgia, for example, private spending on education accounted for about 54 percent of total education spending, or 2.7 percent of GDP in 2000 (World Bank 2002b). In Moldova, the corresponding figures for 2005 were 28 percent (including 79 percent of the total tertiary education funding), or 1.7 percent of GDP. By comparison, in EU15 countries the average share of private funds was around 10 percent of the total education spending (UNESCO 2007). Thus, it would be safe to conclude that the existing divergences in the overall accessibility of education (especially tertiary one) between the post-Soviet countries tend to expand.

Input/output interrelations: a paradox of universal education

The above paragraphs highlighted the two major features of post-Soviet education system prevalent in EEN countries: 1) a mass character of output – the scale of education (especially of higher education) that is even larger than in the world's richest countries, and 2) extremely low inputs – the levels of per capita financing which are among the lowest in the world. The consequence is the deterioration of the quality of education and its inability to meet society's growing needs (UNDP 2004).

A most obvious evidence of the declining quality of education in EEN/Russia is the inadequacy of the knowledge and skills acquired in the education system. Despite remarkable achievements, public education in these countries does not adequately provide students with the capabilities they need to compete in a market economy. The Soviet education system stressed memorized factual and procedural knowledge – not learning skills that provide the basis for a flexible labor force able to adapt to changing markets and employer needs, and current education systems have fully inherited this bias (World Bank 2000).

Lately, Russia has repeatedly held bottom of the list positions in PISA (Program for International Student Assessment) ratings, according to tests conducted by OECD among 15-year old pupils. In 2000, Russian teenagers ranked 27th among 32 countries in reading abilities (including comprehension, analysis and formulating own viewpoint), were 26th in natural sciences and ranked 21st in math; in 2006, they ranked 39th, 34th and 34th accordingly among 57 countries, noticeably reducing performance across all areas (OECD 2007).

The same is true for higher education: according to 2006 Academic ranking of world universities published by the Institute of Higher Education at Shanghai Jiao Tong University, the top 500 list of world's best universities includes only two universities from Russia: The Moscow State, 70th in the world and 21st in Europe, and St. Petersburg State, world's 340th. To compare, the same rating includes 22 universities in France, 20 in China, four in Brazil, two in Poland but none from EEN (Institute of Higher Education 2006). International marginalization of Russian universities is also reflected in a declining number of international students studying in Russia: Russian share of the world education market currently does not exceed 0.5 percent (Sobolevskaya 2005). This is due to several factors, but primarily to a low competitiveness of Russian higher education and its inadequate integration into global education processes.

Finally, a widely acknowledged evidence of the declining quality of education in EEN/Russia (which is actually a result of the two problems described above) is its inability to meet the demands of the labor market, with corresponding distortions in the structure of the human capital. The basis of Russian higher education system are newly-formed low-calibre universities (in fact, oversize colleges) and "diploma mills" (Tomusk 1998), where 50 to 65 percent of students will not even dream of employment matching their qualifications. According to the polls among university graduates, over 50 percent of them are not using received competencies in their work (Kuzminov 2004), while the contents and complexity of this work quite often have little in common with the employee skills. Over a half of employers surveyed in 2004-05 thought that university graduates required additional theoretical and practical training, and according to recruitment agencies, only 13 to 20 percent of enterprises' managers are ready to employ college graduates offhand (Gerasimova 2006).

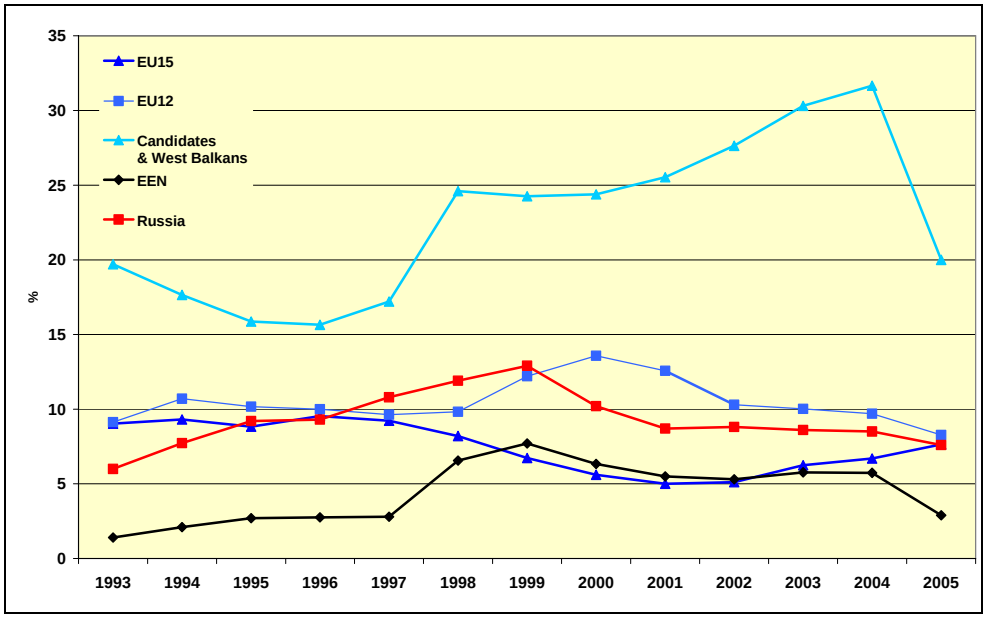
Labor market and changing job structure

The labor market and education are among the two most important ways to build human capital. Labor market exclusion – the inability to generate a livable family income, lack of recognition for one's daily work, discrimination, lack of basic legal protections on the job – prompts a chain of social and economic effects that deepen and solidify social exclusion. On the other hand, improvements in human capital through education, training, and better quality jobs can contribute significantly to greater inclusion through higher income, greater social integration, and stronger cultural awareness and identity.

The employment levels of the central-plan period, when employment was not only a right but also a duty for most of those of working age, could not be sus-

tained in a market-based system. Hence, actual labor market conditions in most countries in the region clearly indicate significant slack. Still, open unemployment is less of a problem in the slower-reforming countries of the former Soviet Union, such as Azerbaijan & Moldova, especially when compared to West Balkans and even most of EU12 (see Fig. H.5). On the other hand, official statistics tend to overestimate unemployment rates in the republics of former Yugoslavia which, when taking informal employment into account, are estimated to be closer to around 20 per cent.

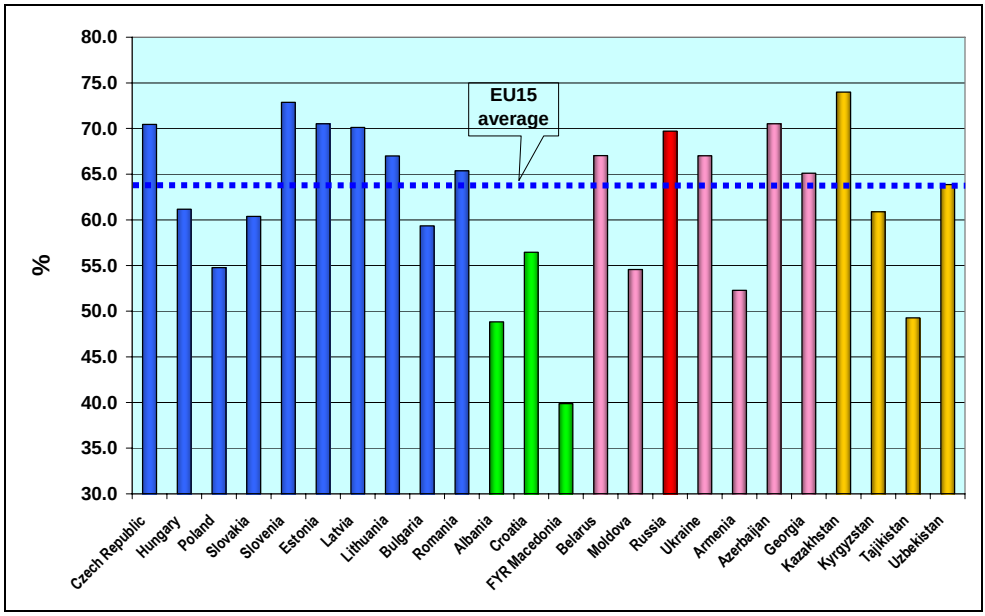
Figure H.5. Unemployment (percent of labor force), 1993–2005



Sources: OECD, EBRD

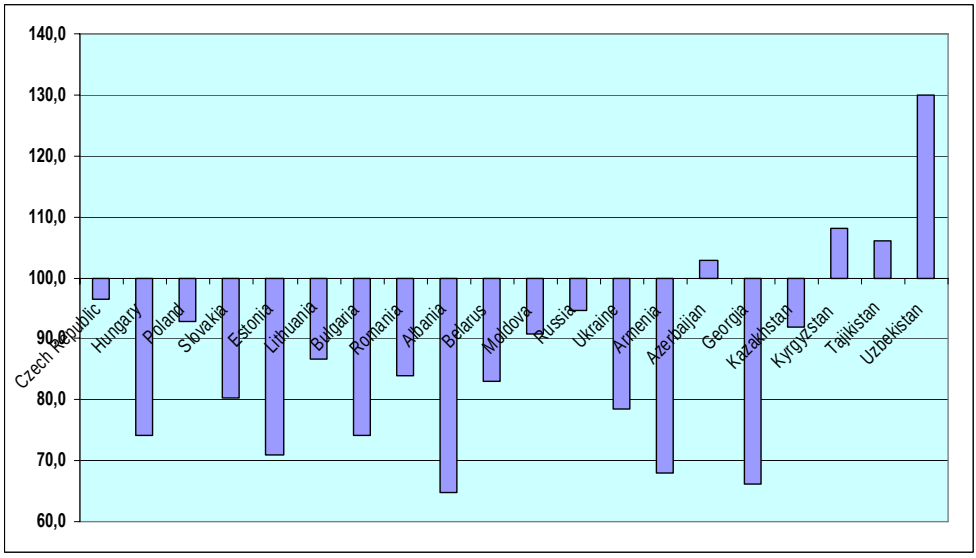
In NMS and West Balkan countries, high unemployment has been accompanied by a major fall in labor force participation rates, as workers became discouraged by lack of job opportunities and gave up their job search (Rutkowski et al. 2004). In these countries, both open unemployment and low labor force participation have led to a low ratio of employment to working age population, below the EU average (Fig. H.5). At the same time, these ratios' reduction is less pronounced in the majority of EEN countries, (fig. H.6) and it stays at a level higher than that of EU15 and most of EU12 countries. However, much of the workforce in EENs is still stuck in low-productivity employment in unrestructured and probably nonviable enterprises or has had to move back to subsistence agriculture (Rutkowski et al 2004).

Figure H.6. Employment ratio (number of employed as percent of population aged 15-59), 2004



Source: UNICEF (2006)

Figure H.7. Employed population in 2004 (1989=100)



Note. For Azerbaijan, the base year is 1990
Source: UNICEF (2006)

This argument can be generally supported by data on overall employment levels as compared to late-1980s (see Fig. H.7). Although the overall employment level in most CIS countries considerably diminished following the fall of production, these reductions on average were smaller than in the majority on EU12 (even taking into account positive population growth trends in Azerbaijan and Central Asian CIS), despite the fact that the fall of production in EU12 was not that sharp compared to EENs.

Table H.1. Labor productivity*, 2003-2004 (EU15=100)

	2003	**2004**
EU10**	54.6	56.5
EU12**	47.3	49.1
Candidates and West Balkans***	38.1	40.0
EEN	28.4	30.1
Russia	32.8	34.4
CIS Central Asia	15.2	15.9

* GDP (2000 PPP) per number of employed, ** excluding Cyprus and Malta, *** Croatia, Macedonia, Turkey and Albania
Sources: OECD, own calculations

This paradox reflects a persistent gap in relative *labor productivity* that exists between the analyzed country groups (see Table H.1). Average labor productivity among EENs is less than one third of the EU15 level. When compared to NMS (EU10), they demonstrate productivity just 10 percentage points higher than Central Asian CIS countries (38 per cent and 28 per cent correspondingly), and are lagging far behind the average level for Candidates and West Balkan states taken together (70.9 per cent of the average for NMS). Russia stays at the level of about 34.5 per cent in relation to EU15 and at 60.9 per cent of the EU10 average.

In many CIS countries, low open unemployment figures and high employment rates conceal several significant employment problems:

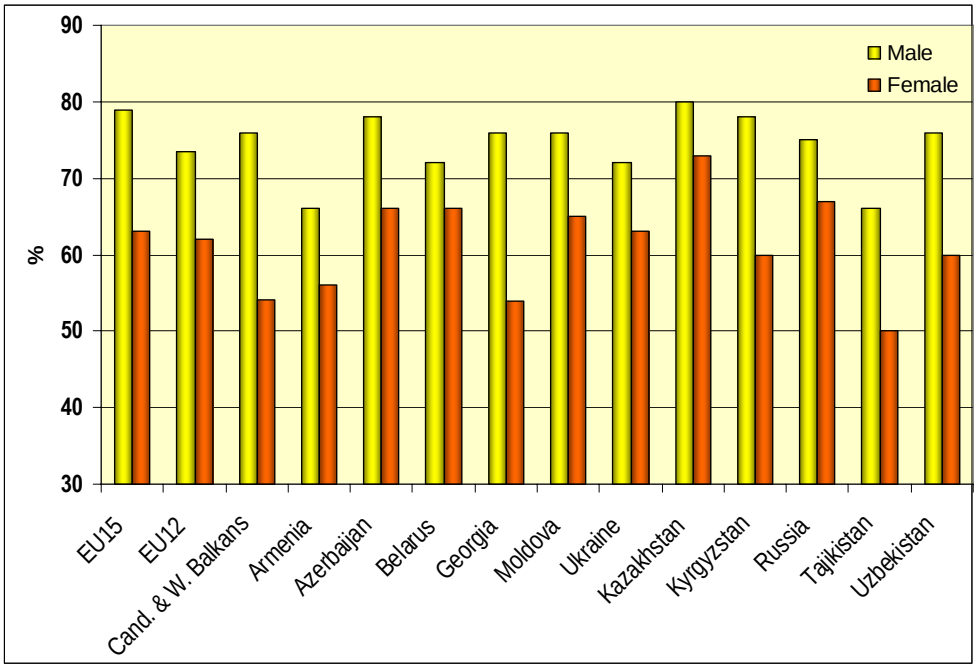
- A delayed enterprise restructuring with persistent overstaffing, especially in low-income CIS countries. Thus, inflows into unemployment are likely to increase as restructuring progresses.
- The dominance of low-productivity jobs in the informal sector to earn subsistence income. The latter served as kind of sustaining strategy for all poor countries in the region and substituted scarce and ineffective social protection. In the low-income CIS, casual and less formal jobs have increased dramatically: self-employment accounts for about 20 percent of total employment in EU12 and for about 50 percent of employment in low income CIS countries. Similarly, informal sector employment as a share of

total employment is estimated at around 40–50 percent in the CIS (Rutkowski et al. 2004).

It is hard to obtain comparable data on self employment across the countries analyzed. Still, the results of several surveys and anecdotal evidence lead us to a conclusion (supported by the World Bank studies) that the nature of self-employment also varies greatly. For some low-skilled workers, especially in the poorer CIS countries, own-account jobs in retail and agriculture are subsistence activities. But for other, more skilled workers, self-employment is sometimes a preferred alternative to formal sector employment because self-employment offers better earning opportunities and more scope for entrepreneurship (Rutkowski et al. 2004).

The nature of jobs has also changed because of sectoral shifts and deindustrialization**.** Most CEE countries have witnessed a fall in the number of blue-collar manufacturing jobs and an increase in white-collar service sector jobs. In contrast, in most CIS countries, deindustrialization was more often associated with an increase in agricultural employment (Rutkowski et al. 2004). Many jobs have been created not only in relatively more skilled activities but also in certain service activities that require low- and medium-level skills that are nonetheless different from the lost manufacturing jobs.

Figure H.8. Labor force participation rate (2004), by gender



Source: World Development Indicators database

Changes in the nature of jobs have affected men more than women. Many jobs have been lost in sectors dominated by male employment – heavy industry and the extraction industry – while new activities have been created in services where women tend to have easier access. As a result, men have suffered relatively more job losses than women have during the transition. For example (Fig. H8), the median female participation rate in EU12, at 62 percent, is very close to the EU15 average (63 percent), while the male ratio, at 73 percent, is significantly below the EU15 average (79 percent). The average female participation in EEN (excluding Armenia and Georgia) is higher or at least at the same level (Ukraine), while male participation is lower compared to EU15. Respective indicators for female participation in Russia and particularly in Kazakhstan are considerably higher than averages for EU15 and NMS. At the opposite end is the low median female participation rate for EU candidates, explained by Turkey's extreme score of 29 percent.

Labor market development is greatly affected by the pace of job creation, on the one hand, and by labor protection regulations, on the other hand. Apparently strict employment protection legislation in the region might have contributed to a slow pace of job creation. The first component is tightly dependent on a general quality of business and investment climate. Here we just outline the constraints that enterprises in most of EEN countries are facing. In low-income CIS these are policy unpredictability, insecure property rights, weak contract enforcement, and unreliable infrastructure. In the middle-income CIS countries (Belarus, Kazakhstan, Russia, and Ukraine), businesses face considerable administrative barriers (for example, numerous permits, inefficient regulations, and red tape). Doing business in CEE countries is generally hampered by high direct costs (for example, high taxation, instability and non-transparency of tax rules, arbitrary tax administration, etc.) (Rutkowski et al. 2004).

Labor market regulations demonstrate large regional disparities. Historically, employment protection legislation (EPL) has been particularly strict in CIS and South-Eastern Europe, and somewhat less strict in most CEE countries. This means that the costs of firing redundant labor in the CIS and SEE may be relatively high. This is likely to discourage them from hiring in the period of economic upturn, to avoid future firing costs in some subsequent downturn.

At the same time, labor market regulations, despite being quite tight in some countries, are rather formal since they are subjected to numerous cases of non-execution and non-compliance. In many CIS and SEE countries (e.g. Azerbaijan, Belarus, Bosnia, Moldova and Ukraine), EPL is stringent, but enforcement capacity is weak. On the opposite pole (mainly NMS, especially Baltic countries and Slovakia) enforcement capacity is strong, while EPL is relatively flexible. EPL is more binding in CEE because of stronger enforcement, despite more liberal regulations. This assessment is consistent with the perceptions of employers, who

deem labor regulations a significant obstacle in the NMS (and also in Turkey), but not in the other parts of the region.

V.3. Innovation, technological and infrastructural gap

A contemporary phase of global economic development is characterized by an ongoing transition of numerous catching-up countries, including EEN, to a post-industrial stage. This transition is essentially conditioned upon these countries' potential of building a knowledge economy, where the skills, experience, and innovation potential of the workforce have greater value than the capital equipment or even capital itself. These processes in turn raise questions about the role of innovations in development, including identification of relative innovation strengths and weaknesses of specific countries, of major challenges the countries are facing in innovation performance and innovational absorption, and the appraisal of policies in terms of their ability to contribute to overcoming these challenges. This is a very ambiguous research task indeed, and these issues are extensively studied by international organizations and renowned research institutions. Our research task here is much more simple. Since innovation potential is widely recognized nowadays as the most important prerequisite for both economic growth and human development, we see the goal of the current section within the broader framework of the ENEPO project in identifying those key bottlenecks and most visible gaps that hinder the process of innovation performance and development.

Indicators and methodology

Various research centers and international organizations have developed multiple methods and indicators to evaluate countries' innovation performance. A widely accepted one is the EU methodology (European Innovation Scoreboard, EIS) which was developed to assess and compare the innovation performance of EU member countries (UNU-MERIT 2008). Within EIS, innovation development indicators are grouped into five key categories: innovation drivers; knowledge creation; innovation & entrepreneurship; application; and intellectual property rights. The main disadvantage of this method for our analysis is a lack of data on EEN countries.

Results on country ranks (KEI index: Knowledge Economy Index) produced by World Bank Knowledge Assessment Methodology (KAM) are very close to those

provided by the Summary Innovation Index (SII) constructed by the EIS, since both include a number of similar indices (World Bank. Knowledge for Development). The advantage of the World Bank composite indices (KI & KEI) for our study is the availability of comparable data for the whole range of analyzed countries.

In addition to KAM, an increasing number of indexes are used to assess a country's readiness for the knowledge economy. Among the most widely cited indexes we can find the Technology Achievement Index (UNDP), the Competitive Industrial Performance Index (UNIDO), the National Innovative Capacity Index (WEF), the Innovation Capability Index(UNCTAD)[36]. The different indexes put the emphasis on various aspects of the science and technology realm: some, such as UNIDO's, are more focused on outcome indicators, whereas others, such as UNCTAD's, place more emphasis on inputs into R&D. The rankings are therefore not always the same. For example, the "Economic Incentive and Institutional Regime" component included in the KEI resulted in a lower score, compared to other indexes, for countries such as Belarus, Georgia, or Ukraine.

UNIDO's index emphasizes outcome indicators (or revealed technological capacity), as shown in the high rankings of countries such as Portugal, Hungary, and Turkey, whereas UNCTAD's index (ICI) puts more emphasis on the inputs into innovation (underlying technological capacity) and therefore shows higher rankings for countries with well-functioning education systems (that, however, somehow failed to translate higher education into innovation - especially in Russia, but also Ukraine and Belarus). Very informative from the analytical point of view, some of these indices are of little value for our research task, since they do not provide any information for over a half of our sample of countries.

In our research we used the following data:

1. Available raw data (indicators from the World Development Indicators database and ITU database).
2. Knowledge Index (KI) and the Knowledge Economy Index (KEI) calculated in accordance with the World Bank Knowledge Assessment Methodology (KAM).

Inputs: Knowledge creation (R&D)

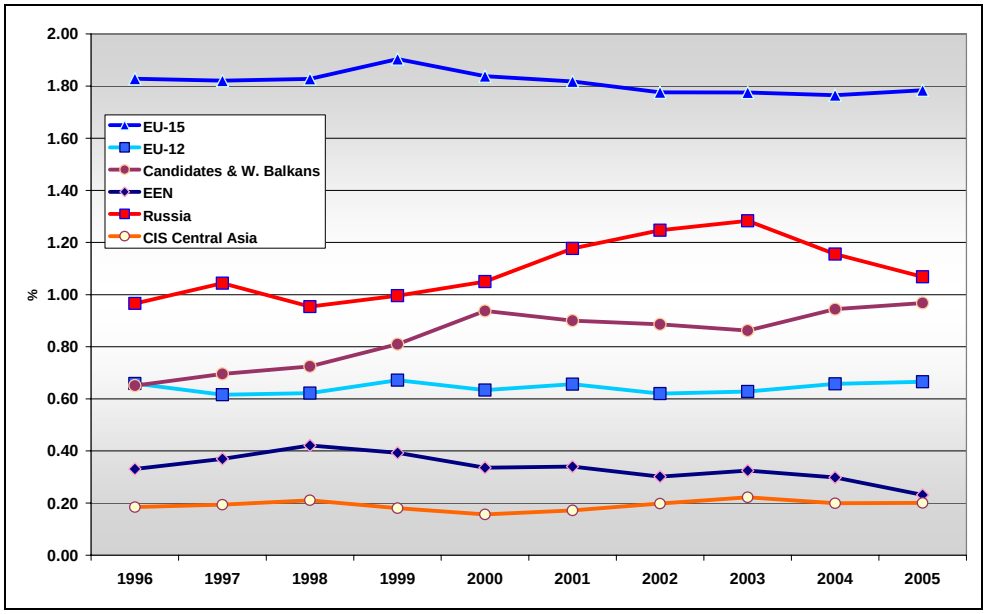
One of the most prevalent indicators of investment in innovation is the ratio of R&D to GDP. This has long been used as a key measure of inputs into the innova-

[36] Attempts to provide a comparative analysis of the composite indices were made in Soubbotina (2005).

tion system by enterprises and governments. By comparing this ratio across our sample of countries we can conclude that these ratios in all sample countries tend to be relatively stable and not related directly to GDP changes.

Median R&D expenditures figures for EU15 countries far exceed corresponding values for all other country groups, staying at the level of about 2 percent, with considerably higher figures in most developed European countries – reaching 3 and even exceeding 4 percent. All other countries, including EU12, have considerably lower levels of expenditures. Only six of them had a ratio of 1 percent or more, including three NMS – Slovenia, Czech Republic and Hungary, Russia, one of EENs (Ukraine), and Croatia. If we exclude Ukraine from the sample, the median for the rest of EEN countries would stay at a level of just 0.3 per cent.

Figure I.1. Total R&D expenditures as per cent of GDP



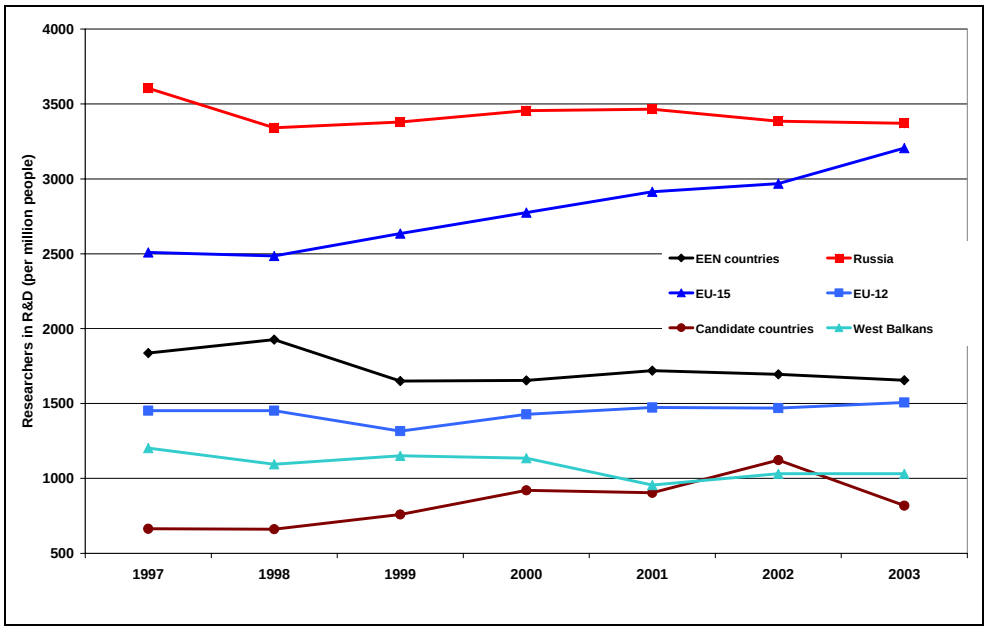
Source: UNESCO Institute for Statistics database, World Development Indicators database

Taking into account low ratios of R&D spending to GDP in EEN, as well as the fact that the respective values of GDP in these countries are generally much lower compared to developed countries, we could hardly question the fact that R&D sphere in Eastern EU neighborhood remains underinvested (see Fig. I.1). We should also take into consideration that these indicators do not provide any information on the efficiency of R&D investments.

Despite a fall in the number of researchers (more than twice from 1992 to 2002), Russia traditionally stands first in the number of researchers per million

people, so far (albeit the gap is narrowing) surpassing the EU15 median level and exceeding the level of EU12 more than twice. These input numbers, however, are not translated into high innovation outcomes (e.g. number of patent applications – see Fig. I.6), reflecting below average productivity of Russian R&D. Retaining an inherited from the USSR structure of R&D sphere, several EEN countries (particularly Georgia, Ukraine, and Belarus) also still preserve high employment in R&D, occupying a third (after EU15) position in the country groups' list (Fig. I.2). This feature comes in line with the mentioned above trend in human capital development.

Figure I.2. Researchers in R&D, per million people

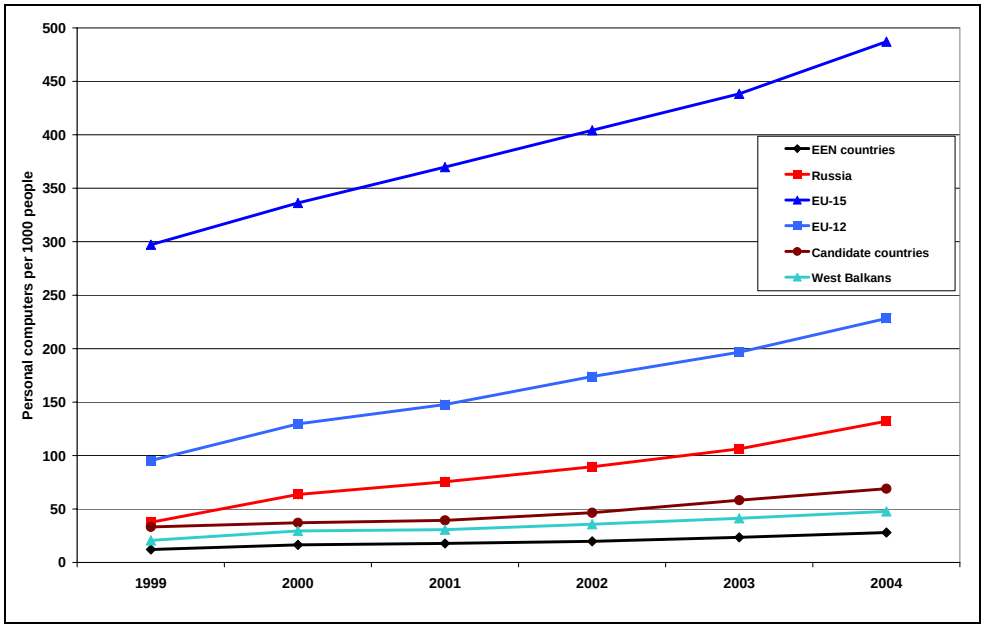


Source: World Development Indicators database

Inputs: Innovation drivers (ICT)

Information and communication technology – blood vessels of innovation system – becomes an increasingly important infrastructural component of intellectual capital. The number of personal computers has been growing in all country groups, but the relative distances since 1999 remained almost unchanged: more than two times – between EU15 and EU12; EU12 / Russia – 1.7 times, Russia / Candidate countries – 1.9 times, and almost five times – between Russia and EEN (see Fig. I.3).

Figure I.3. Personal computers, per 1 000 people



Source: World Development Indicators database

The "digital divide" in international Internet bandwidth, characterizing accessibility of worldwide web, is remarkable: EU15 and the nearest group (EU12) differ by an order of magnitude; indicators for the next country group (candidate countries) are almost 2.5 times lower than in EU12. The distance from candidate countries to Russia (the next closest neighbor) is nearly twofold; the overall level of international Internet bandwidth in EEN countries is extremely low – three times lower than in the group of Balkan states (Fig. I.4). In 2003, Denmark alone had the international Internet bandwidth 11 times larger than the whole of CIS. The situation in individual EEN and candidate / potential candidate countries, however, varies: though lagging in average figures for the group as a whole, Internet access could vary by factor if we compare the highest level in EEN (Moldova) to the lowest level in potential candidates' group (Albania).

The numbers of Internet users and their trends of growth closely correlate with the number of personal computers (see Fig. I.5). The gap between Western Europe and EEN/Russia in Internet penetration rates[37] is huge: in 2003, EU15 led at a high 42.9 percent, followed by the Baltic States (31.4 per cent), EU12 (16.1 per cent) and trailed by CIS (5.6 per cent). At the same time CIS, the region with the lowest

[37] A percentage of Internet users among the population in an age group of 15 to 74 years old.

penetration, had the second highest growth rate of close to 80 percent, a development that suggests that the "digital divide" is to some extent narrowing (ITU 2005).

Figure I.4. International Internet bandwidth, bits per person, 1999–2004

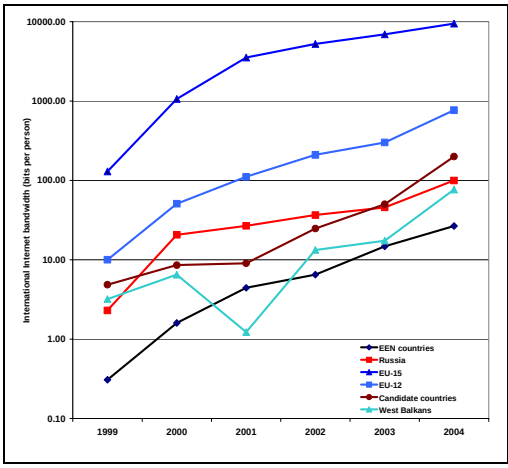
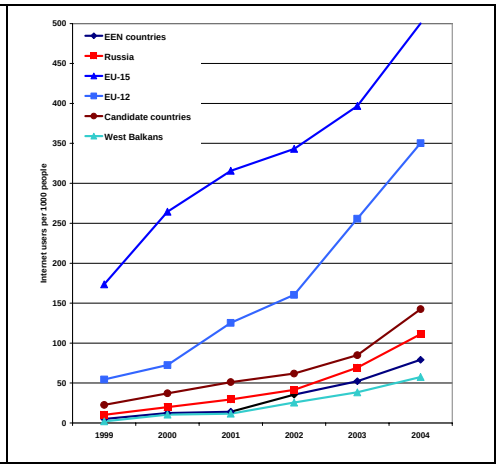
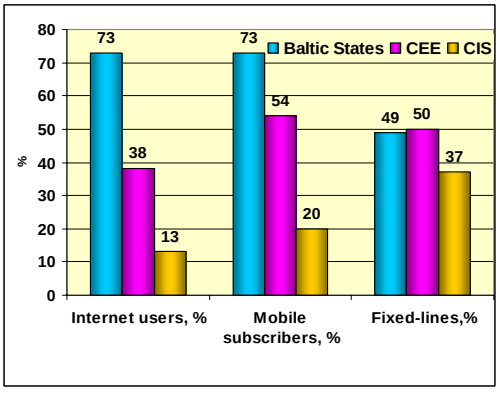


Figure I.5. Internet users, per 1 000 people, 1999–2004



Source: World Development Indicators database

Figure. I.6. ICT penetration rates as a % of penetration rates in EU15, 2003



Source: ITU Database.

To characterize information infrastructure components, indicators on other communications infrastructure (mobile and fixed-line) are generally used. In mobile communications, the East-West gap in Europe, although somewhat smaller compared to Internet, still remains significant (Fig. I.6). The CIS average mobile penetration remains at a very low 17.1 per cent: in 2003 almost half of the CIS countries – Armenia, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan – had

penetration levels under five percent, and only in two CIS countries – Azerbaijan and Georgia – mobile had slightly overtaken fixed line penetration. At the same time this region with the lowest mobile subscribers rate has by far the highest growth rates, an average of 99.4 percent. European fastest growing mobile market, Russia, more than doubled the number of cellular subscribers during 2004, from 36.5 million to 74.4 million. During 2004, Russia overtook Germany, France, Spain and the UK to become the largest mobile market in Europe. Despite Russia's impressive subscriber numbers, it has its own digital divide, with the vast majority of subscribers located in large urban centers (ITU 2005).

Overall, the "digital divide" that separated EEN/Russia from the rest of Europe is much greater in newer ICTs (mobile and Internet) than in fixed lines. Indeed, penetration levels for Internet use in CIS are only 13 percent of those in Western Europe (Fig. I.6). The gap is slightly smaller in the mobile sector, where CIS penetration rates stand at one fifth of those in Western Europe. The gap is smallest in the "traditional" ICTs of fixed lines where CIS' penetration level represents 37 percent of that of Western Europe. NMS have about half the mobile and fixed line penetration levels of EU15, but lag further behind in Internet use.

Outcomes: Patent Applications and Journal Articles

The two indicators reflecting the outcomes of innovation performance are "Patent applications filed by residents" and "Scientific and technical journal articles per million people". Both indicators point to huge gaps between EU15 and other country groups. In the case of patent applications they range from roughly 2.5 times between EU15 and Russia to 8-10 times between EU15 and other country groups (Figs. I.7 – I.8).

At the same time, the gaps in the number of patent applications between Western Europe and EEN/Russia are not as wide as could be expected judging by relative GDP figures or R&D expenditures. Recent figures for 2004 published by World Intellectual Property Organization (WIPO) indicate that EEN countries such as Russia, Ukraine and Belarus also have relatively high rates of patent activity when compared with total GDP and with R&D expenditure. Russia ranks 6th in the world (after Japan, USA, Korea, Germany and China) in absolute number of resident patent filings, with Ukraine ranking 11th. The scores in patent filings per billion dollars of GDP (PPP) are 17.6 for Russia (6th rank), 16.9 for Belarus and 14.7 for Ukraine (8th and 9th rank accordingly), while ranking on patent filings per R&D expenditure has placed Belarus world's third, with Ukraine ranking 5th, and Russia ranking 6th (WIPO 2006).

Figure I.7. Resident patent applications, per 1 million people, 1996–2002

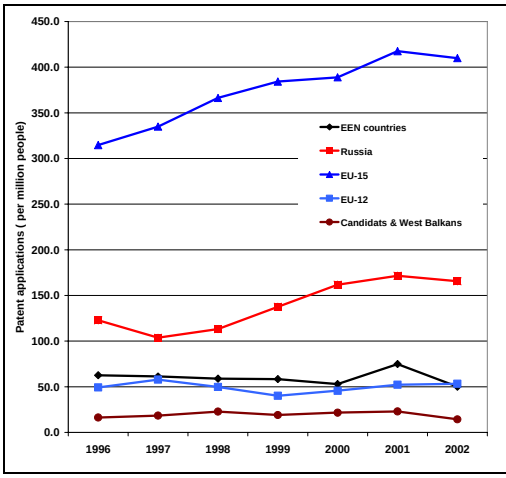
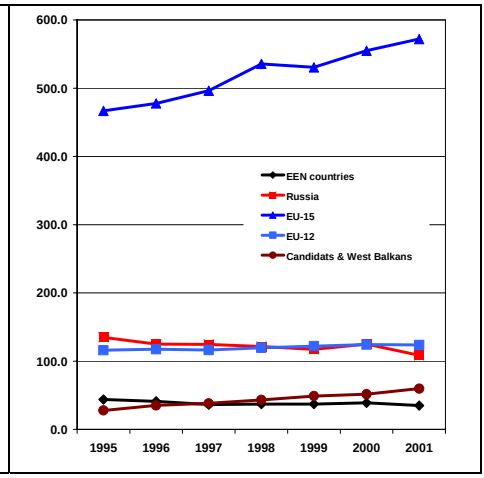


Figure I.8. Scientific and technical journal articles per million people, 1995–2001



Source: World Development Indicators database

Still, it would be premature making conclusions concerning changes in EEN/Russia's patenting intensity and moreover on prospects of bridging the gap in this area. First, in absolute numbers of patents issued these countries (even taken together) still lagging far behind, say, Germany. Second, and more importantly, the structure of Russian patent applications radically differs from that of developed countries: just 9 per cent of applications in Russia were in telecoms, IT and electronics, against 40 to 50 percent for OECD countries, with a majority filed in 'food and agriculture' and 'materials and instrumentation' sectors (Jaggi 2005). There are no grounds to believe that other EEN countries would demonstrate a radically different patents' structure.

Weighted indicators on Scientific and technical journal articles demonstrate an even more bleak picture (Fig. I.8): a five-fold and growing gap between EU15 and NMS/Russia; the latter level, in turn, is twice the median for candidate countries (this gap would have been much larger if we excluded Croatia with a score 1.5 times higher than Russia).

Composite Indices

To present a more generalized picture of international differences in innovation performance we use composite indices developed in accordance with the World Bank Knowledge Assessment Methodology – KAM (Knowledge Index, KI, and Knowledge Economy Index, KEI), as well as their main components (pillars).

There are several reasons for using aggregate scores produced by this methodology. Country's national innovation capacity depends on a certain number of pillars (human capital, information infrastructure, the innovation system, as well as the economic incentives regime), which allow a country to articulate its transition into a knowledge economy and use its resources efficiently in the absorption and creation of new knowledge.

Three components of Knowledge Index (KI) represent key variables which characterize a country's ability to generate, adopt and diffuse knowledge. These are:

- Education and human resources (further on referred to as "Education") which includes three variables: adult literacy rate, secondary enrollment rate and tertiary enrollment rate;
- Innovation system (Innovation) which includes the following variables: Researchers in R&D, per million people, Patent applications granted by the USPTO, per million of population, Scientific and technical journal articles, per million of population;
- Information and communication technology (ICT), including Telephones (mainlines plus mobile phones) per 1,000 persons, Computers per 1,000 persons, and Internet users per 1,000 persons.

Knowledge Index (KI) is a simple average of the normalized performance scores of a country's key variables in three Knowledge Economy pillars. In addition, the Knowledge Economy Index (KEI) takes into account whether the environment is conducive for knowledge to be used effectively for economic development. This is achieved by adding one more pillar, that is "Economic incentive and institutional regime" (Institutions) which includes variables on tariff and non-tariff barriers, regulatory quality and Rule of law. Thus KEI takes into account whether the environment is conducive for knowledge to be used effectively for economic development.

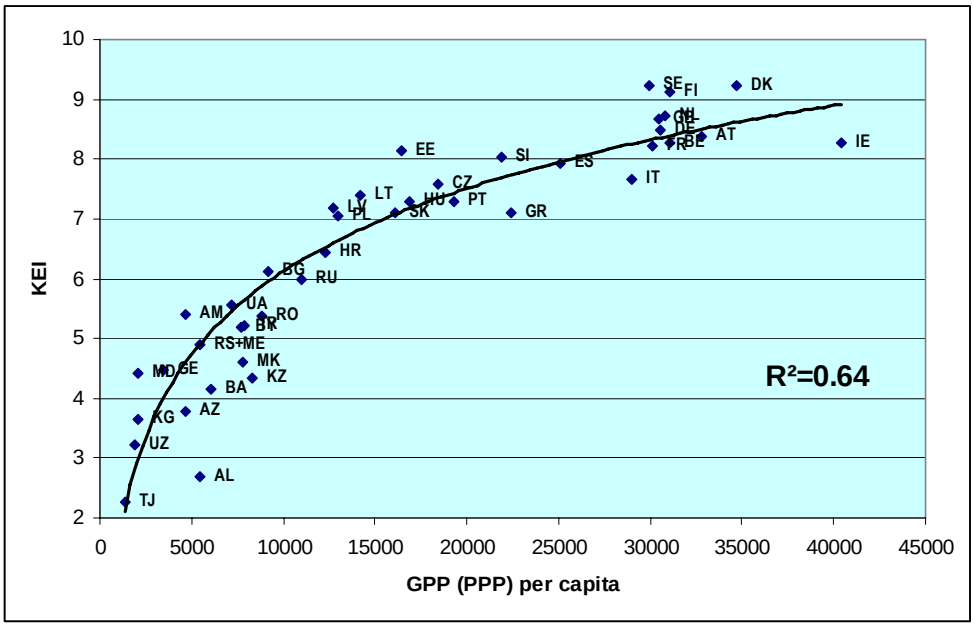
The trend line in Fig. I.9 suggests that KEI scores (reflecting innovation performance) are closely correlated with per capita GDP levels, in particular for the "low-income" countries. The richest countries prove to have close GDP levels for significantly different innovation performance. More generally, the link between innovation and GDP remains difficult to establish at national level, considering the innovation is only one factor among other structural ones.

By comparing countries' (country groups') scores for each of the pillars as well as scores of KI and KEI indices we can:

1. evaluate differences (gaps) between countries (country groups) in innovation performance across specific pillars;

2. assess overall differences in KI and KEI scores;
3. identify specific gaps (bottlenecks) in innovation performance for each country (country group).

Figure I.9. Regression of Knowledge Economy Index on GDP (PPP) per capita



Sources: World Bank KAM database, WEO database.

The results of such an exercise are presented in Figs. I.10 and I.11, where respective data are translated into radar diagram format (for each country group, we used median values as aggregate scores).

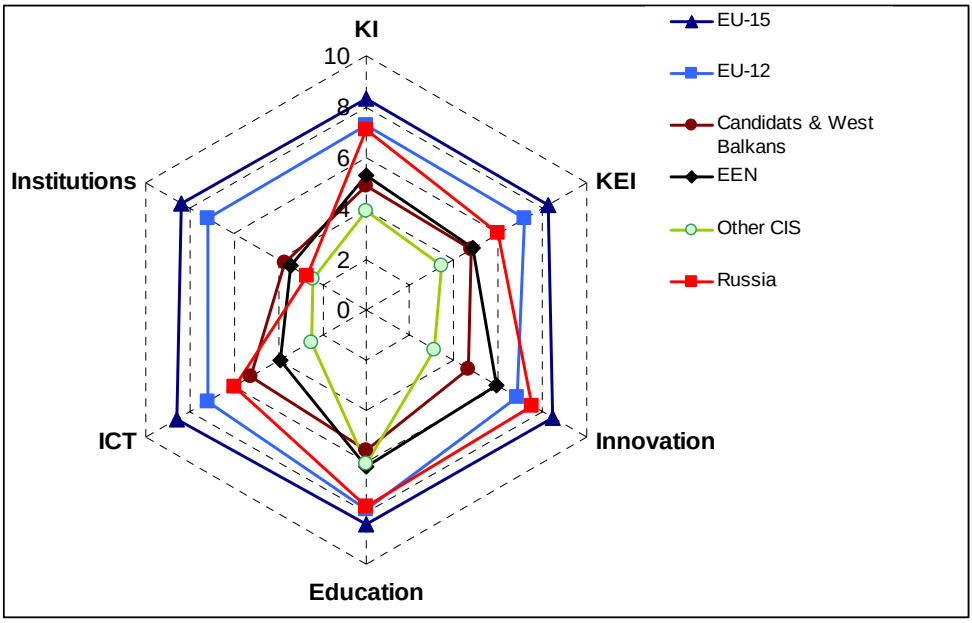
Overall conclusions from Fig. I.10 could be summarized as follows:

As regards innovation infrastructure (ICT), country groups are distributed exactly in accordance with GDP per capita: EU12 are the nearest to EU15 group, next comes Russia, followed by Candidates and West Balkans, EEN and other CIS members. Differences within EEN group are significant: score for Belarus is as high as the Candidates' median, with Ukrainian scores also close to this country group. Within Candidates group, the general level is very low, with Croatia alone approaching the lowest scores in the EU12 group.

In "Innovation systems" relative positions of country groups change: the closest neighbor of EU15 is Russia, followed in turn by EU12, EEN, and Candidates & West Balkans' group, with the worst results demonstrated by Central Asian CIS.

Individual country scores for most of EENs (excluding Moldova) stay quite close to some of the EU12 (e.g. Latvia, Bulgaria, and Romania).

Figure I.10. KI, KEI and constituent pillars across country groups

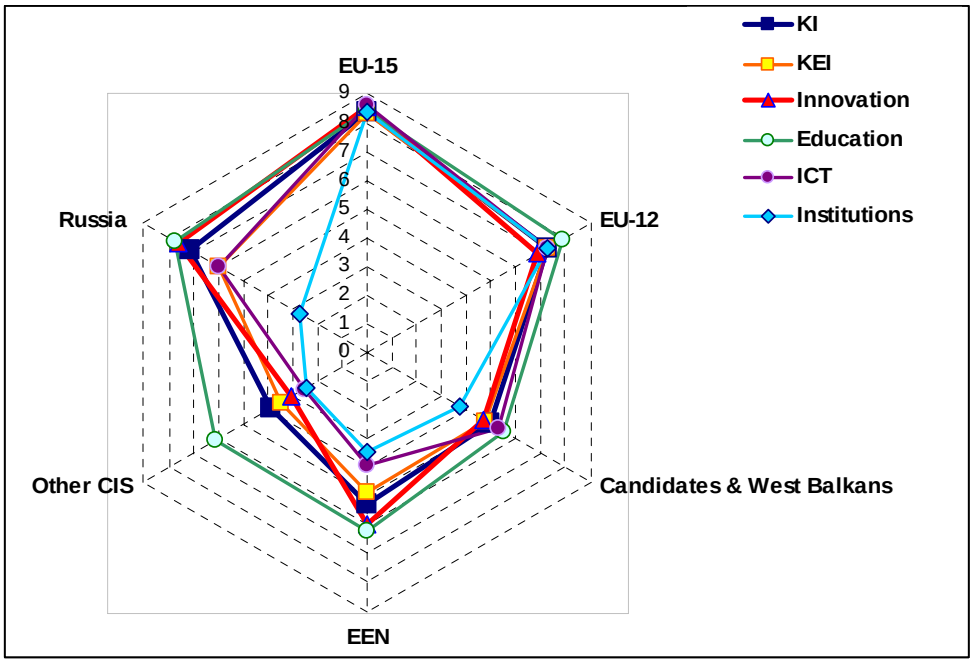


Source: World Bank KAM database

As could be expected, country groups' distribution within Education pillar demonstrates that scores for EU12 and Russia are almost equal, with EEN and other CIS countries also exhibiting lower, but very similar results, whereas the Candidates & West Balkans are only catching up (due to extremely low scores displayed by Albania and Turkey). Scores for individual EEN countries are rather aligned (excluding Moldova and Azerbaijan which have lower country scores) and are much the same as e.g. for Romania, Bulgaria, or Slovakia.

The Institutions pillar demonstrates a most diverse picture. After EU12, which are naturally located quite close to EU15, we can observe a gap of 3.5 points wide. Candidates & West Balkans appear to be the nearest neighbors to EU12, followed by EENs with very similar median score. Scores for Russia and other CIS are very close, but lag substantially behind. Naturally, scores for individual Candidates and EENs are quire different. If it were not for Croatia and Turkey (in the group of Candidate countries) and Armenia and Ukraine (EENs) that either exceed or are equal to respective scores for Bulgaria and Romania (EU12), the gap between the respective country groups would have been considerably larger.

Figure I.11. Country groups across KI, KEI and constituent pillars

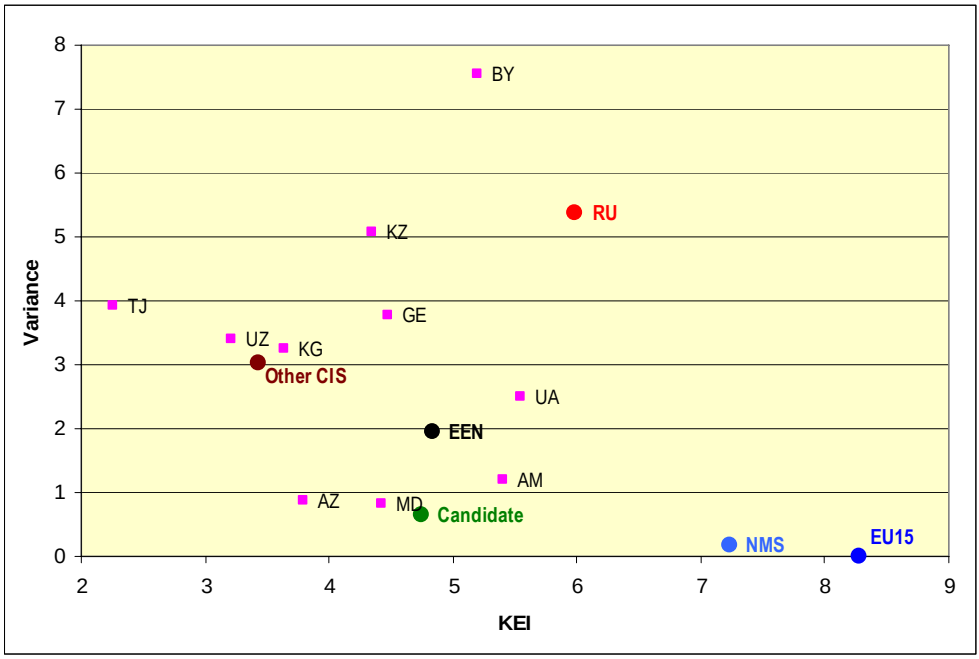


Source: World Bank KAM database

Fig. I.11 provides a different angle of analysis by transposing the same analyzed variables across country groups. In particular, the figure vividly demonstrates that the least developed pillar in all FSU countries, and particularly in Russia, is "Economic incentives and institutional regime". This sphere appears to be least developed in the Candidate countries as well. This stands in contrast to EU12 where Institution pillar is the second most developed after Education.

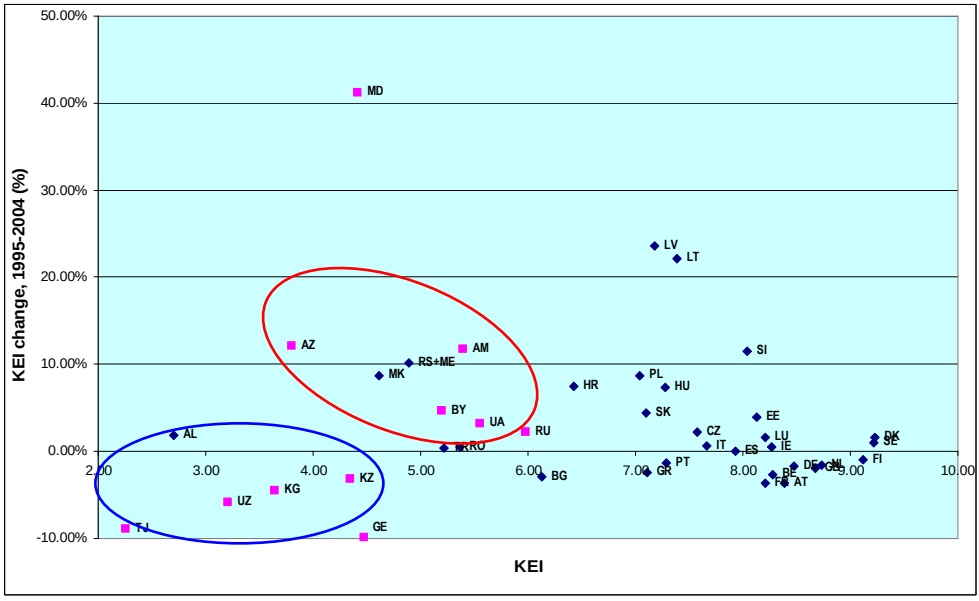
The four constituent pillars of KEI provide further insight into the relative innovation strengths and weaknesses of European countries. Many of these countries are characterized by an extremely uneven development of innovation dimensions. This is especially characteristic of Russia, Central Asia CIS and EEN (Fig. I.12). On the other hand, the spread of KEI pillars' scores is minimal for EU15 and EU12, and is just slightly larger for Candidate countries. Meanwhile, recent evidence suggests that countries with an even performance on each of the key innovation dimensions perform better overall than countries with an uneven distribution, since a 'blockage' in one field, such as poor knowledge creation, could prevent progress. This suggests, in particular for countries lagging behind, that given equal costs, policy would be more effective in improving overall innovation performance by concentrating on improving areas of weakness rather than on making further improvements to areas of strength (EC 2006).

Figure I.12. KEI variance across countries and country groups



Source: World Bank KAM database

Figure I.13. KEI trends



Source: World Bank KAM database

At Fig. I.13 KEI countries' scores are plotted against KEI percentage change over the preceding decade. That could introduce an intertemporal dimension into our analysis, providing some insight at the prospects of EEN catching up with EU in terms of innovation performance.

The figure shows the current innovation performance as measured by the KEI on the horizontal axis against the short-run trend performance of the KEI on the vertical axis. This enables us to select, from the viewpoint of the EU/EEN gap, at least two distinct groups of countries. The first one includes countries with below the average KEI scores but with an average or above average trend performance (Belarus, Ukraine, Russia, Armenia and Azerbaijan); the countries belonging to the second group have below average KEI values and a below average negative trend (Georgia and Central Asian CIS). It is evident that the first group members are more likely to catch up, at least in the long run, while another group is falling further behind.

Conclusions

1. A comparison of differences in the four pillars underlying knowledge economy potential of the country groups analyzed drives us to a conclusion that in a number of FSU countries (e.g. Russia, Ukraine, Belarus), as well as in the former Yugoslav countries (Serbia, Croatia), the inherited research potential and human capital provide incentives for a recoveryof their innovation capacity. However, absorptive capacity remains low in all EEN (and moreover in FSU in general). A high variance in underlying pillar scores provides support for such a conclusion.
2. An evident competitive advantage of Russia and EEN countries is a fairly high human capital stock. However, there is an obvious mismatch between the number of researchers employed in the region and the results of their activity (at least in the form of publications or patents registered), as well as low expenditures on R&D.
3. A high variance of underlying pillar scores in EEN countries is to a great extent affected by striking gaps in institutional and economic incentives regime. It might well be that a country has a fairly high education level and a fairly well developed ICT infrastructure, but its institutional regime is so weak that it presents a severe bottleneck for a further innovation absorption and development. The evident shortcomings of the institutional framework, as well as inadequate governmental resources to support R&D and innovation are the major handicaps.

Most general features of innovation performance that could be captured by the analysis of sets of available comparable indicators are only a top of the iceberg of serious problems and striking gaps existing in this sphere. Due to a lack of reliable and comparable data we could not provide any sound analysis on the structure of R&D expenditures (applied research vs. fundamental science, public vs. private expenditures, defense-oriented vs. non-military research, and especially on commercial investment potential). Still, anecdotal evidence leads us to believe that principle differences existing in different fields of research between groups of countries are not a reflection of the unique course in innovation process, but rather a reflection of inadequate reforming and restructuring of R&D sector. One of numerous examples is the proportion of applied research with a high commercial potential which is in fact tremendously low compared to developed countries. Poor institutional environment and low entrepreneurship potential discourage private R&D in companies; public participation in funding private industrial R&D and commercialization of innovative ideas are also low, which markedly reduces an overall national innovation capacity.

V.4 Openness and trade potential for development

"Openness" dimension and interaction potential `of the specific country are among the most important prerequisites of catching-up. This endogenous potential is especially important taking into consideration the specific features and limitations of ENP policy options and instruments. Foreign trade potential and trade openness of countries are obviously central for the analysis of this particular dimension. Still, other elements of "openness" are no less important. These include barriers for movement of persons and labor migrations, border transparency, easiness of human contacts and contacts between civil society organizations, etc. Notwithstanding the importance of these components to ENP, in this section we focus our analysis predominantly on trade relations and foreign capital inflows.

Besides, trade potential and "openness" naturally play quite different roles across the region's countries, being determined by the countries' size and geographical location, population distribution, etc. Thus, no universal model of involvement into international trade could be attributed as a universal scheme. Still, several specific features of this dimension characteristic for EEN countries could be emphasized, with a focus on those characteristics that could affect future relations with the EU.

The majority of empirical studies on the topic of trade and development apply the terms 'openness' and 'trade liberalization' as synonyms. However, a closer look at the meaning of these terms reveals that they may bear considerable differences. Openness initially refers to a country's situation with regard to its trade relations. Apart from (trade) policy measures, this situation is also influenced by other factors such as the size of a country's domestic market, its natural resource endowment, and its geographic location. For example, as a rule, smaller countries with a coastline will tend to engage more in trade than large countries or countries with an unfavorable geographical location – independent of the way tariff and non-tariff trade policy has been designed. Thus assessing a different scale of the countries' involvement into international trade, we should take into consideration a country's so-called "natural openness" as well as its (trade) policy measures (VENRO 2004). In contrast, the term 'trade liberalization' solely addresses a country's trade policy measures.

One of the hottest topics for economists throughout the 20th century was the role of "openness" in economic development, with international trade most frequently used as a measure of openness. This debate dates back to the works of Adam Smith and David Ricardo; later on, it continued to be actively discussed by different scholars. Interest to this issue reinvigorated after the end of the World War II, when a trend to more openness in international economic relations became evident.

Arguments for more openness are mainly based on efficient allocation of resources through comparative advantage, dissemination of knowledge and new technologies, and enhanced competition in domestic and international markets. Areas of specialization promoted by trade demonstrate increasing returns to scale in endogenous growth models (Young 1991, Grossman and Helpman 1991 in Chang, Khaltani and Loayza 2005).

In contrast, in case of existence of institutional imperfections, openness can lead to concentration on extractive industries, sub-utilization of human and capital resources, natural resource depletion and establishment of vested interest in societies that try to preserve the status quo (Matsuyama 1992, Rodriguez and Rodrik 2001).

There is a vast body of literature on the effects of openness on growth. In spite of the fact that in general there is evidence that trade liberalization has a positive effect on growth (Dollar 1992, Ben-David 1993, Sachs and Warner 1995a, and Frankel and Romer 1999), there were some weak points that were criticized by Rodriguez and Rodrik (2001): selected indicators were not perfect measures of openness, the results were not robust, etc.

The most recent works take into account these shortcomings, and the emphasis now is more on the role of institutions and country-specific experience. Dollar and Kraay (2002, 2004) find that trade and institutions (measured in form of governance indicators) have a positive impact on both growth, income and poverty. Trade is more important especially in the short run.

Bolaky and Freund (2004) continue analysis of the role of institutions and show that trade does not lead to growth in economies with excessive regulation. This happens because excessive regulation prevents resources moving to more productive sectors and to the most efficient firms. In addition, in highly regulated economies trade may increase in sectors without comparative advantage. Therefore, trade liberalization should be accompanied by regulatory reforms.

Wacziarg and Welch (2003) also find that liberalization is linked to higher volumes of trade, investment and growth. In addition, as a result of analyzing 13 country-case studies, noticeable heterogeneity in the growth response to trade liberalization is revealed. The authors show that political stability has a positive impact on the effect of liberalization on growth. Chang (2005) also presents panel evidence that impact of trade depends on a broad mix of policy, institutions and infrastructure.

There are works that focus on the impact of different factors on trade. For instance, Bougheas et al. (1998), Limao and Vables (2004) analyze effects of infrastructure on transport costs. Wilson et al. (2004) analyze a quantitative impact of trade facilitation by four aspects - ports, customs, regulations, and e-business (which is a proxy for the service sectors of telecommunications and financial intermediation).

In sum, empirical research demonstrates that involvement in international trade relations does matter for development, but the context in which it is placed is extremely important. Volume of trade by itself should be considered cautiously since the structure of trade is more important than its volume from the viewpoint of its possible impact on development. Institutions stand both as catalysts of the impact of trade on development and determinants of trade.

Choice of indicators

Openness measures that provide support to the comparative analysis of openness across countries and time periods, could be either *outcome-based* (showing the actual realization of openness), or *policy-based* (reflecting the possibility for easy exchange provided by policy instruments). Outcome-based measures take into account trade flows of goods, services and capital, while policy-based meas-

ures consider factors essential to effective participation of the country in international trade and capital exchange, such as various market-based institutions.

Most analysts use both kinds of measures, particularly because the exclusive observation of either measure may be misleading. Prasad et al. (2003) give examples of economies that show high policy-based openness, but achieve low openness in outcomes (e.g. remote countries in the case of trade flows) and for countries that were *de jure* closed to financial flows, but *de facto* suffered severe capital outflows. The current section provides examples demonstrating both policy-based and outcome-based openness indicators.

As far as policy-based indicators are concerned, tariff and non-tariff trade barriers would provide a promising indicator of a country's trade policy. However, while data on tariff barriers are usually available, it is difficult to accurately establish the level of non-tariff barriers and quantify them (VENRO 2004).

One index that combines both tariff and non-tariff trade barriers is the still relatively new IMF Trade Restrictiveness Index (TRI) which provides weightings for the various trade barriers. On a ten-point scale, countries with a rating of 1 to 4 are regarded as 'open'. Countries with an index of 5 and 6 pursue a 'moderate' trade policy, while those with an index of 7 to 10 are viewed as 'restrictive'. However, this index also bears a number of weaknesses. For one thing, data has so far only been gathered for the period since 1997. Second, a number of countries are not covered. Third, the IMF concedes that not all aspects of trade policy are addressed. In particular, only some of the non-tariff trade barriers are applied in the calculations. Thus this index is only of limited use in quantitative studies (IMF 2005).

Substantially more methodologically sound is the World Bank Overall Trade Restrictiveness Index (WB-OTRI) that attempts to summarize the effects of both tariff and non-tariff barriers reflected in their combined impact on the affected economy[38]. By capturing the tariff and non-tariff distortions that a country imposes on its import bundle with trade policies, WB-OTRI represents the equivalent uniform tariff of the different policy instruments for a country that would keep its total imports at their observed levels (Kee et al. 2005). At the same time, WB-OTRI relies primarily on UNCTAD's non-tariff barriers data for its analysis. Because of this, it was possible to calculate the OTRI for only about 70 countries using data

[38] The WB-OTRI methodology entails the estimation of import demand elasticities by country and product at the 6-digit level of the Harmonized System (HS) of product classification. Then, an estimate is made of the impact on imports of core NTBs as well as domestic support granted to agriculture. These impact estimates are transformed into price equivalents using the import demand elasticities. The resulting tariff equivalents of NTBs are added to the average tariff rates to produce an overall measure of trade restrictiveness (IMF 2005).

from 2000 or later. Partly due to these data constraints, it is of limited use for international comparisons.

Summing up, it has to be noted that there is no ideal measurement of openness so far. But since empirical literature contains a considerable wealth of different approaches and methods, it is possible to gain insights into the effects of openness and trade on development by viewing the literature on hand as a whole.

Gaps in trade and foreign direct investment

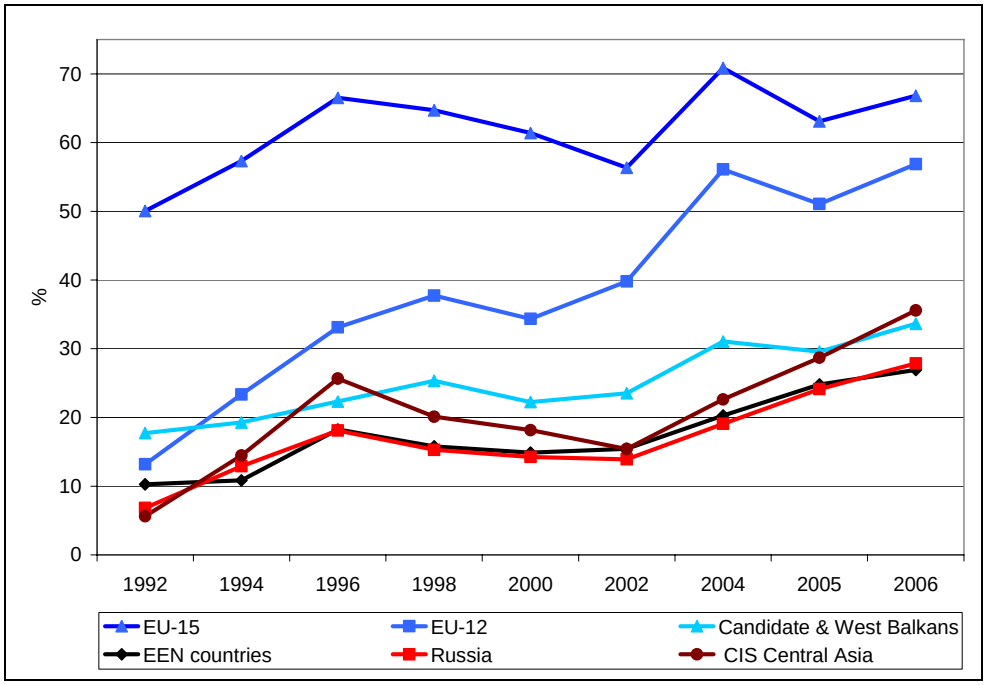
Analysis of the "outcome-based" trade openness indicators can be started from considering a widely used measure of openness: share of exports and imports to GDP (PPP). For cross-country comparisons of trade/GDP ratios to be correct, however, we need to address an ever-present problem of the 'non-traded service bias'. This problem is connected with the tendency that in more developed countries, where production of manufactured goods is more efficient, economic activity is increasingly carried out in the non-tradable services sector, and the price level of services is, as a rule, higher than in the less developed economies. In the analysis of openness, the first of these two problems is usually solved by using only the merchandise export component of total exports in the numerator of the openness index (valued at current exchange rates), while the second one – by using GDP data at purchasing power parity (PPP), rather than at current exchange rates in the denominator of the index. Alcána and Ciccone (2004), who found that international trade has an economically significant and statistically robust positive effect on productivity, called the openness indicator with GDP valued at PPP 'real openness'.

Figure O.1 shows that there is still a significant gap in the ratio of merchandise exports plus imports to GDP between EU15 and other country groups. However, the gap between EU15 and NMS was gradually diminishing since the end of the 1990s and became quite small by 2006. All countries and country groups demonstrated considerable growth in openness during the last decade. Among EENs, Belarus, Moldova and, more recently, Georgia demonstrated the greatest increases in openness during the 2000s, whereas the lowest growth was registered in Armenia. Among Central Asian CIS, Kazakhstan was clearly the best performer, while in the Candidates/West Balkans group Turkey and Serbia demonstrated very high growth rates. Still, all these countries lag far behind the majority of NMS.

There are sizable differences among EEN and other country groups with regards to their trade openness. Although rates of integration into the world trade of EEN on average stay at the same level as in West Balkans, other groups of countries (Candidates and especially NMS) are well ahead. In Trans-Caucasian repub-

lics the level of integration into the world trade, despite growing very rapidly during the last decade, remains considerably low, visibly lower than in potential candidates (excluding Albania). In Russia, despite a rapid growth of oil exports, trade/GDP ratio remains relatively low (27.9 per cent), and no explosive growth could be seen ahead.

Figure O.1. Median value of the ratio of merchandise exports plus imports to GDP PPP, per cent (1992–2006)



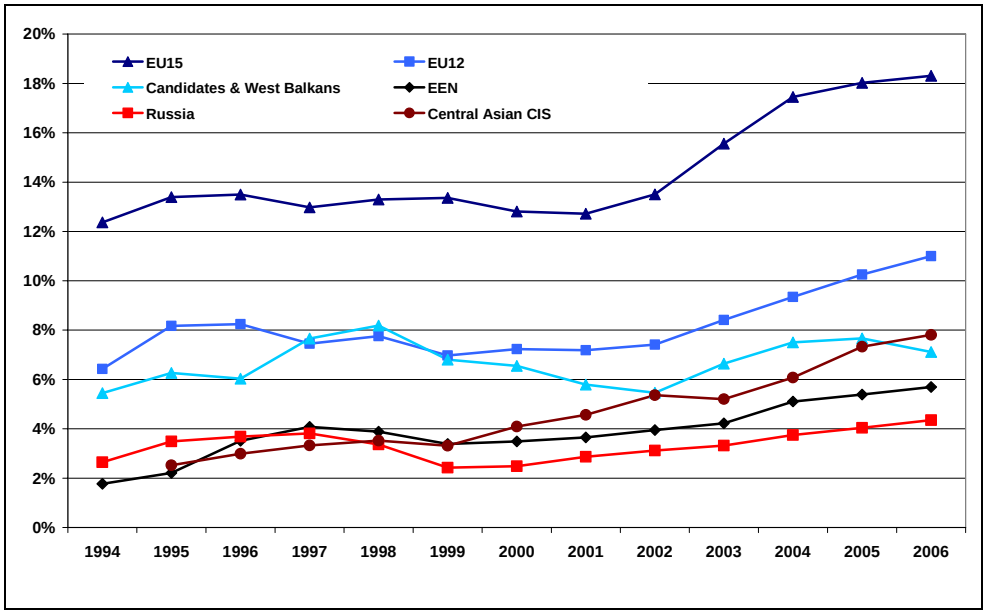
Source: UNCTAD database

The picture with **trade in services** is more blurred compared to merchandise trade. Trade in services is important for consideration, especially for former communist countries, where services industries were given low priority under central planning, since in many cases they were not considered "productive" activity. The services sectors have begun to emerge as a dynamic force in economic growth in an increasing number of countries in the region. During recent years in particular, telecommunications, transportation, and energy services, as well as banking, are examples of services sectors that have become core targets of domestic reform in some countries.

Figure O.2 demonstrates that exports of services have been growing steadily both in Central Asian and EEN countries, but at a much lower rate compared to NMS. The role of services sector remains very low in Russia, where the share of

trade in services to GDP PPP barely exceeds 4 per cent. This is likely due to the fact that services sectors in these countries are burdened by regulation that provides protection from the competitive pressures that accompany exposure to international trade (World Bank 2005b).

Figure O.2. Median value of the ratio of exports and imports of services to GDP PPP, per cent (1992 – 2006)

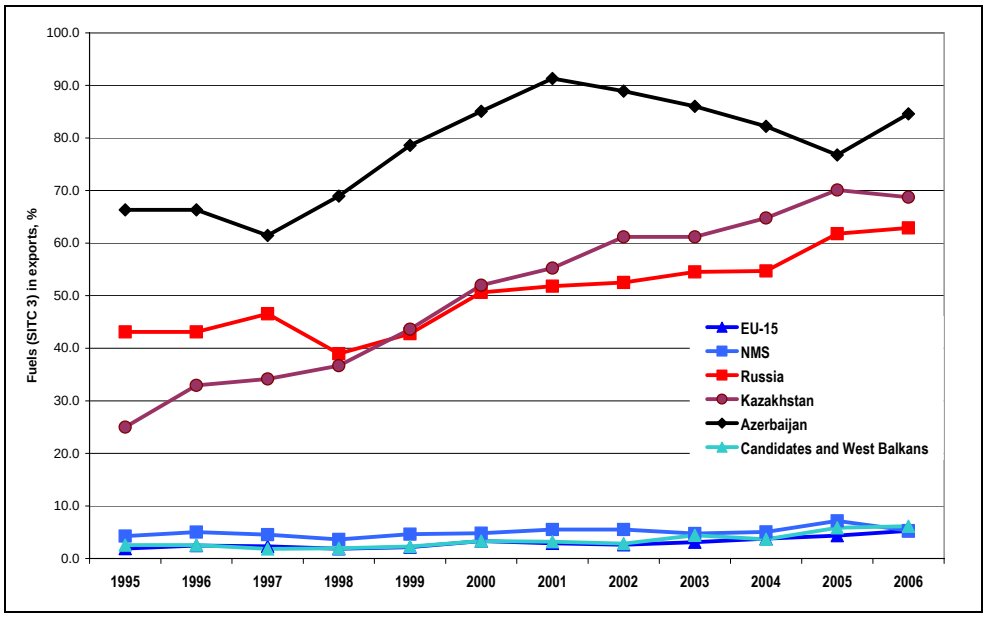


Sources: UNCTAD database, WEO database

In spite of some evidence of deeper integration of EEN, CIS, candidate and West Balkans countries in the world economy in comparison to the beginning of the 1990s, it is important to consider the "quality" of trade flows as it may have crucial effect on the countries' development.

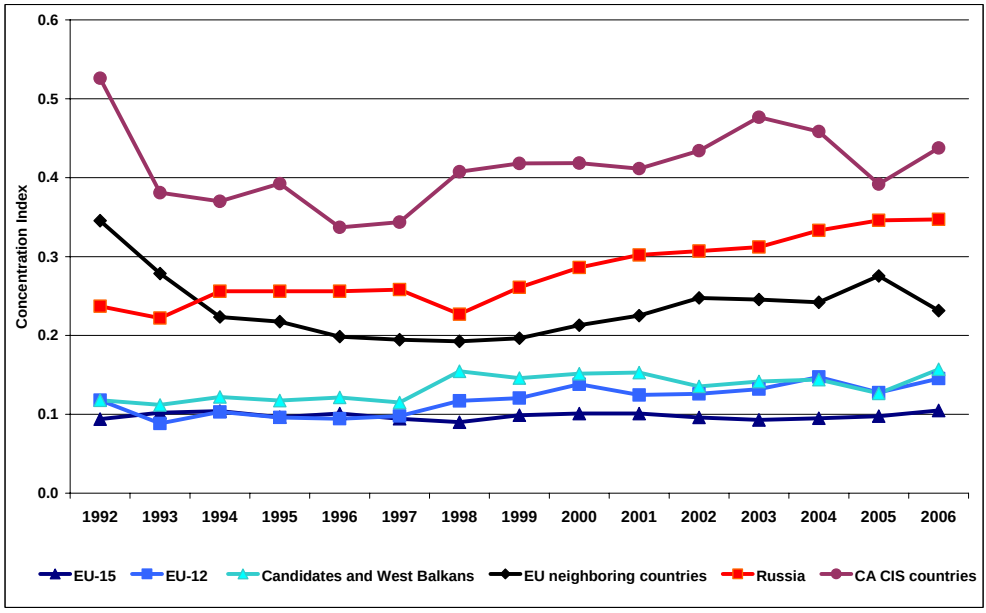
Important information to this end can be obtained from the analysis of **export commodity structure**, namely shares of fuel and high-technology exports in total merchandise exports. This information is presented at Figures O.3 and O.5. The analysis of these proportions demonstrates that there is a heavy reliance on raw materials in the trade structure of Central Asian countries with the value of 42.1 per cent in 2004 (this figure might be higher if Turkmenistan and Uzbekistan are included) and Russia with the value of 50.2 per cent in 2004. Fuel export plays an important role in the trade of some EEN countries too, mainly in case of Azerbaijan (82 per cent in 2004).

Figure O.3. Median share of fuel exports (% of manufactured exports, 1995–2006)



Source: World Development Indicators

Figure O.4. Median concentration index in exports, 1992–2006[39]



Source: UNCTAD database

[39] The higher is index the higher is concentration.

Index of concentration, reflecting the differences in export structure, shows a similar pattern[40]. EEN exports to EU obviously keep to rely on primary products or basic manufacturing. EEN countries generally failed to diversify export products during the recent years: almost in all countries exports remained highly concentrated and tend further to concentrate on a few commodity groups as compared to NMS and Candidate countries. The worst situation is in Central Asian countries and the Russian Federation (see Fig. O.4).

The opposite picture is observed after the analysis of shares of high-technology exports in total manufactured exports of countries (see Fig. O.5)[41]. The gap between EU15 and other countries is huge. The share of high-technology exports in EU15 countries remained about 16 per cent throughout the whole of the period considered. Second best performers – Russia and Central Asian countries – were loosing their positions after 2002. EU12 countries were catching up with them and in 2004 outstripped Central Asian countries.

To provide a more analytically significant description of the existing differences in commodity structure of trade flows one has to refer to factor intensities of the countries' exports and imports which are basically affected by the differences in countries' factor endowments, initial conditions, and levels of development in general. According to the World Bank report (2005b), CIS countries are notable for a higher natural-resource and lower skilled-labor intensity as compared to all other country groups. Moreover, relatively little has changed in this regard over the course of the transition among these countries which have been almost "frozen in time" – as distinct from the NMS and the candidates' economies where there has been a substantial change in the commodity composition and factor intensity of trade (see Fig. O.6). The existing composition and factor intensity of exports put the participation of the CIS countries in the evolving modern international di-

[40] Concentration index reflects the difference between the structure of trade of a given country and the world average. It is calculated using the shares of all three-digit products in a country's exports, based on Herfindahl-Hirschmann index normalized to obtain values ranking from 0 to 1 (maximum concentration).

$$H_j = \frac{\sqrt{\sum_{i=1}^{239}\left(\frac{x_i}{X}\right)^2}}{1-\sqrt{1/239}} - \frac{\sqrt{1/239}}{1-\sqrt{1/239}},$$

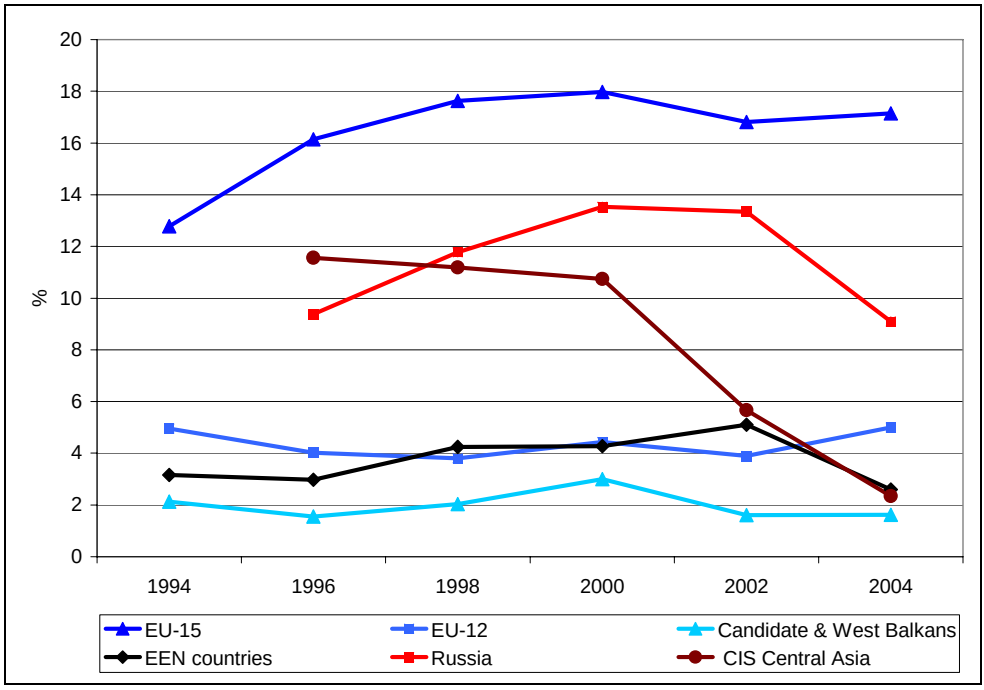
where H_j = country index and X_i = value of exports of product i, 239 = number of products (at the three-digit level of SITC, Revision 2), and

$$X = \sum_{i}^{239} x_i .$$

[41] High-technology exports include products with high R&D intensity, such as aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

vision of labor and their future growth prospects at risk, even if they have assisted these countries during the initial transition period. Skilled-labor-intensive and capital-intensive industries tend to pay higher wages, and growth of exports in these sectors leads to expanded production, an increase in economic growth (World Bank 2005b).

Figure O.5. Median share of high-technology exports (per cent of manufactured exports, 1994–2004)



Source: World Development Indicators[42]

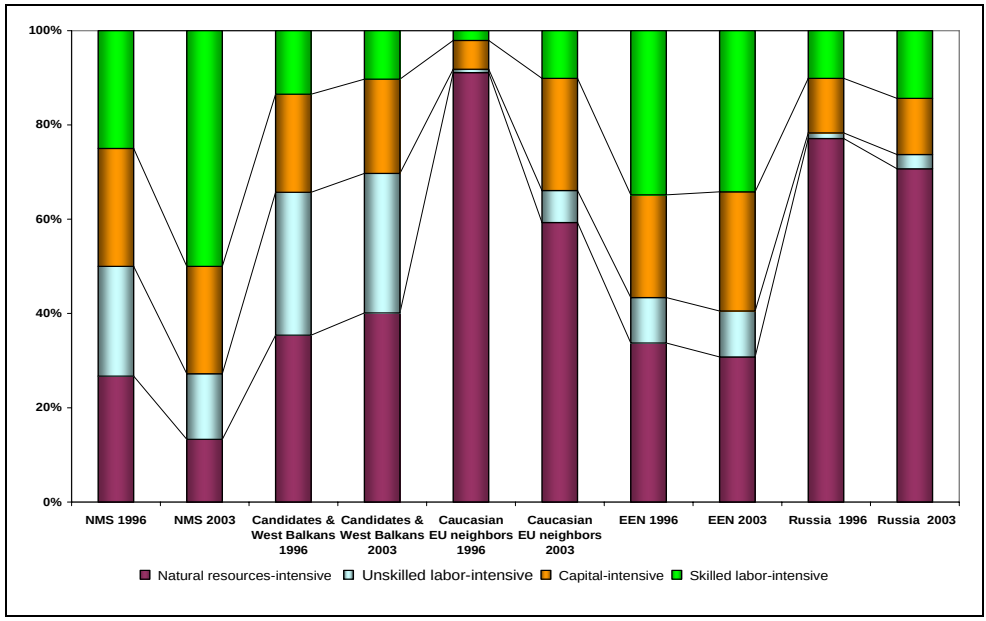
- The geographical concentration of trade would rather be an issue to be omitted within the theme of the development gap if it were not for one important point[43]. The EU share in exports and imports of all groups of countries analyzed has considerably expanded during the past ten years which is easily explained by the end of the Communist era. However, there are substantial differences in the geographic destination of exports across all analyzed country groups. These very schematic changes reflect trends which are analyzed in detail elsewhere. The overall conclusions of these

[42] For Russia and Central Asian countries, the data is available only from 1996.
[43] For a detailed analysis of EU/CIS commodiy and geographic trade patterns, see ENEPO Work-package 3 'Analysis of EU-CIS trade flows'.

studies are the following: A sizeable difference in trade scale between the EU12/Candidates &West Balkans, on the one hand, and the CIS, on the other hand: merchandise trade flows of the former group are almost twice the size of those of the CIS.

- A high degree of trade patterns diversity within the trade blocks: some CIS countries (e.g. Ukraine) are increasing trade with countries outside CIS, while some West Balkans countries (e.g. Serbia) have trade patterns similar to those of CIS members.
- Intraregional trade flows within CIS are more (sub)regionalized and concentrated: the majority of CIS members (but not all) are increasingly trading between themselves.
- Intra-European trade flows of the EU12/Candidates group are considerably more dispersed compared to CIS; still, the majority of these countries are more actively trading between themselves than with CIS members.

Figure O.6. Factor intensity of merchandise exports



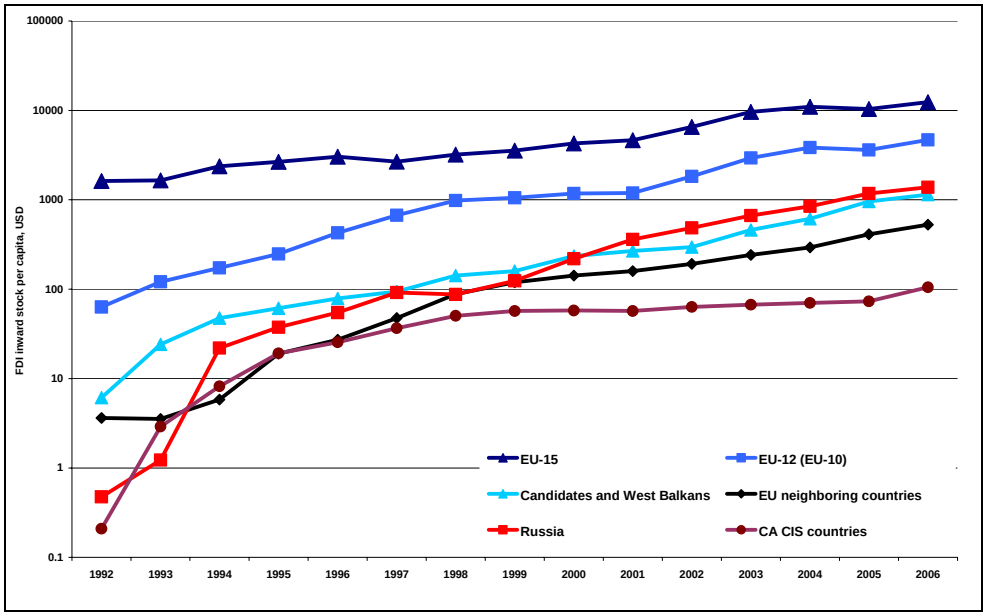
Source: calculated based on World Bank (2005b)

Taken together, this evidence suggests that, despite an increased openness and increased geographic diversification of trade flows throughout the region, a clear trend is emerging towards the bifurcation of the region under analysis into two major trade "poles": the geographic pattern of trade flows is becoming character-

ized by a "Euro-centric" clustering and a "Russia-centric" clustering (World Bank 2005b).

The level of attracted **foreign direct investment** (FDI) per capita is one of the focal indicators of openness. FDI inflows characterize the presence of foreign firms and have an impact on country's participation in international trade. According to the World Bank (2005b), there is empirical evidence that firms with foreign capital are more export-oriented. In general, FDI and country ability to participate in international trade have common determinants. All this makes the consideration of FDI volumes essential in the groups of countries analyzed.

Figure O.7. Median FDI inward stocks per capita, USD



Source: UNCTAD database

Fig. O.7 clearly shows that FDI into transition economies have been constantly rising, but their magnitude and importance remain highly unequal among the country subgroups. The figure also demonstrates how huge is the gap between EU15 and other country groups in FDI inward stocks. Only EU12 countries managed to significantly improve the situation with FDI, but the difference is still very large. EU12 opened their firms and banks to foreign investors, that led to higher levels of investment, know-how and competition (World Bank, 2002). Studies of sources of growth in Eastern Europe for the period 1995-2000 show that FDI stimulated growth. These studies demonstrate that regions with twice as much FDI

than others have almost 6 times higher growth rates (Anos-Casero et al. 2005, Tondl & Vuksic 2003).

There are some slight positive tendencies with respect to FDI stocks in candidate and Western Balkans countries, Russia and EEN countries, but these increases are still not sufficient for closing the gap. Median FDI stocks per capita in Russia and West Balkans group are about ten times smaller compared to EU15, while in EEN and Central Asia these stocks are 4.2 per cent and 0.85 per cent of the EU15 level respectively. Large FDI inflows to some EEN countries reflect the transition to market-led economies, with heavy privatization programs involving sales to foreign investors. In many countries, such as Russia and Azerbaijan, large FDI inflows were driven by the investments in the resource sector (Esanov et al. 2001).

Kinoshita and Campos (2003) demonstrated that the most important determinants of FDI location in 25 CIS and Eastern European countries were institutions and agglomeration economies that override the importance of other economic variables. The region's FDI is also motivated by abundance of natural resources and low labor cost. Poor quality of the bureaucracy is found to be a deterrent to foreign investors as they conceive it as a high transaction cost which directly affects profitability of their investment projects. A similar argument is made with respect to the rule of law, which was also found to be an important determinant of FDI in transition economies. Furthermore, foreign investors prefer transition countries that are more open to trade and with fewer restrictions on FDI as the destinations of their investment. It has also been found that progress on economic reform (external liberalization) plays a large role. Finally, FDI motives vary greatly between non-CIS and CIS countries. In the non-CIS countries that receive FDI mostly in the manufacturing sector, institutions and agglomeration are chief considerations for investors. In the CIS countries that receive FDI mostly in the resource sector, abundance of natural resources and infrastructure are crucial factors (Kinoshita and Campos 2003).

Summing up, the analysis of "outcome-based" indicators of openness gaps reveals that in spite of an overall deeper integration of the considered countries into the world economy, there is still a wide gap between EU-25 and other groups of countries. The situation with the structure of trade is particularly alarming. The analysis shows that exports of CIS and EU neighboring countries is strongly resource-oriented with a low share of high-technology products and with low skilled-labor intensity that put at a serious risk the growth prospects for these countries. The situation in NMS,, candidate countries and West Balkans is somewhat better, and they are closer to catching up with the EU15 compared to other countries considered.

Determinants of openness

Gaps in "openness" between EU15 and other EU and CIS countries are provoked by sound differences in policy-based factors that could be grouped into the three broad categories: trade regime, institutions and logistical support infrastructure.

Trade regime

Trade regime is one of the most obvious factors affecting trade. Among countries considered, the most liberal trade regimes are in WTO members (e.g. Albania, Armenia, Croatia, Georgia, the Kyrgyz Republic, and Moldova). At another extreme are countries with highly protectionist regimes (e.g. Uzbekistan, Turkmenistan and Belarus). Large countries like Russia and Ukraine fall in between.

In several countries considered, trade regimes were severely affected by armed conflicts. For instance, conflicts in Abkhazia, Southern Ossetia and Transdniestria significantly damaged formal trade transactions in Georgia and Moldova accordingly and led to the formation of "black holes" in terms of illegal arms transactions, and smuggling of tobacco, liquor, and oil products, thus resulting in significant trade revenue losses for these countries (World Bank 2004a). The unresolved security issues impose a heavy cost on the three South Caucasus states in terms of forgone or diverted trade. According to a World Bank study (Polyakov 2001), Armenia could double its exports and halve its trade deficit, and Azerbaijan could increase its exports by about 11 per cent, if the economic blockade caused by Nagorny Karabakh conflict were to be lifted.

In non-WTO members of the Region **non-tariff barriers** (NTB)[44] on imports are more common. Ukraine uses its technical standards system as a vehicle for controlling imports into various sectors (World Bank 2004b). Serbia and Montenegro used to have a combination of licensing and quotas on steel imports (EC 2004). Moreover, NTBs are frequently used not just as measures of protection of national economies, but for political pressure as well (e.g. recent cases with banning imports of Georgian and Moldovan wine to Russia related to politically motivated tensions). Importantly, besides formal trade barriers, there exist informal ones significantly hampering bilateral trade between countries both in Europe and

[44] NTB include an array of measures other than high import tariffs employed to restrict imports. Two sets of such measures are (1) direct price influencers, such as export subsidies, exchange rate manipulations, methods of imports valuation, customs surcharges, establishment of minimum import prices, unreasonable standards and inspection procedures, and (2) indirect price influencers, such as import licensing and import quotas.

Central Asia. Many of these barriers result from institutional weaknesses or weak infrastructure, for example in transport or finance[45].

A combined burden of both tariff and non-tariff barriers upon a country's trade regime is captured by the World Bank Overall Trade Restrictiveness Index (WB-OTRI) that is available only for a limited number of countries. A brief examination of the index values (see Table O.1) demonstrates that NMS have on average more liberal tariff policies than EEN economies, and even more liberal import regimes compared to the EU15. Indeed, Estonia and Latvia have some of the most liberal trade regimes in the world. In contrast, trade regimes in the EEN and the West Balkans/Candidates are on average slightly more restrictive. Striking is the fact, however, that maximum index values are observed in Russia, leaving far behind even protectionist (in terms of tariff schedule) Belarus: that obviously reflects both higher than average (and rising) import tariffs[46], and highly restrictive non-tariff barriers, which are in turn indicative of an unpredictable regulatory environment in Russia.

Table O.1. World Bank Overall Trade Restrictiveness Index (2005)

	OTRI (tariff + NTB), all goods		OTRI, tariff only (all goods)	
	2000-2004 avg	2005-2006 latest	2000-2004 avg	2005-2006 latest
EU15 average	9.63	8.67	3.90	4.33
Czech Republic	6.28	8.67	5.68	4.33
Estonia	1.30	8.67	1.00	4.33
Hungary	…	8.67	…	4.33
Latvia	10.82	8.67	2.52	4.33
Lithuania		8.67	…	4.33
Poland	13.96	8.67	11.22	4.33
Slovakia	14.00	8.67	…	4.33
Romania	16.97	17.36	14.38	14.46
Turkey	12.83	11.06	5.73	4.47
Albania	12.12	7.33	11.57	6.50
Belarus	17.79	…	9.82	…
Moldova	6.07	4.81	2.13	2.74
Russia	26.75	25.57	7.96	9.17
Ukraine	9.17	9.85	4.05	3.57
Kazakhstan	16.81	…	9.87	…

Note: the 15 old EU-members (both in 2000-04 and in 2005-06) and EU10 (in 2005-06) are considered as a single economy, and only their extra-EU trade is taken into account
Source: World Bank World Trade Indicators

[45] For more information of trade and non-trade barriers existing in the considered countries one may refer to Asian Development Bank (2006) and World Bank (2005b).

[46] Recent authoritative expert estimates (see Shepotylo and Tarr 2007) that take fully into account specific tariffs suggest that the average tariff in Russia has increased between 2001 and 2003 from about 11.5% to between 13% and 14.5% and it has held steady in 2004 and 2005.

Institutions

In spite of the fact that in many considered countries trade regimes are quite liberal, trade performance there is far from attaining its potential. The empirical research conducted by the World Bank (2005b) shows that CIS countries trade broadly in line with their current potential, but the countries of South Eastern Europe under-trade significantly that opens a possibility to catch up. This can be explained by a weak market and trade-related institutions, as well as by poor infrastructure. "Outcome-based" gaps arise from institutional characteristics that form business climate. Among the most important of them are rule of law, bureaucratic efficiency, enforcement of law and property rights, etc. More specifically, these are closelyrelated to border-crossing procedures and administrative rules and have enormous impact on the costs of doing business and trade logistics costs in particular (World Bank 2005b, Shortall 2007). Wilson, Mann, and Otsuki (2004) show that firms in different groups of countries consider regulatory requirements as a key factor in export performance (for details and comparisons, see section V.6).

Serious institutional weaknesses also exist, especially in CIS countries, in particular areas critical to international trade, such as availability of trade finance and insurance, or the transparency of customs procedures. In Bosnia and Herzegovina, Georgia, Moldova, Kazakhstan and many other CIS countries, customs are not able to control large parts of the border. The physical infrastructure at customs posts is weak (for example, in the Caucasus) and probably would not be able to cope with significant increases in trade (World Bank 2005b).

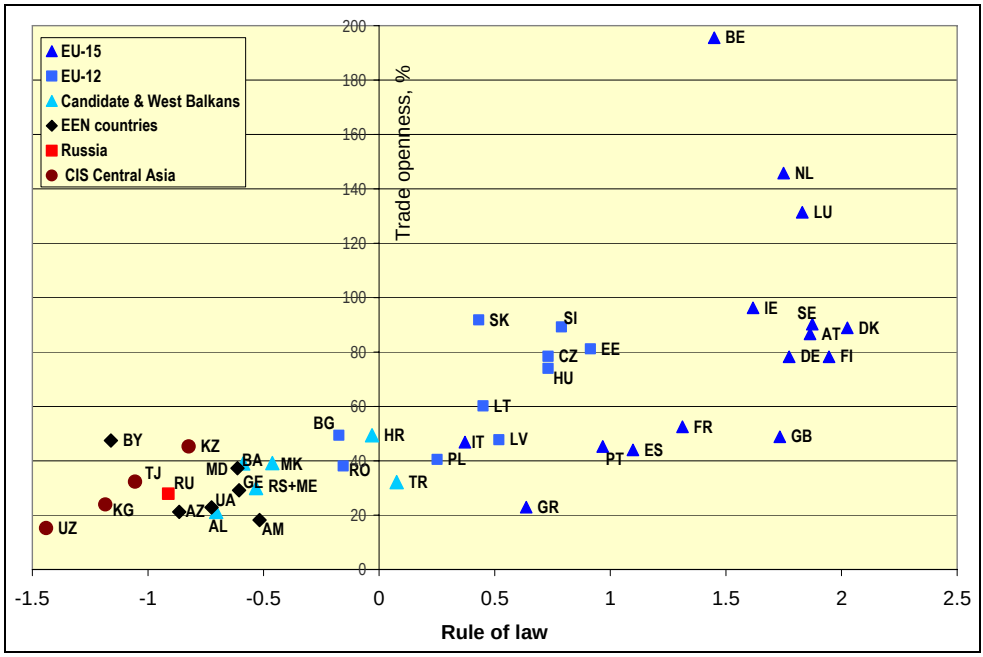
In many cases these difficulties are compounded by serious internal management problems. Customs procedures across the CIS are characterized by overreliance on physical inspection; they often change, leaving room for arbitrary interpretation and application (Molnar & Ojala 2003). Some observers even claim the Iron Curtain has been replaced by a curtain of red tape. There is widespread confusion and a lack of clarity about how customs rules should be applied, and interpretations of the rules can vary from one customs point to another, even within the same city! (Kemp 1998).

In Azerbaijan, there are problems of coordination and communication among the different agencies involved in clearance of imported merchandise. In a number of CIS countries, approvals by the standards or health agencies take a long time and sometimes rules are arbitrarily enforced. In Kyrgyz Republic, approvals are needed from different agencies, which are physically situated in different parts of the country. Dispute settlement procedures are lengthy and nontransparent, leading participants to resort to bribes in an effort to resolve them (World Bank 2005b). It

has been repeatedly recognized by Russian authorities that corruption among customs officers presents a serious problem impeding the functioning of the customs system: in 2005 alone, the internal security units of the Federal customs service instituted over 530 criminal proceedings against customs officials (Federal Customs Service 2006).

For checking the assumption about a positive relationship between the quality of institutions and the degree of openness, a simple scattering of the rule of law indicator on the ratio of merchandise trade to GDP PPP could be useful. Figure O.8 provides an evidence of a positive relationship between these two indicators. All of EU15 and NMS countries, except Bulgaria and Romania, are located in the second right quadrant, while other countries are mainly in the left first quadrant with negative scores on rule of law.

Figure O.8. Rule of law indicator and merchandise trade to GDP PPP, 2006



Sources: UNCTAD database, World Bank Institute's Governance Indicators

Infrastructure and logistics

Finally, an important group of factors influencing integration into global markets is trade facilitation infrastructure. In this context, it includes trade related transport and communication facilities, as well as modern mechanisms in logistical operations which are the core elements affecting transportation costs. Transport facilities include development of railways, roads, ports, and air transport, while

international logistics encompass an array of actions – from transportation, consolidation of cargo, warehousing, and border clearance to in-country distribution and payment systems, including such actors as freight forwarders, express carriers, third-party logistics providers, customs brokers, warehousing managers and other links of supply chain.

In many of the countries of the region under study, especially in Western Balkans and the CIS, the transport infrastructure, especially poor road and rail transport, is a major impediment to expanded trade. However, this is not so much due to the road and rail coverage, but to the poor quality of the network as a result of the maintenance backlogs.

The transport network is relatively extensive, but it was developed to meet the industrial and military needs of the FSU. The railways and pipelines, in particular, were designed to take raw materials to distant processing plants, and not to local destinations. The road network was designed with a strategic focus on connecting the Republics with Moscow and through the capitals with the neighboring Republic. As a result, there are often no straightforward connections between locations in the same country. In Central Asia, for example road and rail links often criss-cross existing borders, aggravated by newly introduced cumbersome immigration procedures (Molnar & Ojala 2003). Despite the generally impressive quantities of infrastructure, the quality of the stock is rather poor. The weak structure of road pavements is aggravated by inadequate maintenance due to the lack of funding. The trucking fleet and rolling stock are also aging, obsolete and not being renewed.

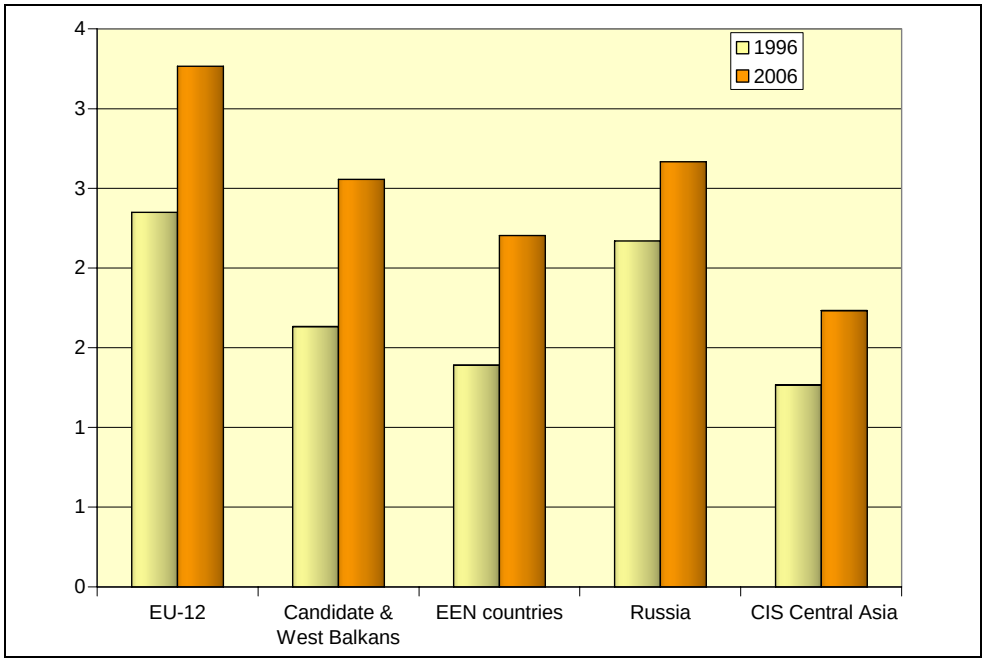
The currently under-developed logistics services, as well as the low performance of transport operators and the lack of the conducive environment for the development of multimodal transport are as much a barrier to international transport as the physical infrastructure impediments. Freight charges are frequently highly subsidized, resulting in poor financial condition of transport enterprises (which in many cases continue to be publicly owned) (World Bank 2005b). Many lower-income CIS countries (Southern Caucasus, Kyrgyzstan, Tajikistan and Moldova) have small and fragmented transport markets that seldom can enjoy scale economies in their operations. Moreover, a landlocked position of the Central Asian CIS puts them at a severe geographical and transportation disadvantage. These problems are exacerbated by corruption, multiple unofficial and semi-official fees and payments, leading to almost prohibitive additional transportation costs[47].

[47] Unofficial fees along a transport route are often collected not only in connection with crossing the border, but they also appear during transit within the country (e.g. in Kazakhstan on the "borders" of the regions). Traffic police can be a particular impediment as international trucks are often considered to be their 'cash cows'. Transit traffic by road is forced by the customs to use convoys, which is costly and time-consuming (mandatory use of parking lots and services, escort etc.) (Molnar & Ojala 2003).

As a result, in the lower-income CIS countries transport costs are on average at least three times higher compared to the EU15. Depending on the world market prices, total transportation costs (official and informal) in these countries may amount up to 50 percent of the value of the goods, which far exceeds comparable costs of the main competitors outside CIS. Especially for low-value commodities, such as agricultural products, transport to international markets becomes virtually impossible. Because of high transport costs, a ton of grain from the US delivered to Novorossiysk is cheaper than a ton of grain from Kazakhstan (Molnar & Ojala 2003). Overall, the high cost of transport dramatically reduces international competitiveness of goods from the lower-income CIS countries and often makes their exports prohibitively expensive.

In spite of some positive trends in reforming the infrastructure sector (especially in candidate and West Balkans countries), there still is a significant gap between the EU and EEN/Central Asian countries, as indicated by an average EBRD index of infrastructural reforms[48] (Fig. O.9). The analysis of infrastructural reforms' progress over time demonstrates that in spite of the positive tendencies in all groups, CIS countries are still far below the level of NMS.

Figure O.9. Average indicator of infrastructural reforms in 1996 and 2006



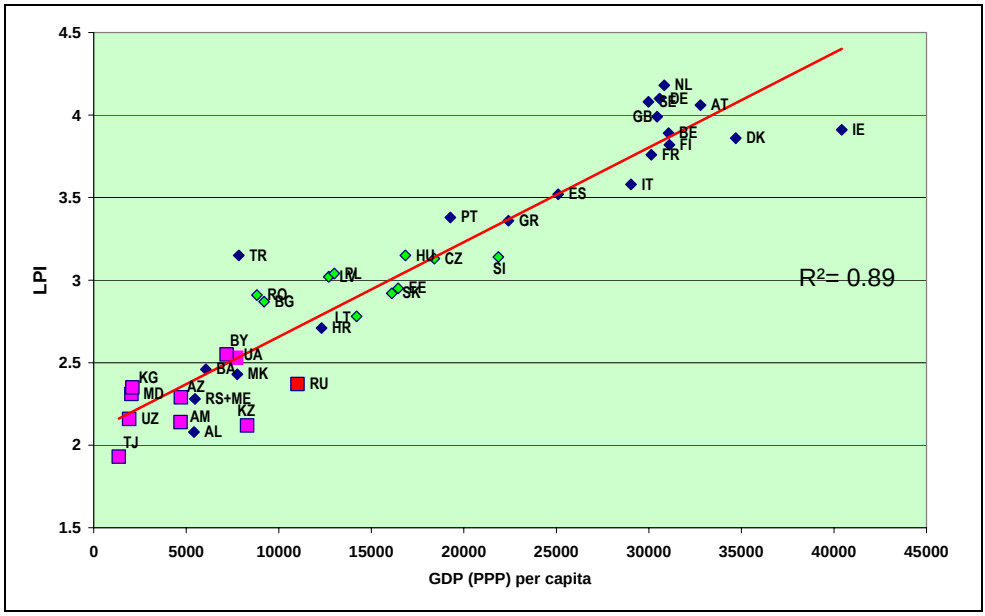
Source: EBRD

[48]Calculated as an average between EBRD indicators of reforms in communications, railways and roads. Score 4 reflects best performance.

Another integral composite index measuring both institutions' performance and infrastructural developments is the new Logistics Performance Index (LPI) developed by the World Bank. LPI uses a comprehensive approach to supply-chain performance to measure some of the critical factors of trade logistics performance, including the quality of infrastructure and logistics services, the security of property from theft and looting, the transparency of government procedures, macroeconomic conditions, and the underlying strength of institutions (Arvis et al. 2007)[49].

Based on surveys of more than 800 logistic operators worldwide, LPI represents an average of the country scores on the seven key dimensions: (1) efficiency and effectiveness of the clearance process by customs and other border control agencies; (2) quality of transport and IT infrastructure for logistics; (3) ease and affordability of arranging shipments; (4) competence in the local logistics industry (e.g., transport operators, customs brokers); (5) ability to track and trace shipments; (6) domestic logistics costs (e.g., local transportation, terminal handling, warehousing); and (7) timeliness of shipments in reaching destination. The country scores demonstrate their comparative performance on a scale from 1 to 5.

Figure O.10. Logistics Performance Index and GDP (PPP) per capita (2005)



Source: World Bank LPI database

[49] The index is constructed using the Principal Component Analysis (PCA) method in order to improve the confidence intervals.

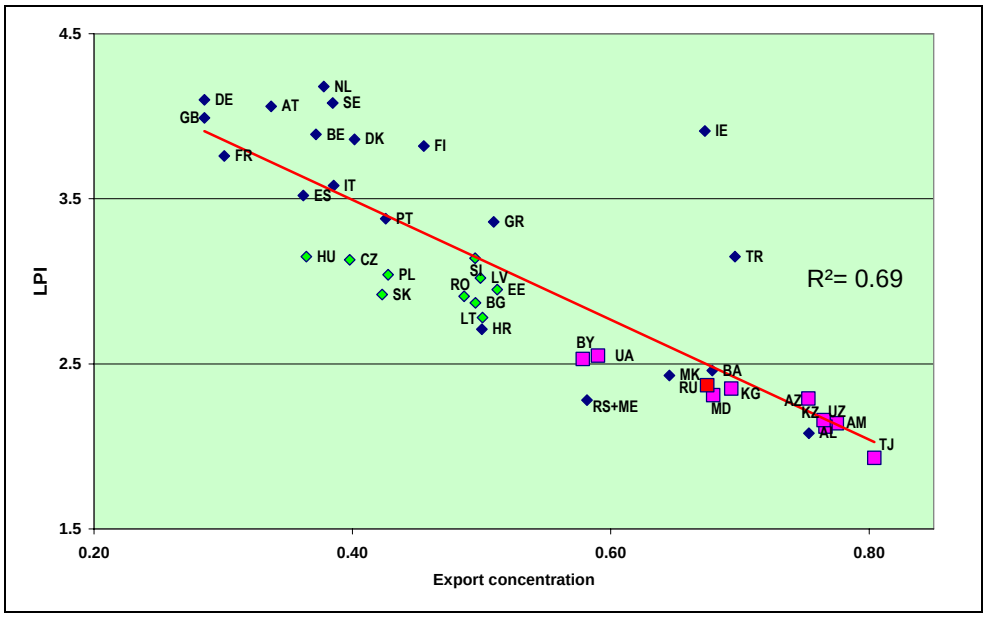
Not unexpectedly, there is a very strong correlation between logistics performance and per capita GDP (Fig. O.10): poorer countries tend to perform worse at all links of the supply chain – from customs procedures, logistics costs, and infrastructure quality to the ability to track shipments and timeliness in reaching destination. The figure also demonstrates the scale of the 'logistics gap' between the top performers (EU15) and the low-income landlocked Central Asian CIS which are among the most logistically constrained in the world[50]. They suffer not only from geographical disadvantages resulting in high transport costs and delays but also from limited access to competitive markets for logistics services and dependence upon the performance of other transit countries (Arvis et al. 2007). The NMS LPI scores are on average about one point lower compared to EU15, while exceeding those of EEN/Russia and of West Balkans by 0.5 – 1.0 points.

The LPI scores also point to noteworthy differences in logistics performance across several comparable countries at similar levels of development. Overachievers and underachievers can be identified by whether they exhibit a positive or negative LPI gap compared with their potential, extrapolated from their GDP per capita (Fig. O.10). Among less developed countries of the region, Turkey which is experiencing economic growth led by manufactured exports, clearly stands out as a logistics overachiever. On the other hand, Russia and Kazakhstan, as most heavily relying on raw materials and fuel exports, tend to underperform significantly in terms of logistics compared to Romania and Bulgaria, and even to Belarus and Ukraine. One reason for this may be the relative absence in these countries of incentives and pressure from the private sector to implement institutional reforms for trade and transport – reflecting the dominance of oil and raw materials in their exports.

Moreover, countries doing fairly well in logistics are also likely to do well in growth, competitiveness, export diversification, and trade expansion (Arvis et al. 2007). To provide an example, a scatter of LPI scores across export concentration index scores (Fig. O.11) demonstrates that countries ranking highly on the LPI tend to have more diversified exports. Our sample of countries is clearly divided into three clusters that broadly correspond to the three major country groups – EU15, NMS and West Balkans/EEN/Russia/CA CIS, with Croatia very closer to NMS in terms of both LPI and export concentration, and Turkey – in terms of LPI.

[50] The difference in LPI points between the top performer in our sample (Netherlands) and the worst performer (Tajikistan) exceeds 2.2. An interpretation of this figure into performance outcome would imply about two additional weeks for getting imports from the port to a firm's warehouse and at least an additional week for exports. It also implies that a shipment is eleven times more likely to be subject to a physical inspection at entry (Arvis et al. 2007).

Figure O.11. Logistics Performance Index and Export Concentration Index (2005)



Sources: World Bank LPI database, UNCTAD statistical database

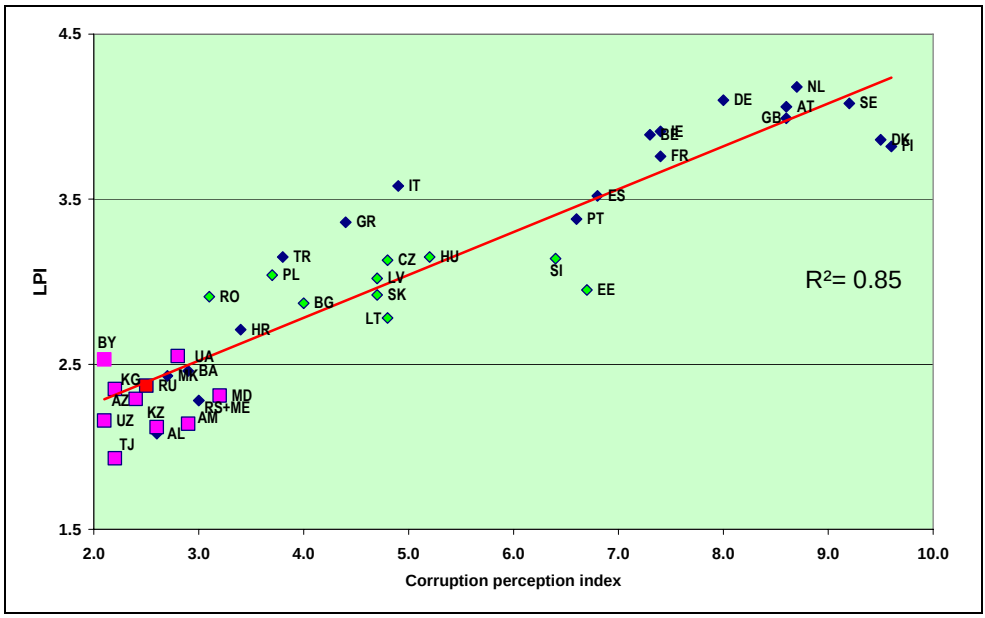
Among many factors determining logistics performance (quality of infrastructure, competence of private and public logistics service providers, efficiency of customs clearance, reliability of supply chains, etc.*)*, broader policy and institutional dimensions, including the overall business environment, the quality of regulation for logistics services, and most importantly, overall governance, stand out as critical issues affecting a country's ability to integrate into global markets.

The transparency of government procurement, the security of property, and the underlying strength of institutions are vital for logistics performance. Unsurprisingly, there is a very strong correlation between logistical performance and the degree of corruption (Fig. O.12), indicating that the less perceived corruption there is in a country, the easier it is to trade and arrange the logistical practicalities with that country. More to that, poor infrastructural and logistical performance are often being replaced by informal arrangements thus stimulating various forms of corruption.

Summing up, during the last decade 27 "transition" countries of Central and Eastern Europe, and CIS became significantly integrated into the world economy. However, liberalizing formal trade policies was not sufficient to close a significant gap between EU15 and other European and CIS countries in openness, measured as 'trade openness" and attraction of foreign investment. The analysis revealed

significant problems in terms of infrastructure and institutions which have a significant effect on trade potential and on how integration into world markets affects development. Therefore, the establishment of effective market-based institutions conducive to sustaining favorable business climate and improving/creation of trade facilitation infrastructure should be an issue on the political and economic agenda of the transition countries.

Figure O.12. Logistics Performance and Corruption Perception Index



Sources: World Bank LPI database; Transparency International

V.5. Gaps in environmental performance

The state of the environment in the CEE and EEN countries is to a great extent affected by the common challenges these countries are facing, including inter alia: persistence of inefficient polluting production structures; relatively extensive but deteriorated environmental infrastructure; unenforceable regulations; enforcement systems focused on punitive actions; a culture of top-down environmental management (OECD 2005).

The geographical region analyzed is far from being homogeneous. Countries differ in natural capital endowments, degree of urbanization, economic structure and in their capacity to respond to environmental issues. In the more urbanized

CEE countries, pollution issues are generally more important, while in the poorer countries, like Azerbaijan[51] or Moldova, natural resources management linked to the productivity of agriculture tends to be more prominent. While assessing specific differences in the state of the environment and environmental management of the country groups analyzed we should take into consideration that, on the one hand, the more developed the country is the greater environmental pressure it usually produces (remembering about large variations in per capita income). On the other hand, common sense and recent studies prove that increased wealth is a prerequisite for environmental improvements (Grossman and Krueger 1995). Several empirical studies have likewise shown that wealth is an important factor in explaining environmental policy results, but not alone determinative of environmental policy (Esty and Porter 2005).

In theory at least, the transition process is consistent with an overall improvement in environmental quality[52]. The above conclusion would most likely hold in the very long run (Vukina et al. 1999). However, in the short- and medium-run, the consequences of transition are far from being obvious. Major closely interrelated current trends in the state of the environment and environmental management in the CEE and EEN countries, identified by scholars and international experts, could be summarized as follows:

1. Pollution (and environmental pressure in general) has sharply decreased in most CEE/NIS because of decline of traditional industrial output (scale effect). The scale effect dominated over composition effects (a shift towards more/less polluting industries) in all countries for virtually all pollutants. The magnitude of this effect, however, is varied: in some countries (e.g. Russia and Ukraine) pollution was not reduced proportionately to the decrease in GDP, while in most CEE countries pollution continued to decrease even after the economic growth resumed (Golub et al. 2003).
2. The new manufacturing specialization varies a lot by country, and no clear general pattern on transition and pollution can be easily identified (composition effect). In many countries, resources have been transferred from

[51] An emerging important environmental issue in Azerbaijan is that of pollution of the Caspian Sea related to developing oil and gas production on the Caspian shelf and its impact upon the valuable marine biological resources.

[52] Attempting to predict environmental consequences of a country's transition to a market economy, one can start with a standard categorization of pollution as an externality. This particular type of market failure can be mainly attributed to the absence of clearly specified property rights over different environmental media. Since centrally planned economies were characterized by a virtual absence of markets, the transition from a centrally planned to a market economy could be interpreted as a movement from a domain of more (complete) market failure to a domain of less market failure (Pearce and Warford, 1993). .

heavy manufacturing industries (iron and steel) towards lighter industries and less polluting sectors (food, beverage and tobacco products)[53]. Despite these heterogeneous patterns, two differential tendencies could be identified:

- a trend towards cleaner manufacturing (in Armenia, Hungary, Macedonia, Poland, and to a lesser extent Slovenia) that shows consistent environmental improvements in the composition of manufacturing output with respect to most pollution emission types, except for VOC and BOD;
- a shift towards dirtier sectors based on heavy manufacturing (Azerbaijan, Bulgaria, Kyrgyzstan, Latvia, Slovakia, and Ukraine). For these countries, the compositional changes of manufacturing output were mostly environmentally harmful (Vukina et al. 1999).

3. In several countries market reforms driving enterprise restructuring and privatization had a beneficial effect on reducing the energy consumption per dollar of GDP and pollution per unit of production (Hungary, Latvia, Poland, Armenia, Belarus). In other countries that expanded their energy and/or petroleum-refining activities, energy and pollution intensities of their industries have remained relatively stable or even increased (e.g. Russia, Azerbaijan, Bulgaria). This was the result of the two opposite and mutually canceling trends: (a) increasing shares of pollution-intensive sectors such as metal smelting and oil production vs. less pollution intensive manufacturing and (b) decline in pollution intensities within several industrial sectors (Cherp et al. 2003).
4. In some countries of the region, there is a legacy of soil contaminated by heavy metals and stockpiles of pesticides and hazardous toxic waste; fine particulate matter and lead are the main pollutants, and transport is responsible for up to 70 per cent of emissions. Emission levels of fine particulate matter are not being monitored at present, but leaded gasoline has been phased out in five EEN countries and in Russia (OECD 2005).
5. Evident reduction of environmental pressures was accompanied by a budgetary crisis that affected the capacity to maintain environmental infrastructure, and induced environment agencies to focus on raising revenue rather than on changing the enterprises' behavior.

[53] These compositional changes towards lighter industries have been accompanied by increases in biochemical oxygen demand (BOD) and volatile organic compounds (VOC) emissions, but decreases in bio-accumulative emissions (e.g. toxic metals) released in soil and air.

6. In NMS, the desire to join the European Union acted as a powerful impetus for environmental improvement and adaptation of the Union's strict environmental standards. On the other hand, many CIS countries still have limited access to international experience on environmental management outside the region and place low priority to environmental issues in the political agenda. Environmental authorities have weakened considerably vis-à-vis powerful industrial interests. The regulatory framework is still poorly developed, municipalities cannot afford the required investments, and there are obstacles to inter-municipal co-operation. Likewise, public has generally lost interest to environmental issues, and these stay at the bottom of the public list of priorities, overshadowed by other more important concerns (OECD 2005).

Selected Indicators

To quantify the existing gaps in the environmental dimension, we have selected **Environmental Sustainability Index** (ESI) that provides a composite profile of national environmental stewardship based on a compilation of 21 indicators that derive from 76 underlying data sets for 146 countries (Esty et al. 2005). The 21 indicators are compiled into five constituent components of the ESI:

- Environmental Systems,
- Reducing Environmental Stresses,
- Reducing Human Vulnerability to Environmental Stresses,
- Societal and Institutional Capacity to Respond to Environmental Challenges,
- Global Stewardship.

These components, as well as values and rankings of the ESI itself provide a clear picture of natural resource endowments, past and present pollution levels, environmental management efforts, and the capacity of a society to improve its environmental performance.

To assess the quality of environmental systems in the countries analyzed, we have selected the two sets of composite indicators[54] reflecting environmental issues important for most countries under review:

[54] For detals on methodology for standardization and transformation of the raw variables underlying these indicatios, as well as their aggregation and weighting, see Esty et al. (2005), Appendix A 'Methodology'.

- *Air Quality (SYS_AIR) indicator* integrating the following variables: Urban population weighted NO2 concentration; Urban population weighted SO2 concentration; Urban population weighted Total Suspended Particulates (TSP) concentration; Indoor air pollution from solid fuel use.
- *Water Quality (SYS_WQL) indicator* integrating the following variables: Dissolved oxygen concentration, Electrical conductivity, Phosphorus concentration, Suspended solids.

The other two indicators reflect efforts undertaken by countries to reduce environmental stress:

- *Reducing Air Pollution (STR_AIR)* integrating the following variables: Anthropogenic NOx emissions per populated land area; Anthropogenic SO2 emissions per populated land area; Anthropogenic volatile organic compounds (VOC) emissions per populated land area; Coal consumption per populated land area; and Vehicles in use per populated land area.
- *Reducing Water Stress (STR_WAT)* integrating the following variables: Industrial organic water pollutant (BOD) emissions per available freshwater; Fertilizer consumption per hectare of arable land; Pesticide consumption per hectare of arable land; Percentage of country under severe water stress.

Main gaps revealed

The two selected variables reflecting the degree of environmental stress show considerable differences across countries and groups of countries. The regression of the two variables' scores on GDP (PPP) per capita provides an illustration of the relative position of different countries with regard to environmental quality and income (see Figs. E.1 – E.2).

As Fig. E.1 suggests, water quality is positively correlated with per capita income, and almost 1/3 of the variance of the water quality indicator is accounted for by per capita GDP. At the same time, some countries (notably Russia, as well as Estonia and Slovenia) perform much better in terms of water quality than their per capita income would suggest. On the other hand, several EEN (Azerbaijan, Ukraine, and Moldova) and candidate (Turkey and Serbia) countries fall well below the regression line – indicating sub-par performance given their level of wealth. Most probably, these striking gaps are accounted for not only by variance in the degree of pollution combating efforts, but rather by natural differences in abundance (shortage) of water resources and correspondingly in the assimilative capacity of water environment.

Figure E.1. Regression of Water Quality indicator (SYS_WQL) on GDP (PPP) per capita

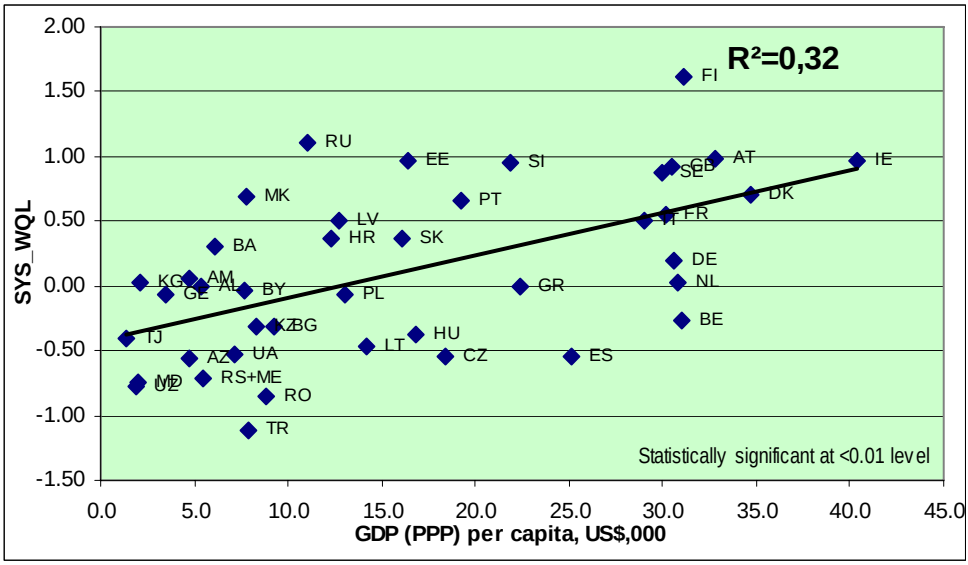


Figure E.2. Regression of Air Quality indicator (SYS_AIR)on GDP (PPP) per capita

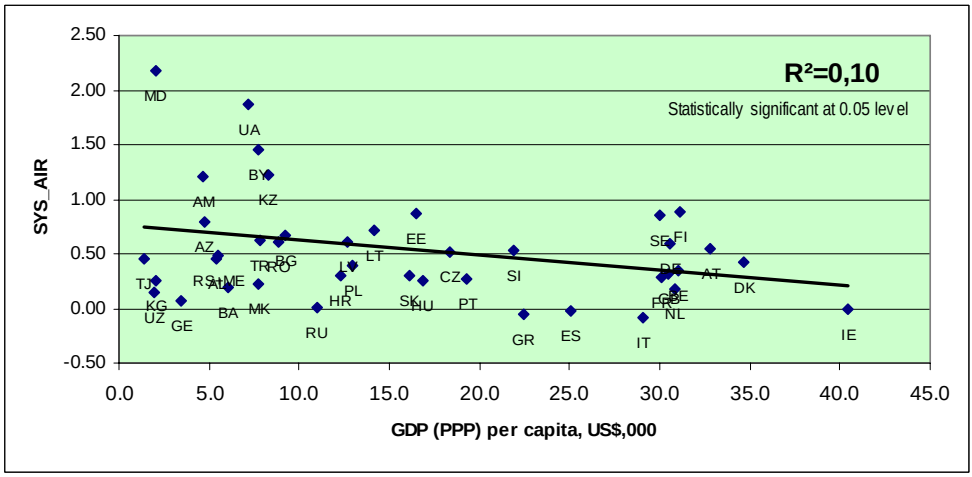
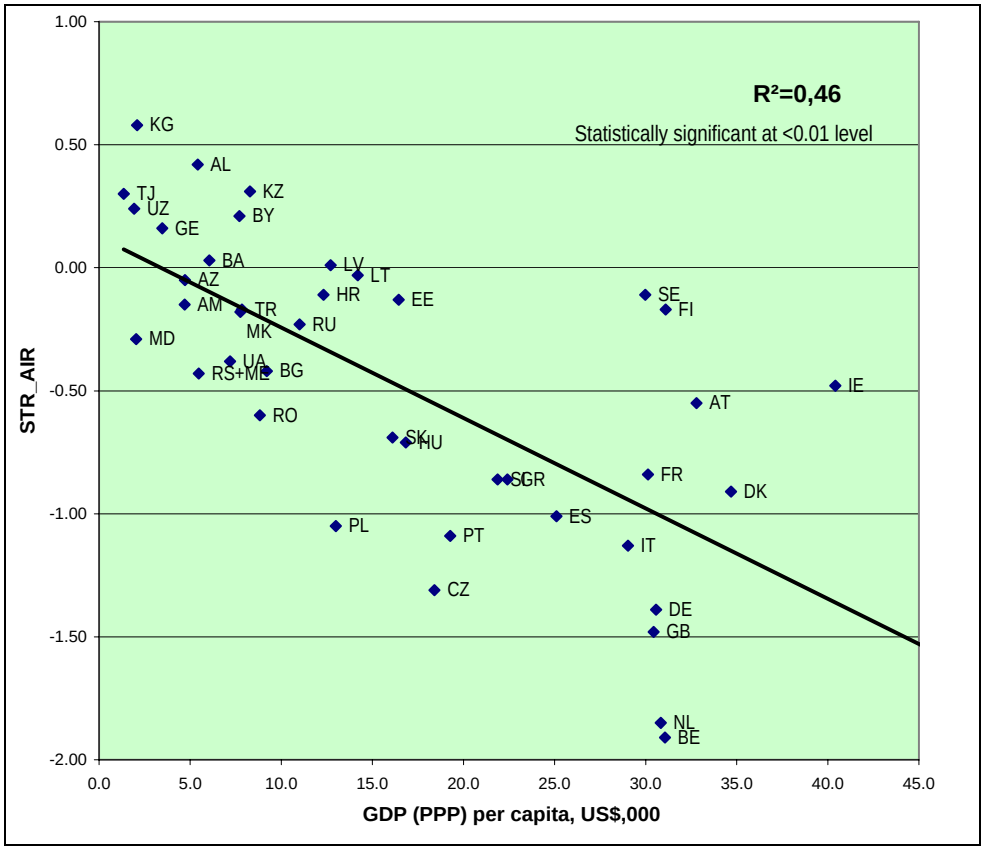


Fig. E.2 illustrates the case when no distinct relationship could be traced between the two variables – income and air pollution indicators. It is evident, however, that the state of atmospheric environment tends to be worse in the poorer FSU countries (Georgia, Kyrgyzstan, Uzbekistan) and lower middle income candidate countries (Turkey, Albania, Bosnia, etc.) – with some notable exceptions both on the positive (Moldova) and negative (Russia) sides.

Figure E.3. Regression of Reducing Air Pollution (STR_AIR) indicator on GDP (PPP) per capita

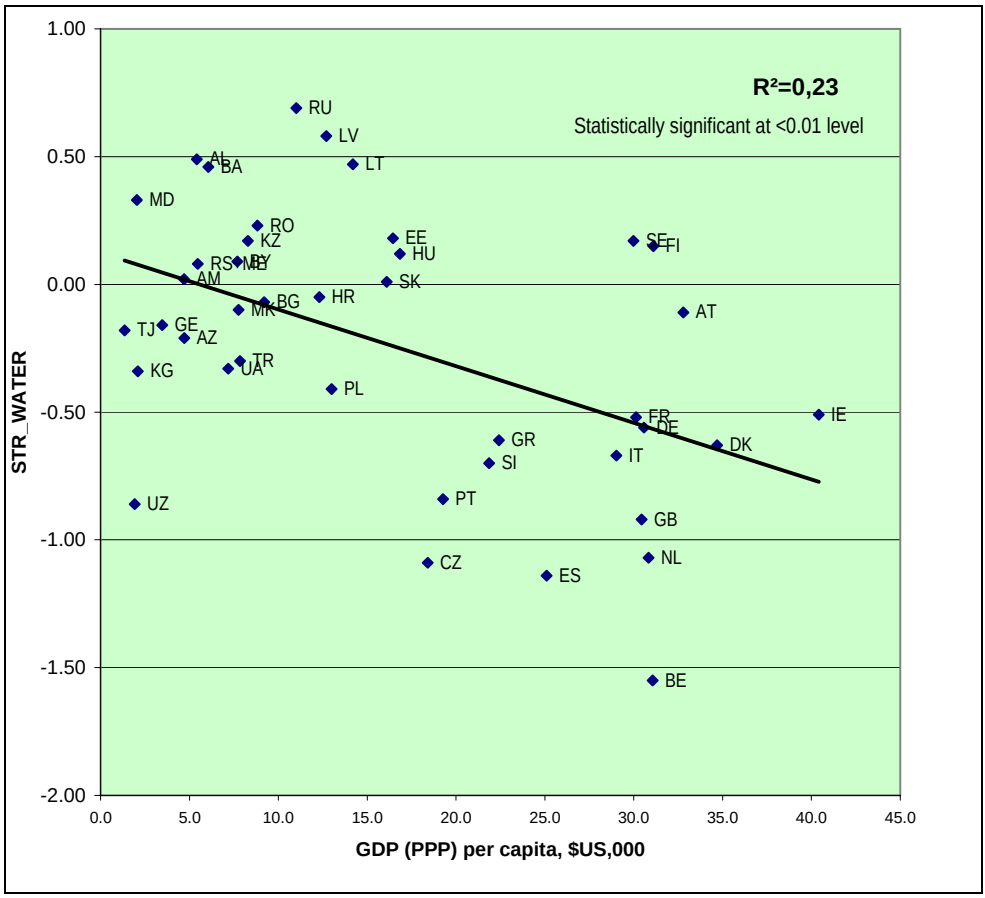


Figures E.3 and E.4 exemplify the cases with a more or less pronounced inverse statistical relationship between wealth and environmental results. This correlation most probably stems from the nature of indicators themselves which are based on emissions (discharges) per unit of land area or volume of freshwater available. Since wealthier countries (EU15) tend to have much higher population (and economy) densities and lower water resources availability compared to their Eastern neighbors, even substantially decreased emissions could still result in low indicator scores. This is especially true in the case of air emissions, the major sources of which (automobiles and energy production) are to a much greater extent associated with GDP per capita in comparison to water discharges that mostly originate as a result of agricultural activities.

The above figures reflect the fact that the EEN countries do not necessarily lag behind EU15 or NMS in environmental results, primarily due to their lower population densities and higher environmental capacities. This observation, however,

would probably not hold when we move to a lower (regional, subregional) level of generalization, since well-known pollution "hot spots" are highly concentrated in several industrial regions of FSU countries.

Figure E.4. Regression of Reducing Water Stress indicator (STR_WATER) on GDP (PPP) per capita



The composite index (ESI) score *per se* quantifies the likelihood that a country will be able to preserve valuable environmental resources effectively over the period of several decades. It enables us to make conclusions regarding and to compare the countries' potential to avoid major environmental deterioration. It is worth noting that ESI scores for the countries analyzed are positively (closer than in the world in general) correlated with GDP per capita (see Fig. E.5). This result suggests that, overall, low incomes per capita do not tend to stimulate environmental performance; on the contrary, high-income countries tend to surpass low-

income ones in this respect by investing more in pollution control and other environmental amenities.

Figure E.5. Regression of ESI values on GDP (PPP) per capita

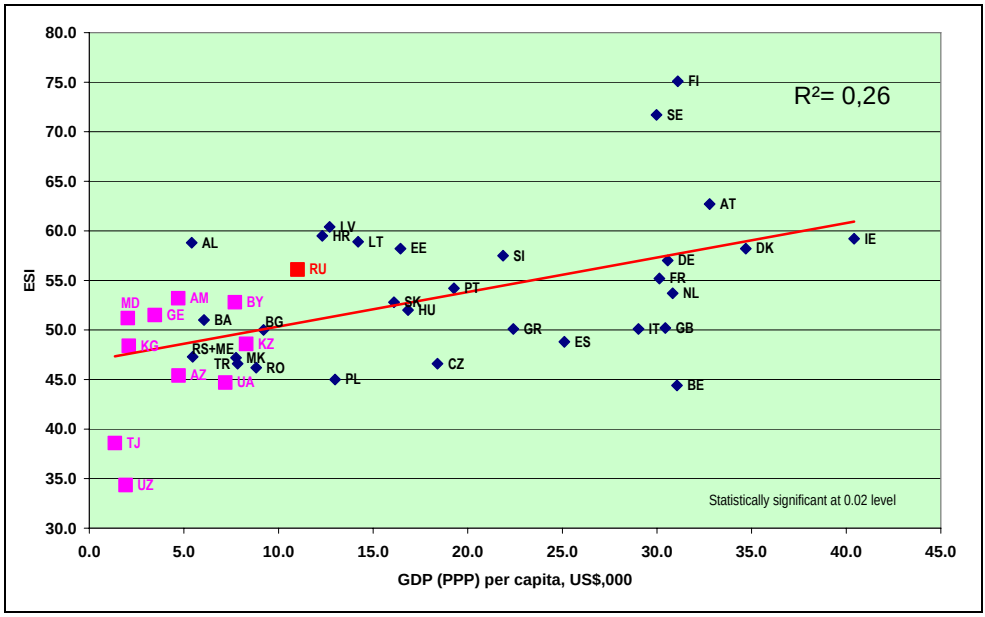


Figure E.6. Regression of Human Vulnerability component on GDP (PPP) per capita

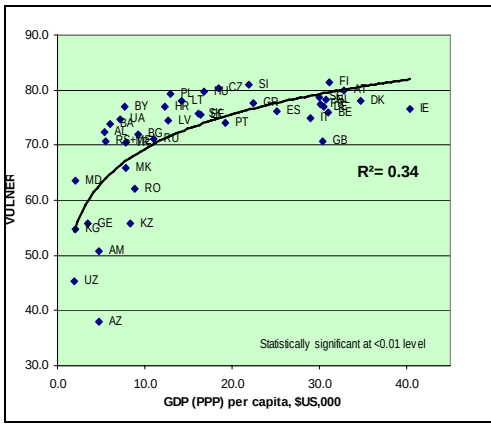
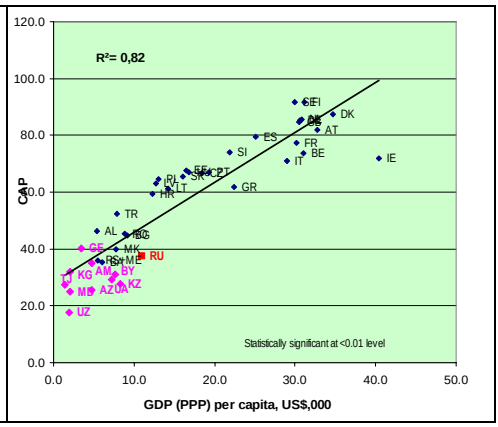


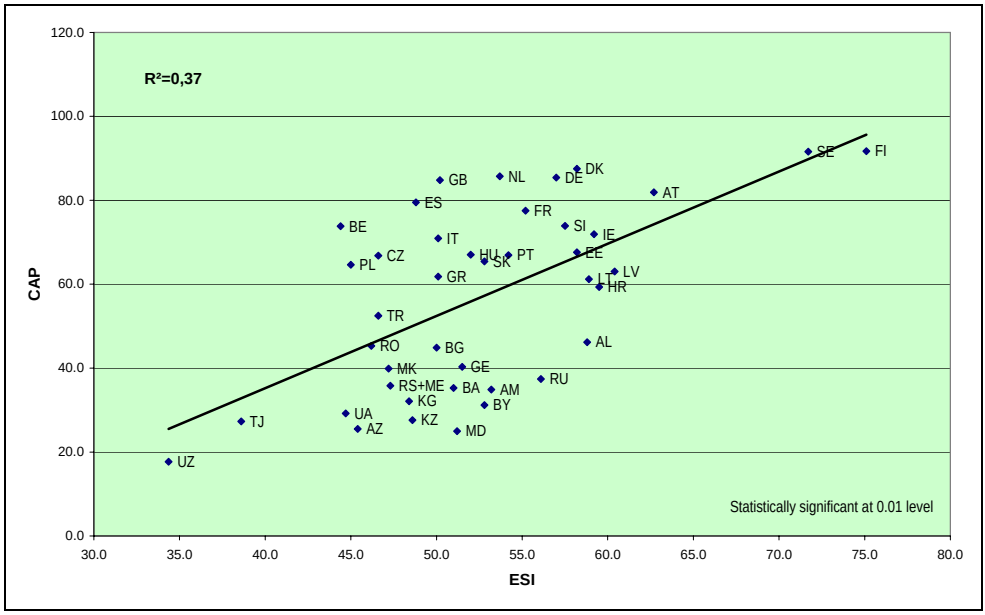
Figure E.7. Regression of Institutional Capacity component on GDP (PPP) per capita



A more illustrative picture of the relationship to per capita income could be obtained by examining the five ESI components. The highest positive correlations are between GDP per capita and the ESI's Human Vulnerability (Fig. E.6) and especially Institutional Capacity (Fig. E.7) components. As was shown above

(Figs. E.3 – E.4), the correlation is negative for environmental stresses, meaning that high-income countries are likely to put more stress on their environments than low-income ones.

Figure E.8. Regression of Institutional Capacity component on ESI



Analysis of available variables leads us to an important conclusion: the size of the gap in environmental performance and sustainability between EU15 and EEN/Russia is most probably closely related to institutional factor. Overall ESI scores are positively correlated not only with Institutional Capacity component (Fig. E.8), but with its underlying variables as well – government effectiveness, rule of law, participation in international environmental agreements, civil and political liberties, democratic institutions, suggesting that countries where robust political debate takes place – facilitated by fair elections, free speech, engaged press, active NGOs, vibrant legislatures, etc. – are more likely to focus on environmental challenges. Striking is the fact that at Fig. E.8 virtually all of FSU countries could be seen well below the regression line – indicating that it is the governance factor that is critical for their below average environmental performance.

The statistical indicators analyzed go well together with anecdotal evidence of poor environmental legislation enforcement, inconsistent policies and inadequate environmental institutions in EEN/Russia. Across the region, legislation is extensive but largely inconsistent and unenforceable. Environmental policies are neither effective nor efficient in stimulating significant environmental improvements, and

policy instruments still present serious shortcomings. Although a broad range of environmental management instruments is being used, the current policy packages are not aimed at achieving specific targets and are not streamlined. Weak, and weakening, institutions are deprived of incentives to achieve environmental objectives (weak authority, out-dated management and decision-making practices, scarcity of resources, high turnover of professionals and frequent restructuring, etc). Cooperation on the issues of mutual interest remains difficult, even in cases when the necessity is obvious (e.g. in the Aral and Caspian Seas) (OECD 2005). Public participation impact is of low significance, levels of public awareness and participation are low and many governments are still reluctant to allow for such participation.

V.6. Institutional dimension of the development gap: analysis of indicators

The main purpose of this section is to benchmark the EU neighborhood countries across an array of institutional dimensions that are known to be critical determinants of economic growth and income convergence. These areas also served to define a "functioning market economy" and "capacity to withstand competitive pressures and market forces" mentioned in the Copenhagen criteria. The analysis thus should highlight the relative positioning of the EEN compared to the NMS, regarding their readiness for starting a convergence process with the EU.

Although the fact that institutions are the most important and universal determinant of economic and human development of nations was theoretically considered since Adam Smith, only recently scholars came to approaching a general answer on the question: what particular kinds of institutions are responsible for persistence and even widening of the development gap between a small group of countries that constitute the core of contemporary world economy, and the rest of the world (North 1990; Easterly and Levine 2002, and many other works).

The most clear and comprehensive approach was recently put forward by North, Wallis, and Weingast (North et al. 2005).. They have distinguished all contemporary constituent systems, composed of economic, political, military, and religious components (all together called social orders) – between those belonging to what they call a "limited access order", and the ones belonging to an "open access order", that is the one based on competition in politics and economy (North et al. 2006).

Under a "limited access order" the firms cannot be treated fairly (hence, uniformly), but always compete for various formal and informal privileges (North et al. 2005). In statistical terms it means that the variations of responses concerning the business environment and some other parameters should be significantly higher under the limited access order, and this variation should decline under transition.

The theory predicts that "open access" countries should outperform the "limited access" ones at least in the following kinds of indicators:

1. Political: freedom of media; freedom, regularity, and fairness of election; trust in political system; plurality of political parties, transparency, accountability, and the like. These are standard democratic norms securing openness of the political system.
2. Competition and "fairness": easiness of starting a business; trade openness (as opposed to protectionism); competition policies, etc.
3. Business environment: complying with regulations; legal protection; access to capital; and other tools that potentially can be used for restriction of business entry in a broad meaning discussed above.
4. Corruption – in all of spheres mentioned above, and corruption per se (embezzlement, extortion, and so on) can characterize the integral effect of the quality of public service and burdensomeness of regulations (if applicable). Although corruption is not a necessary component of a "natural state", we can argue that such kind of state can sustain higher level of corruption than an "open access" one. For this reason, reduction in corruption to certain level is a necessary condition for joining a club of the most advanced countries.

When applying a concept of transition from a "limited access order" to an "open access" one (North et al. 2006), we should remember that the countries under analysis are undergoing a very special kind of transition and in fact neither the USSR nor other countries of the communist bloc were natural states in the full meaning, thus responds could be different. Besides, the countries analyzed are currently at different stages of transition from a limited access order to an open access one (North et al. 2005).

Proceeding from historically inherited differences in the culture of governance (see Section II), we hypothesize that the main gap in governance and related indicators should be observed roughly at the borders of USSR/Russian Empire.

By the above listed criteria the EU15 countries should appear the most "open"; NMS should, on average, appear somewhat more "closed"; the "candidates" should occupy an intermediate position; and the CIS countries should in most cases close the list. The most intriguing questions are, however: (1) are the EEN

significantly different from the rest of CIS; (2) are the EEN more or less "advanced" than the candidates; and (3) where the main "gap" is – between the NMS and EU15, or between NMS and candidates or EEN countries? In which of the abovementioned dimensions the institutional gap is most visible?

For empirical analysis we used the World Bank Institute's Governance Indicators (GI); the most recent (2006) data of the World Economic Forum's Global Executive Opinion Survey (GEOS); the World Bank/IFC Enterprise Survey (ES) (only five of the EU15 countries are covered); the World Bank's Cost of Doing Business (CODB) survey, and The Freedom House "Freedom in the World" ratings (FH).

To produce a visual illustration of sound differences in specific components (responses) that characterize different aspects of institutional development for each of the country groups, we have chosen a uniform way of data procession. We have calculated averages of scores for each country group and then took their differences from EU15 scores. The results reflect the "distances" between the specified country group and EU15, or the magnitude of the gap and are presented in a graphic (radar) form. Zero point corresponds to EU15 average, while locations of the respective country group scores are determined by their "distance" from the EU15 group.

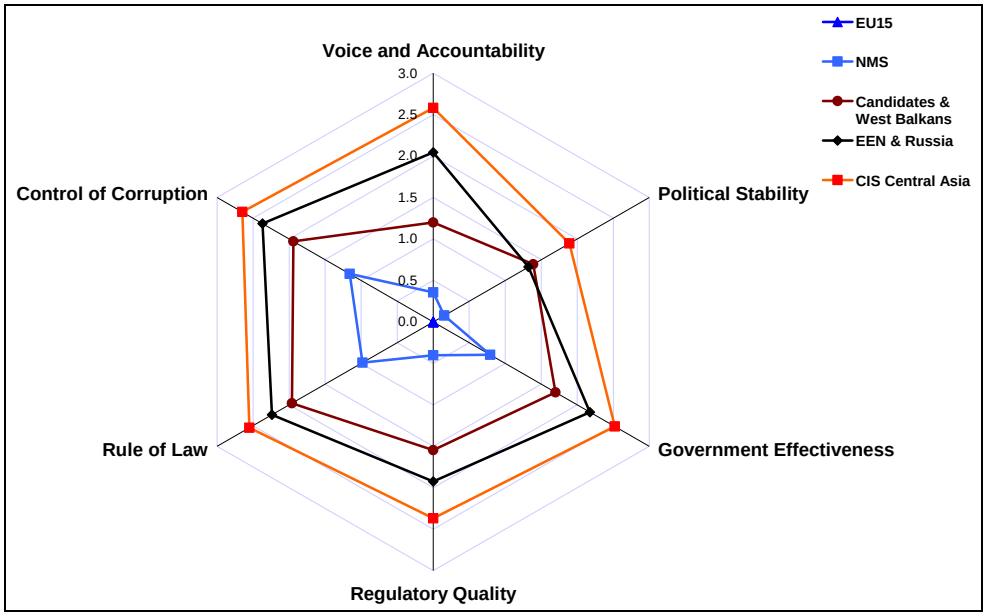
The overall status quo of gaps existing in various components of institutional development could be drawn from the World Bank Institute's Governance Indicators (GI), where governance quality is measured according to six broad areas (Kaufmann et al. 2003). These areas are: voice and accountability, rule of law, control of corruption, regulatory quality, political stability and government effectiveness. The quality of governance determines to a great extent the attractiveness of the business environment for investment and production. Good governance makes it easier to start, run and close a business; it reduces transaction costs and improves the predictability in the application of government rules and regulations. Relative distances between the country groups are shown at Fig. D.1.

The results obtained seem to be fully in line with our hypothesis. Since this figure reflects an aggregate picture of "total" gaps existing in institutional dimension, across all spheres covered by these indices, EEN countries occupy an intermediate position between the group of candidates and the group of Central Asian CIS which is most distant from the EU15. EEN/Russia group is the most "close" to EU15 in political stability, with the furthermost distances in rule of law and control of corruption.

A more detailed insight could be driven from responses contained in World Economic Forum's Global Executive Opinion Survey (GEOS) and the World Bank/IFC Enterprise Survey (ES). The results are not entirely the same and rela-

tive distances between country groups in these datasets could vary a great deal. Still, the overall conclusions remain somewhat similar. Further on, we discuss the results obtained by selected components of the institutional dimension, and provide illustrations of the existing differences between the groups of countries analyzed.

Figure D.1. World Bank Institute's Governance Indicators



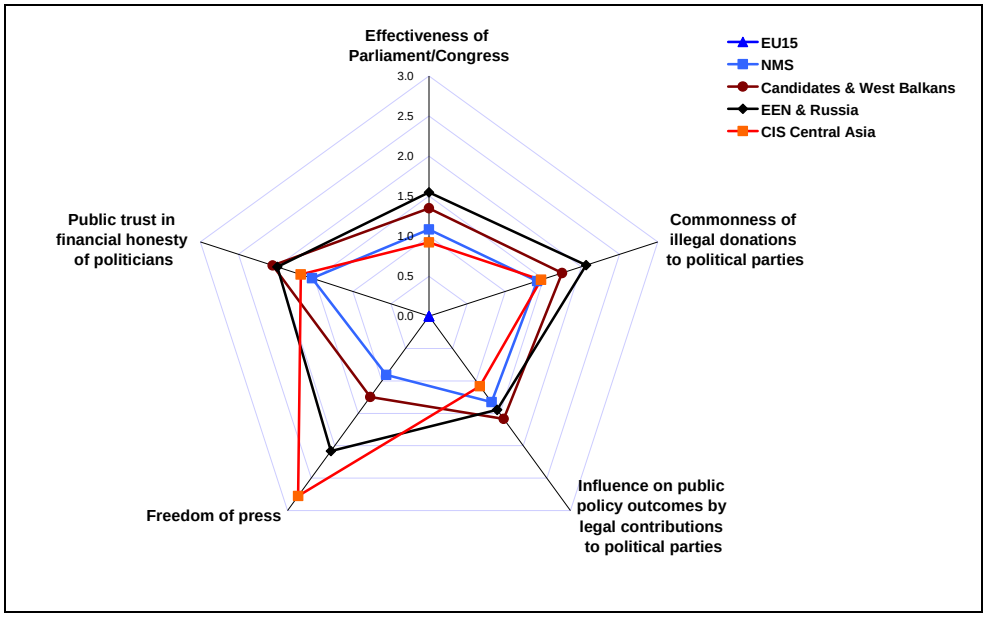
Political institutions

GEOS data on polity component are plotted at Fig. D.2. that reflects "distances" dividing the country groups analyzed from EU15 (EU15=0) across five specific polity areas (1) effectiveness of Parliament/Congress; (2) commonness of illegal donations to political parties; (3) influence on specific public policy outcomes by means of legal contributions to political parties; (4) freedom of press, and (5) public trust in the financial honesty of politicians.

In the Polity component, by all of considered indicators but freedom of press, the gaps between EU15 and NMS are nearly twice as wide as the ones between NMS and EEN/Russia, with Candidates appearing in the middle (having mostly insignificant differences to both groups). Differences between Candidates group, EEN, and Central Asian CIS are generally quite low. In the case of impact of legal political contribution, the NMS/EEN gap is statistically insignificant, while Central Asian CIS even have a small but significant advantage over the EEN. How-

ever, this may be the case when the same formal institutions work in different ways.

Figure D.2. Political institutions



The NMS and Candidates are closer to EU15 in freedom of press, and respectively the major (and the widest) gap lies on the border of the CIS. However, individual scores for Ukraine and Georgia are close to NMS. In public trust in financial honesty of politicians, the distance between EU15 and NMS is the largest, as well as the one between NMS and EEN/Russia.

If we turn to GI "Voice and accountability" indicator (Fig. D.1) we would find that the outline of differences in the aggregate form is almost the same, although the gap between NMS and EU15 is much narrower than the one between NMS and EEN, with Candidates appearing in between (while for other indicators the differences between EEN and Candidates are much smaller). Also insignificant appear the gaps in political stability between EEN and Candidates. Overall, the most substantial gap here lies between the latter two and NMS.

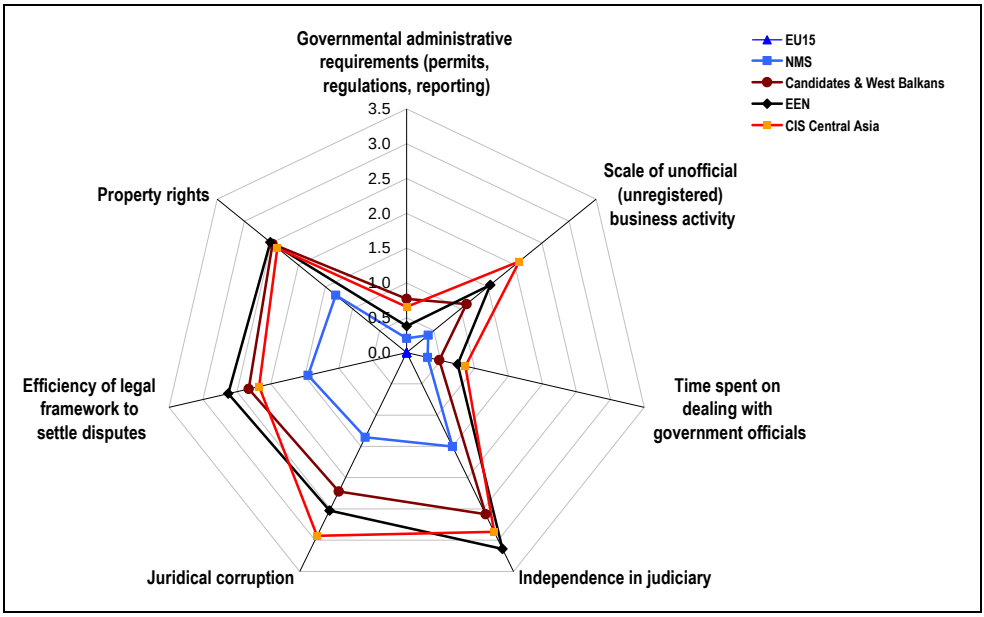
Relative FH indices reveal a very similar picture*:* NMS and EU15 appear quite close, the EEN and CIS indistinguishable by most parameters, both significantly worse than the leaders; and Candidates in between these two groups. However, low scores of EEN are mostly caused by Belarus, with Ukraine, Georgia and Moldova being not worse than the EU Candidates.

To introduce a gender dimension in the analysis of political institutions, we used a Political empowerment subindex of the Global Gender Gap Index that reflects the numbers of women in parliament and at ministerial positions, as well as the number of years of a female head of state. In this area, the overall pattern is very much similar, except that the gaps between EU15 and NMS/Candidates and between EU15 and EEN/Central Asian CIS are almost twice as wide in percentage terms compared to polity indicators, with EEN/Russia occupying the farthest position from the EU15. Indeed, some of the countries of the EEN/CIS group rank among the worst performers in the 128 countries sample covered in the 2007 rankings: Kyrgyzstan ranks 118th, Russia, with just 10 per cent women in parliament, - 120th, and Armenia – 125th (Hausmann et al. 2007).

Regulations & Legal protection

For Regulatory Burden component, we have selected from GEOS the following variables: (1) governmental administrative requirements (permits, regulations, reporting); (2) scale of unofficial or unregistered business activity, and (3) time spent on dealing/negotiating with government officials (see Fig. D.3).

Figure D.3. Regulations and Legal protection components



Analysis shows that compliance with regulations is most burdensome in the EU candidates (as compared to EU15 average), with EEN being very close to EU12

average. In terms of the "time tax" EEN is still significantly worse than Candidates, and the rest are indistinguishable. Unregistered business activities are perceived to be almost equally rare in both parts of EU, while EEN and Candidates are statistically very close, both significantly worse than the EU.

By World Bank/IFC Enterprise Survey (ES), on the contrary, the main and really wide (more than twofold) gap in time tax appears between Candidates and the EU countries, with the EU15 and NMS being remarkably close; EEN are significantly worse than EU15, and 56 per cent worse than NMS. The inconsistency in results between the two surveys should most probably be attributed to the differences in their methodologies. Predictability and consistency of interpretations of regulations is almost equally good in Central Asia, Candidates and EU15, while being significantly more problematic in the NMS and EEN. According to WB CODB survey, dealing with licenses (the most relevant indicator with regard to business entry) takes significantly more time in Candidates and CIS than in EU15, and requires significantly more procedures in all other groups than in the EU15.

The selected GEOS **Legal Protection** variables, also displayed at Fig. D.3, include: 1) independence in judiciary, 2) juridical corruption, 3) efficiency of the legal framework for private businesses to settle disputes, and 4) protection of property rights, including over financial assets.

In courts' independence, no significant differences were found between EEN and Central Asian CIS, while the gap observed between the latter two and NMS is one of the largest. NMS countries generally appear almost in the middle between EEN and EU15, with an important exception of, again, independence in judiciary where the EEN/NMS gap is wider by half than the one between NMS and EU15. In juridical corruption, and notably in protection of property rights EEN countries are virtually indistinguishable in these characteristics from Candidates and CA CIS, while the largest gaps are between these and NMS, and NMS and EU15.

With respect to legal protection, CODB database focuses on contract enforcement. Here, differences between NMS and EU15, as well as between Candidates and NMS are insignificant; EEN have the same number of procedures as NMS (and about 20 per cent more than EU15), but they take nearly twice less time in EEN than in both categories of EU countries, while bearing on average about 40 per cent more in costs. In Central Asia, contract enforcement is almost equally costly as in EU15, but most burdensome in terms of procedures.

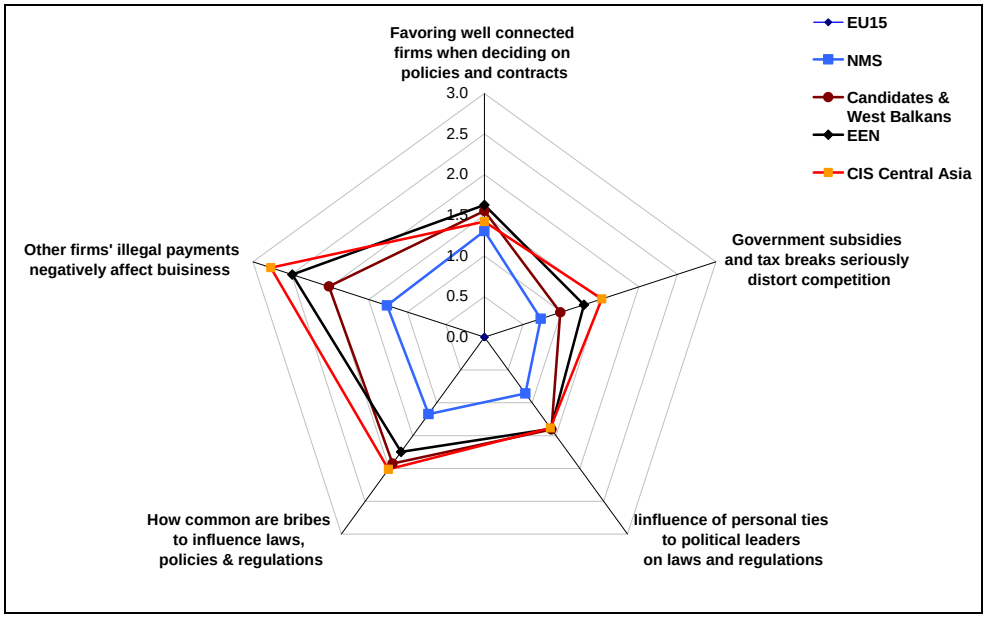
Fairness

For the analysis of the Fairness component, we have selected from GEOS questionnaire (and plotted at Fig. D.4) the following variables:

1. When deciding upon policies and contracts, government officials usually favour well connected firms and individuals, or stay neutral;
2. Distortion of competition by government subsidies and taxes;
3. Impact of personal ties to political leaders on laws and regulations that have a substantial impact on business;
4. In your industry, how commonly would you estimate that firms make undocumented extra payments or bribes connected with the influencing of laws, policies, regulations or decrees to favour selected business interests;

Do other firms' illegal payments to influence government policies, laws or regulations impose costs or otherwise negatively affect your firm.

Figure D.4. Fairness



For most of indicators, EEN scores are statistically indistinguishable from Candidates and Central Asian CIS. Differences between NMS and Candidates are also insignificant in favoritism and distortions of competition. Most of indicators characterizing favoritism and state capture in the treatment of firms by the government demonstrate significant but not very wide gaps between EU15/NMS/EEN groups of countries, with the ones for EU15/NMS tending to be somewhat larger. The exception is the question on favoritism for well connected firms that relates also to procurement: the gap between EEN and EU15 is 3.5 times wider than the one between NMS and EEN. This corresponds well to the answers concerning corruption in procurement.

Corruption

To analyze and display relative differences in the perception of corruption levels, we used the responds to several questions selected from GEOS database (Fig. D.5). These referred to: (1) commonness of extra payments (bribes) to lower-level public servants; (2) similar payments to high ranking politicians, political parties and senior public servants; (3) commonness of undocumented extra payments or bribes related to connection to public utilities (e.g., telephone or electricity); (4) similar payments connected with annual tax payments; (5) making undocumented extra payments or bribes connected with the awarding of public contracts or investment projects; (6) an expected size of "additional payments" (per cent of the contract value) to government officials for the bid to succeed, and (7) commonness of diversion of public funds to companies, individuals or groups due to corruption.

According to GEOS, as can be seen from Fig. D.5, EU15 and NMS significantly differ in all indicators, except the extent of corruption in taxation and utilities, while the largest differentials are observed in procurement and embezzlement. In the latter indicators, Candidates are significantly below NMS, while the gap between them is less significant in grand and petty corruption, and corruption in procurement. The scale of corruption in EEN, while far exceeding that of NMS, is generally fairly close to Candidates' scores. However, EEN are "well ahead" of the Candidates, as well of other country groups, in the expected bribe size. The smallest EEN/NMS gaps are in grand corruption and procurement with the largest gap observed in taxation.

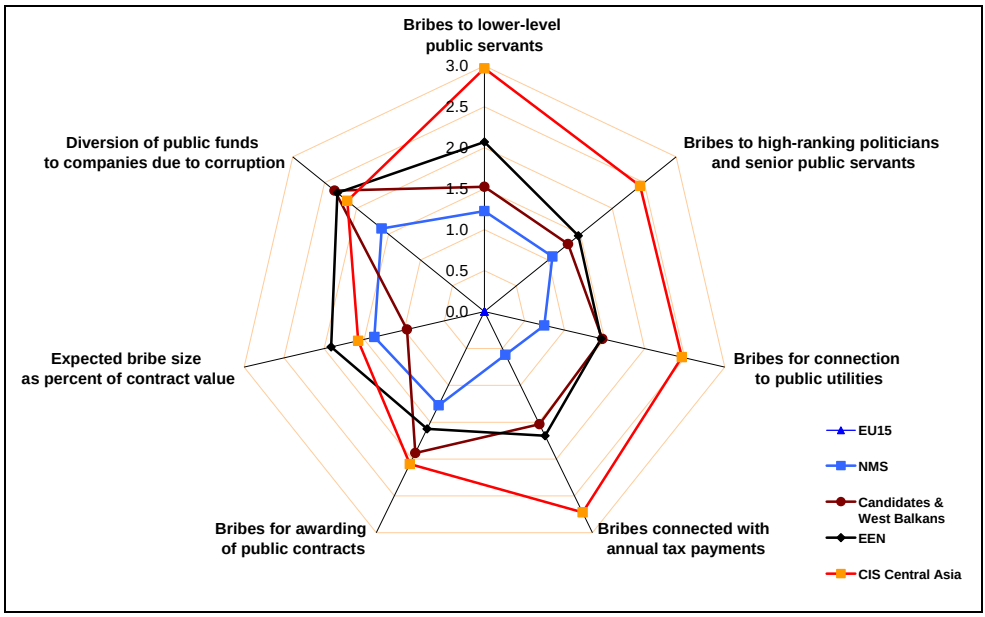
According to **ES** data records, bribe tax (as percentage of sales) in NMS is three times higher than in EU15; in Candidate countries, the relative indicator is four times, in EEN – almost six times, and in Central Asian CIS – almost eight times higher. The distance between NMS and EEN countries is the most significant.

According to WB Governance Indicators, the gaps between EU15/NMS and NMS/EEN are roughly equal, while the differences between Candidates, EEN and CIS are of much lower magnitude; however, all of them are statistically significant.

Analysis of standard deviations (GEOS) is even more revealing, because here the contrast between EEN and EU15 is much more profound: differences in values reach two times and more. This means that corruption in the EU15 countries, to the extent it exists, is far more uniform, with significantly less "special" treatment that can be used for restricting business entry. Still, most of this difference is observed between EU15 and NMS, again with the exception of tax payment where both gaps are roughly equal to each other. At the same time, in this parameter the

CA CIS and EEN are indistinguishable in all indicators. Candidates are similar to EEN in all of indicators but the embezzlement and size of kick-offs, where, however, they blur with NMS. In the case of kick-offs both gaps are relatively low, which means that this practice is well-established everywhere. However, "openness" of corruption in procurement is significantly less in NMS than in the EU15, while the differences between NMS and the rest of the groups are less profound.

Figure D.5. Corruption



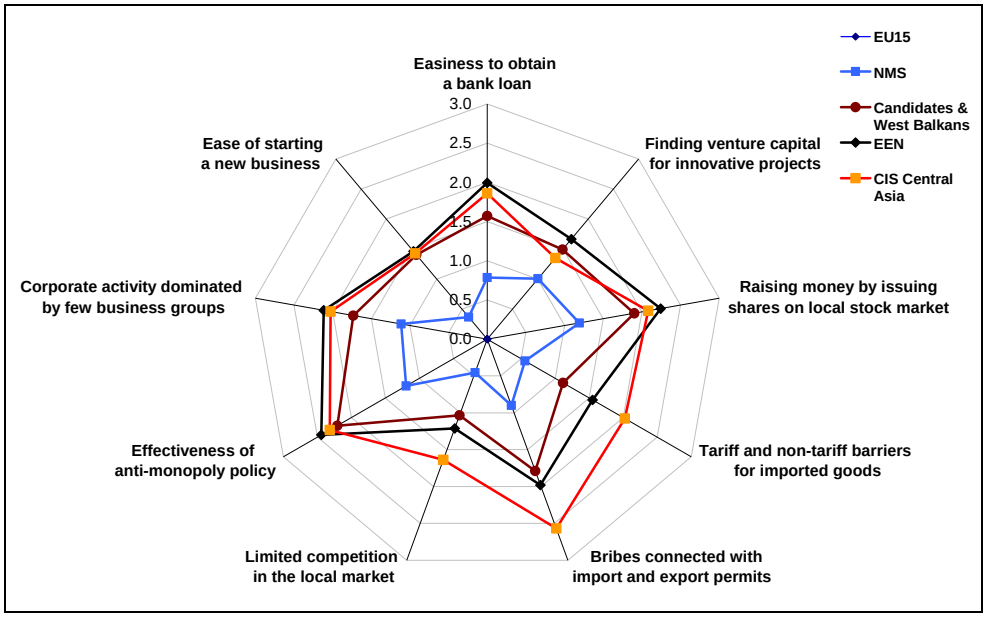
Access to Capital and Competition

For the analysis of the **Access to Capital** component, the following variables were selected from GEOS: (1) easiness to obtain a bank loan with only a good business plan and no collateral; (2) entrepreneurs with innovative but risky projects can generally find venture capital, and (3) easiness of raising money by issuing shares on the local stock market (Fig. D.6).

The analysis demonstrates that NMS countries are substantially closer to the EU15 than EEN to NMS only in one variable – more open access to banking loans not secured by collateral, i.e. the ones especially critical for startups. Notably, the unevenness in this set of indicators is generally low and rarely statistically significant. Access to bank loans is also the only point where there is a minor but significant difference between EEN and Candidates. Otherwise, Central Asian CIS, EEN, and Candidates are quite similar.

CODB, on the contrary, indicates significant and profound gaps between the CIS and EEN, on the one hand, and EU15 and NMS, on the other hand, in terms of credit information, particularly in private credit bureau coverage (which is simply zero for most of EEN and the whole of Central Asia), and protecting investors, particularly control over directors. The Candidate countries are in between. However, unlike GEOS and ES, these results refer rather to the maturity of financial institutions, than reflect accessibility of capital as such.

Figure D.6. Access to capital and Competition



We consider three dimensions of **competition** covered by the surveys: trade barriers, business entry in the narrow meaning (setting up a business) and exit, and the level of competition and concentration as such.

According to GEOS (Fig. D.6), in terms of formal barriers to trade all of the groups differ from each other with a "step" of 8-10 per cent of the EU15 score. However, in terms of corruption in the foreign trade, the gaps are more profound: Candidates are exactly twice as worse than NMS compared to EU15, and are almost the same as EEN, while Central Asian CIS are almost three times as worse. Here the most speaking is unevenness of responses: while EEN are still indistinguishable from CA CIS and Candidates, the NMS differ from EU15 almost by a half, while EEN differ from NMS by another 30 per cent.

Starting a new business is much easier in EU15 and NMS on the one hand, than in Candidates, EEN, and CIS, on the other hand, with blurred differences within

both groups. Overall level of competition, as assessed by GEOS, supports the main hypothesis, while EEN is again indistinguishable from CA CIS and Candidates. In terms of fierceness of competition, the main gap lies between EEN and NMS; while in the effectiveness of antimonopoly policies and concentration the gaps are of roughly equal magnitudes.

CODB reveals large and mostly significant gaps in all dimensions, all in accord with the main hypothesis. The exceptions are costs of import and export that are roughly similar in NMS and Candidates, and in both cases insignificantly differ from those for EU15 – maybe due to geographical proximity to the main EU markets. In the rest of the parameters, Candidates are also close to NMS, being significantly different only in time for export, where they are rather closer to EEN. In the meantime, EEN are indistinguishable from Candidates and NMS in the number of documents needed for export and import. Finally, there are significant gaps between EEN and CIS Central Asia across all variables.

Conclusions

In general, our main hypothesis (that the main gap in governance and related indicators should be observed roughly at the borders of the former USSR) holds with one important reservation: most of the indicators for EEN are very close to those of both the EU candidates and Central Asian CIS.

Among the most characteristic instances where the EEN are on average significantly worse off than Candidates we should specify judiciary independence, size of kick-offs (GEOS); time to pay taxes (CODB); voice and accountability, government effectiveness, and control of corruption (GI); consistency and predictability of legislation (ES); civic freedoms (FH); and freedom from government (HF). At the same time, the EEN have significant advantages in the cost of registration of property, and time spent on enforcing a contract (CODB).

Central Asian CIS countries are significantly worse than EEN in the spheres of corruption in public utilities, foreign trade (GEOS), and taxation (ES); all of the governance indicators but political stability and regulatory quality (GI). The latter is to some extent inconsistent with findings of the CODB (significantly worse in trade regulations), and FH, where the difference in rule of law is the only one that is significant within the whole CIS. As an integral result of some institutional differences, the role of internal financing is significantly more important in Central Asian CIS than in EEN.

Candidates appear the worst in terms of business regulations; EEN countries – in the administration of taxes (although CIS Central Asia are even worse in the corruption in taxation).

In terms of *political institutions*, the EEN countries express tremendous intra-group differences: from Belarus that has very low scores in all dimensions but political stability (that is not an advantage in this case, and hardly facilitates "openness of access", rather the opposite), to Ukraine and Georgia closely followed by Moldova that are approaching the NMS countries. The EEN are systematically much worse than NMS (comparing to NMS/EU15 gap) in the freedom of (international) trade and tax administration (but not the tax rates).

In corruption, however, the difference between NMS and EU15 is generally larger, except for corruption in taxation (although integral index provided by EFW still admits somewhat larger gap between NMS and EEN). In terms of business regulation the picture is mixed. In terms of legal protection and property rights, the integral indexes (EFW, HF) show that the NMS are much closer to EU15 than to EEN.

At the same time, the raw survey data (GEOS, ES, CODB) often demonstrate the opposite. In terms of "fairness", somewhat contrary to the hypothesis, the gap between NMS and the EU15 appears of similar size or wider than the one between NMS and the EEN countries.

Thus our hypothesis that the main gap in governance and political institutions should be observed between CIS (including EEN) and the rest of countries to some extent comes into conflict with factual evidence. In fact, GEOS (that does not cover Belarus) reveals that the major gap in political institutions assessed by this survey lies rather between EU15 and NMS, with the EEN/NMS gap being approximately half as wide. By the GI and FH, the NMS are much closer to EU15, but the main gap is between them and the Candidates, although the EEN are still significantly worse than the latter.

Yet, the main gap between the NMS and the EEN most probably lies at the *informal* level. This refers to foreign trade procedures (twice as much time needed to comply with nearly the same number of documents), taxation, business registration, and so forth. While there are no significant differences in business concentration, the gap in fierceness of competition is still twice as high between NMS and EEN, than between EU15 and NMS.

Should the informal patterns of unequal treatment of the firms (currently revealed in higher standard deviations) be eliminated, the rate of competition will increase and catch up in a few years; and access to capital could be made much easier – because in both cases the respective institutional changes could be driven by market forces, if just an appropriate framework would be in place. Foreign trade, capital and credit markets issues, and tax regulations remain the most problematic areas that prevent from such a catch-up most of all.

It is also possible that the analyzed business surveys just failed to capture some of the real differences, since they lay at the informal level. For example, it could happen that the surveyed CEOs understand the notions of "difficult", "often" and so on differently in different countries. Besides, the samples of CEOs are pre-selected, and hence biased, in all countries merely because they include only those who managed to survive in the respective business environment at least to the moment when the survey was held. Thus, for example, for them it was not too much difficult to run their businesses, otherwise they would hardly become CEOs. Such a bias should to some (unobservable and unpredictable) extent blur the contrasts between countries. The same refers to the problems of measurement of corruption, abuses of human rights, and other cultural-specific issues.

VI. MEASURING THE GAP

As discussed in previous sections, the gap between the EU and the neighboring countries, being multidimensional, is characterized by a variety of indicators. At the same time, one would like to have a one-dimensional measure of the distance to the EU which would incorporate the major differences across countries. There are some ready candidates for the measure: GDP per capita is one of the major indicators reflecting *economic* development, while Human Development Index (HDI) allows complementing GDP per capita measure with a human development dimension. The latter is done via constructing a weighted average of the indicators of a long and healthy life, knowledge and a decent standard of living.

GDP per capita, being an aggregate economic indicator, is likely to downplay the 'social' dimension of development, with the potential discrepancy being larger particularly in transition countries with their rapidly changing institutions and socio-economic indicators, such as income distribution and redistribution ones. HDI is criticized for both arbitrary choice of raw indicators used, and for the arbitrary weighting scheme (e.g., McGillivray (1991), Paul (1996)). The potential bias from using a narrow list of indicators is greater for the developing countries for which the index could be not robust with respect to the inclusion or exclusion of indicators. Scholars keep suggesting alternative aggregate measures of development for subsets of countries (e.g., Cahill and Sanchez 2001), with the majority of the measures being based on the principal component analysis. We suggest utilizing the principal component approach to produce a composite development index for the set of .countries under review. The approach allows identifying clusters of countries based on the distance to the EU along the chosen dimensions. We then compare the rankings of NMS and EEN/Russia.with respect to the distance to the EU15 based on the constructed composite development index with the rankings implied by GDP per capita and HDI.

To measure the gap to the EU15 level, we proceed in two steps. First, we subdivide the set of indicators available to characterize the neighboring countries into subgroups which reflect different dimensions of the gap: macroeconomic structure, balance of payment position, institutions, demography and human capital, health, infrastructure, innovation, and environmental sustainability. The list of variables that constitute each of the groups is presented in Table A6.1 in the Appendix. Note that the set of the variables used is constrained by data availability only with no *a priory* judgment on the relevance of inclusion or exclusion of an indicator. To

come up with a measure of a gap along each of the dimensions, we estimate the first two principal components based on the variables that characterize the dimension. The two principal components are then used to measure distances to the EU15 in the areas of macroeconomic structure, balance of payment position, institutional development, demography and human capital, health, and infrastructure. The procedure allows getting an insight into the nature of the gap between each of the reviewed countries and the EU15 along each of the six dimensions. In addition, to characterize innovation potential and environmental sustainability, we use the composite indices already available. GDP per capita[55] is considered as a separate ninth dimension of the gap. As a result, the ratings along the nine dimensions characterize the gap between each of EEN/Russiaand the EU15 average.

Second, we apply the principle component analysis directly to the full set of the raw indicators that characterize various dimensions of countries' development and come up with a composite index of development. The composite index allows getting ratings of the countries in terms of their closeness to the EU.

The first procedure allows getting a better understanding of the nature of the gap along each of the dimensions. The second procedure generates a composite measure of development which is free from arbitration in the choice of both the set of indicators and the weighting scheme used. While being superior in terms of technology of measuring the aggregate gap, the second approach gives very little insight into the composition of the gap as compared to the first approach. That is why we keep both approaches. Finally, we compare the rankings of the reviewed countries with respect to the distance to the EU15 average based on the constructed Composite Development Index to the rankings implied by GDP per capita and HDI.

To remind, the principal components method is the standard method[56] used to construct aggregate measures or indices based on a set of raw indicators. It allows mapping from the space of raw indicators (which are often highly correlated with each other) into a space of principal components (which are orthogonal to each other)[57]. The principal components being the weighted sums of the raw indicators

[55] GDP per capita is measured using purchasing power parity.

[56] Principal component analysis is one of the methods of factor analysis. A competing technique would be a multidimensional scaling which seeks factors which *differentiate* variables while factor analysis looks for the factors which *underlie* the variables (Darlington et. al. 1973). We would like to obtain the latter.

[57] The mathematical technique used in principal component analysis is eigen analysis: a square symmetric covariance matrix is solved for the eigenvalues and eigenvectors. The eigenvector associated with the largest eigenvalue has the same direction as the first principal component. The eigenvector associated with the second largest eigenvalue determines the direction of the second principal component. The sum of the eigenvalues equals the trace of the square matrix and the maximum number of eigenvectors equals the number

allow reducing dimensionality, and by this, making discussion of the difference across objects under study more tractable. The first two components in majority of cases explain the main variation in the raw indicators which simplifies the clustering of the objects under study.

We start by considering each of the six dimensions: macroeconomic structure, balance of payment position, institutional development, demography and human capital, health and infrastructure (Sections VI.1-VI.6). Section VI.7 characterizes the gap between the EU15 and the EEN/Russia along the nine dimensions mentioned above. Section VI.8 comes up with the Composite Development Index. Section VI.9 concludes.

VI.1 Macroeconomic Structure

We characterize macroeconomic structure of the countries under consideration by a wide range of indicators (the full list of variables is presented in Table A6.1 in the Appendix. In particular, we use GDP growth rate (5-year average), fiscal balance indicators, including gross external debt, CPI and real wage growth rates, unemployment rate, employment and labor productivity growth rates, sectoral composition of GDP, energy consumption indicators, estimates of informal economy, female and male labor force activity rates, and characteristics of income distribution.

Principal component analysis is used to derive a set of orthogonal factors – principal components – based on initial indicators. The factor loadings for the first two components[58] and the corresponding significance ratios are presented in Table 6.1. The table also shows correlation, and its significance, between each individual indicator in the list and the respective principal component. The latter allows better understanding which indicators in the list (in bold in the table) are the major ones that form the principal components – the weighted sums. This, in turn, helps coming up with an interpretation of the components.

of rows (or columns) of this matrix. Given the difference in the units of measurement of the raw variables, they are standardized by subtracting the mean and dividing by the standard deviation before applying the principal component analysis.

[58] Six principal components explain 82% of variation in the factors used. The first two components explain 52% of the variation. It is for the expositional benefit that we consider only two components.

The relative positions of the countries under study with respect to the EU15 average[59] in the plane of the first two principal components – the two macrostructure indices – are presented at Figure 6.1. To simplify the interpretation of the indices, the set of the indicators generating the positive and the negative change of each of the two indices, as well as the sets of those indicators that affect both indices simultaneously (together with the direction they operate), are depicted at the Figure. The resulting allocation of the countries in the plane of two macrostructure indices is in comfort with the economic intuition.

Table 6.1. Factor Loadings and Significance of Factors, Principal Components, Macrostructure

List of indicators	Factor Loadings[60]		Correlation[61] (5% significance P-values)	
	Macrostructure index 1 (1st Principal Component)	*Macrostructure index 2 (2nd Principal Component)*	*Macrostructure index 1 (1st Principal Component)*	*Macrostructure index 2 (1st Principal Component)*
GDP annual growth rate (per cent)	-0.10764	0.06017	**-0.8422** *(0.0000)*	0.1813 *(0.2972)*
Total general government expenditure, % of GDP	0.10491	0.06461	**0.8209** *(0.0000)*	0.1947 *(0.2624)*
General government balance, % of GDP	-0.00395	0.18943	-0.0309 *(0.8602)*	**0.5708** *(0.0003)*
Inflation, consumer price index	-0.06318	0.13503	**-0.4943** *(0.0025)*	**0.4069** *(0.0153)*
Real wage, annual percentage change	-0.10946	0.10395	**-0.8564** *(0.0000)*	**0.3132** *(0.0669)*
Unemployment, % of labor force	0.00285	-0.17460	0.0223 *(0.8989)*	**-0.5261** *(0.0012)*
Employment growth, annual percentage change	0.04072	0.00701	**0.3186** *(0.0621)*	0.0211 *(0.9042)*
Labor productivity, annual percentage change	-0.10465	0.05058	**-0.8188** *(0.0000)*	0.1524 *(0.3821)*
Agriculture, value added (% of GDP)	-0.09908	-0.01525	**-0.7752** *(0.0000)*	-0.0460 *(0.7932)*
Manufacturing, value added (% of GDP)	0.02135	0.12521	0.1671 *(0.3374)*	**0.3773** *(0.0255)*
Electricity consumption per capita (kW-h)	0.09688	0.13634	**0.7580** *(0.0000)*	**0.4108** *(0.0142)*
Carbon dioxide emissions per capita	0.08003	0.11791	**0.6261** *(0.0001)*	**0.3553** *(0.0362)*

[59] EU average is calculated as a population weighted average.
[60] Weights of raw factors in the relevant principal component.
[61] Correlation between the raw factor and the principal component.

List of indicators	Factor Loadings[60]		Correlation[61] (5% significance P-values)	
	Macrostructure index 1 (1st Principal Component)	*Macrostructure index 2 (2nd Principal Component)*	*Macrostructure index 1 (1st Principal Component)*	*Macrostructure index 2 (1st Principal Component)*
GDP per unit of energy use	0.08054	-0.20025	**0.6302** *(0.0000)*	**-0.6034** *(0.0001)*
Distribution of family income: Gini index	-0.04403	-0.13740	**-0.3445** *(0.0427)*	**-0.4140** *(0.0134)*
Ratio of richest 10% to poorest 10%	0.01822	-0.17447	0.1426 *(0.4139)*	**-0.5257** *(0.0012)*
Estimated annual earned income F/M Ratio, %	0.03177	0.20621	0.2486 *(0.1499)*	**0.6214** *(0.0001)*
Gross external debt, % of GDP	0.09435	-0.03729	**0.7382** *(0.0000)*	-0.1124 *(0.5205)*
Labour force activity rate (% females)	0.04647	0.20757	**0.3636** *(0.0318)*	**0.6255** *(0.0001)*
Labour force activity rate (% males)	0.05790	0.03157	**0.4530** *(0.0063)*	0.0951 *(0.5867)*
Gross Average Monthly Wages	0.11686	-0.00510	**0.9143** *(0.0000)*	-0.0154 *(0.9302)*
Informal economy estimate	-0.11273	0.01438	**-0.8820** *(0.0000)*	0.0433 *(0.8048)*

As is seen from the table and the Figure 6.1, the further the countries are to the *negative* domain of the first macrostructure index (the first principal component), the more they tend to have higher GDP growth rates, higher growth rates of labor productivity and higher labor force participation of males, but also lower employment growth, lower share of government in GDP, lower external debt and lower wages. The share of agriculture in GDP and of informal economy is also relatively higher for the countries.

The allocation of countries along the second macrostructure index (the second principal component) is driven mainly by the difference in the share of manufacturing in value added, female to male ratio in earnings (the higher the indicators – the higher is the coordinate) and unemployment rate and the rich-to-poor ratio (the higher the indicators, the lower is the coordinate).

Additionally, countries with relatively high inflation rates are to be seen in the right bottom part of the plane. Those with high efficiency of energy use are closer to the upper left part. High levels of income inequality based on Gini measure are observed among countries at the left bottom part of the plane. Finally, high per capita rates of electricity consumption and carbon dioxide emissions, as well as relatively high female labor force participation rates are in countries closer to the upper right part of the plane.

Figure 6.1. Allocation of countries in the plane of the first two principal components based on indicators of MACROECONOMIC STRUCTURE.

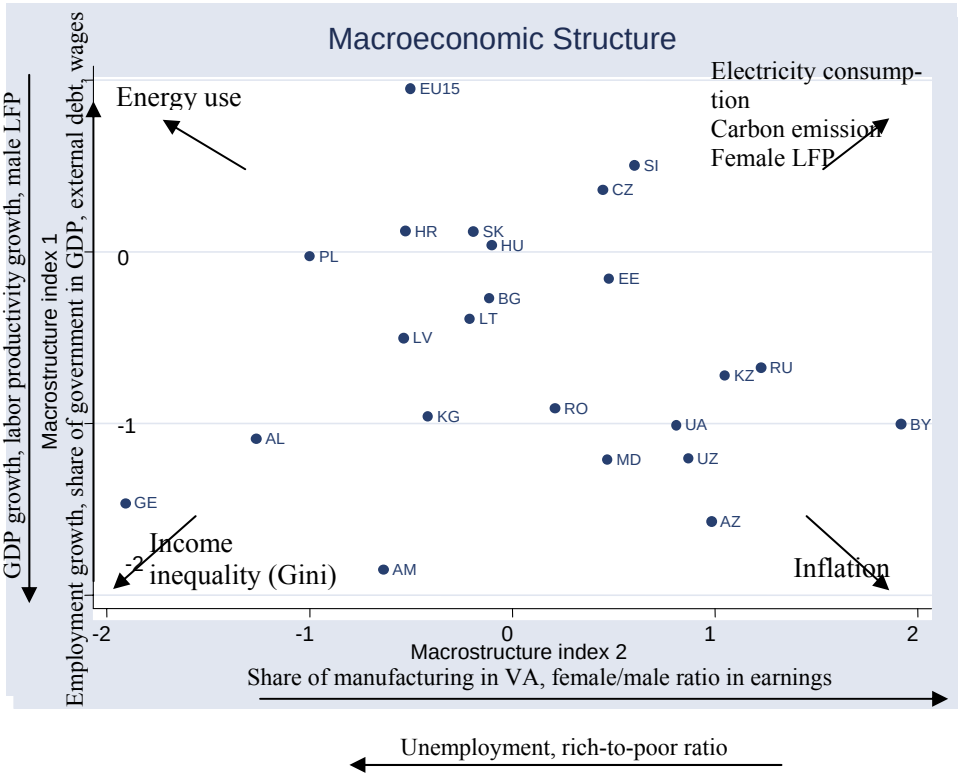


Table 6.2 presents the values of the first and the second macrostructure indices for the pool of countries reviewed, with the EU15 being a reference point. In addition, the two indices are used to translate the relative position of a country into a measure of its distance[62] from the EU15 average along the macrostructure dimension. Table 6.2 presents ranking of the distances for each of the countries[63]. It comes from the table that Croatia and Slovakia form the closest to the EU15 average group. Hungary, Poland, the Czech Republic and Slovenia are in the next shortest distance from the EU-average. The third layer is formed by Bulgaria, with

[62] Distance from a country to EU is calculated as follows :

$\sqrt{(f_{1EU} - f_{1c})^2 + (f_{2EU} - f_{2c})^2}$, where f_1 and f_2 - the country's value of the first and the second index respectively.

[63] Note that the groups are based solely on the distance from EU-average and are very heterogeneous otherwise as is clear from the Fig. 6.1..

Lithuania, Latvia and Estonia being in the fourth group. Kyrgyzstan and Romania are the next followed by Albania and Kazakhstan. Ukraine, Moldova and Russia are in the seventh group. Uzbekistan comes next. The last but one group comprises of Georgia, Armenia and Azerbaijan. Belarus is at the largest distance to the EU15 average as measured by the macrostructure indices.

Table 6.2. Ranking[64] of the Distance from EU15 average, MACROECONOMIC STRUCTURE

Country	Distance from EU15 average, ranking	Country	Macrostructure index 1	Macrostructure index 2
EU15	0	EU15	0.95	-0.50
Croatia	1	Slovenia	0.50	0.60
Slovakia	1	Czech Rep.	0.36	0.45
Hungary	2	Croatia	0.12	-0.53
Poland	2	Slovakia	0.12	-0.19
Czech Republic	2	Hungary	0.04	-0.10
Slovenia	2	Poland	-0.03	-1.00
Bulgaria	3	Estonia	-0.16	0.48
Lithuania	4	Bulgaria	-0.27	-0.11
Latvia	4	Lithuania	-0.39	-0.21
Estonia	4	Latvia	-0.50	-0.53
Kyrgyzstan	5	Russian Fed.	-0.67	1.23
Romania	5	Kazakhstan	-0.72	1.05
Albania	6	Romania	-0.91	0.21
Kazakhstan	6	Kyrgyzstan	-0.96	-0.42
Ukraine	7	Belarus	-1.00	1.92
Moldova	7	Ukraine	-1.01	0.81
Russia	7	Albania	-1.09	-1.26
Uzbekistan	8	Uzbekistan	-1.21	0.87
Georgia	9	Moldova	-1.21	0.47
Armenia	9	Georgia	-1.47	-1.91
Azerbaijan	9	Azerbaijan	-1.57	0.98
Belarus	10	Armenia	-1.85	-0.64

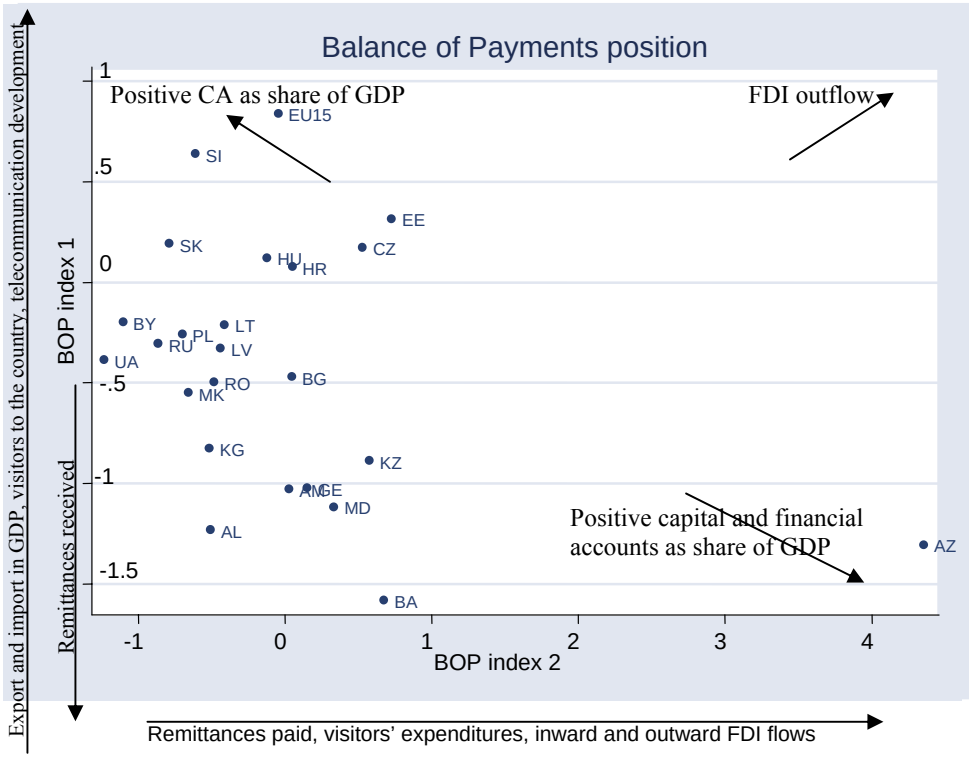
VI.2 Balance of payments position

We characterize balance of payments positions of the economies by a set variables, including exports and imports as percentage of GDP, ratios of number of

[64] The ranking of the countires is based on the calculated distance from EU. Countries with a similar distance are given the same rank.

visitors to population, of expenditures of visitors to GDP, and ratios of inward and outward flows of foreign direct investment to exports and imports and to gross financial capital flows, as well as remittances paid and received to GDP. Current account and capital account balances are taken into account. We also include characteristics of international telecommunication development in the countries. The full list of variables used is presented in Table A6.1 in the Appendix.

Figure 6.2. Allocation of countries in the plane of the first two principal components based on indicators of balance of payments



The initial indicators are weighted using the principal component. The factor loadings for the first two components[65] – balance of payments' position indices 1 and 2 – and the corresponding significance ratios are presented in Table 6.3. The relative positions of the countries to the EU15 average in the plane of the first and the second balance of payments indices are presented at Fig. 6.2. Again, to simplify the interpretation of the indices, the set of the indicators generating the posi-

[65] Six principal components explain 90% of variation in the factors used. The first two components explain 55% of the variation. It is for the expositional benefit that we consider only two components

tive and the negative change of each of the two indices, as well as the sets of those indicators that affect both indices simultaneously (together with the direction they operate), are depicted at the diagram. The resulting allocation of the countries in the plane of two BOP indices is in comfort with the economic intuition.

As suggested by the table and the diagram, the larger the coordinate of the first BOP position index, the higher is the share of imports and exports in GDP, larger number of visitors to the country as percentage of population and higher use of international telecommunication facilities. At the same time, the amount of remittances received is higher in the countries more in the negative domain of the first component.

The second BOP position index is related mainly to the amount of remittances paid, visitors' expenditures and inward and outward flows of foreign direct investment: the higher the level of the indicators, the further the country will be to the positive domain of the second component. Additionally, larger outflows of foreign direct investment are observed when moving to the north-east. Larger and positive current account as GDP share is when moving to the north-west, while larger and positive capital and financial account as GDP share is when going to the south-east.

Table 6.3. Factor Loadings and Significance of Factors, Principal Components, BOP Position

List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	BOP index 1 (1st Principal Component)	*BOP index 2 (2nd Principal Component)*	*BOP index 1 (1st Principal Component)*	*BOP index 2 (2nd Principal Component)*
Openness of economy	0.42676	0.12236	**0.8787** *(0.0000)*	0.1723 *(0.3378)*
Merchandise exports	0.00000	0.00000	0.8945 *(0.0000)*	0.1505 *(0.4032)*
Merchandise imports	0.01458	0.01881	**0.8086** *(0.0000)*	0.1892 *(0.2916)*
Arrivals of visitors	0.10564	0.02688	**0.6080** *(0.0002)*	0.0961 *(0.5946)*
Total expenditures of visitors	-0.00163	0.00945	-0.0094 *(0.9587)*	**0.0338** *(0.8518)*
Outgoing international calls per inhabitant	0.15106	0.03250	**0.8694** *(0.0000)*	0.1163 *(0.5194)*
International Internet bandwidth	0.14760	0.03884	**0.8495** *(0.0000)*	0.1389 *(0.4407)*
FDI: outward flows, % GFCF	0.12196	0.15356	**0.7019** *(0.0000)*	**0.5493** *(0.0009)*

List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	BOP index 1 (1st Principal Component)	*BOP index 2 (2nd Principal Component)*	*BOP index 1 (1st Principal Component)*	*BOP index 2 (2nd Principal Component)*
FDI: outward flows, % of exports	0.03978	0.18089	0.2290 *(0.2000)*	**0.6470** *(0.0000)*
FDI: inward flows, % GFCF	-0.02703	0.20113	-0.1556 *(0.3874)*	**0.7194** *(0.0000)*
FDI: inward flows, % of exports	-0.03190	0.23236	-0.1836 *(0.3064)*	**0.8311** *(0.0000)*
Workers' remittances: Payments, % of trade	-0.04132	0.11620	-0.2378 *(0.1827)*	**0.4156** *(0.0161)*
Workers' remittances: Payments, % of GDP	-0.04038	0.17309	-0.2324 *(0.1931)*	**0.6191** *(0.0001)*
Workers' remittances: Receipts, % of trade	-0.08731	0.01882	**-0.5025** *(0.0029)*	0.0673 *(0.7097)*
Workers' remittances: Receipts, % of GDP	-0.08457	0.02851	**-0.4867** *(0.0041)*	0.1020 *(0.5723)*
Balance of payments: capital and financial account summaries	-0.07371	0.20672	**-0.4242** *(0.0139)*	**0.7394** *(0.0000)*
Balance of current account	0.09502	-0.17664	**0.5469** *(0.0010)*	**-0.6318** *(0.0001)*

Table 6.4 presents the values of the first and the second BOP position indices for the pool of the transition countries, with the EU15 being a reference point. In addition, the two indices are used to translate the relative position of a country into a measure of its distance from the EU15 average as of the BOP position. Table 6.4 presents ranking of the distances for each of the countries. According to the BOP position indicators, Slovenia is the closest to the EU15 average country. Hungary and Croatia are the next closest, followed by the Czech Republic and Estonia. Next come Slovakia, Lithuania and Latvia, each forming a separate group. Poland and Bulgaria form the seventh group. Romania and Russia are in the eighth group. Belarus and Macedonia each form the next two groups. Ukraine and Kyrgyzstan form the eleventh group, followed by Kazakhstan. Armenia and Georgia are in the next thirteenth group. Moldova, Albania, Bosnia and Herzegovina and Azerbaijan each form the last four most distant from the EU15 group. Note that Azerbaijan is much further along the BOP position dimension from the EU15 indicators than the rest countries.

Table 6.4. Ranking of the Distance from EU15 average, BALANCE OF PAYMENTS

Country	Distance from EU15 average ranking	Country	BOP index 1	BOP index 2
EU15	0	EU15	0.83	-0.04
Slovenia	1	Slovenia	0.63	-0.60
Hungary	2	Estonia	0.31	0.73
Croatia	2	Slovakia	0.19	-0.78
Czech Rep.	3	Czech Rep.	0.17	0.54
Estonia	3	Hungary	0.11	-0.12
Slovakia	4	Croatia	0.07	0.06
Lithuania	5	Belarus	-0.20	-1.10
Latvia	6	Lithuania	-0.22	-0.40
Poland	7	Poland	-0.27	-0.69
Bulgaria	7	Ukraine	-0.31	-0.86
Romania	8	Latvia	-0.33	-0.43
Russian Fed.	8	Kazakhstan	-0.39	-1.22
Belarus	9	Bulgaria	-0.48	0.05
Macedonia	10	Romania	-0.50	-0.48
Ukraine	11	Macedonia	-0.55	-0.65
Kyrgyzstan	11	Russian Fed.	-0.83	-0.51
Kazakhstan	12	Kyrgyzstan	-0.89	0.58
Armenia	13	Georgia	-1.03	0.16
Georgia	13	Armenia	-1.03	0.04
Moldova	14	Moldova	-1.12	0.34
Albania	15	Albania	-1.24	-0.50
Azerbaijan	17	Azerbaijan	-1.31	4.36

VI.3 Institutions

To characterize variation in institutional arrangements in the countries under study we utilize the World bank's indicators on institutional development (indices on voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption) and a set of indicators from the World Bank Doing business survey. The indicators reflect fundamental differences in institutions from different sides. The full list of indicators used is in Table A6.1 in the Appendix.

The first two components based on the list of variables that characterize institutions explain only 41 per cent of the total variance[66], implying a significant hetero-

[66] It is suggested that six components explaining 65% of the variation are retained.

geneity in the indicators that characterize the institutional framework. For descriptive purposes, however, we will analyze only the first two components.

The factor loadings – the weights with which every indicator in the list enters the first and the second components respectively – are presented in Table 6.5. Fig. 6.3 shows the position of the countries under consideration in the space of the first and the second institutions' indices, that, to remind, are the weighted sums of the initial indicators that characterize the institutional framework in the countries. The diagram allows getting an idea on the relative positions of each country in the space, and on relative positions of one country to another in terms of difference or similarities with respect to institutions.

The table and the diagram reflect the fact that the further the countries are to the *negative* domain of the first principal component, the higher are political stability index, credit information index and private bureau coverage. Director liability index and recovery rate in case of closing business are also higher. At the same time, the further the country is to the negative domain of the first principal component the easier it is to get a license, less time is required to start business, less procedures to register property, lower number of payments and less time spent on paying taxes. Fewer documents are required for exports or imports, and time spent for imports is also less. Numbers of procedures to enforce contracts, costs of contract enforcement and time and cost of closing business also diminish when one moves to the domain of negative coordinates of the first principal component.

Table 6.5. Factor Loadings and Significance of Factors in Principal Components, INSTITUTIONS

List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	Institutions index 1	*Institutions index 2*	*Institutions index 1*	*Institutions index 2*
Voice and Accountability	-0.14978	0.10989	**-0.8863** *(0.0000)*	**0.2735** *(0.0878)*
Political Stability	-0.03126	-0.00109	**-0.8390** *(0.0000)*	0.1220 *(0.4532)*
Government Effectiveness	0.00000	0.00000	-0.9665 *(0.0000)*	0.0893 *(0.5837)*
Regulatory Quality	0.00000	0.00000	-0.9462 *(0.0000)*	0.1213 *(0.4559)*
Rule of Law	0.00000	0.00000	-0.9628 *(0.0000)*	0.0970 *(0.5116)*
Control of Corruption	-0.19497	0.04453	**-0.9541** *(0.0000)*	0.0905 *(0.5787)*
Starting a Business: Procedures (number)	0.03519	0.09826	**0.6486** *(0.0000)*	**0.4362** *(0.0049)*

List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	Institutions index 1	*Institutions index 2*	*Institutions index 1*	*Institutions index 2*
Starting a Business: Time (days)	0.01601	0.07044	**0.4249** *(0.0063)*	0.2669 *(0.0959)*
Starting a Business: Cost (% of income per capita)	0.05227	0.09902	**0.5144** *(0.007)*	**0.4505** *(0.0035)*
Starting a Business: Min. capital (% of income per capita)	0.01368	0.08492	0.1352 *(0.4056)*	**0.2988** *(0.0611)*
Dealing with Licenses: Procedures (number)	0.0545	-0.05609	**0.5834** *(0.0001)*	-0.1818 *(0.2616)*
Dealing with Licenses: Time (days)	0.02036	0.07058	**0.6042** *(0.000)*	0.2408 *(0.1344)*
Dealing with Licenses: Cost (% of income per capita)	0.0631	0.01413	**0.3524** *(0.0257)*	0.0882 *(0.5884)*
Difficulty of Hiring Index	0.01024	0.25936	0.0592 *(0.7165)*	**0.6023** *(0.0000)*
Rigidity of Hours Index	0.00617	0.1477	-0.1565 *(0.3348)*	**0.2704** *(0.0915)*
Difficulty of Firing Index	0.00084	0.21155	0.1211 *(0.4565)*	**0.4651** *(0.0025)*
Rigidity of Employment Index	0.00000	0.00000	0.0175 *(0.9145)*	**0.6970** *(0.0000)*
Non-wage labor cost (% of salary)	0.03279	0.05671	0.2366 *(0.1416)*	**0.2611** *(0.1037)*
Firing costs (weeks of wages)	0.03198	0.1438	-0.1710 *(0.2913)*	**0.5268** *(0.0005)*
Registering Property: Procedures (number)	0.00333	0.03305	**0.5960** *(0.0000)*	0.1106 *(0.4968)*
Registering Property: Time (days)	-0.03163	0.09441	0.2359 *(0.1428)*	**0.3108** *(0.0509)*
Registering Property: Cost (% of income per capita)	-0.00391	0.08576	-0.2049 *(0.2047)*	**0.2989** *(0.0610)*
Getting Credit: Legal Rights Index	-0.07001	-0.0397	-0.2235 *(0.1657)*	-0.1628 *(0.3154)*
Getting Credit: Credit Information Index	0.00059	0.06741	**-0.6964** *(0.0000)*	0.1908 *(0.2328)*
Getting Credit: Public registry coverage (% adults)	-0.02936	0.06331	-0.2423 *(0.1320)*	**0.2857** *(0.0739)*
Getting Credit: Private bureau coverage (% adults)	-0.02795	-0.02256	**-0.6030** *(0.000)*	-0.0525 *(0.7479)*

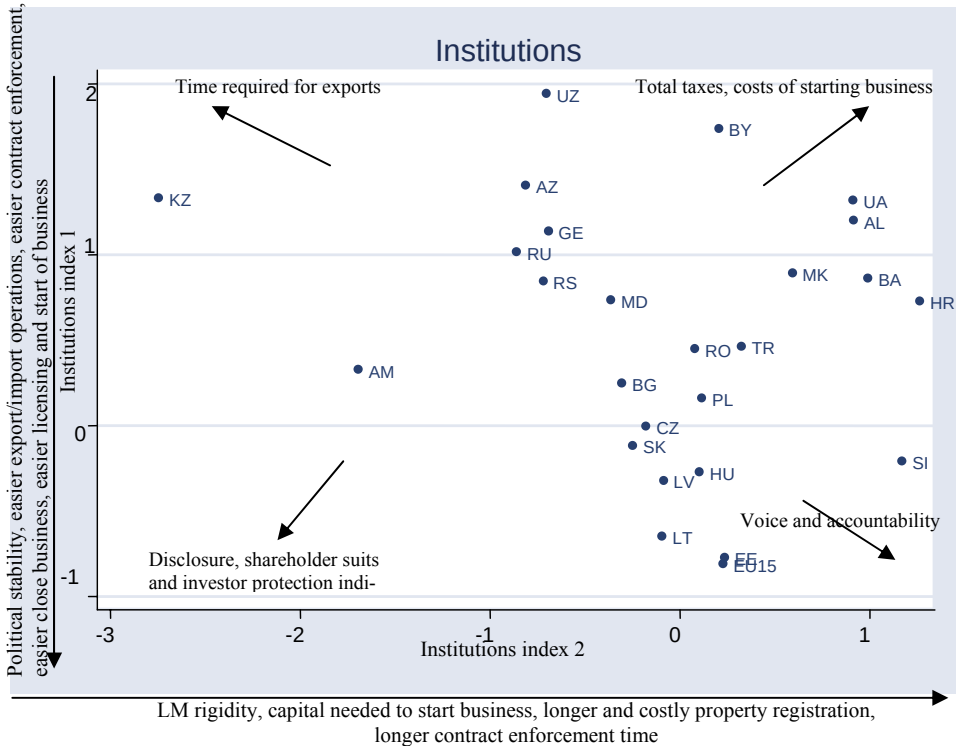
List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	Institutions index 1	*Institutions index 2*	*Institutions index 1*	*Institutions index 2*
Protecting Investors: Disclosure Index	-0.04272	-0.21591	**-0.3190** *(0.0448)*	**-0.4332** *(0.0052)*
Protecting Investors: Director Liability Index	-0.05478	-0.00663	**-0.3066** *(0.0543)*	0.2217 *(0.1691)*
Protecting Investors: Shareholder Suits Index	0.0000	-0.17121	-0.2469 *(0.1246)*	**-0.4706** *(0.0022)*
Protecting Investors: Investor Protection Index	0.00000	0.00000	-0.5300 *(0.0004)*	-0.4619 *(0.0027)*
Paying Taxes: Payments (number)	0.12419	-0.03705	**0.7568** *(0.0000)*	-0.0043 *(0.9789)*
Paying Taxes: Time (hours)	0.01444	0.03206	**0.3656** *(0.0204)*	0.0761 *(0.6405)*
Paying Taxes: Total tax rate (% profit)	0.02627	0.05506	**0.3843** *(0.0143)*	**0.1426** *(0.3802)*
Documents for export (number)	0.02309	-0.04973	**0.6992** *(0.0000)*	-0.2366 *(0.1415)*
Time for export (days)	0.07815	-0.09137	**0.7973** *(0.0000)*	**-0.3459** *(0.0288)*
Documents for import (number)	0.04648	0.0017	**0.7062** *(0.0000)*	0.0076 *(0.9629)*
Time for import (days)	0.07414	-0.08354	**0.7817** *(0.0000)*	-0.2793 *(0.0810)*
Enforcing Contracts: Procedures (number)	0.01092	0.01607	**0.5665** *(0.0001)*	0.0401 *(0.8060)*
Enforcing Contracts: Time (days)	0.03899	0.11673	0.0284 *(0.8621)*	**0.4715** *(0.0021)*
Enforcing Contracts: Cost (% of debt)	0.04485	0.01395	**0.4643** *(0.0025)*	0.0787 *(0.6292)*
Closing a Business: Time (years)	0.04512	-0.00854	**0.5355** *(0.0004)*	-0.0552 *(0.7353)*
Closing a Business: Cost (% of estate)	0.04538	0.06561	**0.4417** *(0.0043)*	0.2589 *(0.1068)*
Closing a Business: Recovery rate (cents on the dollar)	-0.04852	0.01369	**-0.8632** *(0.0000)*	-0.0025 *(0.9878)*

The allocation of countries along the second principal component is mainly driven by the difference in labor market rigidity: indices of difficulty of hiring and firing, hiring and firing costs and rigidity of employment and hours of work all increase when one moves from the left to the right. In addition, the further the country is to the positive domain of the second principal component, the larger is the minimum capital as percentage of per capita income needed to start business, the

longer and more costly is to register property, the longer is the time to enforce contracts and the higher is the public registry coverage.

Additionally, countries with higher costs of starting business and higher total tax rate are in the upper right part of the plane, while those with more time required for exports are at the upper left part of the plane. Voice and accountability index is relatively higher at the bottom and to the right, while disclosure index, shareholder suits index and investor protection index is higher at the bottom to the left.

Figure 6.3. Allocation of countries in the plane of the first two principal components based on indicators of INSTITUTIONS



The allocation of countries is in line with the aforementioned interpretation of the principal components and is in comfort with the economic intuition. Estonia has the closest position to the EU15 average, with Lithuania being the next closest (Table 6.6). The third group of countries in the shortest distance from the EU15 average includes Hungary and Latvia. A bit further is the group formed by Slovakia, Czech Republic and Poland. Slovenia, Bulgaria, Romania and Turkey are in

the fifth group. It is followed by Moldova and Macedonia, each being a separate group. The Balkan countries of Bosnia and Herzegovina, Croatia and Serbia and Montenegro are in the next group. They are followed by a heterogeneous group of Albania, Russia, Georgia, Armenia and Ukraine. Azerbaijan and Belarus each form a separate group. Uzbekistan and Kazakhstan are in the most distance from EU15 average.

Table 6.6. Ranking based on the Distance from EU15 average, INSTITUTIONS

Country	Distance from EU15 average ranking	Country	Institutions index 1	Institutions index 2
EU15	0	EU15	-0.82	0.23
Estonia	1	Estonia	-0.78	0.24
Lithuania	2	Lithuania	-0.66	-0.09
Hungary	3	Latvia	-0.33	-0.08
Latvia	3	Hungary	-0.28	0.11
Slovak Republic	4	Slovenia	-0.21	1.17
Czech Republic	4	Slovakia	-0.12	-0.24
Poland	4	Czech Rep.	-0.01	-0.17
Slovenia	5	Poland	0.15	0.12
Bulgaria	5	Bulgaria	0.24	-0.30
Romania	5	Armenia	0.32	-1.69
Moldova	6	Romania	0.44	0.08
Macedonia	7	Croatia	0.72	1.27
Bosnia-Herzegovina	8	Moldova	0.73	-0.36
Croatia	8	Serbia and Montenegro	0.84	-0.71
Serbia and Montenegro	8	Bosnia and Herzegovina	0.86	1.00
Albania	9	Macedonia	0.88	0.60
Russia	9	Russian Fed.	1.01	-0.85
Georgia	9	Georgia	1.13	-0.69
Armenia	9	Albania	1.19	0.92
Ukraine	9	Ukraine	1.31	0.92
Azerbaijan	10	Kazakhstan	1.32	-2.74
Belarus	11	Azerbaijan	1.40	-0.81
Uzbekistan	12	Belarus	1.73	0.21
Kazakhstan	13	Uzbekistan	1.94	-0.70

VI.4 Demography and Human Capital

To characterize demographic situation in the countries, we use natural growth rate of population, fertility and birth rates, net migration rate, population density

and the share of urban population. The level of human capital accumulation in the countries is characterized by secondary and tertiary enrollment rates and adult literacy rate (the full list of indicators is in Table A6.1 in the Appendix).

The raw indicators are then used to derive the first two principal components[67]. The resulting factor loadings and the corresponding significance ratios are presented in Table 6.7, while the relative positions of the countries with respect to the EU15 average in the plane of the first and the second index of demography and human capital are presented at Fig. 6.4.

Table 6.7. Factor Loadings and Significance of Factors in Principal Components, Demography and Human Capital

List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	Demography and HC index 1	*Demography and HC index 2*	*Demography and HC index 1*	*Demography and HC index 2*
Urban population, proportion	0.18671	0.06465	**0.8276** *0.0000*	0.1544 *0.3351*
Population density	0.10126	0.13607	**0.4489** *0.0032*	**0.3250** *0.0381*
Rate of natural population increase	-0.16145	0.27299	**-0.7156** *0.0000*	**0.6520** *0.0000*
Net migration rate, average	0.13892	0.02152	**0.6157** *0.0000*	0.0514 *0.7496*
Birth rate, crude	-0.17179	0.26217	**-0.7614** *0.0000*	**0.6262** *0.0000*
Fertility rate, total	-0.14794	0.30500	**-0.6557** *0.0000*	**0.7285** *0.0000*
Gross secondary enrollment ratio	0.16145	0.26610	**0.7156** *0.0000*	**0.6356** *0.0000*
Higher education enrolments	0.17024	0.08481	**0.7546** *0.0000*	0.2026 *0.2040*
Adult literacy rate	0.05288	0.11734	0.2344 *0.1402*	**0.2803** *0.0759*
Combined gross enrolment ratio	0.16089	0.25975	**0.7131** *0.0000*	**0.6204** *0.0000*

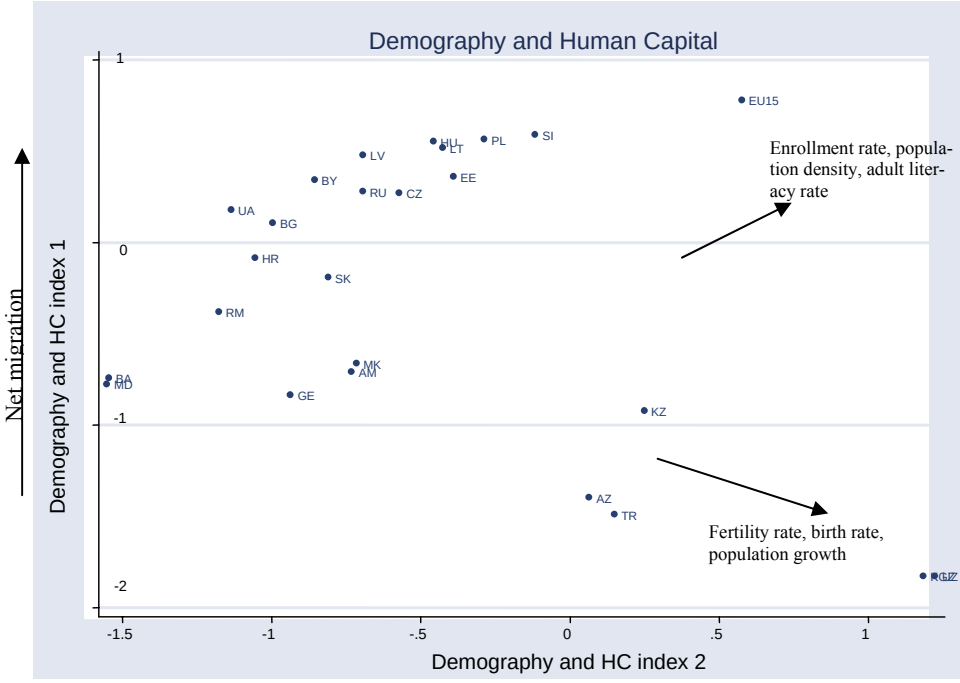
The table suggests that the countries with the highest fertility and birth rates and the highest population increase are to be located in the bottom right corner of the plane. The countries in the right upper corner are those with the highest enrollment rates, adult literacy rates and population density. Net migration tends to

[67] The three principal components explain 80% of variation in the factors used. The first two components explain almost 70% of the variation.

push the first component up hence implying that the countries in the upper part of the panel are net importers of labor.

The allocation of the countries is as suggested above: EU15 average is in the upper right corner, while Azerbaijan, Turkey, Kyrgyzstan, Uzbekistan and Tajikistan are in the right bottom part of the plane. Moldova and Bosnia and Herzegovina having relatively low adult literacy rates are in the left part of the plane.

Figure 6.4. Allocation of countries in the plane of the first two principal components based on indicators of DEMOGRAPHY AND HUMAN CAPITAL



The relative positions of the countries are translated into a distance from EU15 average and the relevant ranking (Table 6.8). The countries could be grouped into 11 layers based on the distance to the EU15 average. Note that the groups are based solely on the distance from EU-average and are very heterogeneous otherwise, as is clear from the diagram. Slovenia is the closest to the EU15 average country. Poland is the second closest. Lithuania, Estonia and Hungary form the next closest to the EU15 average group of countries. The Czech Republic, Latvia, the Russian Federation are in the fourth group, while Belarus form the fifth one. Slovakia, Bulgaria and Kazakhstan are in the sixth group. Next come Ukraine and Croatia, followed by Macedonia, Armenia and Romania. Georgia, Azerbaijan and Turkey could be considered as the next ninth group. The most distant from EU15

average group, except Tajikistan which is even further, is formed by Bosnia and Herzegovina, Moldova, Kyrgyzstan and Uzbekistan.

Table 6.8. Ranking of the Distance from EU15 average, DEMOGRAPHY AND HUMAN CAPITAL

Country	Distance from EU15 average ranking	Country	Demography &HC index 1	Demography &HC index 2
EU15	0	EU15	0.77	0.58
Slovenia	1	Slovenia	0.58	-0.11
Poland	2	Poland	0.56	-0.28
Lithuania	3	Hungary	0.55	-0.45
Estonia	3	Lithuania	0.52	-0.42
Hungary	3	Latvia	0.47	-0.69
Czech Rep.	4	Estonia	0.36	-0.39
Latvia	4	Belarus	0.34	-0.85
Russian Fed.	4	Russian Fed.	0.28	-0.69
Belarus	5	Czech Rep.	0.27	-0.57
Slovakia	6	Ukraine	0.17	-1.13
Bulgaria	6	Bulgaria	0.10	-0.99
Kazakhstan	6	Croatia	-0.09	-1.05
Ukraine	7	Slovakia	-0.19	-0.81
Croatia	7	Romania	-0.38	-1.17
Macedonia	8	Macedonia	-0.67	-0.71
Armenia	8	Armenia	-0.71	-0.73
Romania	8	Bosnia and Herzegovina	-0.75	-1.54
Georgia	9	Moldova	-0.78	-1.55
Azerbaijan	9	Georgia	-0.84	-0.93
Bosnia and Herzegovina	10	Kazakhstan	-0.93	0.25
Moldova	10	Azerbaijan	-1.40	0.07
Kyrgyzstan	10	Kyrgyzstan	-1.83	1.19
Uzbekistan	10	Uzbekistan	-1.83	1.23
Tajikistan	11	Tajikistan	-3.45	2.52

VI.5 Health

We use health and life expectancy indicators to characterize variation in health across the countries. In particular, we use HIV and tuberculosis prevalence indicators, public and private health expenditure indicators, clean water accessibility indicator, infant mortality and low birth shares, and average female and male life

expectancy rates. The full list of variables used is presented in Table A6.1 in the Appendix.

The raw indicators are then used to derive the two health indices[68]. The corresponding factor loadings and significance ratios are presented in Table 6.9. The relative positions of the countries as compared to the EU15 average in the plane of the two health indices are presented at Fig. 6.5. The allocation of the countries is in comfort with the economic intuition.

As suggested by the table and the diagram, the more the country is to the positive domain of the first principal component the less is tuberculosis prevalence, the higher is expenditure on health as GDP share and less out-of-pocket health expenditures. The shares of population with access to improved water and female life expectancy at birth are also higher.

Table 6.9. Factor Loadings and Significance of Factors Principal Components, Health

List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	Health index 1	*Health index 2*	*Health index 1*	*Health index 2*
HIV prevalence	-0.00832	0.38501	-0.0429 *(0.8066)*	**0.6078** *(0.0001)*
Tuberculosis cases	-0.16213	0.03474	**-0.8369** *(0.0000)*	0.0548 *(0.7543)*
Total expenditure on health, % of GDP	0.16563	-0.06291	**0.8550** *(0.0000)*	-0.0993 *(0.5703)*
Out-of-pocket expenditures, % of private expenditures on health	-0.12155	0.11924	**-0.6274** *(0.0001)*	0.1883 *(0.2788)*
Population with sustainable access to an improved water source (%)	0.13848	0.07113	**0.7148** *(0.0000)*	0.1123 *(0.5207)*
Newborns with low birth weight (%)	-0.08309	-0.41500	**-0.4289** *(0.0101)*	**-0.6552** *(0.0000)*
One-year-olds fully immunized against measles (%)	-0.06019	0.40399	**-0.3107** *(0.0693)*	**0.6378** *(0.0000)*
Contraceptive prevalence rate (%)	0.11656	0.20042	**0.6017** *(0.0001)*	**0.3164** *(0.0640)*
Infant mortality rate	-0.15583	-0.19506	**-0.8044** *(0.0000)*	**-0.3079** *(0.0719)*
Average life expectancy at birth for males	0.16151	-0.21490	**0.8337** *(0.0000)*	**-0.3393** *(0.0462)*
Average life expectancy at birth for females	0.17750	-0.02995	**0.9162** *(0.0000)*	-0.0473 *(0.7874)*

[68] The analysis suggests that three principal components explaining 68% of variation in the factors used are to be retained. The first two components explain 59% of the variation.

The allocation of countries along the second health indicator is driven mainly by the difference in the HIV prevalence rate. Additionally, there is a group of indicators that enter both components. As a result, life expectancy at birth for males increases when we move north-west in the diagram, contraceptive prevalence rate – when we move north-east. Proportions of newborns with low weight and infant mortality rates increase when moving to the south-west of the two-component plane, while immunization rate is higher to the south-east.

Figure 6.5. Allocation of countries in the plane of the first two principal components based on indicators of HEALTH

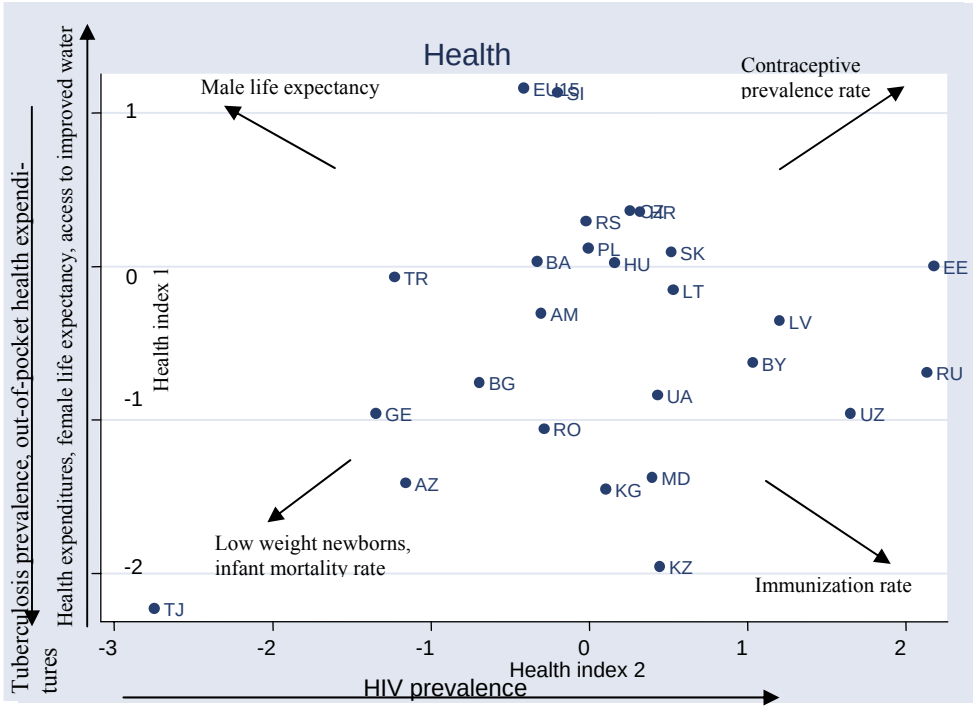


Table 6.10 presents the values of the first and the second health indices for the pool of the transition countries, with the EU15 being a reference point. In addition, the two indices are used to translate the relative position of a country into a measure of its distance from the EU15 average as of the health dimension. Table 6.10 also presents ranking of the distances for each of the countries. It follows from the table that Slovenia is the closest to the EU15 average when health indicators are considered. The Czech Republic comes next, followed by Croatia and Poland. Hungary forms the fourth group and Turkey, Slovakia and Armenia – the fifth

group[69]. Lithuania and Bulgaria are the next closest, each forming a separate group. Ukraine and Romania are in the eighth group, followed by Latvia, Georgia and Belarus. The next shortest distance to EU15 average is in Kyrgyzstan, Moldova and Azerbaijan. The last five groups each consist of one country and are in the following order: Estonia, Uzbekistan, Russia, Kazakhstan and Tajikistan, with the last one being much further from the others in terms of health situation.

Table 6.10. Ranking of the Distance from EU15 average, HEALTH

Country	Distance from EU15 average ranking	Country	Health index 1	Health index 2
EU15	0	EU15	1.14	-0.43
Slovenia	1	Slovenia	1.12	-0.23
Czech Rep.	2	Czech Rep.	0.36	0.24
Croatia	3	Croatia	0.35	0.34
Poland	3	Poland	0.11	0.03
Hungary	4	Slovakia	0.09	0.50
Slovakia	5	Hungary	0.04	0.11
Armenia	5	Estonia	0.01	2.07
Lithuania	6	Lithuania	-0.15	0.61
Bulgaria	7	Armenia	-0.29	-0.29
Ukraine	8	Latvia	-0.34	1.18
Romania	8	Belarus	-0.60	1.02
Latvia	9	Russian Fed.	-0.65	1.97
Georgia	9	Bulgaria	-0.73	-0.69
Belarus	9	Ukraine	-0.80	0.42
Kyrgyzstan	10	Uzbekistan	-0.91	1.50
Moldova	10	Georgia	-0.94	-1.24
Azerbaijan	10	Romania	-1.01	-0.29
Estonia	11	Moldova	-1.30	0.47
Uzbekistan	12	Azerbaijan	-1.38	-1.17
Russian Fed.	13	Kyrgyzstan	-1.39	0.14
Kazakhstan	14	Kazakhstan	-1.88	0.43
Tajikistan	15	Tajikistan	-2.17	-2.75

VI.6 Infrastructure

Infrastructure is characterized by a set of indicators reflecting density of paved roads, railroads and pipelines and passenger and cargo use of roads, railroads and

[69] We need to stress here again that the relative positions are defined as a distance from EU-average in the plane of two main components, and countries in different parts of the plane could have the same distance to EU average.

air crafts. The full list of indicators used is presented in Table A6.1 in the Appendix. The raw indicators are then used to derive the two indices based on principal components' methodology[70]. The corresponding factor loadings and significance ratios are presented in Table 6.11.

Table 6.11. Factor Loadings and Significance of Factors Principal Components, Infrastructure

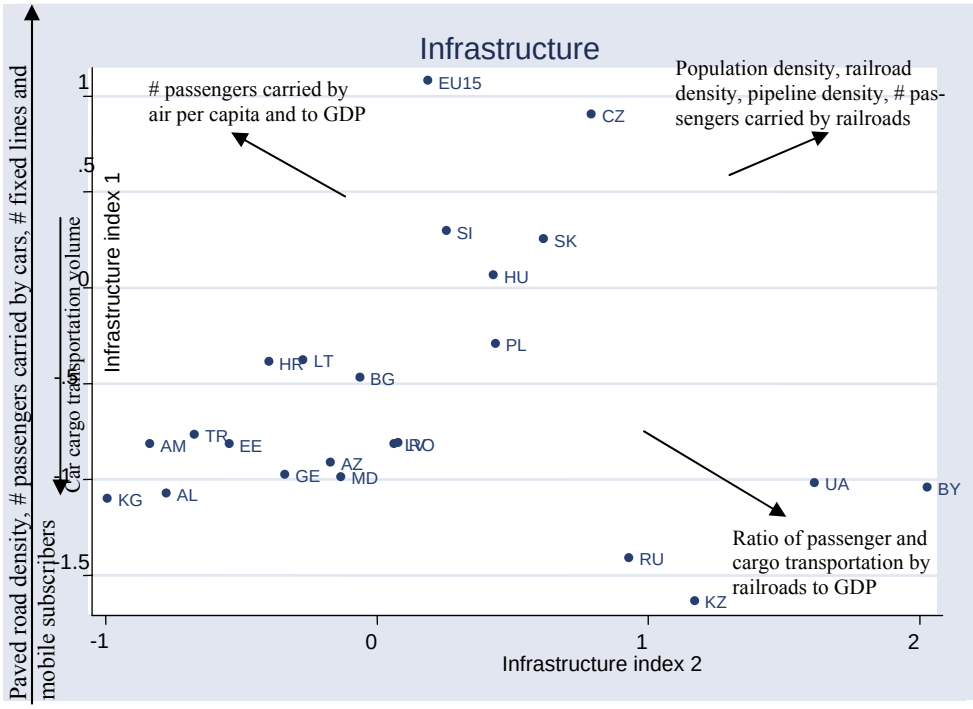
List of indicators	Factor Loadings		Correlation (5% significance P-values)	
	Infrastructure index 1	*Infrastructure index 2*	*Infrastructure index 1*	*Infrastructure index 2*
Population density	0.13543	0.13971	**0.7317** *(0.0000)*	**0.3324** *(0.0444)*
Paved roads density	0.14803	0.10373	**0.7998** *(0.0000)*	0.2468 *(0.1408)*
Passengers carried per capita, cars	0.15759	-0.00518	**0.8515** *(0.0000)*	-0.0123 *(0.9423)*
Passengers carried per GDP, cars	0.07347	0.01202	**0.3970** *(0.0150)*	0.0286 *(0.8666)*
Goods hauled, cars	-0.05452	0.06464	**-0.2946** *(0.0767)*	0.1538 *(0.3634)*
Railways density	0.13461	0.15543	**0.7273** *(0.0000)*	**0.3698** *(0.0243)*
Passengers carried, per capita, railway	0.07324	0.26228	**0.3957** *(0.0153)*	**0.6240** *(0.0000)*
Passengers carried, per GDP, railway	-0.06347	0.26707	**-0.3429** *(0.0377)*	**0.6355** *(0.0000)*
Goods hauled, per GDP, railway	-0.11362	0.15896	**-0.6139** *(0.0001)*	**0.3782** *(0.0210)*
Pipelines density	0.11230	0.17831	**0.6067** *(0.0001)*	**0.4242** *(0.0089)*
Passengers carried, per capita, air	0.08460	-0.26263	**0.4571** *(0.0045)*	**-0.6249** *(0.0000)*
Passengers carried, per GDP, air	0.07339	-0.29939	**0.3965** *(0.0151)*	**-0.7123** *(0.0000)*
Main telephone lines per capita	0.15407	-0.00321	**0.8325** *(0.0000)*	-0.0076 *(0.9642)*
Mobile phone per capita	0.14936	-0.07550	**0.8070** *(0.0000)*	-0.1796 *(0.2874)*

[70] The analysis suggests that five principal components explaining 85% of variation in the factors used are to be retained. The first two components explain 75% of the variation.

The relative positions of the countries to the EU15 average in the plane of the two infrastructure indices are presented at Fig. 6.6. The allocation of the countries is in line with the economic intuition.

The factor loadings imply that the countries with relatively high population density, high density of railroads and pipelines and high number of passengers carried by railroads in per capita terms should be expected in the right and upper part of the first two principal component plane. At the same time the countries with high ratio of passenger and cargo transportation by railroads to GDP should be positioned at the right and bottom part of the plane. Countries with high number of passengers carried by air, both in per capita and GDP terms, are more to the upper left part. Also, the higher is the paved road density, number of passengers carried by cars, both in per capita and per GDP terms, and number of fixed lines and mobile subscribers, the higher is the relevant coordinate at the first main component. At the same time, the higher is the volume of cargo transportation by cars the lower is the relevant coordinate of the first main component. The second component is independent of any of the paved roads characteristics and of fixed line and mobile phones density indicators.

Figure 6.6. Allocation of countries in the plane of the first two principal components based on indicators of INFRASTRUCTURE



The values of the two infrastructure indices for each of the countries in the sample, together with the countries' ranking derived from translation of the relative positions of the country into a distance from EU15 average are presented in Table 6.12. There are twelve groups of countries according to their infrastructure gap from EU15 average. First come the Czech Republic, Slovenia, Slovakia, Hungary and Poland, each being in a distinct group. The sixth group in the shortest distance comprises of Lithuania, Bulgaria and Croatia. Romania and Latvia follow. The eighth group in terms of infrastructure development gap from EU15 includes Azerbaijan, Estonia and Turkey. Then come Moldova, Georgia and Armenia, followed by Albania. Kyrgyzstan, Ukraine and the Russian Federation form the eleventh group, while Belarus and Kazakhstan conclude[71].

Table 6.12. Ranking of the Distance from EU15 average, INFRASTRUCTURE

Country	Distance from EU15 average (ranking)	Country	Infrastructure index 1	Infrastructure index 2
EU15	0	EU15	1.07	0.19
Czech Rep.	1	Czech Rep.	0.90	0.79
Slovenia	2	Slovenia	0.29	0.26
Slovakia	3	Slovakia	0.25	0.62
Hungary	4	Hungary	0.06	0.43
Poland	5	Poland	-0.30	0.44
Lithuania	6	Lithuania	-0.38	-0.27
Bulgaria	6	Croatia	-0.39	-0.39
Croatia	6	Bulgaria	-0.47	-0.06
Romania	7	Romania	-0.82	0.08
Latvia	7	Latvia	-0.82	0.07
Azerbaijan	8	Armenia	-0.82	-0.83
Estonia	8	Estonia	-0.82	-0.54
Moldova	9	Azerbaijan	-0.92	-0.17
Georgia	9	Georgia	-0.98	-0.34
Armenia	9	Moldova	-0.99	-0.13
Albania	10	Ukraine	-1.02	1.62
Kyrgyzstan	11	Belarus	-1.05	2.03
Ukraine	11	Albania	-1.08	-0.77
Russian Fed.	11	Kyrgyzstan	-1.11	-0.99
Belarus	12	Russian Fed.	-1.42	0.93
Kazakhstan	12	Kazakhstan	-1.64	1.18

[71] Note that we do not have Uzbekistan and Tajikistan here due to gaps in some of the indicators.

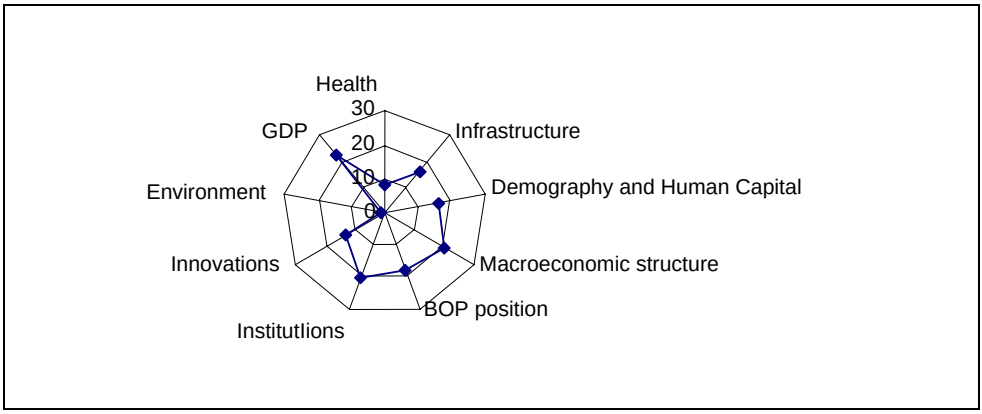
VI.7 Characterization of the gap for the neighboring countries

The rankings of the countries in terms of their closeness to the EU generated in sections VI.1-VI.6 are now used to characterize the gaps between the neighboring countries and the EU in the areas of macroeconomic structure, balance of payment position, institutional development, demography and human capital, health and infrastructure. The procedure allowed getting an insight into the nature of the gap between each of the neighboring country to the EU15 along each of the six dimensions. In addition, to characterize innovation potential and environmental sustainability of the countries under consideration, we use the composite indices (already available, see Table A6.2 in the Appendix). To complete the picture, GDP per capita[72] is considered as a separate, ninth dimension of the gap. As a result, the rankings along the nine dimensions characterize the gap of each of the neighboring countries to the EU15 average.

Figures 6.7-6.13 plot the rankings of each of the countries along the nine dimensions, and Fig. 6.14 combines the positions of the seven countries.

Armenia has a very high ranking in terms of environmental sustainability, rather high ranking along health dimension and dimension of innovative potential, and moderate ranking along the rest of dimensions (Fig. 6.7). Armenia is rated not high according to GDP per capita.

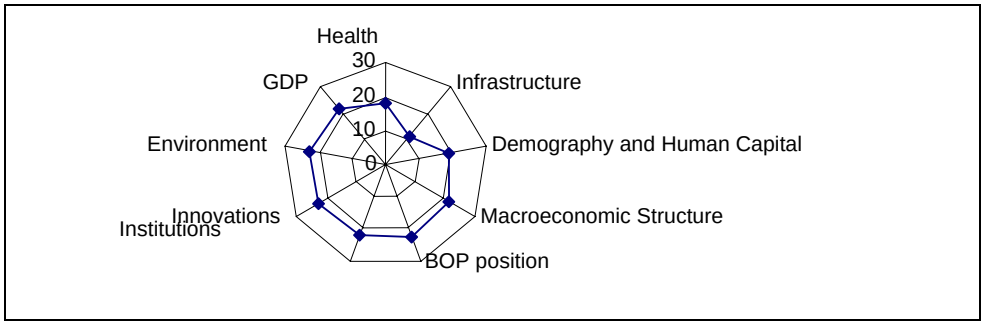
Figure 6.7. Gap to EU15: Armenia



Azerbaijan is rather distant from the EU15 average. It is only infrastructure where Azerbaijan is rated somewhat closer (Table 6.12), while its ranking is pretty low along the other eight dimensions (Fig. 6.8).

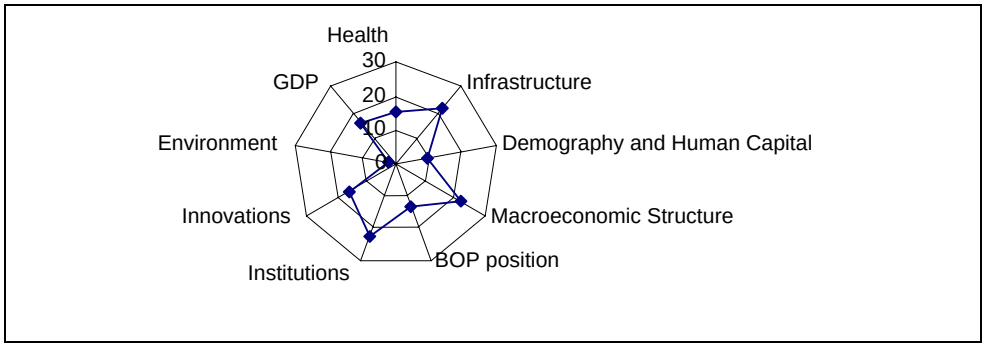
[72] GDP per capita is measured using purchasing power parity.

Figure 6.8. Gap to EU15: Azerbaijan



Belarus is in relatively short distance to the EU15 along environmental sustainability and demography and human capital dimensions (Fig. 6.9). Belarus is more distant from the EU along BOP position, health, innovation and GDP per capita. The largest distance from EU is along infrastructure, macroeconomic structure and institution development dimensions.

Figure 6.9. Gap to EU15: Belarus



Georgia is doing relatively well along the dimension of environmental sustainability (Fig. 6.10). Its developments in health and infrastructure show moderate distance from the EU15 average, while along the rest six dimensions Georgia is among the farthest third of the countries.

Moldova is rated high along the environmental sustainability, and rather high along the dimension of institutional development (Fig. 6.11). It is rated modestly in terms of infrastructure, macroeconomic structure and health. At the same time, Moldova's GDP per capita is the lowest in the group of the countries.

Figure 6.10. Gap to EU15: Georgia

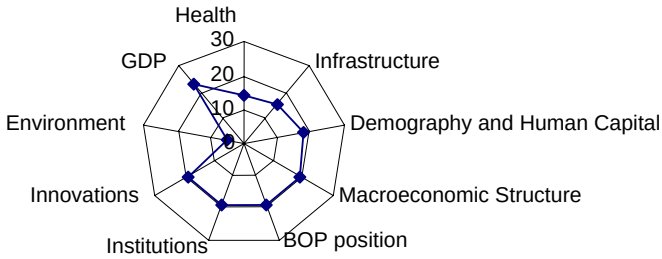
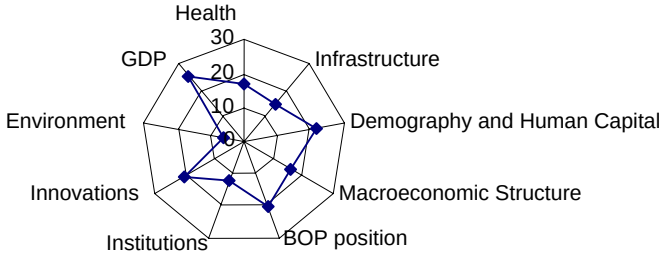
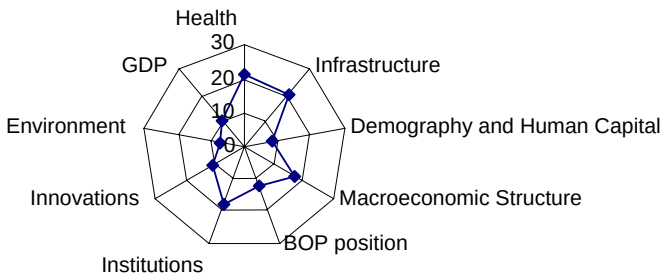


Figure 6.11. Gap to EU15: Moldova



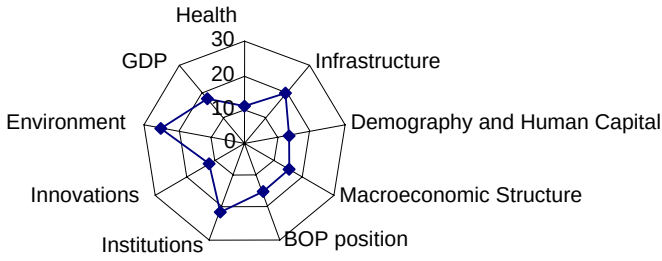
The Russian Federation shows relatively close to the EU15 average in terms of environmental sustainability, demography and human capital, GDP per capita, innovation potential and openness (Fig. 6.12). At the same time, the ranking along the rest of the dimensions – health, infrastructure, macroeconomic structure and institutional development – is rather low. The difference between the two groups of indicators is sizeable.

Figure 6.12. Gap to EU15: Russian Federation



Ukraine is moderately far from the EU15 average in terms of health, demography and human capital, innovations, economic structure, BOP position and GDP per capita (Fig. 6.13). The level of development of infrastructure and institutions is much lower than in the EU15. Ukraine has the lowest ranking among the seven countries along the environmental sustainability dimension.

Figure 6.13 Gap to EU15: Ukraine



If the relative positions of the seven countries-neighbors along all the nine dimensions are considered, one could see that there is no country being the closest to the EU along all the nine dimensions. Some countries are closer along the health dimension (Armenia and Ukraine), others are at a shorter distance from the EU in terms of infrastructure (Azerbaijan), BOP position and demography and human capital (Belarus and the Russian Federation), institutional development (Moldova) and environmental sustainability (Armenia, Belarus and Georgia).

VI.8 Composite Development Indices

The previous section summarized the relative positions of each of the seven neighboring countries with respect to EU15 in the space of nine separate dimensions. It is instructive to have a composite measure of the gap - a composite index – allowing measuring the distance to the EU15 along one dimension. To come up with such an index, we apply the principle component methodology directly to the full set of the raw indicators[73] that characterize various dimension of countries'

[73] The innovation and environment sustainability *indices* are not included. The inclusion of the indices produces changes the indices in the second decimal only.

development. As a result, we obtain two composite indices which together explain 41 per cent of total variation in the full set of raw indicators[74], which is promising given the diversity of the raw indicators used. The factor loadings or, in other words, the weights with which the raw indicators enter the composite indices are presented in Table 6.13 (5 per cent significant weights are in bold). Given the endogeneity of the set of indicators that got significant weights in the composite indices (which is a general characteristic of the method itself), there is little sense in trying to name each of the two composite indices when the raw indicators are so diverse. It is rather reasonable to name them what they really are: Composite Development Index 1 and Composite Development Index 2.

Table 6.13 Factor loadings[75], composite development indices

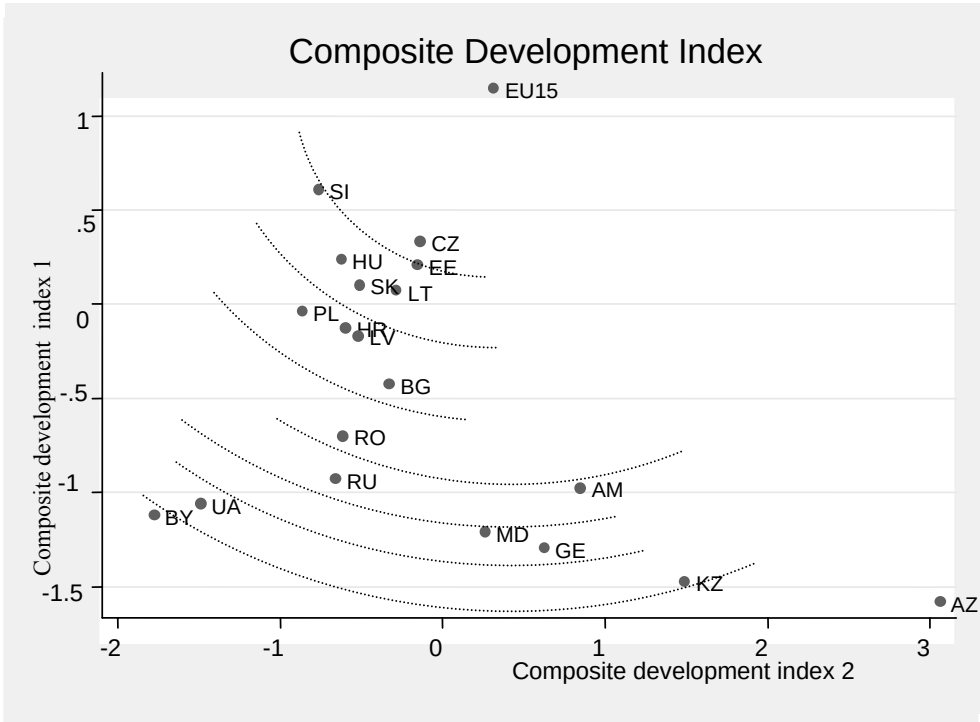
List of indicators	Factor loadings	
	Composite index 1	**Composite index 2**
Urban population, proportion	**0.19836**	0.14982
Birth rate, crude	-0.19273	0.54355
Adult literacy rate	-0.06404	0.05869
Unemployment, % of labor force	0.15687	-0.15889
Employment growth, annual percentage change	-0.09979	-0.0563
Labour force activity rate (% females)	0.15203	-0.06681
Passengers carried per capita, cars	**0.49312**	0.08491
Goods hauled, cars	-0.1712	0.08371
Starting a Business: Cost (% of income per capita)	0.2331	-0.16665
Dealing with Licenses: Procedures (number)	**-0.06536**	0.0263
Dealing with Licenses: Cost (% of income per capita)	**-0.23288**	0.26931
Difficulty of Hiring Index	0.28248	-0.15708
Non-wage labor cost (% of salary)	-0.05348	-0.2574
Registering Property: Time (days)	0.10353	-0.29286
Getting Credit: Legal Rights Index	-0.01148	0.03356
Getting Credit: Public registry coverage (% adults)	**-0.10044**	0.24859
Protecting Investors: Shareholder Suits Index	0.1346	-0.12036
Paying Taxes: Time (hours)	**-0.2964**	-0.14647
Enforcing Contracts: Procedures (number)	-0.21479	-0.11406
Enforcing Contracts: Time (days)	0.07805	0.19705
Closing a Business: Time (years)	**-0.10036**	-0.00847
FDI: inward flows, % GFCF	0.32779	**0.17607**
Workers' remittances: Receipts, % of GDP	**-0.13776**	0.16931
HIV prevalence	-0.09298	-0.08637
Out-of-pocket expenditures, % of private expenditures on health	**0.00144**	0.03939
Contraceptive prevalence rate (%)	**0.22777**	**-0.09651**

[74] Seven components explain 70% of the variation.

[75] We do not report the raw indicators which got zero weights to make the table comprehensive.

The positions of the countries under consideration in the plane of the two composite indices are shown at Fig. 6.14. One of the advantages of studying the countries in the plane of the first two components is the easiness of clustering, in this particular case, on the grounds of countries' distance[76] to the EU15. The magnitudes of the countries' distances are reported in Table 6.14, while 'at-a-glance' clustering is shown at the diagram.

Figure 6.14. Allocation of countries in the plane of the two COMPOSITE DEVELOPMENT INDICES



As is clear from the diagram, Armenia and Russia are the closest to the EU15 among the seven countries-neighbors, with Moldova and Georgia following. Ukraine and Kazakhstan are in the next group of countries which are at a longer distance from the EU15 average according to the measure of the geometric dis-

[76] A natural measure of distance from a country to EU is: $\sqrt{(f_{1EU} - f_{1c})^2 + (f_{2EU} - f_{2c})^2}$, where f_1 and f_2 - the country's values of the first and the second index respectively

tance based on the two composite indicators. Belarus follows, and Azerbaijan is at the farthest distance.

It is instructive to compare the rankings of the neighboring countries based on the geometric measure of distance to the EU15 along the constructed Composite Development Indices to the traditional measures of economic and social development – GDP per capita and HDI. The corresponding rankings are presented in Table 6.14.

VI.9 Conclusions

To measure the gap in development between the European Union and the neighboring countries, we have proposed a Composite Development Indicator. The indicator is the result of application of the principal component method to the set of indicators reflecting macroeconomic structure, balance of payments position, institutions, demography and human capital, health and infrastructure. The measure is free from arbitration in the choice of both the set of indicators which is bounded by availability only, and the weighting scheme used. The comparison of the rankings produced by the Composite Development Indicator to those produced by HDI and GDP per capita shows similarities within the sample of new member states and candidate countries, as well as considerable permutation within the neighboring countries group. The latter is in favor of a high potential of use of the proposed indicator, which is well grounded in terms of technology of measuring the aggregate gap, to position the countries relative to the EU15. The Composite Development Indicator is used to rank the neighboring countries according to their aggregate closeness to the EU.

Additionally, to get a better understanding of the nature of the development[77] gap, we consider indicators in each of the dimensions separately. As a result we obtain ranking of the neighboring countries along each of the component. It turns out that there is no country which leads along all the dimensions, with some being closer to the EU15 along one dimension but further away along another ones.

[77] The term 'Composite *development* indicator' is chosen to stress the aggregate character of the indicator despite the fact that some of the indicators used are rather development-neutral.

Table 6.14. Distance from EU15 based on the Composite Development Indicator, HDI and GDP per capita (PPP)

Values of composite index			Distance from EU15 based on the Composite Development Indicator (i.e. the geometric sum of the two composite indices)		HDI (2005)		GDP per capita, PPP, current international $		Distance from EU15, average ranking, 9 dimensions	
	I	II								
EU15	1.14	0.32	EU15	0	EU15	0.943	EU15	32564	EU15	0
Slovenia	0.61	-0.76	Czech Rep.	0.93	Slovenia	0.917	Slovenia	22273	Slovenia	4
Czech Rep.	0.33	-0.13	Estonia	1.05	Czech Rep.	0.891	Czech Rep.	20538	Hungary	4
Hungary	0.24	-0.62	Slovenia	1.20	Hungary	0.874	Hungary	17887	Czech Rep.	5
Estonia	0.21	-0.15	Lithuania	1.23	Poland	0.87	Slovakia	15871	Slovakia	5
Slovakia	0.10	-0.51	Hungary	1.31	Slovakia	0.863	Estonia	15478	Lithuania	7
Lithuania	0.07	-0.28	Slovakia	1.33	Lithuania	0.862	Lithuania	14494	Estonia	7
Poland	-0.04	-0.86	Latvia	1.56	Estonia	0.86	Poland	13847	Poland	8
Croatia	-0.13	-0.59	Croatia	1.57	Latvia	0.855	Latvia	13646	Croatia	9
Latvia	-0.17	-0.52	Poland	1.67	Croatia	0.85	Croatia	13042	Bulgaria	9
Bulgaria	-0.43	-0.32	Bulgaria	1.70	Bulgaria	0.824	Russian Fed.	10845	Latvia	9
Romania	-0.70	-0.61	Romania	2.07	Romania	0.813	Romania	9060	Romania	12
Russian Fed.	-0.93	-0.65	Armenia	2.19	Belarus	0.804	Bulgaria	9032	Russian Fed.	14
Armenia	-0.98	0.85	Russian Fed.	2.29	Russian Fed.	0.802	Belarus	7918	Armenia	15
Ukraine	-1.06	-1.49	Moldova	2.36	Kazakhstan	0.794	Kazakhstan	7857	Belarus	15
Belarus	-1.13	-1.77	Georgia	2.46	Ukraine	0.788	Ukraine	6848	Ukraine	16
Moldova	-1.21	0.27	Ukraine	2.85	Armenia	0.775	Azerbaijan	5016	Georgia	17
Georgia	-1.30	0.63	Kazakhstan	2.87	Georgia	0.754	Armenia	4945	Moldova	17
Kazakhstan	-1.48	1.50	Belarus	3.09	Azerbaijan	0.746	Georgia	3365	Kazakhstan	18
Azerbaijan	-1.58	3.06	Azerbaijan	3.87	Moldova	0.708	Moldova	2100	Azerbaijan	20

Appendix

Table A6.1. List of variables78 used to characterize the eight dimensions of the gap to the EU

Variable	Description
MACROECONOMIC STRUCTURE	
growth	GDP annual growth rate, per cent, 5-year average
gov_exp	Total general government expenditure, % of GDP
gov_bal	General government balance, % of GDP
infl	Inflation, consumer price index, 5-year average
wage	Real wage, annual percentage change, 5-year average
unemp	Unemployment, % of labor force
empl_gr	Employment growth, annual percentage change, 5-year average
labor_pr	Labor productivity, annual percentage change, 5-year average
agri_gdp	Agriculture, value added (% of GDP)
man_gdp	Manufacturing, value added (% of GDP)
electr_cons	Electricity consumption per capita (kW-h)
carb_em	Carbon dioxide emissions per capita
energy_gdp	GDP per unit of energy use (2000 PPP US$ per kg of oil equivalent)
gini	Distribution of family income: Gini index
rich	Ratio of richest 10% to poorest 10%
inc_mf	Estimated annual earned income (1,000 PPP US$) ,female/male ratio, %
debt	Gross external debt, % of GDP
lfp_f	Female labour force participation rate (%)
lfp_m	Male labour force participation rate (%)
wage_ppp	Gross average monthly wages ($US, at current exchange rates and PPP-adjusted)
inform	Informal economy estimate (% GNP)
OPENNESS	
open	Openness of economy (merchandise exports plus imports as percentage of GDP PPP)
export	Merchandise exports as percentage of GDP PPP (2000)
import	Merchandise imports as percentage of GDP PPP (2000)
arrivals	Arrivals of visitors in percent to the population
visitor_exp	Total expenditures of visitors in per cent to GDP
intercalls	Outgoing international calls per inhabitant (minutes)
internet	International Internet bandwidth (bits per inhabitant)
fdi_outfl_gfcf	Foreign direct investment: outward flows[79], % Gross Financial Capital Flow (GFCF)

[78] Data for 2002-2005 years are used. For each country the last available data point is used. Sources include EBRD, Heritage Foundation, IFS, OECD, WEO database, UN data, TransMONEE Database, Eurostat database, Human Development Report and World Development Indicators

Variable	Description
fdi_outfl_exp	Foreign direct investment: outward flows, % of exports
fdi_inwfl_gfcf	Foreign direct investment: inward flows, % GFCF
fdi_inwfl_imp	Foreign direct investment: inward flows, % of imports
work_r_pay_trade	Workers' remittances: Payments, % of trade
work_r_pay_gdp	Workers' remittances: Payments, % of GDP
wor_r_rec_trade	Workers' remittances: Receipts, % of trade
wor_r_rec_gdp	Workers' remittances: Receipts, % of GDP
bop	Balance of payments: capital and financial account summaries, % of GDP
bca	Balance of current account, % of GDP
INSTITUTIONS[80]	
x1	Voice and Accountability
x2	Political Stability
x3	Government Effectiveness
x4	Regulatory Quality
x5	Rule of Law
x6	Control of Corruption
x7	Starting a Business: Procedures (number)
x8	Starting a Business: Time (days)
x9	Starting a Business: Cost (% of income per capita)
x10	Starting a Business: Min. capital (% of income per capita)
x11	Dealing with Licenses: Procedures (number)
x12	Dealing with Licenses: Time (days)
x13	Dealing with Licenses: Cost (% of income per capita)
x14	Difficulty of Hiring Index
x15	Rigidity of Hours Index
x16	Difficulty of Firing Index
x17	Rigidity of Employment Index
x18	Non-wage labor cost (% of salary)
x19	Firing costs (weeks of wages)
x20	Registering Property: Procedures (number)
x21	Registering Property: Time (days)
x22	Registering Property: Cost (% of income per capita)
x23	Getting Credit: Legal Rights Index
x24	Getting Credit: Credit Information Index
x25	Getting Credit: Public registry coverage (% adults)
x26	Getting Credit: Private bureau coverage (% adults)
x27	Protecting Investors: Disclosure Index
x28	Protecting Investors: Director Liability Index
x29	Protecting Investors: Shareholder Suits Index
x30	Protecting Investors: Investor Protection Index
x31	Paying Taxes: Payments (number)
x32	Paying Taxes: Time (hours)

[79] Hereafter: FDI flows - three year averaged flows

[80] Data for 2005 year are used. Source: EBRD (Doing business) and the World bank

Variable	Description
x33	Paying Taxes: Total tax rate (% profit)
x34	Documents for export (number)
x35	Time for export (days)
x36	Documents for import (number)
x37	Time for import (days)
x38	Enforcing Contracts: Procedures (number)
x39	Enforcing Contracts: Time (days)
x40	Enforcing Contracts: Cost (% of debt)
x41	Closing a Business: Time (years)
x42	Closing a Business: Cost (% of estate)
x43	Closing a Business: Recovery rate (cents on the dollar)
DEMOGRAHY AND HUMAN CAPITAL	
ur_pop	Urban population, proportion
pop_den	Population density (persons per sq. km)
pop_incr	Rate of natural population increase
migr	Net migration rate, average (per 1,000 pop.)
birth	Birth rate, crude (per 1,000 people)
fert	Fertility rate, total (live births per woman)
enrol_sec	Gross secondary enrollment ratio (% of population aged 15-18)
enrol_high	Higher education enrolments (gross rates, per cent of population aged 19-24)
ad_lit	Adult literacy rate
gross_enrol	Combined gross enrolment ratio for primary, secondary and tertiary schools (%)
HEALTH	
hiv	HIV prevalence
tub	Tuberculosis cases per 100000
totexph	Total expenditure on health, % of GDP
outexph	Out-of-pocket expenditures, % of private expenditures on health
water	Population with sustainable access to an improved water source (%)
lwght	Newborns with low birth weight (%)
immeasle	One-year-olds fully immunized against measles (%)
contra	Contraceptive prevalence rate (%)
infmor	Infant mortality rate (per 1000 births), 5-year average
life_m	Average life expectancy at birth for males, years
life_f	Average life expectancy at birth for females, years
INFRASTRUCTURE	
Pop_den	Population density
road_den	Paved roads density per sq. km
pass_km_cap	Passengers carried, passenger-km per capita, cars
pas_km_gdp	Passengers carried, passenger-km per $1,000 GDP (PPP), cars
good_car	Goods hauled, ton-km, per $1,000 GDP (PPP), cars
rail_den	Railways density per 100 sq. km
pass_km_r_c	Passengers carried(railway), passenger-km per capita
pass_km_r_g	Passengers carried, passenger-km per $1,000 GDP (PPP)
good_rail	Goods hauled (railway), ton-km per $1,000 GDP (PPP)

Variable	Description
pipes	Pipelines density per 100 sq. km
pass_air_c	Passengers carried per 1,000 inhabitants (air)
pass_air_gdp	Passengers carried per $1,000 GDP (PPP) (air)
telephone	Main telephone lines per 100 inhabitants
mobtel	Mobile phone subscribers per 100 inhabitants
INNOVATION	
	Knowledge Economy Index (the World Bank), 2004
ENVIRONMENTAL SUSTAINABILITY	
	Environmental Sustainability Index (Yale University), 2005

Table A6.2 Distance from EU15 average, ranking: GDP per capita, innovation and environmental sustainability

GDP per capita		Innovative potential		Environmental sustainability	
EU15	0	EU15	0	EU15	0
Slovenia	1	Estonia	1	Armenia	1
Czech Republic	2	Slovenia	2	Belarus	2
Hungary	3	Czech Rep.	3	Slovakia	3
Estonia	4	Lithuania	4	Hungary	4
Slovakia	5	Hungary	5	Georgia	5
Lithuania	6	Latvia	6	Moldova	6
Poland	7	Slovakia	7	Russian Fed.	7
Latvia	8	Poland	8	Bosnia & Herzegovina	8
Croatia	9	Croatia	9	Bulgaria	9
Russia	10	Bulgaria	10	Slovenia	10
Bulgaria	11	Russian Fed.	11	Estonia	11
Romania	12	Ukraine	12	Kazakhstan	12
Kazakhstan	13	Armenia	13	Albania	13
Turkey	14	Romania	14	Kyrgyzstan	14
Macedonia	15	Turkey	15	Lithuania	15
Belarus	16	Belarus	16	Croatia	16
Ukraine	17	Serbia & Montenegro	17	Serbia & Montenegro	17
Bosnia & Herzegovina	18	Macedonia	18	Macedonia	18
Serbia & Montenegro	19	Georgia	19	Latvia	19
Albania	20	Moldova	20	Czech Rep.	20
Azerbaijan	21	Kazakhstan	21	Turkey	21
Armenia	22	Bosnia & Herzegovina	22	Romania	22
Georgia	23	Azerbaijan	23	Azerbaijan	23
Kyrgyzstan	24	Kyrgyzstan	24	Poland	24
Moldova	25	Uzbekistan	25	Ukraine	25
Uzbekistan	26	Albania	26	Tajikistan	26
Tajikistan	27	Tajikistan	27	Uzbekistan	27

VII. CONCLUDING REMARKS

The analysis of data collected, their aggregation and evaluation enable us to make several important conclusions with regard to the gap origins, its evolution over time and differences across groups of countries, its structure and range across various dimensions of development.

1. The current development gap between the EU and EEN/Russia has a strong historical background, one of the major factors being the level of development achieved by the turn of the XIX century. Broadly speaking, the European part of the former Russian Empire experienced the first stage of industrialization and capitalism before the First World War, while Central Asia was still feudal. Socio-economic feudal structures and relations as well as institutional and legal environment remained intact until the Bolshevik revolution. The socialist period further contributed to a divergence of country groups in terms of economic structure and efficiency. The number of years spent under socialism could serve as a proxy for the extent of the current development lag.
2. The research has proved that in general, for the analyzed period, countries with higher per capita income tended to catch up faster than lower income ones. The least progress in filling the development gap with EU15 has been shown by the low income CIS economies, while NMS demonstrated a higher degree of catching up with EU15. This can be explained by the impact of adaptation recession in transition economies as well as by 'vicious circle' or 'poverty traps' theories, according to which poor countries have lower attractiveness to investors because of the low level of returns to capital. Thus, the development lag in terms of per capita income is likely to persist and it will take a considerable time, especially for low-income EEN to achieve substantial results in catching-up.

   Market reforms appeared to be an important determinant of closing the gap. A split of the sample of the analyzed transition countries into 'active reformers' and 'slow and partial reformers' showed a clear positive relationship between the reform progress and progress in catching up. Thus we can conclude that promotion of comprehensive market reforms is still very topical for the most of the region's economies. These issues are increasingly being addressed by the EU in the European neighborhood and

partnership instrument (ENPI), where institutional and administrative reforms were identified as top priority issues for most of the EEN.

3. The analysis of raw indicators and available composite indices produced by international organizations and research groups describing selected dimensions of development allowed us to highlight substantial gaps that could potentially hinder social and economic cooperation of the neighboring states with the EU and to prevent the removal of the remaining dividing lines in Europe.

   3.1. The per capita income figures, not being able alone to measure the whole spectre of disparities in the quality of life among the region's countries, display a close to perfect correlation with subjective indicators reflecting people's perception of well-being. However, very low scores of subjective indicators in EEN/Russia are indicative of the societal trends not captured by income or poverty scores - a widespread pessimism, collapsing expectations, people's perceptions of inequalities, social exclusion, as well as low level of trust in political and public institutions, widespread corruption and state capture.

   3.2. The education system in Russia/EEN is still characterized by: 1) a mass character of output – the scale of education (especially of higher education) that is even larger than in the world's richest countries, and 2) low inputs – the levels of per capita financing that remain very low. The consequence is the deterioration of the quality of education, its inability to meet the society growing needs and the inferior quality of human capital compared to the EU countries. This is particularly true for lower-income EEN like Moldova, Georgia, Azerbaijan and Armenia that trail behind in the second half of the world educational rankings.

   3.3. Despite several competitive advantages of EEN/Russia (a fairly high human capital stock and well-developed research institutions), their absorptive capacity for innovations on the whole remains low. There is an apparent mismatch between the large number of researchers employed in the region and the results of their activities, as well as low expenditures on R&D. As distinct from the EU, EEN countries also demonstrate a high variance in the development of the four pillars of 'knowledge economy' – innovation, education, ICT and institutional regime, with the latter presenting the major bottleneck for innovation absorption and performance.

   3.4. Liberalizing formal trade policies and regulatory regimes was not sufficient to close a significant gap in trade openness and the attraction

of foreign investment between the EU15 and the CIS/EEN group, while the NMS are rapidly catching up with the "old" EU members:

- The NMS and even candidate countries are significantly more integrated into the world economy compared to EEN. Despite a growth in oil exports, trade to GDP ratio in Russia continues to remain low;
- In contrast to NMS and the SEE economies, EEN/Russia failed to diversify their exports structure in the course of transition, continuing to rely mainly on primary products or basic manufacturing;
- A clear trend has emerged that those countries that have performed more effectively in terms of economic reforms are also those that have integrated more effectively into global economy. On the contrary, 'slow reformers' tend to remain relatively closed and are being left on the periphery of the contemporary international division of labor. Thus, relative openness (that tended to grow during the past decade among NMS and SEE) actually decreased in most CIS countries;
- Although FDI into both NMS and EEN/Russia have been constantly growing, FDI stocks per capita differ by a factor of 20 between EU15 and NMS, and by several orders of magnitude – between EU15 and EEN/Russia;
- The most important obstacle for FDI flows and mutual trade development is the regulatory environment in the EEN (especially quality of bureaucracy and the rule of law) that overrides the importance of other economic variables;
- Sound differences between CIS and non-CIS countries are related to the structure of FDI: non-CIS countries receive FDI mostly in the manufacturing sector, whereas in resource-abundant CIS countries, such as Azerbaijan and Russia, large FDI inflows were driven by investments in the resource sector;
- Especially in CIS countries, serious institutional weaknesses in areas critical to international trade, such as customs, are a major impediment to trade development;
- Under-developed infrastructure and logistics services, as well as low performance of transport operators are exacerbated by a se-

vere corruption, leading to almost prohibitive additional transportation costs.

3.5. The quantitative indicators analyzed go well together with anecdotal evidence of poor environmental legislation enforcement, inconsistent policies and inadequate environmental institutions in EEN/Russia. Across the region, legislation is extensive but largely inconsistent and unenforceable. Environmental policies are neither effective nor efficient in stimulating significant environmental improvements. Weak, and weakening, institutions are deprived of incentives to achieve environmental objectives (weak authority, scarcity of resources, high turnover of professionals, frequent restructuring, etc.). Levels of public awareness and participation are low, and their impact is of low significance.

3.6. In institutional development, EEN/Russia overall occupy an intermediate position between EU candidates, on the one hand, and Central Asian CIS, on the other hand:

- On average, EEN lag considerably behind Candidate countries in judiciary independence, size of kick-offs, time to pay taxes, voice and accountability, government effectiveness and control of corruption; consistency and predictability of legislation, civic freedoms and freedom from government. At the same time, EEN have significant advantages in the cost of registration of property, and time needed for enforcing contracts;
- Candidates appear the worst in terms of business regulations; EEN/Russia – in the administration of taxes (although other CIS are even worse in corruption in taxation);
- The patterns of EEN/NMS gap versus NMS/EU15 gap are much less consistent. In terms of political institutions, the EEN countries express significant intra-group differences: from Belarus that has very low scores in all dimensions but political stability (that is hardly an advantage in this case), to Ukraine and Georgia closely followed by Moldova that are approaching the NMS. The EEN countries considerably lag behind NMS (compared to NMS/EU15 gap) in freedom of international trade and tax administration;
- In corruption, the difference between NMS and EU15 is generally larger than it is between them and EEN countries, except for corruption in taxation;

- In terms of legal protection and property rights, the integral indexes show that the NMS countries are much closer to EU15 than to EEN.

4. To measure the development gap between the EU15 and EEN, we (1) have applied the principal component method to the full set of the raw indicators that characterize various dimension of countries' development and (2) developed a Composite Development Indicator. This indicator is further used to group the neighboring countries according to their aggregate closeness to the EU in the plane of the first two components. The magnitudes of the countries' distances based on the first two components allowed to determine relative distances of a specific country from the EU15 and to cluster their positions on the grounds of their distances to the EU15. Armenia and Russia are the closest to the EU15 among EEN, with Moldova and Georgia following. Ukraine and Kazakhstan are in the next group of countries which are at a longer distance from the EU15 average according to the measure of the geometric distance based on the two composite indicators. Belarus forms a separate group, as well as Azerbaijan that is at a farthest distance.
5. To get a better understanding of the nature of the development gap, we considered indicators in each of the dimensions separately. The countries' coordinates in the space of the two principal components were used to measure the distances of countries to the EU15 average which were then converted into the rankings of countries along the nine dimensions. As a result we obtained rankings of the neighboring countries along each of the component. There is no country being the nearest one to EU15 along all nine dimensions. Some countries lead along the health dimension (Armenia and Ukraine), others are at a shorter distance from the EU in terms of infrastructure (Azerbaijan), openness and demography and human capital (Belarus and Russia), institutional development (Moldova) and environmental sustainability (Armenia, Belarus and Georgia). Innovation potential appears to be a bottleneck for development in Azerbaijan, Moldova, Georgia.
6. In the course of our analysis, we addressed gaps and disparities in development that still serve as remaining dividing lines between the EU members and the ENN. Clearly, assistance provided under the national ENPI, to be effective, should focus on the strategic priorities addressed throughout the current report and presented in a generalized form in Section VI. In the latest version of the EU Eastern Regional Programme Strategy paper (2007-2013), the priority EC response strategies are closely related (di-

rectly or indirectly) to the existing disparities hindering inter-country communication (EU 2007). At the same time, the respective EU Country Strategy Papers and other assistance programming documents should preserve individual, tailor-made approaches and contain country-specific components. To cite just one example, problematic environmental situation in Ukraine and Azerbaijan calls for intensive actions, including improvement of legislation and institutional development. The EU environmental legislation could serve as a framework for closing this gap that could certainly become a specific issue to be mentioned in Country National Strategies, as well as thereafter serve as a direction of a financial assistance (Hinc et al. 2008).

7. Still, both EEN club participants, other neighboring countries and NMS share a lot of common challenges across various dimensions of development. This suggests that many problems could be solved by means of the unified measures well tested within the EU borders. For example, the expanding the gap in the quality of education between the EU15 and EEN countries calls for enhanced cooperation in the sphere of higher and vocational education, e.g. expanding the opportunities of studies at universities of the EU Member States, involving students into Erasmus programme, or taking part in special scholarship schemes aimed at attracting talented young people in such disciplines as hard sciences, engineering and mathematics (Hinc et al. 2008).
8. As demonstrated throughout the report, striking gaps in regulatory regimes between EEN/Russia and EU are omnipresent in virtually every dimension of development. This is true for the lack of a business-friendly environment for investors (both domestic and foreign), as well as for development of innovation potential or addressing the needs of the business sector. The World Economic Forum's Global Competitiveness Index (GCI) confirms the perceived weaknesses in the institutional environment and business standards across CIS. In a recent WEF Executive Opinion Survey, four factors consistently cited by entrepreneurs as being the main obstacles to competitiveness are corruption, access to finance, inefficient government bureaucracy and tax regulations (WEF 2007). Poor regulatory regimes undermine all the macroeconomic reforms and policy efforts undertaken by governments by preserving persistent double-digit inflation and increasing public deficits and debt which are destructive for international cooperation. Thus, adaptation of the neighboring countries' regulatory regimes to that of the EU remains the most important part of the association agreements being negotiated (EC 2008).

9. The past recent years witnessed a considerable progress of some EEN countries in the quality of governance in the region, not necessarily captured by statistics available at the time of writing. Georgia in particular showed strong improvements on all indicators during the period 2005-2007; Georgia and Armenia also lead the other CIS countries in controlling corruption. Azerbaijan and Belarus, on the other hand, are at the bottom of the regional corruption ranking. Although Belarus made a small relative improvement in 2006, it is the only country that did not make progress (even showing a strong relapse) in fighting corruption over the entire period of 2000-2007. In other words, there is still a lot of resistance to reforming bureaucracies and improving public governance, with all CIS countries apart from Georgia being unable to improve their Corruption Perception Index scores and rankings compared to 2006 (TI 2008).

   World Bank's 2008 Doing Business report suggests that the CIS countries are making a steady progress in putting in place a favorable business environment. Indeed, with the exception of Moldova and Ukraine, all the EEN countries improved their Doing Business rankings. However, the Doing Business indicators in Russia, Belarus and Ukraine lag considerably behind those of the two CIS frontrunners, Georgia and Armenia. While Russia and Belarus both made progress in 2007 and improved their relative positions, Ukraine shows no tangible improvements in the ease of doing business. This is a cause of concern as regards prospects for broader-based economic growth in the long term (World Bank 2007).

   The improved taxes and getting credit were the areas where most progress was made during the past two years. In four EEN countries – Azerbaijan, Belarus, Georgia, and Moldova – it became easier for entrepreneurs to start a new business. On the other hand, a combination of structural and institutional factors still hinders the development of trade in the region. This is demonstrated by the relative worsening of the 'Trading Across Borders' element of the 2008 Doing Business' indicators that, apart from Georgia, worsened or stagnated (World Bank 2007).

   Overall, the performance of the seven EEN countries on items such as government effectiveness, rule of law, and control of corruption places them on average in the lower third (20th-30th percentile) of the world ranking. There is an increasing gap between the members of the group, however. While Armenia and Georgia are performing at about the world average, Azerbaijan and Belarus on the other hand are usually the last in the regional rankings (EC 2008).

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