



# CONSULTING ASSISTANCE ON ECONOMIC REFORM II

## DISCUSSION PAPERS

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### Benchmarking Competitiveness in Transition Economies

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***SYSTEMIC TRANSFORMATION IN TRANSITION ECONOMIES***

**Volume II**

**Benchmarking Competitiveness in Transition Economies**

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# Table of contents

<b>List of tables and figures</b>	<b>v</b>
<b>Acknowledgements</b>	<b>vii</b>
<b>Executive summary</b>	<b>ix</b>
<b>1 Introduction</b>	<b>1</b>
<i>1.1 Competitiveness</i>	<i>1</i>
<i>1.2 The use of indicators</i>	<i>3</i>
<i>1.3 The cluster approach</i>	<i>4</i>
<b>2 The construction of the indicators</b>	<b>5</b>
<b>3 Results: A comparison among transition countries</b>	<b>18</b>
<i>3.1 Cluster-level comparisons</i>	<i>18</i>
<i>3.2 Within-cluster differences of competitiveness</i>	<i>22</i>
<i>3.3 The components of the sub-indicators</i>	<i>27</i>
<i>3.4 Comparisons with economic performance</i>	<i>35</i>
<b>4 Comparisons outside the transition region</b>	<b>37</b>
<b>References</b>	<b>39</b>



## List of tables and figures

Table 1: Summary of the initial conditions based typology .....	5
Table 2: Openness sub-indicator (ICO) for competitiveness indicator, 1998. ....	10
Table 3: Technology sub-indicator (ICT) for competitiveness indicator, 1998. <i>Source: Authors' calculations.</i> .....	11
Table 4: Good government sub-indicator (ICG) for competitiveness indicator, 1998. ....	12
Table 5: Infrastructure sub-indicator (ICI) for competitiveness indicator, 1998. ....	13
Table 6: Financial sector sub-indicator (ICF) for competitiveness indicator, 1998. ....	14
Table 7: Labor markets (ICL) for competitiveness indicator, 1998. ....	16
Table 8: Institutions sub-indicator (ICN) for competitiveness indicator, 1998. ....	17
Table 9: Summary of competitiveness indicator and the countries' ranks on its sub-indicators, 1998. <i>Source: authors' calculations.</i> .....	19
Table 10: Summary of openness indicator and its sub-indicators, best to worst, 1998. <i>Source: authors' calculations.</i> .....	29
Table 11: Summary of good government indicator and its sub-indicators, best to worst, 1998. <i>Source: authors' calculations.</i> .....	30
Table 12: Summary of infrastructure indicator and its sub-indicators, best to worst, 1998. <i>Source: authors' calculations.</i> .....	31
Table 13: Summary of financial sector indicator and its sub-indicators, best to worst, 1998. <i>Source: authors' calculations.</i> .....	32
Table 14: Summary of labor indicator and its sub-indicators, best to worst, 1998. <i>Source: authors' calculations.</i> .....	33
Table 15: Summary of institutions indicator and its sub-indicators, best to worst, 1998. <i>Source: authors' calculations.</i> .....	34
Figure 1: Competitiveness patterns for 1998. <i>Source: Authors' calculations.</i> .....	20
Figure 2: Intra-cluster differences in competitiveness and in openness. <i>Source: Authors' calculations.</i> .....	23
Figure 3: Intra-cluster differences in technology and in government. <i>Source: Authors' calculations.</i> .....	24
Figure 4: Intra-cluster differences in infrastructure and in finance. <i>Source: Authors' calculations.</i> .....	25
Figure 5: Intra-cluster differences in labor and in institutions. <i>Source: Authors' calculations.</i> ....	26
Figure 6: Competitiveness and per capita economic growth go together. <i>Source: Author's calculations and WDI.</i> .....	36
Figure 7: Competitiveness attracts foreign direct investment. <i>Source: Author's calculations and EBRD.</i> .....	36
Figure 8: Comparison of transition country competitiveness with the rest of the world for 1998. ....	38



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## Executive summary

This paper is one of a series resulting from a large policy research project that the Harvard Institute for International Development (HIID) is carrying out for the United States Agency for International Development (USAID). The goal of the study is to evaluate the privatization and economic restructuring experience of countries in transition and to make recommendations on how USAID might improve the impact of its assistance to these countries. Of particular concern to USAID are (i) whether the existing reform paradigm needs adjustment (econometrically analyzed in Sachs, Zinnes, and Eilat (2000, vol. 3)) and (ii) the role of competitiveness and international integration in achieving sustainable economic transition and how donor assistance can support these.

In the present paper, we focus on measuring the current level of international competitiveness of countries in transition. We view competitiveness as a measure of the levers a country has to promote sustained improvements in its well being, given the competition from world markets. In this sense, competitiveness is an input into the production process, *not* the output of the process. We construct our measure of competitiveness based on the Global Competitiveness Report series categories, the determinants of transition described in Sachs, Zinnes, and Eilat, (2000, vol. 1), the work of Michael Porter, and other related country characteristics described in the literature. While the enabling environment is important, our definition (i.e., the variables we include) stresses the synergies among firms and between firms, markets, and government. By bringing to bear all the existing data on these countries, together with new survey data collected for the purpose, we are able to go beyond the mere ranking of countries to decompose the sources of competitiveness into their constituent parts.

We first present the detailed design and motivation of our indicator. The indicator is built around seven sub-indicators, each constructed to reflect a specific area's role in competitiveness. These are openness (including regulatory environment, current account and capital account), technology, good government (including public administration, macro policy, fiscal policy, and policy coherence), infrastructure (including availability and deregulation), the financial sector (including investment performance, the banking sector, capital markets and non-banks financial institutions), labor markets (including quality of labor and market efficiency), and institutions (including political environment, rule of law and competition in markets). We then use the measures to assess each country's standing viz. the other transition countries. We do this by examining both inter- and intra-cluster differences, where the country clustering is taken from Sachs, Zinnes, and Eilat (2000, vol. 1) and is based on the initial conditions of transition. To provide a feel for the resulting competitiveness indicator we illustrate how it correlates to standard performance measures such as foreign direct investment and GDP growth. The paper ends by comparing the transition countries' competitiveness to countries in the rest of the world.

Since our competitiveness indicator is built up from economically meaningful sub-indicators, we are also able to examine the components of competitiveness. These yield insights that allow us to pinpoint where countries are most lagging behind, a key signal for the potential benefits of technical assistance. Note, however, that this paper does not examine the causality behind these rankings beyond decomposing it. A brief summary of our results follows.

- *Inter-cluster differences.* The EU Border States and the Baltics are the most competitive (Hungary being number 1) with the “new” states (Slovakia, Slovenia, and Croatia) at the bottom of the “EU” group; these are followed by the Balkans, the Western FSU, the Caucasus, and Central Asia. While excelling in all areas, the relatively strongest areas of the EU Border

States are good government and technology. Relative to the EU Border States, the Baltics weakest points are infrastructure, technology and labor markets. The Baltics are the most open cluster of all, however. Central Asia was lagging in all sub-indicators. The Caucasus' relative bright points were their labor (scoring above average) and their infrastructure. The Western FSU's best performance was on finance and labor.

- *Intra-cluster differences.* Relatively poor infrastructure followed by openness and quality/effectiveness of institutions are why the Czech Republic ranks behind Hungary (though the Czech Republic has the best transition scores for government and labor). While Macedonia started out with initial conditions typical for the Balkans, its competitiveness performance has fallen far behind, generally scoring as Central Asia. Moldova, on the other hand, has initial conditions of the Western FSU but by 1998 shows a pattern of competitiveness similar to the Balkans, its geographic home. In the Caucasus, Georgia displayed great volatility, having among the sample's better infrastructure but worst financial sector, while Armenia and Azerbaijan generally scored similarly. Kazakhstan and Kyrgyz Republic, their own sub-cluster, uniformly were the best performers in Central Asia (excepting the surprisingly good showing of labor in Turkmenistan).
- *Sub-indicator decomposition.* Decomposition helped to pinpoint the sources of the sub-indicator scores. In many cases, we found substantial divergence between the sub-indicator rank and sub-sub-indicator scores. Poland's level of openness is due to its relatively poor activity in its current account (as is Georgia's); Slovenia's openness is pulled down by capital account performance. Highly open current or capital accounts alone, however, do not guarantee a high rank for openness, as Tajikistan and Azerbaijan respectively show. Romania and Macedonia illustrate that a stable policy framework does not guarantee good government. The Czech Republic's mediocre infrastructure performance is due to poor regulation of public utilities and services, leading to higher cost service provision. Poland and Hungary had the opposite problem: great infrastructure regulation but mediocre availability. A number of EU Border States and Russia are experiencing excessively restrictive labor markets, pulling down their overall labor competitiveness. Russia's financial sector performance was pulled down by poor investment performance, though its non-bank financial institutions were among the best of all countries. Perhaps one of the most important punch lines of our work was the finding that the best predictor of the other indicators as well as overall competitiveness is quality of institutions, broadly defined.
- *Comparisons with economic performance.* Competitiveness and its underlying sub-indicators were positively correlated with GDP per capita growth over the transition period and contemporaneous foreign direct investment. Clearly, competitiveness breeds wealth creation and vice versa, and investors are attracted to countries that are competitive.
- *Competitiveness comparisons with the non-transition countries.* Our competitiveness indicator perfectly matches the Global Competitiveness Report results for the seven overlapping countries. As for the others, we find that the Balkans, the Caucasus, the Western FSU, and Central Asia are less competitive than the rest of the countries in the GCR. The EU Border States (with the exception of Croatia) and the Baltics, on the other hand, are in the same league as Turkey and are more competitive than the Andean Pact countries and economic powerhouses such as Brazil, India, and South Africa.

While only indicative, these results suggest how such multi-level indicators may be used to summarize a vast amount of data in order to pinpoint where technical assistance is required. Moreover, the score of the highest-ranking country on a sub-indicator suggests the likely limits of feasibility for near-term reform. Thus, there is reason to believe that the better a country's rank is (i.e., the closer it is to this "envelop"), the more likely the impact of additional technical assistance is subject to diminishing returns. While this is relevant for prioritizing assistance, it also has bearing for setting aid "graduation" points. Finally, the indicator "recipes" provided in this paper make it easy to annually generate an updated "big picture" to track the concrete fruits of progress in reform in transition economies. In sum, these indicators may be seen as a complementary tool to deeper analysis.



# 1 Introduction

This paper develops a heuristic framework to help understand the current level of international competitiveness of countries in transition as a result of their first decade of what Sachs (1996) calls systemic transformation. We view competitiveness as a measure of the levers a country has to promote sustained improvements in its well being, given the competition from world markets. In this sense, competitiveness is an input into the production process, *not* the output of the process. By bringing to bear all the existing data on these countries, together with new survey data collected for the purpose, we are able to go beyond the mere ranking of countries to decompose the sources of competitiveness into their constituent parts.

This paper is the second in a series of three resulting from a large policy research project that the Harvard Institute for International Development (HIID) is carrying out for the United States Agency for International Development (USAID). The goal of the study is to evaluate the privatization and economic restructuring experience of countries in transition and to make recommendations on how USAID might improve the impact of its assistance to these countries. Of particular concern to USAID is (i) whether the existing reform paradigm needs adjustment and (ii) the role of competitiveness and international integration in achieving sustainable economic transition and how donor assistance can support these. Based on indicators developed in the present paper and its volume 1 counterpart (which examines progress in transition), Sachs, Zinnes, and Eilat (2000, vol. 3) econometrically addresses some of these issues in detail.

In this paper we develop a methodology to construct a measure of competitiveness and use it to assess each country's standing *viz.* the other transition countries, examining both inter- and intra-cluster differences. We then compare the transition countries' competitiveness to countries in the rest of the world. Since our competitiveness indicator is built up from economically meaningful sub-indicators, we are also able to examine the components of competitiveness. These yield insights that allow us to pinpoint where countries are most lagging behind, a signal for the potential benefits of technical assistance. We close by comparing our competitiveness measure to familiar, published economic aggregates.

## 1.1 Competitiveness

Since 1990, a literature has developed in the transition economy context of econometric studies that examines the impact of transition on firm performance for various subsets of countries. Frydman *et. al.* (1998), looking at 200 firms in Hungary, Poland and the Czech Republic, uses changes in employment and revenues as performance measures. Pohl *et. al.* (1997), looking at 6,000 firms across Central and Eastern Europe, and Claessens and Djankov (1998), looking at 6,300 firms in seven countries, focus on labor productivity and growth in total factor productivity. These studies do not associate their productivity measures with national competitiveness, however. Rather they use them as proxies of firm performance. They then examine the effects of enterprise restructuring on firm performance and behavior, and especially *viz.* rapid privatization, ownership structure, wage restraint, and financial discipline.

While concepts such as “profitability”, “efficiency”, and “productivity” have very specific meanings in the economics of the firm, the concept of “competitiveness” is rather elusive. This is all the more so at the level of a country. Economics has historically dealt with competition among nations through the notion of “*comparative advantage*”<sup>1</sup>. They then focused on dis-

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<sup>1</sup> The theory of comparative advantage states when there are two countries, if each specializes in the products in which it has the greatest *relative efficiency*, trade will be mutually profitable to both countries and real incomes of

covering where these advantages were and what factors of production would most benefit from trade.

More recently, the business literature has examined the so-called competitiveness of nations, focusing on the “*absolute advantage*” some countries have over others. Several definitions are found in this literature. Tyson (1992) calls competitiveness “our ability to produce goods and services that meet the test of international competition while our citizens enjoy a standard of living that is both rising and sustainable”. Michael Porter (1990) states that “[t]he only meaningful concept of competitiveness at the national level is productivity” defined as “the value of the output produced by a unit of labor”. What they stress is that competitiveness is much more than simply having efficient and low-cost firms. First, they point to a host of potential externalities between firms (both within and across sectors) and network effects that can yield competitiveness synergies. Next they point to quality of government (both its institutions as well as its laws and policies) as an important feature. So are geography and culture.

Krugman (1994), on the other hand, strongly opposes this trend in the literature, and goes as far as to imply that the whole concept is “largely meaningless” and that “concerns about competitiveness are, as an empirical matter, almost completely unfounded”. While we can sympathize with Krugman’s view, we, nevertheless, believe that a competitiveness indicator can provide a useful measuring rod for policy purposes.

Competitiveness, in our view, is a way to use uniform criteria to assess whether a country is doing all it can to promote the highest degree possible of sustained improvements in its population’s well being, given the increasing competition in the world markets it faces. The use of this notion is important since firm productivity, GDP or even GDP growth by themselves cannot reveal this information completely. A country can have a current high GDP due only to vast natural resources or a good starting point (initial conditions); this does not imply that the country should score highly on competitiveness. A country can have a low GDP growth rate due to the fact that it is close to its steady state GDP; this does not imply that the country should receive a low score for competitiveness. As we shall see, competitiveness correlates well, but not perfectly, with GDP and GDP growth.

Competitiveness is, however, one of several “inputs” in the production function that generates the welfare of a nation. We take competitiveness to include only elements that are to some degree controllable by the economic agents of the country. Therefore, while petroleum reserves or the degree landlocked may have a significant effect on a country’s ability to produce, we exclude such characteristics from our definition. Therefore, to fully explain country *performance* requires both our measure of competitiveness as well as a specification of initial conditions.

We restrict our view of competitiveness to elements that, according to the beliefs of experts, all countries should promote. What makes it meaningful is that while disagreeing on the exact definition of competitiveness, most experts do share opinions on what needs to be done to *improve* competitiveness. For the present paper, therefore, we take the definition of competitiveness as no more than method and the components from which it is constructed. Its strength arises from the fact that these components were chosen to reflect those elements that would be critical in guaranteeing the welfare of a nation under the current trends of world globalization.

In this vein, we follow yet another source of literature on competitiveness coming from the fashion for producing indicators, the most well known of these being the World Economic Forum’s annual Global Competitiveness Report (GCR). The GCR takes as a definition of com-

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productive factors taken as a whole will rise in both countries. This is true whether or not one of the countries is absolutely more efficient in the production of both goods.

petitiveness “the ability of a national economy to achieve sustained high rates of economic growth” (WEF 1997; 12). The focus is then on “suitable policies, institutions and other economic characteristics” (WEF 1997; 12) that promote such growth.

## 1.2 *The use of indicators*

The advantage of this last approach to competitiveness is that it lends itself to empirical measurement. *In principle* one need only canvass the opinions of experts on what the key factors are and what their relative importance is to promoting sustained high rates of economic growth. These factors may be aggregated using any one of a number of statistical methods.

While the World Economic Forum specializes on competitiveness, many other well-known organizations are in the business of producing indicators. These include the European Bank for Reconstruction and Development (EBRD), the Heritage Foundation and Freedom House.<sup>2</sup> Following these organizations and the GCR in particular, we construct our indicators by manipulation of both “hard” data, such as the numerical information published by multi-lateral statistical reporting agencies, and “soft data”, based on survey responses. Our survey approach differs from the GCR, however, in that we have tried to reduce some of the cultural biases that may affect their results. While the GCR asks business executives directly about their opinion on *subjective* issues, we survey think-tanks on their expert opinion about *factual* data where such data are not fully available.<sup>3</sup>

The motivation for the use of indicators is twofold: first, it allows summarizing a large amount of data in a tractable way. Indicators provide an easy way to capture a concept in the case that a single specific variable cannot; examples of this are presented below. Second, the indicator approach helps to overcome problems of scarcity and quality of the data. Data scarcity is a major obstacle of any work on transition economies. In addition, much of the data suffers from a multitude of reporting biases and measurement problems, often related to the newness of government collection agencies as well as to corruption.

Indicators have several advantages in this regard. If their constituent data are noisy or even missing, the aggregation afforded by the indicator is able to cancel these out and put the “law of large numbers” to work<sup>4</sup>. Thus, we have collected as much published and unpublished data as currently available from reputable sources. This has led to a massive database of several hundred variables. We then augmented this database by carrying out our own survey of 25 foreign economic research institutes located in the transition economies. Indicators allow us to further reduce biases by using seemingly identical variables. For example, for exports we have averaged figures reported via the balance of payments statistics with those obtained from the trade authorities. The indicator approach allows us to squeeze out more information from the limited, existing data. For example we are able to take advantage of dates of occurrence to create

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<sup>2</sup> We understand that the World Bank is also considering whether to publish indicators on the quality of country reform programs.

<sup>3</sup> For example, we ask, “Is a government firm the dominant firm in sector X”? The GCR asks, “Is starting a new business in your country difficult or easy?” The latter form of question may suffer from several potential biases, among which being cultural attitudes. Some cultures, for example, are inherently over (or under) critical or more (or less) optimistic. Each country has a different experiential frame of reference against which to make comparisons. For example, if you’ve never started a business in an easy environment, you may think your (relatively difficult) country is not so bad.

<sup>4</sup> Note, however, that the deeper down you go into the sub-indicator’s hierarchy, the less the “law of large numbers” applies and the more subject to the biases mentioned in the text. Therefore, in Table 10 through Table 15 we only report the first two levels of sub-indicators.

additional series, which we call “duration” data. These sorts of variables reflect the number of years since an occurrence of a particular event or introduction of a policy or international agreement. Thus, we can measure the sophistication of the revenue system by including both a dummy variable for the existence of a VAT tax *and* another variable indicating the number of years that have passed since its introduction. The latter picks up the deepening and improved experience a country acquires as it familiarizes itself over the years with a new reform instrument. In addition, we have in some cases used data for 1997 where 1998 data were not yet available; therefore, our competitiveness indicator is, strictly speaking, for the period 1997-8.

In spite of being of such practical use to policy makers, there are those who criticize the use of indicators as “atheoretic”. Why, they ask, use one particular set of data and weights over another? While this is not the place to debate philosophy, this criticism misses the point. Economic variables are *all* inherently conceptual, artificial constructs defined only in terms of their data definitions.<sup>5</sup> “Consumption” for national accounts work is defined by the inclusion of some inputs (e.g., clothing) and not others (non-market transactions such as environmental amenities). GDP is used to capture economic well being, though expenditures to protect oneself against crime actually *raise* GDP. In fact, because of the lack of agreement on the exact definition of such terms a whole industry has grown up of alternative national accounts measurements. Nevertheless, GDP continues to be applied because *it is useful*.

We stress here that it is exactly the use of expert opinion that makes our approach so strong. This is because our task in defining “competitiveness” is precisely to capture the pre-analytic concept these very experts have in mind, in the first place. Thus, our *exact* definition of competitiveness comprises the list of input variables, the weights we have assigned to each, the hierarchy of aggregation, and the aggregation method itself. Just as in the case of GDP, this explicit definition provides a transparent means of discussion of an admittedly difficult subject. Fortunately, as reported below, sensitivity analysis confirms that our results are robust to even rather substantial changes to the components of our definition.

### 1.3 *The cluster approach*

While the 25 countries in our sample appear to exhibit a large variety of transition experiences, in fact, mostly because of common geographical, historical, and resource patterns there are significant similarities. Building on this insight, in the companion paper, Sachs, Zinnes, and Eilat (2000, vol. 1) we assign countries to groups based on similarities in their initial conditions at the start of transition in a way that minimizes within-cluster country differences and maximizes across-cluster country differences.<sup>6</sup> We identify representative variables that describe the initial conditions based on economic theory and what is relevant for a country’s prospects of transition performance. By considering groups or “clusters” of countries based on their “initial conditions”, we greatly simplify our analysis throughout the study, as well as highlight the most fundamental problems facing the various groups of transition economies. Moreover, the cluster approach permits a more controlled basis for comparing “successful” and “failed” policies implemented during transition and thereby offers a way to assess policy effectiveness. The cluster approach allows us to identify the underlying issues in a way more parsimonious than 25 individual

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<sup>5</sup> This is also true in the natural sciences. Consider the terms “entropy” or “noise” in physics, not to mention the latter’s use at the sub-atomic level of a particle’s “color” or “charm”. In each case, practical considerations lead to a definition of a term that also carries a pre-analytic meaning.

<sup>6</sup> Categories of initial conditions include: physical geography, macroeconomics, demographics and health, trade and trade orientation, infrastructure, industrialization, wealth, human capital, market memory, physical capital, culture, political situation.

country assessments. Applying the methods laid out in our companion paper resulted in seven clusters of transition countries, as listed in Table 1.

**Table 1:** Summary of the initial conditions based typology

<i>Cluster name*</i>	<i>Country membership</i>
EU-border states (1)	Croatia, Czech Republic, Hungary, Poland, Slovakia, Slovenia,
The Balkans (2)	Bulgaria, Macedonia, Romania
Baltic States (3)	Estonia, Latvia, Lithuania
Albania (4)	Albania
Western FSU (5)	Belarus, Moldova, Russia, Ukraine
Caucuses (6)	Armenia, Azerbaijan, Georgia
Central Asia (7)	Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan

\*The number in parentheses is used as a cluster identifier in other parts of the study.

## 2 The construction of the indicators

The construction of the indicators is done in a hierarchical way.<sup>7</sup> For *each* level, starting from the lowest, and within the same branch of the definitional tree (for which the weights add up to one), we:

- (1) select variables, ensuring that each one is monotonically related to the concept,<sup>8</sup>
- (2) sign them (multiply by  $-1$ , where necessary) so that each new variable is *positively* related to the concept level (i.e., so that “more is better”),
- (3) standardize<sup>9</sup> all the variables, including any sub-indicators constructed from the previous level,
- (4) multiply them by the assigned weights, and
- (5) add up all the resulting products.

We then climb up one level up and repeat this five-step process until we reach the highest level, the competitiveness indicator itself. As were the variables, the weights are chosen by canvassing expert opinion (including our own) about the relative importance for competitiveness of the variables selected. In some cases, however, we made adjustments to reflect our knowledge of data quality and quantity.

To make cross-country comparisons, we often needed to deflate (divide) variables of interest by another variable (the deflator). For example, Russia may have greater absolute levels of stock market capitalization but this itself is not economically interesting. What is interesting is this measure after “correcting” for the relative size of the country or economy. In most cases, the

<sup>7</sup> We use the terms “indicator”, “sub-indicator”, and “sub-sub-indicator” to refer to the final competitiveness measure and to its first- and second-level components, respectively. The exception is in Table 2 through Table 8 where the term in the “Definition” column refers to an aggregated variable that has been standardized as described below.

<sup>8</sup> In other words, the variable’s relationship to the conceptual level being captured must be either always positive or always negative and not depend on the value of the variable. See the example of “unemployment” below on how to correct for non-monotonicity.

<sup>9</sup> To standardize, we subtract the sample mean from each observation and then divide the result by the sample standard deviation. This forces a mean of zero and a variance of one, making otherwise “unlike” objects “like” objects suitable for aggregation. Without the standardization procedure, data aggregation in indicator construction becomes completely meaningless. While this may seem self-evident to those working in applied economics, comments received on an earlier draft of this work indicate that some confusion may exist on this point.

obvious choice is GDP. However, there are a number of problems with using GDP. First, due to the existence of large *unofficial* economies<sup>10</sup> (whose share of total activity varies significantly across countries), *official* GDP can grossly under-represent the true size of economic activity. An alternative deflator is to use population. The problem here is that population does not reflect the level of economic activity as accurately as GDP, nor the size and extent of the market. We have, therefore, applied the most appropriate deflator in each case, according to the concept we wanted to capture. In the rare case where both ways of deflating had a rationale, we constructed two variables, one for each deflator, and included them both in the aggregation process. (An example of this case is our treatment of FDI). In other cases, we use the logarithmic transformation of the population when we believed that the variable should have been higher for a bigger country, but less than proportional to the size of the population (for example, this was the case when deflating the number of local and foreign insurance companies).

Finally, to investigate the robustness of our indicators, we subjected our results to sensitivity analysis. This involved investigating the consequences of perturbing (by 20 to 50 percent) the weights of the top two levels of aggregation (the sub-indicators and sub-sub-indicators). We present these results together with the indicator rankings in section 3.1.<sup>11</sup>

Using the above methods, we have crafted a competitiveness indicator for the period 1997-8 that is both easily comparable to the GCR and sensitive to transition economy peculiarities. As an example of the latter, consider investment. In non-transition countries, more investment *per se* is usually considered better. In the case of a transition economy however, central planners, in their zeal to industrialize, allocated a disproportionate share of state resources toward investment. Unfortunately, without the existence of price signals and with political criteria for investment goals, the return on these investments was typically low. These tendencies, while disappearing, still exist, making total domestic investment a poor indicator of increases in productive capital. Rather, in several transition countries – and especially at the outset of transition – what was needed was a *lower* level of (state) investment, not a higher one. Thus, for our transition indicator, we focus on *private* sector investment aggregates alone.

A final note should be made about Russia. The relatively high position of Russia in these indicators may come as a surprise to some of the readers. These readers should note that the data collected for this sample was mostly gathered in the years 1997 and 1998. Therefore, this data could not reflect the entire intensity of the mid-1998 Russian crisis. Moreover, the competitiveness indicator is not a short-term performance measure, though it does correlate well with medium-term performance (see section 3.4). Thus, for example, the fact that Russia is relatively well positioned competitively among these countries according to particular sub-indicators gives limited indication of the degree of exposure to the *short-term* risks of globalization.

The resulting competitiveness indicator contains seven sub-indicators and builds upon the work of Warner (1998). These include (second-level sub-indicators in parentheses) openness (including regulatory environment, current account and capital account), technology, good government (including public administration, macro policy, fiscal policy, and policy coherence), infrastructure (including availability and deregulation), the financial sector (including investment performance, the banking sector, capital markets and non-banks financial institutions), labor markets (including quality of labor and market efficiency), and institutions (including political environment, rule of law and competition in markets).

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<sup>10</sup> This occurs due to tax evasion, avoidance of predatory bureaucracies, corruption, and weak statistical agencies.

<sup>11</sup> Although full descriptions of these exercises are not provided here, they are available from the authors upon request.

The weights given to the indicators were equal, following the GCR, with three exceptions: The technology sub-indicator was given half the weight of the others, and the labor and infrastructure indicators were given two-thirds of the others. The reason for the smaller weights for these three was that the data for these categories was not as plentiful as the four others. We therefore did not want a small number of variables to have too high of an impact on the final competitiveness indicator. For the same reason, unlike in the GCR we do not provide an independent sub-indicator for managerial quality, but instead merged this category with the labor sub-indicator.<sup>12</sup>

In the remainder of the chapter, we describe the data definitions or “recipes” used in the construction of the indicator and its sub-indicators<sup>13</sup>. As an example of how to interpret the sub-indicator tables, consider the “recipe” for the openness indicator in Table 2. First note that all the categories and subcategories of the table have weights listed in the column “Weight” and direction (positive or negative) of the impact on competitiveness listed in the column “Effect”. These comprise levels. For a given level, as explained above, the weights add up to unity (1). Thus for example, the weights for “regulatory environment” (0.4), “current account activity” (0.25), and “capital account activity” (0.35) add to 1 as do the weights in the “regulatory environment” category for “trade” (0.4), “compliance with international standards” (0.4) and “foreign ownership” (0.2). With a sub-category such as “IMF” (which provides half the total weight to the sub-category “compliance with international standards”), the weights for “existence” (0.5) and for “duration” (0.5) also must add up to one.

*Openness.* This indicator seeks to capture the ease in which economic activity can take advantage of the foreign sector for markets, know-how, competition, financing, investment, sources of inputs, and other components linking its markets and firms to the global economy. As shown in Table 2, we group these components into three categories, the regulatory environment, current account activity, and capital account activity. The regulatory environment category captures the state of general regulations directly impacting commerce and foreign participation in the economy. The current account category captures the trade flows and direct regulatory obstacles impeding them. The capital account category captures both aggregate financial flows in and out of the country as well as various forms of foreign investment participation in the domestic economy.

We applied a number of specific data manipulations in order to capture this sub-indicator. For FDI we used both 1998 figures and cumulative 1990-1998 figures. The former reflects a country's current accommodation to foreign investment; the latter reflects the fact that when foreigners hold a large stake in the economy, this promotes its relations with the outside world. These variables are each included twice, once deflated by population and once deflated by GDP, in order to capture the effect of the size of the economy in attracting FDI. For imports and exports we used an average of two alternative measures: balance of payments data and trade authority data, both corrected for country size (population). The theory behind this correction is

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<sup>12</sup> In future versions, we hope to collect survey data so that we will be able to construct all eight GCR sub-indicators and assign them equal weights.

<sup>13</sup> One important remark should be made here. Although the sub-indicators described below were planned to capture the concept described in their label, they are ultimately defined only by their composition. Therefore one should consider them only relative to their “recipe”. For example, a country with a poor road system may nonetheless receive a reasonable score on infrastructure if it has done much in the way of improving competitiveness and regulation of its infrastructure. A country with bad schooling system may still have a reasonable labor indicator if its labor markets are competitive. A country can have a “good government” but damaging import restrictions, provided it has other compensating features, such as good public administration.

that small countries tend to have higher trade intensities, not because of their "openness" as we want to capture it, but merely because of arbitrary borders (e.g., trade between the U.S. states is not considered international trade but trade between European states is). The correction is done by regressing trade per unit GDP for a sample of 200 countries against the log of their population (one regression for exports, one for imports). We then use the coefficients obtained to predict the "expected" level of trade a transition country should have, given its size<sup>14</sup>. The difference between the actual and expected levels of trade becomes one variable we use as a measure of openness. With respect to exports, we use an additional measure: exports to non-transition countries (deflated by GDP). This is a better measure of openness since it reflects mainly post-Soviet trade relations, as opposed to Soviet era trade agreements.

Technology. Access and use of technologies are important factors in competitiveness. Unfortunately, it is also an area where data scarcity is rather pronounced. For this reason, technology received only half the weight it otherwise deserves on economic considerations. Constrained again by choice of data, we have chosen three types of technology use for this sub-indicator as presented in Table 3. These include the use of vehicles, office equipment (in the form of fax machines) and "real" internet users<sup>15</sup>.

We applied a number of specific data manipulations in order to capture this sub-indicator. To use internet hosts as a proxy for the technology level, we needed to account for the fact that the number of hosts per capita may depend on the size of the population (due to economies of scale). To correct for this effect, we regressed the number of real internet hosts per capita in 35 developed countries (excluding the US) on the population of the country, in a similar fashion to the technique used above for trade<sup>16</sup>. We then used the estimated coefficients to predict the number of hosts per capita that a transition country "should" have, given its population. The ratio between the actual and the predicted number of hosts is our measure for this variable<sup>17</sup>.

Good government. Perhaps ironically, one of the most important inputs into competitiveness is not to be found in the private sector; it's the government. Government provides the physical and regulatory infrastructure and rules of the game for a level playing field. It also provides for orderly trading arrangements in the form of a stable currency and overall macro environment as well as compliance with the international trade regimes. The government can also act as a coordinator and provider of information where private agent transactions costs would otherwise be high. Unfortunately, many of the transition countries have not been countries *per se* for many years and therefore do not have experience or a tradition in providing government services. Worse, corruption, rent seeking, and poor training have often made governments in the region the source of the problem rather than the solution.

As shown in Table 4, we have identified four key components to describe the quality of good government as it pertains to competitiveness. These include the quality of public administration, macroeconomic policy, fiscal policy, and overall policy coherence and control. Regarding fiscal policy, we focus on how revenues are raised, though we also include the expenditure side. Of particular concern are how taxes are collected, the existence and sophistication of government bond markets, and use of the inflation tax. Policy coherence and control refers to

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<sup>14</sup> For Example, in Russia, the expected value for imports and exports is 22 percent. For Estonia the figures are 57 percent and 46 percent, respectively.

<sup>15</sup> "Real" reflects the fact that some corrections have been made to account for double counting due to duplicate servers, as well as other technical corrections.

<sup>16</sup> We also included the size of the country as an explanatory variable, but we dropped it when it did not prove to be significant.

<sup>17</sup> These numbers range from 0.4 in Hungary to 0.0008 in Uzbekistan.

whether policies are stable and consistently enforced, thereby keeping the unofficial economy to a minimum.

We applied a number of specific data manipulations in order to capture this sub-indicator. Since the inflation rate is a volatile measure, a three-year average (1996-1998) was used instead of the 1998 value. In addition, a log transformation was used so that the extremely high values sometimes experienced would not dominate this sub-indicator. A negative inflation rate was counted as zero. The variable, “democratic stability” was constructed by dividing the average tenure of the government over the transition period by the Freedom House democracy indicator (where “smaller” is better). This variable is constructed to reflect that neither governments that change every few months nor once every decade are good for competitiveness. The former will breed policy instability and the latter reduce accountability.

*Infrastructure.* Clearly, the availability of infrastructure is important for competitiveness. Availability, however, is only one characteristic of infrastructure quality necessary for country competitiveness. Good regulation of infrastructure – and especially for those services provided through monopoly supply – is another important aspect. Good regulation ensures good accountability of the provider to the beneficiary and also helps to keep operating and capital costs down. Finally, for infrastructure that is provided by the market, it is important that competition among firms is maintained. These three aspects make up the sub-sub-indicators for the infrastructure sub-indicator, whose design is given in Table 5. Note that due to the lack of more variables for the availability sub-sub-indicator, the infrastructure sub-indicator received only two-thirds the weight of the other sub-indicators.

*Financial sector.* Table 6 shows how we capture this sector through a general investment indicator as well as indicators for each major financial sub-sector. The latter includes the banking sector, the capital markets (including stock market and securities markets), and the non-bank financial institutions (including pension funds, insurance). In each case we have emphasized the regulatory environment for orderly and transparent transactions and for the presence of internationally accepted standards of accounting and conduct. We have also placed importance on the degree of competition in each market component, as well as whether there is a foreign presence.

*Management and labor markets.* This indicator comprises two sub-sub-indicators, one for quality and one for degree of market efficiency. The former captures the degree of preparedness and qualifications for an efficient workforce; the latter looks for the presence of market distortions in the form of taxation and quantitative restrictions. Unfortunately, together with the technology indicator, data scarcity was most severe for this sub-indicator and, therefore, we assigned it only two-thirds the weight of the other sub-indicators. The sub-indicator design is shown in Table 7.

**Table 2: Openness sub-indicator (ICO) for competitiveness indicator, 1998.**

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
<b>Regulatory environment (O.1)</b>	Indicator	Pos	<b>0.4</b>	ICORE	M0V1	Computed
Trade (O.1.1)	Trade and foreign exchange liberalization index	Pos	0.4	Tfxlib	0 to 1 (1 best)	EBRD*
Compliance with international standards (O.1.2)	Indicator	Pos	0.4	Icompl	M0V1	Computed
IMF (O.1.2.1)	Indicator	Pos	0.5	Iimf	M0V1	Computed
Existence	Agreed with Article 8?	Pos	0.5	Art8	Yes=1, No=0	IFS
Duration	Years under IMF Article 8		0.5	Art8yrs	Non-Neg number	IFS
WTO (O.1.2.2)	Indicator	Pos	0.5	Iwto	M0V1	Computed
Existence	WTO member?	Pos	0.5	WTO	Yes=1, No=0	EBRD
Duration	Years as WTO member	Pos	0.5	WTOyrs	Non-Neg number	EBRD
Foreign ownership (O.1.3)	Degree of restrictions on foreign land ownership	Pos	0.2	FgnLdA25	0 (Not permitted) to 3 (no restrictions)	Survey
<b>Current account (O.2)</b>	Indicator	Pos	<b>0.25</b>	ICOCUR	M0V1	Computed
Imports (O.2.1)	Indicator	Pos	0.4	Iimp	M0V1	Computed
Flows (O.2.1.1)	Imports / GDP (size adjusted)	Pos	0.7	ImpGdp	Decimal number	EBRD, WDI
Tariff barriers (O.2.1.2)	Tariff revenues / Imports	Neg	0.3	TrfImp	Decimal number	EBRD
Exports (O.2.2)	Indicator	Pos	0.6	Iexp	M0V1	Computed
Flows (O.2.2.1)	Indicator	Pos	0.8	ExpGdp	Decimal number	Computed
	Exports / GDP (size adjusted)	Pos	0.5	ExpRel	Decimal number	EBRD, WDI
	Exports to non transition countries/ GDP	Pos	0.5	ExpNTr	Decimal number	EBRD, WDI
Credits (O.2.2.2)	Export credits / Exports	Pos	0.2	XcrdtExp	Decimal number	GFS, EBRD

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
<b>Capital account (O.3)</b>	Indicator	Pos	<b>0.35</b>	ICOcap	M0V1	Computed
Foreign investment (O.3.2)	Indicator	Pos	0.6	Fgninv	M0V1	Computed
	Cumulative FDI per capita	Pos	0.2	FdiCuPop	USD	EBRD
	Cumulative FDI / GDP	Pos	0.2	FdiCuGdp	Decimal number	EBRD
	FDI per capita	Pos	0.2	FdiPop	USD	EBRD
	FDI / GDP	Pos	0.2	FdiGdp	Decimal number	EBRD
	Index of foreign investment	Neg	0.2	Fgninv_H	1 to 5 (1 best)	Heritage
Foreign banks (O.3.3)	Number of foreign banks /ln(population)	Pos	0.2	FgnbnkPo	Decimal number	EBRD

*Table notes:*

1) Source for table construction: authors' design building upon sub-indicators of Warner (1999).

2) Sources' abbreviations:

<i>Source</i>	<i>Definition</i>
EBRD	EBRD transition reports, 1997-1999
Freedom	Freedom House (see references)
GFS	IMF's Government Financial Statistics
Havrylyshyn	His paper (see references) uses IMF and national sources
Hellman	See references
Heritage	Heritage Foundation
IFS	IMF's International Financial Statistics
Survey	HIID Competitiveness in Transition Survey of Foreign Institutes
WDI	World Development Indicators, World Bank
WB	World Bank Enterprise Reform and Privatization Database

3) General abbreviations:

\* : Standardized and extended by Havrylyshyn (see references)

M0V1: Mean zero, variance 1

**Table 3:** Technology sub-indicator (ICT) for competitiveness indicator, 1998. *Source:* Authors' calculations.

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
	Fax machines per 1000 persons	Pos	0.2	Faxm	Number	WDI
	Vehicles per 1000 persons	Pos	0.2	Vhcls	Number	WDI
	Internet hosts per capita (size adjusted)	Pos	0.6	Interhosts	Fraction	International Telecom Database

*Notes:* See end of Table 2.

**Table 4:** Good government sub-indicator (ICG) for competitiveness indicator, 1998.

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
<b>Public administration (G.1)</b>	Indicator	Pos	<b>0.3</b>	ICGpa	M0V1	Computed
General (G.1.1)	Public administration index	Neg	0.4	Gpa98	1 to 7 (1 best)	Freedom
Corruption (G.1.2)	Corruption index	Pos	0.4	Co98	0 to 1 (1 best)	Freedom
Civil service (G.1.3)	If civil service was reformed	Pos	0.2	CvservG9	Yes=1, No=0	Survey
<b>Macroeconomic policy (G.2)</b>	Indicator	Pos	<b>0.2</b>	ICGmp	M0V1	Computed
	Macro policy index	Neg	0.5	Ma98	1 to 7 (1 best)	Freedom
	Monetary policy index	Neg	0.5	Mony_H	1 to 5 (1 best)	Heritage
<b>Fiscal policy (G.3)</b>	Indicator	Pos	<b>0.3</b>	ICGfp	M0V1	Computed
Revenues (G.3.1)	Indicator	Pos	0.9	Rev	M0V1	Computed
Taxes (G.3.1.1)	Indicator	Pos	0.5	Taxes	M0V1	Computed
General	Level of taxation index	Neg	0.3	Tax_H	1 to 5 (1 best)	Heritage
Collection	Indicator	Pos	0.35	Collect	M0V1	Computed
	Tax Revenues/Gdp	Pos	0.2	TaxRev	Decimal number	EBRD
	Tariff revenue / total taxes	Neg	0.2	TrfTax	Decimal number	EBRD
	Efficiency of tax collection for Social Security	Pos	0.4	SSColEff	percent	EBRD
	Tax arrears / GDP	Neg	0.2	Taxarr	Decimal number	WB
System reform	Indicator	Pos	0.2	Taxref	M0V1	Computed
Existence	Has there been tax administration reform	Pos	0.5	TxrefG8	Yes=1, No=0	Survey
Duration	Years since tax administrative reform	Pos	0.5	TxrefG8y	Number of years	Survey
Sophistication	Indicator	Pos	0.15	Taxsoph	M0V1	Computed
Existence	Is there a VAT	Pos	0.5	VAT	Yes=1, No=0	EBRD
Duration	Years VAT in existence	Pos	0.5	VATyrs	Number of years	EBRD
Bonds (G.3.1.2)	Indicator	Pos	0.3	Bonds	M0V1	Computed
Domestic (G.3.1.2.1)	Indicator	Pos	0.5	Bnd_dom	M0V1	Computed
Existence	Is there a Treasury bill market	Pos	0.5	Tbills	Yes=1, No=0	EBRD
Duration	Number of years with Treasury bill market	Pos	0.5	Tbillsyr	Number of years	EBRD
External (G.3.1.2.2)	International sovereign bond issue	Pos	0.5	Bnd_ext	Yes=1, No=0	Computed

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
Inflation (G.3.1.3)	Rate of inflation	Neg	0.2	Inflat	Percent	Havrylyshyn
Expenditures (G.3.2)	Central government balance / GDP	Pos	0.1	Cgb	Decimal number	GFS
<b>Policy coherence/control (G.4)</b>	Indicator	Pos	<b>0.2</b>	ICGcoh	M0V1	Computed
Unofficial economy (G.4.1)	Black market index	Neg	0.4	Blkmkt_H	1 to 5 (1 best)	Heritage
Monetization (G.4.2)	Broad money / GDP	Pos	0.2	M2Gdp	Number	EBRD
Stability (G.4.3)	Indicator	Pos	0.4	Stable	M0V1	Computed
Financial stability (G.4.3.1)	Indicator	Pos	0.4	Stabfin	M0V1	Computed
Existence	Whether a BIS member	Pos	0.5	StabfinX	Yes=1, No=0	EBRD
Duration	Years as BIS member	Pos	0.5	Stabfiny	Number of years	EBRD
Democratic stability (G.4.3.2)	Average government tenure / democracy index	Pos	0.6	Stabdem	M0V1	Hellman, Freedom

Notes: See end of Table 2.

**Table 5:** Infrastructure sub-indicator (ICI) for competitiveness indicator, 1998.

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
<b>Availability (I.1)</b>	Indicator	Pos	<b>0.4</b>	ICIav	M0V1	Computed
	Telephones per 1000 persons	Pos	0.6	Teleph	Number	WDI, EBRD
	Paved roads share of roads	Pos	0.4	Paved	Decimal number	WDI
<b>Deregulation (I.2)</b>	Indicator	Pos	<b>0.6</b>	ICde	M0V1	Computed
General	Indicator	pos	0.5	ICires	M0V1	Computed
	Railways index	Pos	0.33	Rail	1 to 4.33 (1 worst)	EBRD
	Telecommunications index	Pos	0.33	Telcom	1 to 4.33 (1 worst)	EBRD
	Electric power index	Pos	0.33	Electp	1 to 4.33 (1 worst)	EBRD
Regulation	Indicator	Pos	0.2	ICireg	M0V1	Computed
	Independent telephone regulator	Pos	0.33	Indtel	Yes=1, No=0	EBRD
	Separate freight & passenger accounts	Pos	0.33	Seprail	Yes=1, No=0	EBRD
	Independent electricity regulator	Pos	0.33	Indelec	Yes=1, No=0	EBRD
Competition in supply	Indicator	Pos	0.3	ICicom	M0V1	Computed
	How competitive is the telephony sector?	Pos	0.25	ComTeE1a	0 (none) to 4 (very)	Survey
	How competitive is the energy sector?	Pos	0.25	ComEnE1c	0 (none) to 4 (very)	Survey
	How competitive is the water sector?	Pos	0.25	ComWaE1d	0 (none) to 4 (very)	Survey
	How competitive is the natural gas sector?	Pos	0.25	ComGsE1e	0 (none) to 4 (very)	Survey

Notes: See end of Table 2.

**Table 6:** Financial sector sub-indicator (ICF) for competitiveness indicator, 1998.

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
<b>Investment performance (F.1)</b>	Indicator	Pos	<b>0.30</b>	ICFip	M0V1	Computed
	Credit to enterprises / GDP	Pos	0.33	Creent	Decimal number	EBRD
	Domestic credit / GDP	Pos	0.33	CreddC12	Decimal number	Survey
	Private investment / GDP	Pos	0.33	PrinvGdp	Decimal number	WB
<b>Banking sector (F.2)</b>	Indicator	Pos	<b>0.25</b>	ICFbk	M0V1	Computed
General (F.2.1)	Indicator	Pos	0.2	Bkperf	M0V1	Computed
	Banking reform & interest rate liberalization	Pos	0.5	Bnkirlib	1 to 4.33 (1 worst)	EBRD
	Banking system index	Neg	0.5	Bank_H	1 to 5 (5 best)	Heritage
Performance (F.2.2)	Bank credit / GDP	Pos	0.2	BcrdtGdp		WDI
Competition (F.2.3)	Indicator	Pos	0.25	Bkcmp	M0V1	Computed
	Interest rate liberalization index	Pos	0.25	Intlib	0=limited <i>de jure</i> 1=limited <i>de facto</i> 2=Full	EBRD
	Degree of competition in banking sector	Pos	0.25	ComBkE1j	0 (none) to 4 (very)	Survey
	Number of banks / ln(population)	Pos	0.25	BnksPop	Decimal number	EBRD
	State bank share of banking sector assets	Neg	0.25	Asobanks	Decimal number	EBRD
Foreign Penetration (F.2.4)	Number of foreign banks/ ln(populations)	Pos	0.2	FgnbnkPo	Number	EBRD
Regulation (F.2.5)	Is there bank deposit insurance	Pos	0.15	Depins	Yes=1, No=0	Survey
<b>Capital markets (F.3)</b>	Indicator	Pos	<b>0.25</b>	ICFkm	M0V1	Computed
Stock market (F.3.1)	Indicator	Pos	0.4	StkMkt	M0V1	Computed
	Existence	Is there a stock market?	Pos	StkMktX	Yes=1, No=0	Survey
Performance	Indicator	Pos	0.5	Smperf	M0V1	Computed
	Stock market capitalization / GDP	Pos	0.6	SmkcGdp	Decimal number	EBRD
	Value of trades / stock market capitalization	Pos	0.2	Smactv	Decimal number	Survey
	Number of stock market transactions/population	Pos	0.2	SmtrPoC2	Number	Survey

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
Regulations	Indicator	Pos	0.3	Kregs	M0V1	Computed
	Shareholder protection index	Pos	0.5	Shrhdpro	0=Inefficient 1=partially efficient	EBRD
	Is there insider dealing protection	Pos	0.5	Insdprpro	Yes=1, No=0	EBRD
Securities markets (F.3.2)	Indicator	Pos	0.3	Secmkts	M0V1	Computed
	Securities market index	Pos	0.33	Securt	1 to 4.33 (1 worst)	EBRD
	Has an international corporate bond been issued	Pos	0.33	Intlcbnd	Yes=1, No=0	EBRD
	Is there a secured transaction law?	Pos	0.33	Sctrlaw	Yes=1, No=0	EBRD
General regulations/standards (F.3.3)	Indicator	Pos	0.3	Kmregs	M0V1	Computed
Oversight	Is there a securities exchange commission?	Pos	0.5	Seccom	Yes=1, No=0	EBRD
Standards	Indicator	Pos	0.5	IAS	M0V1	Computed
Existence	Is IAS in force	Pos	0.5	IASexist	Yes=1, No=0	EBRD
Duration	Years that IAS in force	Pos	0.5	IASyrs	Number	EBRD
<b>Non-bank financial institutions (F.4)</b>	Indicator	Pos	<b>0.2</b>	ICFnbf	M0V1	Computed
Pension funds (F.4.1)	Are there private pension funds?	Pos	0.3	PrpenC11	Yes=1, No=0	Survey
Insurance markets (F.4.2)	Indicator	Pos	0.7	Insmkts	M0V1	Computed
Competition	Indicator	Pos	0.6	Inscomp	M0V1	Computed
	Number of insurance firms / ln(population)	Pos	0.2	InscoPC6	Decimal number	Survey, WDI
	Private sector share of number of insurance companies	Pos	0.25	InsprC76	Decimal number	Survey
	Is government the dominant firm?	Neg	0.25	InsgvC9	Yes=1, No=0	Survey
	Number of foreign insurance companies/ln(population)	Pos	0.3	InsfPoC8	Number	Survey
Regulation	Indicator	Pos	0.4	InslwC16	M0V1	Computed
Existence	Is there an insurance law?	Pos	0.5	InslawX	Yes=1, No=0	Survey
Duration	Years insurance law in force	Pos	0.5	Inslawy	Number	Survey

Notes: See end of Table 2.

**Table 7:** Labor markets (ICL) for competitiveness indicator, 1998.

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
<b>Management and labor quality (L.1)</b>	Indicator	Pos	<b>0.7</b>	ICLq	M0V1	Computed
Education (L.1.1)	Indicator	Pos	0.5	Labeledu	M0V1	Computed
General	Education index	Pos	0.3	Educ	0 to 1 (1 best)	UNDP
Domestic	School enrolment ratio (1995)	Pos	0.25	School95	Percent	UNDP
Foreign	Indicator	Pos	0.25	Edu_fgn	M0V1	Computed
	Scholars in the US per worker	Pos	0.5	FgnschLf	Decimal number	NA
	Students in the US per worker	Pos	0.5	FgnstuLf	Decimal number	NA
Skills	Physicians per 1000 persons	Pos	0.2	Phys	Decimal number	WDI
Human development (L.1.2)	Indicator	Pos	0.3	Humdev	M0V1	Computed
	Human development index (1995)	Pos	0.6	Humdev95	0 to 1 (1 best)	UNDP
	Life expectancy	Pos	0.4	Lifeexp	Years	WDI
Government commitment (L.1.3)	Budget share for education and health	Pos	0.2	EBudF7	Decimal number	Survey
<b>Market efficiency (L.2)</b>	Indicator	Pos	<b>0.3</b>	ICLef	M0V1	Computed
Performance (L.2.1)	Unemployment rate (deviation from 8-12 range)	Neg	0.1	Unemp	Decimal number	EBRD
Government restrictions (L.2.2)	Indicator	Pos	0.5	Govrestr	M0V1	Computed
	Are there restrictions on wage increases?	Neg	0.5	Wagereg	Yes=1, No=0	EBRD
	Restrictiveness of hiring and firing	Neg	0.5	HirFiE10	0=minimal 1=moderate 2=Very	Survey
Tax distortions (L.2.3)	Employer + employee tax wedge	Neg	0.4	WagtxE89	Decimal number	Survey

*Notes:* See end of Table 2.

**Table 8:** Institutions sub-indicator (ICN) for competitiveness indicator, 1998.

<i>Category</i>	<i>Definition</i>	<i>Effect</i>	<i>Weight</i>	<i>Variable</i>	<i>Scoring</i>	<i>Source</i>
<b>Political environment (N.1)</b>	Indicator	Pos	<b>0.3</b>	ICNpol	M0V1	Computed
Democracy (N.1.1)	Indicator	Pos	0.5	Democrcy	M0V1	Computed
	Democracy index	Neg	0.5	Democ_fh	1 to 7 (1 best)	Freedom
	Political process index	Neg	0.5	Polproc	1 to 7 (1 best)	Freedom
Civil society (N.1.2)	Indicator	Pos	0.5	Civilsoc	M0V1	Computed
	Independent media	Neg	0.5	IndMedia	1 to 7 (1 best)	Freedom
	Civil society index	Neg	0.5	Civil_fh	1 to 7 (1 best)	Freedom
<b>Rule of law (N.2)</b>	Indicator	Pos	<b>0.4</b>	ICNrul	M0V1	Computed
Due process (N.2.1)	Indicator	Pos	0.4	Idueproc	M0V1	Computed
General	Indicator	Pos	0.8	Dueprgen	M0V1	Computed
	Rule of law index	Neg	0.4	RoL	1 to 7 (1 best)	Freedom
	Legal system effectiveness & extensiveness	Pos	0.4	Leg	0 to 1 (1 best)	EBRD
	Corporate governance index	Pos	0.2	govent	1 to 4.33 (1 worst)	EBRD
Bankruptcy	Indicator	Pos	0.2	Bnrptcy	M0V1	Computed
	Effectiveness of bankruptcy proceedings	Pos	0.6	Bkrptpro	0=ineffective 1=partially effective 2=Effective	EBRD
	Are there bankruptcy courts?	Pos	0.4	BktyctB9	Yes=1, No=0	Survey
Corruption (N.2.2)	Corruption index	Pos	0.4	Co98	0 to 1 (1 best)	Freedom
Property rights (N.2.3)	Property rights index	Neg	0.2	Prorgt_H	1 to 5 (1 best)	Heritage
<b>Competition in markets (N.3)</b>	Indicator	Pos	<b>0.3</b>	ICNcom	M0V1	Computed
Regulation (N.3.1)	Indicator	Pos	0.8	Compreg	M0V1	Computed
General	Competiton policy index	Pos	0.5	Comppl	1 to 4.33 (1 worst)	EBRD
Implementation	Indicator	Pos	0.5	Compimpl	M0V1	Computed
	Is there a competition law?	Pos	0.3	CmplwXE6	Yes=1, No=0	Survey
	Is there a competition office?	Pos	0.4	CcomXE12	Yes=1, No=0	Survey
	Years competition office operating	Pos	0.3	CcomYE12	Integer	Survey
Performance (N.3.2)	Average competition score in eleven strategic and infrastructure sectors	Pos	0.2	CompetE1	0 to 4 (4 best)	Survey

Notes: See end of Table 2.

We applied the following data manipulation in order to capture this sub-indicator. The unemployment variable is used to proxy for the rigidity of the labor market in the country. A high level of unemployment may indicate the existence of rigidities that do not allow the market to arrive at equilibrium (market-clearing). A low level of unemployment, on the other hand, also suggests labor rigidities since the high degree of economic restructuring necessary in a transition economy should cause high unemployment to be observed. We, therefore, chose to penalize a country for deviations from what we considered as a natural rate of employment, outside the range of 8-12 percent<sup>18</sup>.

*Institutions.* Table 8, in presenting the institutional software inputs, provides what might be called the enabling environment for competitiveness. It stresses the need for orderly and stable institutional arrangements to ensure accountable government (“Political environment”) but *not* the quality of government administration (which is in the Good Government sub-indicator), a transparent and level playing field (“Rule of law”) in business activity, and an honest degree of competition (“Competition in markets”). In turn, the “Political environment” captures both the democratic process as well as the functioning civil society. “Rule of law” captures the quality of due process in law (including bankruptcy), the degree of corruption, and the existence and enforcement of property rights.

### 3 Results: A comparison among transition countries

Table 9 presents the results of the indicator and sub-indicator “recipes” given in section 2. We begin by describing these results at the cluster level. We then examine the within-cluster performance differences. We end the section by comparing our indicators to economic performance measures such as GDP growth and foreign direct investment.

#### 3.1 Cluster-level comparisons

Looking first at the competitiveness indicator column in Table 9 immediately reveals the strength of the cluster notion and the similarity of within cluster performance.<sup>19</sup> The EU border States and the Baltics stand squarely at the top with the Baltics tightly grouped together and the “new” states falling at the end of the group. The Balkans (minus Macedonia) come next followed by the Caucasus and Central Asia. The Western FSU pepper the lower half of the ranking, with Russia best at rank 11. Kazakhstan and Kyrgyz Republic are the top performers of the Central Asia group. As we show in Sachs, Zinnes, Eilat (2000, vol. 1) Albania fits neatly into the Central Asia range.

The sub-indicators in this table help to pinpoint the strengths and weaknesses of each country *relative* to its competition. While countries for the most part respect their competitiveness position across the sub-indicators, there are some notable exceptions. Georgia, for example, with a competitiveness rank of 16 is ranked number 9 on infrastructure and 24 in its financial sector. Slovenia, on the other hand, ranks 5th in competitiveness and 13th in its financial sector. Labor quality seems to be the most out of line with the overall competitiveness scores. Armenia

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<sup>18</sup> So a country within this range gets no negative points. A country where the unemployment is below 8 percent gets a score that is the difference between 8 percent and its unemployment rate. A country where the unemployment is above 12 percent gets a score that is the difference between its unemployment rate and 12 percent.

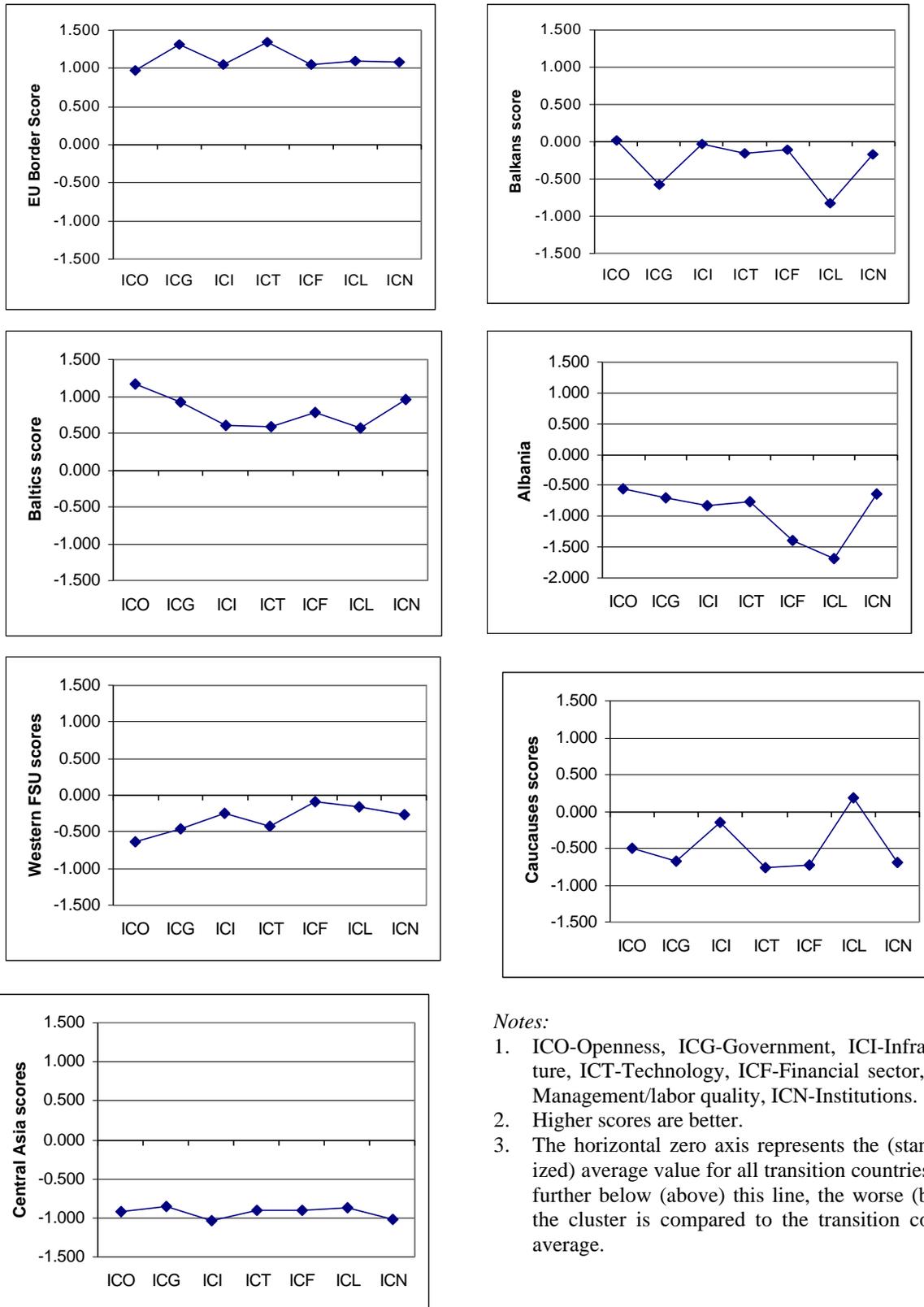
<sup>19</sup> In the sub-indicator tables we have included the actual indicator score as well as the rank in order to suggest the closeness of countries. Sensitivity analysis reveals that where the indicator scores are at least 0.03 of each other country rankings are robust to weight changes of as great as 20 percent.

and Turkmenistan with competitiveness ranks of 18 and 25 score 8th and 9th in terms of labor. Latvia, on the other hand, with a competitiveness rank of 5, ranks 14 in terms of labor.

**Table 9:** Summary of competitiveness indicator and the countries' ranks on its sub-indicators, 1998. *Source:* authors' calculations

<i>Country</i>	<b>Competitiveness rank</b>	<b>Competitiveness indicator</b>	Openness	Good government	Infrastructure	Technology	Financial sector	Management and Labor	Institutions
Hungary	<b>1</b>	2.027	<b>1</b>	3	<b>1</b>	2	<b>1</b>	3	2
Czech Rep.	2	1.847	3	<b>1</b>	3	<b>1</b>	2	<b>1</b>	3
Poland	3	1.555	4	2	2	3	5	4	<b>1</b>
Estonia	4	1.228	2	4	7	4	4	7	4
Slovenia	5	0.920	7	5	4	5	13	2	5
Lithuania	6	0.774	6	8	5	10	9	5	7
Latvia	7	0.738	5	6	11	8	6	13	6
Slovakia	8	0.702	8	9	12	6	3	6	8
Croatia	9	0.272	12	7	8	7	10	14	14
Bulgaria	10	0.046	10	13	6	9	16	17	9
Russia	11	0.029	16	11	15	11	7	11	11
Romania	12	-0.064	9	19	13	12	8	19	12
Moldova	13	-0.220	11	10	16	17	12	21	10
Kazakhstan	14	-0.343	15	12	14	16	11	18	17
Ukraine	15	-0.410	18	16	10	14	20	12	15
Georgia	16	-0.469	17	14	9	18	24	10	13
Kyrgyz Rep.	17	-0.496	14	15	19	22	14	20	16
Armenia	18	-0.571	20	17	17	19	18	8	20
Azerbaijan	19	-0.620	13	23	18	21	15	16	24
Macedonia	20	-0.813	19	18	22	13	17	24	19
Belarus	21	-0.838	23	21	20	15	19	15	21
Albania	22	-1.081	21	20	23	23	22	23	18
Uzbekistan	23	-1.314	24	22	21	<b>25</b>	23	22	23
Tajikistan	24	-1.351	22	24	<b>25</b>	20	21	<b>25</b>	22
Turkmenistan	<b>25</b>	-1.549	<b>25</b>	<b>25</b>	24	24	<b>25</b>	9	<b>25</b>

**Figure 1:** Competitiveness patterns for 1998. *Source:* Authors' calculations.



*Notes:*

1. ICO-Openness, ICG-Government, ICI-Infrastructure, ICT-Technology, ICF-Financial sector, ICL-Management/labor quality, ICN-Institutions.
2. Higher scores are better.
3. The horizontal zero axis represents the (standardized) average value for all transition countries. The further below (above) this line, the worse (better) the cluster is compared to the transition country average.

Following the approach used in Zinnes (1987), Figure 1 provides a simple way to chart each cluster's relative performance and to make inter-cluster comparisons. Each graph can be considered the cluster's pattern of competitiveness for 1998. While the Baltics still come out on top after the EU Border States (average competitiveness scores of 0.91 and 1.22, respectively), we see that the Baltics greatest strength is their openness, scoring even higher than the EU Border States. We see, however, that for both of these clusters the quality of its governments receive among the highest scores. The Baltics' weak areas keeping them from the level of competitiveness found in the EU Border States are their infrastructure, technology, and the quality of their labor.

Turning next to the Balkans (average competitiveness score of -0.28), we see that they edge out the Western FSU (average competitiveness score of -0.36) for next in line. The Balkans receive almost average scores for all sub-indicators except in good government and in labor market quality, where they are well below average – and worse than the Western FSU. (Note how the Balkan country, Albania also performs particularly poorly in labor). Besides labor quality (favoring the Western FSU) the main additional strength of the Balkans over the Western FSU is in openness.

The Caucasus (with an average competitiveness score of -0.55) do their best in labor quality (where they even score above average) and in infrastructure. Note, however, that this cluster, together with the Balkans, scores uniformly poorly wherever organizational matters are required, as its government and institutions sub-indicators attest to. Interestingly, the financial sub-indicator, which also requires substantial organizational efforts, also is relatively the weakest for this cluster.

Finally Central Asia (average competitiveness score of -1.01) is the worst on each sub-indicator (ignoring Albania). Perhaps not surprisingly, it is most behind in its institutions; rule of law, the political process, and civil society are simply least developed in this part of the sample.

Before moving on, we would like to return to the question of robustness of these results. As mentioned earlier, the method we used to investigate the robustness of our competitiveness indicator, as well as its sub indicators, was to check the impact of perturbations of the weights on the resulting rankings. If small perturbations in the weights would lead to big changes in the rankings, this would suggest that the rankings are somewhat arbitrary since the expert opinion upon which they are based is subject to some error. Fortunately, this was not the case, as the following summary indicates.

First, we changed the weight of each sub-indicator in turn by 20 percent above and below the weight described in section 2. The result from repeating this exercise 14 times (twice for each sub-indicator) was that a few country pairs developed reversals but *no* countries jumped beyond their immediate neighbor. In particular, there were 3 reversals (21 percent of the tests) in rank between Russia and Bulgaria, 3 reversals in rank between Georgia and Kyrgyz Republic and two reversals in rank (14 percent of the tests) between Belarus and Macedonia. That is, as a rule of thumb, countries with indicator values of no more than 0.03 apart can swap places for changes of 20 percent in the weights, even though such reversals are rare. For the same exercise with a plus-or-minus change of 50 percent in the weights we got a total of 20 reversals for pairs of countries and only 2 changes of order for a triplet of countries. The latter occurred for countries not more than 0.1 apart in their indicator values. This implies that a difference of 0.1 and above between countries is robust, even to unreasonably large changes in the weighting scheme.

Finally, we tested the effect of giving equal weights to each sub-indicator. This led to reversals of order between Latvia-Slovakia, Kazakhstan-Ukraine, Kyrgyz Rep.-Armenia, and Macedonia-Belarus, all neighbors in the competitiveness ranking of Table 9.

### 3.2 *Within-cluster differences of competitiveness*

The across-cluster differences above provide a handy way to identify patterns of competitiveness. They also offer benchmarks for countries in a cluster to compare their overall performance against other countries with similar initial, transition conditions. Let us now examine these within cluster differences, as illustrated in the graphs of Figure 2 through Figure 5.

As shown in Table 9, we see that Hungary, the Czech Republic, and Poland tend to do the best and the “new” states the worst in the EU Border States. For competitiveness, the spread is substantial between Hungary and Croatia – 2 standard deviations. Finally we see that while the Czech Republic excels in its labor markets, it does below average for its cluster in infrastructure. Regarding the latter, note that infrastructure in Hungary is almost 3 standard deviations above the average for all transition countries and almost 2 above the mean for its own cluster, while its labor is “only” average for its cluster.

In keeping with the aggregate competitiveness indicator rankings, in the Balkans we find, with the exception of good government and finance, that Macedonia is uniformly and significantly behind Romania and Bulgaria. The main divergence is the financial sector in Romania, which is significantly ahead of the rest of the cluster.

In the case of the Baltics, we find performance at the sub-indicator level in line with the competitiveness scores.

The Western FSU presents more diversity at the country level. While Russia is overall the most competitive and has by far the most developed financial sector<sup>20</sup>, Moldova is the most open and has the best government and institutions – with Belarus having by far the worst. Moldova, on the other hand has by far the weakest management and labor markets. These results for Moldova through into some doubt its classification as being part of the Western FSU. An examination of the sub-indicator figures suggests that it follows more closely the cluster means of the Balkans than those of the Western FSU. The clustering procedure, as described at the start of the paper, is based on the countries’ initial conditions at the start of transition. These results for 1998, almost a decade later, suggest that Moldova has begun to look again like it is in the Balkans. Finally, note that Ukraine has the best infrastructure with, again, Belarus having the worst.

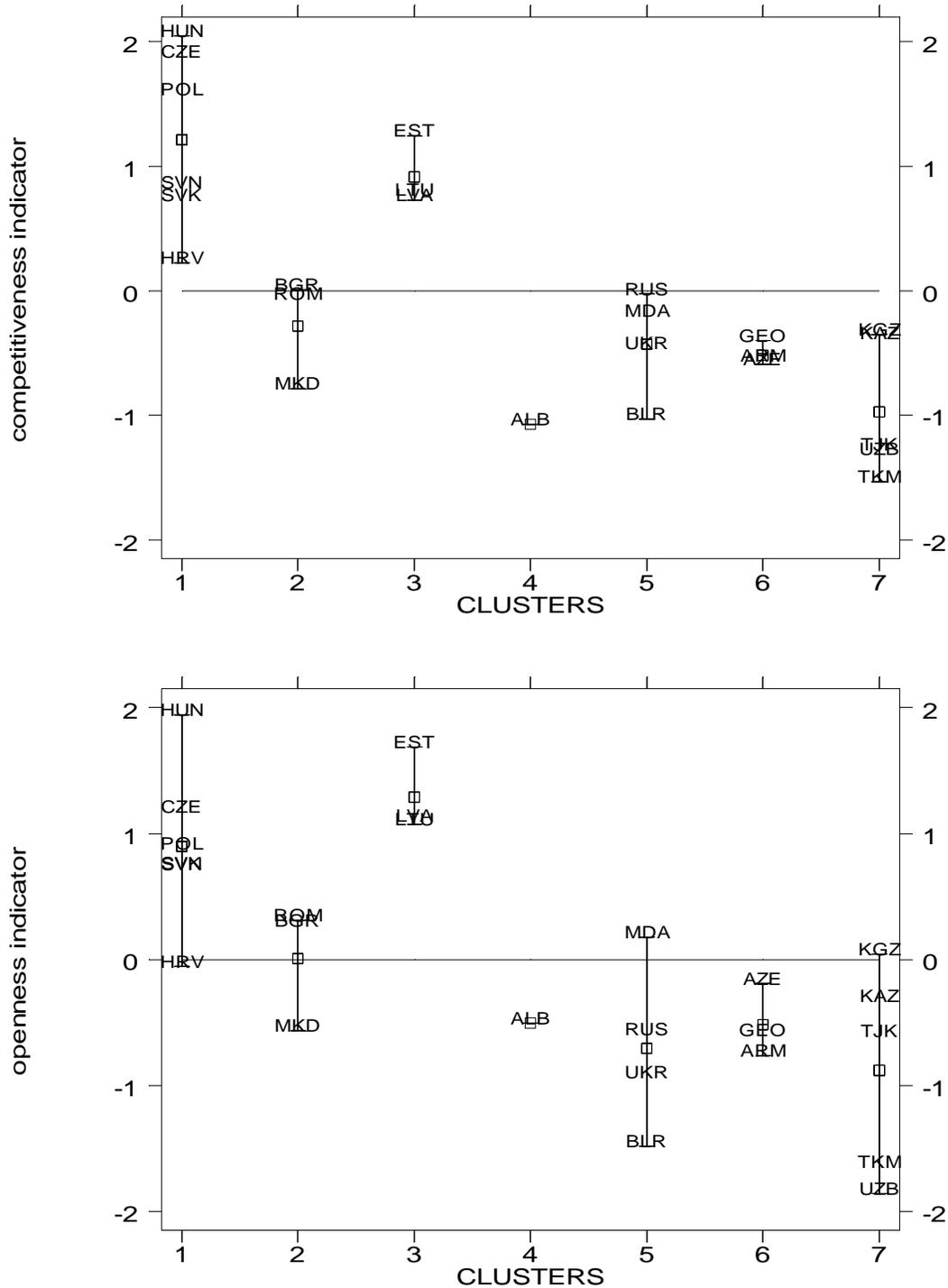
While the competitiveness scores for the Caucasus were very close, the sub-indicator figures reveal Georgia, varying significantly around the cluster means, to be the odd man out relative to Armenia and Azerbaijan, which are much more similar (openness and labor, being the exceptions here). In particular, while Georgia’s financial sector is substantially less developed than the rest of the cluster, its infrastructure and institutions scores were by far the best in the cluster.

Finally, with the exception of labor markets, the pattern in Central Asia is fairly constant across sub-indicators. Kazakhstan and the Kyrgyz Republic do the best – often by a wide margin – and Turkmenistan does the worst, again by far. In the case of labor markets Turkmenistan substantially exceeds its other cluster members, with scores at the level of those of the Baltics. This might seem at first glance as a surprise, yet, Turkmenistan was ranked tenth in the world (and ninth in our sample) in the latest UNDP education report.

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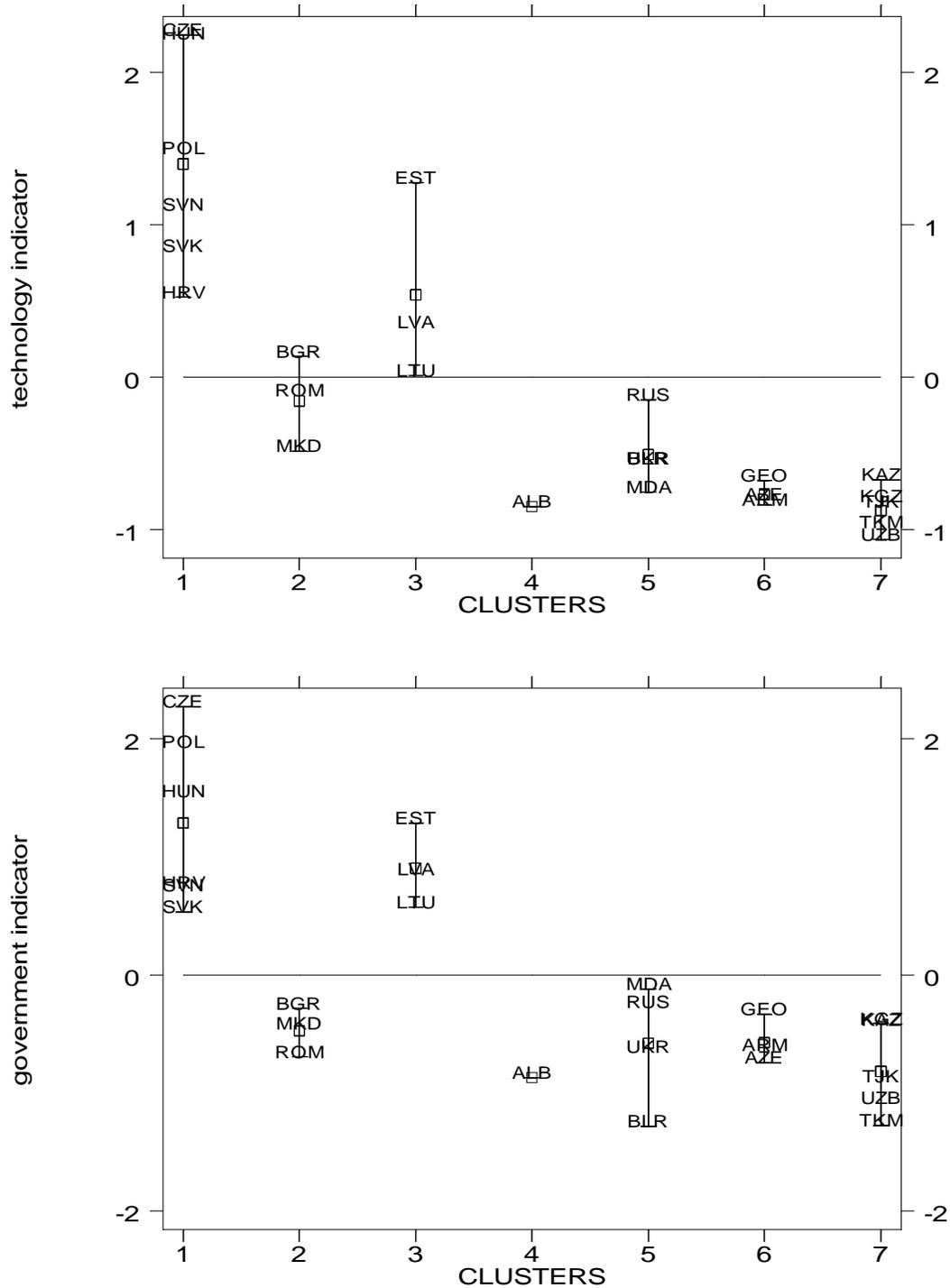
<sup>20</sup> See our discussion interpreting these results for Russia at the start of in section 2.

**Figure 2:** Intra-cluster differences in competitiveness and in openness. *Source:* Authors' calculations.



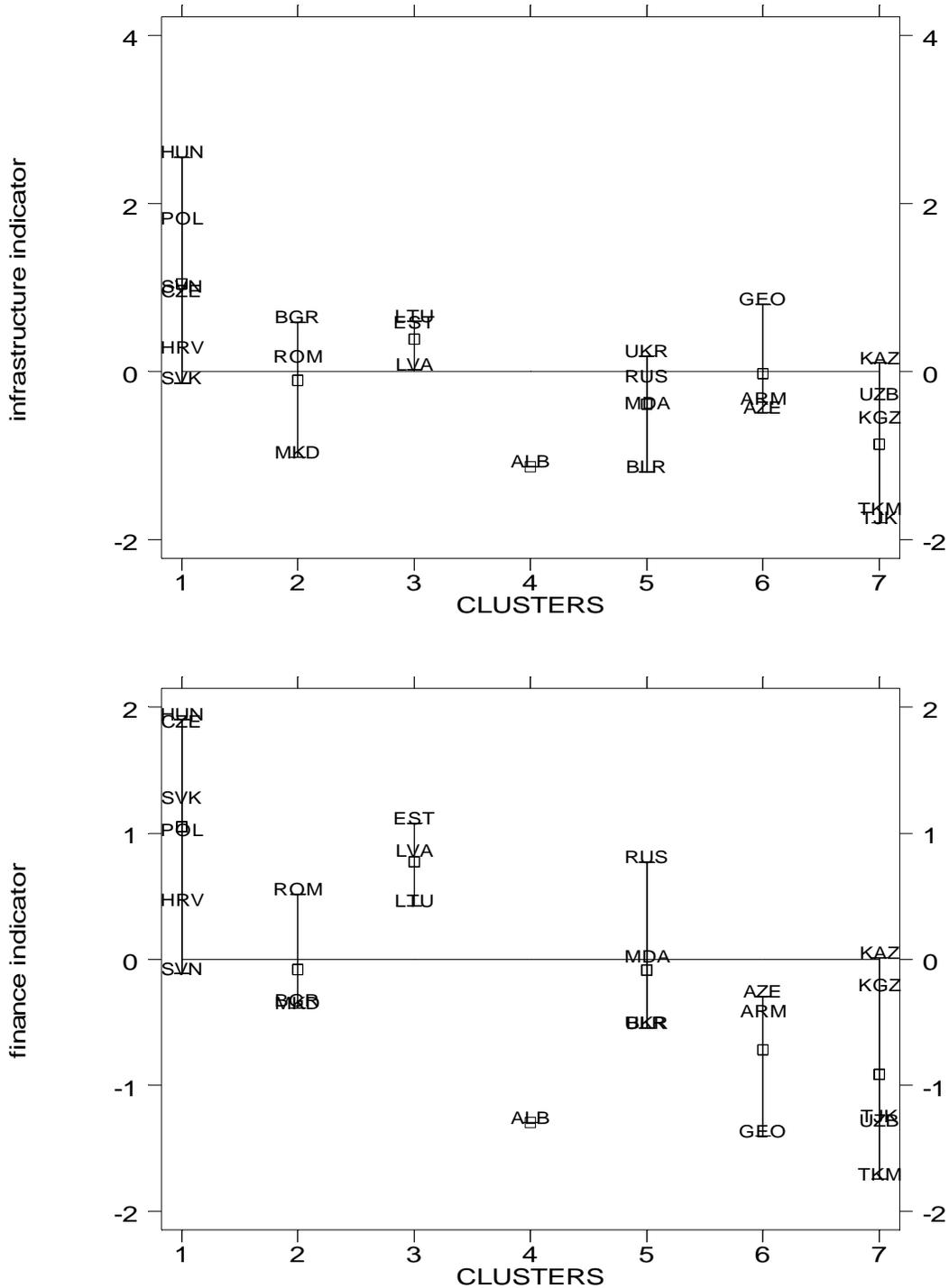
*Notes:* The cluster numbers are: 1-EU Border States, 2-Balkans, 3-Baltics, 4-Albania, 5-Western FSU, 6-Caucasus, 7-Central Asia. Hollow squares refer to each cluster's average and the horizontal line is the average (zero) for the entire sample of transition countries.

**Figure 3:** Intra-cluster differences in technology and in government. Source: Authors' calculations.



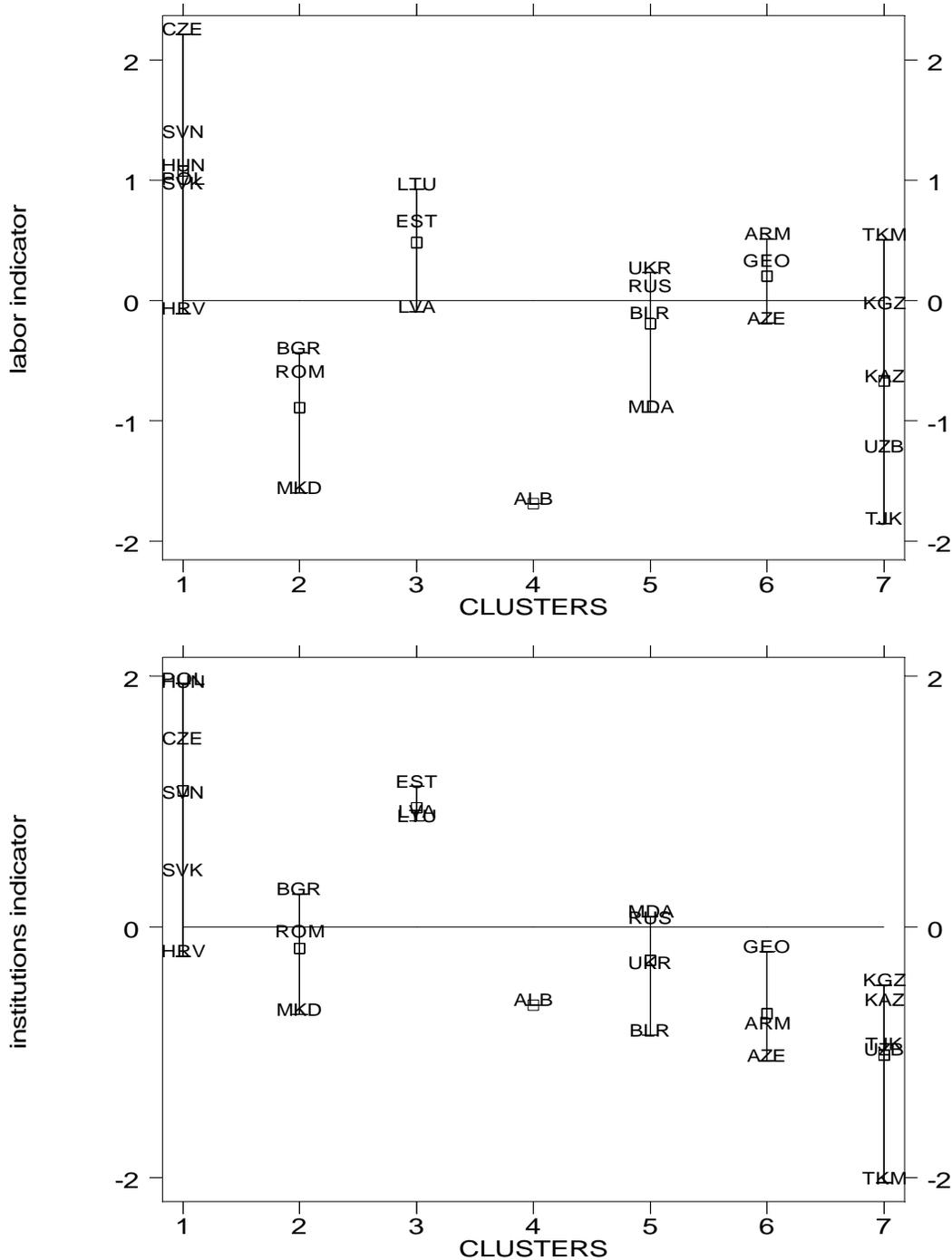
*Notes:* The cluster numbers are: 1-EU Border States, 2-Balkans, 3-Baltics, 4-Albania, 5-Western FSU, 6-Caucasus, 7-Central Asia. Hollow squares refer to each cluster's average and the horizontal line is the average (zero) for the entire sample of transition countries.

**Figure 4:** Intra-cluster differences in infrastructure and in finance. Source: Authors' calculations.



*Notes:* The cluster numbers are: 1-EU Border States, 2-Balkans, 3-Baltics, 4-Albania, 5-Western FSU, 6-Caucasus, 7-Central Asia. Hollow squares refer to each cluster's average and the horizontal line is the average (zero) for the entire sample of transition countries.

**Figure 5:** Intra-cluster differences in labor and in institutions. Source: Authors' calculations.



**Notes:** The cluster numbers are: 1-EU Border States, 2-Balkans, 3-Baltics, 4-Albania, 5-Western FSU, 6-Caucasus, 7-Central Asia. Hollow squares refer to each cluster's average and the horizontal line is the average (zero) for the entire sample of transition countries.

While we do believe in general that the sub-indicators provide a good indicative picture of the sources of strength and weakness in a country's overall competitiveness position, care needs to be taken when inferring cause and effect. In the case where a particular sub-indicator scores relatively badly within a cluster, its *direct* strengthening may or may not be the best policy. For example, Georgia's poor (for its cluster) showing of its financial sector may be more a reflection of its lack of foreign Diaspora or lack of a petroleum sector than it is reflection of a stymied sector relative to its development needs. As we have stressed in the introduction, the goals of this paper are to highlight the stylized facts, not to provide an analytic treatment – or even tests – of causality.

### 3.3 *The components of the sub-indicators*

As a final comparison of the clusters and countries we may drop down by one level to decompose sub-indicator performance. For this purpose we calculate the “sub-sub-indicators” described in Table 2 through Table 8 containing the design of each sub-indicator. The results are given in Table 10 through Table 15. Let us identify from these tables some of the main weaknesses – and strengths – of the countries at this lower level of disaggregation, keeping in mind the caveat at the end of the last section. At the same time we use these tables for explanations regarding the within-cluster observations made in conjunction with our discussion of Figure 2 through Figure 5.

*Openness.* While Hungary is number one in openness, it achieves this standing due to its favorable international regulatory environment and open capital account but in spite of a relatively weak performance of its current account, where it ranks 6th. Estonia on the other hand achieves high scores on openness (2<sup>nd</sup>) with improvements still required regarding its compliance with international regulation (where it ranks 10th). Poland, the least open of the “mature” EU Border States (ranked 4th), is the worst country in the cluster in terms of its current account openness, ranking 15th out of all the countries. Slovenia, 7th in openness, ranks 19th overall in its capital account. The opposite pattern is found in Central Asia. Tajikistan, ranked 22<sup>nd</sup> overall in openness, ranks 2<sup>nd</sup> in its current account (due to extremely high exports imports compared to its GDP); Belarus also chimes in for a spectacular 9th on this component in spite of an overall openness ranking of 23<sup>rd</sup>. With Azerbaijan, ranked 13th overall in openness achieves a rank of 2<sup>nd</sup> place in terms of its capital account openness. The Kyrgyz Republic, ranked 14th on openness, scores 4th in its regulatory environment. We see that Georgia's openness performance is held back by its current account performance, alone.

*Good government.* Here, third-ranked Hungary is pulled down by its relatively poor showing (11th) for the quality of its fiscal policy. Tajikistan, ranked 24th in terms of good government overall, achieves 4th best performance in terms of its macro policy environment. Interestingly, both Romania and Macedonia, while not doing well overall on this sub-indicator – 19th and 18th, respectively, manage good scores in terms of government policy stability.<sup>21</sup>

*Infrastructure.* Here the poor rankings for Hungary and Poland (10th and 17th) for infrastructure availability still do not prevent their receiving first and second place overall. This is because of the greater weight placed on regulation and competition (0.6) as well as their high scores on the latter. Nevertheless, it does suggest where these two front-runners could improve

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<sup>21</sup> Note that stable policy does not mean that what has been maintained is necessarily good policy.

their competitiveness performance.<sup>22</sup> The Czech Republic has the opposite issue, scoring 9th in regulation and competition and first in availability. Finally, Georgia's relatively good showing on infrastructure, scoring 9th overall is driven by a high level of competition (third-best) in the infrastructure sector compared to other countries in the sample. Belarus, Slovakia, and Croatia all show great divergence between their good performance for availability relative to their overall infrastructure score, Belarus' being particularly out of line. For Romania it is the opposite: availability is among the worst while it scores well on regulation and competition.

*Financial sector.* The Czech Republic's overall sector score of 2<sup>nd</sup> is blemished by a relatively poor score of 11th for non-bank financial institutions; the same for Poland where its number 5 rank overall hides a poor 14th on non-bank financial institutions. Croatia also does very poorly on this sub-sub-indicator, receiving a rank of 20th. In fact, country non-bank financial institution performance highlights substantial divergences with competitiveness rankings. Countries doing surprisingly well are Belarus, Kazakhstan, and Russia (coming in first place!)<sup>23</sup>. Slovakia, scoring 3<sup>rd</sup> overall on its financial sector, needs to do serious work on its capital markets (where it scores 17th) if it wants a more competitive financial sector. Russia, with an overall financial sector score of 7th, would have done even better if it weren't for its very poor investment performance scored of 21<sup>st</sup> overall. Uzbekistan and Azerbaijan do unexpectedly well on investment performance, with ranks of 10th and 6th, respectively. Banking mirrored best overall indicator and sub-indicator rankings, the exception being Macedonia whose banking ranking of 8th belied its overall competitiveness ranking of 20th. Similarly, Armenia does very well on its capital market performance (8th) relative to its overall competitiveness ranking of 18th. Finally, note the divergence between Slovenia's competitiveness rank (5th) and its overall financial sector performance (13th).

*Management and labor markets.* Here Slovenia, Hungary and Poland are all pulled down by labor market inefficiencies due to wage controls and tax distortions. Albania, on the other hand, while ranking 25th in terms of labor quality, has achieved a very free – and therefore efficient – labor market, scoring 1st on market efficiency. Georgia also has the same problem, with ranks of 15th and 3<sup>rd</sup>, respectively. Romania and Azerbaijan also do well on labor market efficiency in spite of a poor overall showing on the sub-indicator. Belarus and Russia on the other hand score very poorly on market efficiency (25th and 21th, respectively) but have a high level of human capital (ranking 6th and 7th, respectively). Finally, note that Turkmenistan's good overall sub-indicator showing is no fluke: it ranks relatively well on both sub-sub-indicators.

*Institutions.* Here the main result is that there are few "reversals". For the most part sub-sub-indicator scores respect the sub-indicator and competitiveness scores. In fact the scores on this sub-indicator are the best predictors of scores on competitiveness – in spite of receiving the lowest weight in the overall indicator! This underscores one of our major policy conclusions: though hard to build and improve, institutions and rule of law matter most in the transition process. Beyond this we point out that Croatia's institutions are quite out of line with their overall competitiveness (14th and 9th, respectively). Slovenia's level of competition in markets is also poor relative to its competitiveness rank (10th vs. 5th). Ukraine and Macedonia score unexpectedly well in market competition and the political environment, respectively, given their competitiveness ranks.

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<sup>22</sup> An alternative explanation is that this may suggest that the other countries are in some sense "over-invested" in our measures of infrastructure availability (paved roads and telephones), given their levels of development. The region does have a reputation for over-production in some areas, notably construction and electricity generation.

<sup>23</sup> In fact this sub-sub-indicator holds the answer to Russia's good overall financial sector performance score.

**Table 10:** Summary of openness indicator and its sub-indicators, best to worst, 1998. *Source:* authors' calculations

<i>Country</i>	<i>Openness rank</i>	<i>Openness indicator</i>	<i>Regulatory environment</i>	<i>Current account</i>	<i>Capital account</i>	<i>Competitiveness rank</i>
Hungary	<b>1</b>	2.053	2	6	<b>1</b>	<b>1</b>
Estonia	2	1.535	10	<b>1</b>	3	4
Czech Rep.	3	1.229	6	4	6	2
Poland	4	1.114	<b>1</b>	15	5	3
Latvia	5	1.008	8	10	4	7
Lithuania	6	0.957	9	8	7	6
Slovenia	7	0.780	3	3	19	5
Slovakia	8	0.649	7	5	12	8
Romania	9	0.397	5	16	9	12
Bulgaria	10	0.362	14	7	10	10
Moldova	11	0.024	11	12	16	13
Croatia	12	-0.022	12	18	13	9
Azerbaijan	13	-0.082	20	23	2	19
Kyrgyz Rep.	14	-0.085	4	21	20	17
Kazakhstan	15	-0.211	17	17	8	14
Russia	16	-0.343	19	13	14	11
Georgia	17	-0.656	13	24	15	16
Ukraine	18	-0.717	21	11	18	15
Macedonia	19	-0.725	15	20	23	20
Armenia	20	-0.741	18	22	21	18
Albania	21	-0.775	16	<b>25</b>	11	22
Tajikistan	22	-0.938	23	2	22	24
Belarus	23	-1.481	24	9	<b>25</b>	21
Uzbekistan	24	-1.637	22	19	24	23
Turkmenistan	<b>25</b>	-1.696	<b>25</b>	14	17	<b>25</b>

**Table 11:** Summary of good government indicator and its sub-indicators, best to worst, 1998.  
*Source:* authors' calculations

<i>Country</i>	<i>Government rank</i>	<i>Government indicator</i>	<i>Public administration</i>	<i>Macro policy</i>	<i>Fiscal policy</i>	<i>Policy/political coherence</i>	<i>Competitiveness rank</i>
Czech Rep.	<b>1</b>	2.066	4	<b>1</b>	3	<b>1</b>	2
Poland	2	1.936	<b>1</b>	5	<b>1</b>	2	3
Hungary	3	1.595	2	2	11	3	<b>1</b>
Estonia	4	1.201	5	3	7	5	4
Slovenia	5	1.066	3	6	8	8	5
Latvia	6	0.913	6	7	2	10	7
Croatia	7	0.710	9	10	4	4	9
Lithuania	8	0.656	7	8	6	12	6
Slovakia	9	0.491	8	11	5	9	8
Moldova	10	-0.059	11	14	9	13	13
Russia	11	-0.273	13	15	13	15	11
Kazakhstan	12	-0.350	17	17	10	17	14
Bulgaria	13	-0.386	10	12	17	20	10
Georgia	14	-0.403	12	13	15	18	16
Kyrgyz Rep.	15	-0.434	14	9	18	16	17
Ukraine	16	-0.639	24	18	12	21	15
Armenia	17	-0.647	15	16	19	22	18
Macedonia	18	-0.676	19	22	21	7	20
Romania	19	-0.676	20	19	24	6	12
Albania	20	-0.782	16	20	20	19	22
Belarus	21	-0.843	18	23	14	<b>25</b>	21
Uzbekistan	22	-0.984	21	24	16	24	23
Azerbaijan	23	-0.997	22	21	23	11	19
Tajikistan	24	-1.116	<b>25</b>	4	<b>25</b>	14	24
Turkmenistan	<b>25</b>	-1.372	23	<b>25</b>	22	23	<b>25</b>

**Table 12:** Summary of infrastructure indicator and its sub-indicators, best to worst, 1998.  
*Source:* authors' calculations

<i>Country</i>	<i>Infrastructure rank</i>	<i>Infrastructure indicator</i>	<i>Availability</i>	<i>Regulation/competition</i>	<i>Competitiveness rank</i>
Hungary	<b>1</b>	2.193	10	<b>1</b>	<b>1</b>
Poland	2	1.383	17	2	3
Czech Rep.	3	1.112	<b>1</b>	9	2
Slovenia	4	1.076	2	8	5
Lithuania	5	0.896	6	6	6
Bulgaria	6	0.893	3	11	10
Estonia	7	0.709	9	4	4
Croatia	8	0.580	4	14	9
Georgia	9	0.538	14	3	16
Ukraine	10	0.269	8	12	15
Latvia	11	0.209	13	7	7
Slovakia	12	0.002	5	21	8
Romania	13	-0.033	23	5	12
Kazakhstan	14	-0.075	18	10	14
Russia	15	-0.181	11	16	11
Moldova	16	-0.357	12	18	13
Armenia	17	-0.465	20	15	18
Azerbaijan	18	-0.532	15	19	19
Kyrgyz Rep.	19	-0.581	19	17	17
Belarus	20	-0.735	7	23	21
Uzbekistan	21	-0.834	21	20	23
Macedonia	22	-0.935	16	22	20
Albania	23	-1.414	<b>25</b>	13	22
Turkmenistan	24	-1.783	22	24	<b>25</b>
Tajikistan	<b>25</b>	-1.936	24	<b>25</b>	24

**Table 13:** Summary of financial sector indicator and its sub-indicators, best to worst, 1998.  
*Source:* authors' calculations

<i>Country</i>	<i>Financial sector rank</i>	<i>Financial sector indicator</i>	<i>Investment performance</i>	<i>Banking</i>	<i>Capital markets</i>	<i>Non-bank Financial Institut.</i>	<i>Competitiveness rank</i>
Hungary	<b>1</b>	1.919	3	<b>1</b>	<b>1</b>	3	<b>1</b>
Czech Rep.	2	1.879	2	2	3	11	2
Slovakia	3	1.250	<b>1</b>	5	17	8	8
Estonia	4	1.088	4	7	6	9	4
Poland	5	0.978	8	3	2	14	3
Latvia	6	0.802	9	6	9	2	7
Russia	7	0.758	21	4	7	<b>1</b>	11
Romania	8	0.483	5	13	12	7	12
Lithuania	9	0.434	13	10	5	6	6
Croatia	10	0.418	7	9	4	20	9
Kazakhstan	11	0.054	14	16	13	5	14
Moldova	12	-0.039	12	15	15	13	13
Slovenia	13	-0.116	11	11	11	19	5
Kyrgyz Rep.	14	-0.266	19	18	10	15	17
Azerbaijan	15	-0.300	6	21	22	10	19
Bulgaria	16	-0.392	15	14	14	21	10
Macedonia	17	-0.410	16	8	16	23	20
Armenia	18	-0.474	18	19	8	18	18
Belarus	19	-0.504	17	20	20	4	21
Ukraine	20	-0.549	24	12	21	12	15
Tajikistan	21	-1.268	23	22	23	16	24
Albania	22	-1.283	22	23	18	24	22
Uzbekistan	23	-1.308	10	<b>25</b>	19	<b>25</b>	23
Georgia	24	-1.409	<b>25</b>	17	<b>25</b>	17	16
Turkmenistan	<b>25</b>	-1.743	20	24	24	22	<b>25</b>

**Table 14:** Summary of labor indicator and its sub-indicators, best to worst, 1998. *Source:* authors' calculations

<i>Country</i>	<i>Labor rank</i>	<i>Labor indicator</i>	<i>Quality</i>	<i>Market efficiency</i>	<i>Competitiveness rank</i>
Czech Rep.	<b>1</b>	2.087	3	2	2
Slovenia	2	1.431	<b>1</b>	16	5
Hungary	3	1.211	2	19	<b>1</b>
Poland	4	0.955	4	13	3
Lithuania	5	0.935	9	4	6
Slovakia	6	0.894	5	7	8
Estonia	7	0.727	8	8	4
Armenia	8	0.459	11	9	18
Turkmenistan	9	0.449	10	15	<b>25</b>
Georgia	10	0.251	15	3	16
Russia	11	0.189	7	21	11
Ukraine	12	0.150	13	11	15
Latvia	13	0.051	14	12	7
Croatia	14	0.034	12	18	9
Belarus	15	-0.063	6	<b>25</b>	21
Azerbaijan	16	-0.151	18	5	19
Bulgaria	17	-0.377	17	14	10
Kazakhstan	18	-0.543	16	20	14
Romania	19	-0.589	21	6	12
Kyrgyz Rep.	20	-0.902	23	10	17
Moldova	21	-0.932	20	17	13
Uzbekistan	22	-1.409	19	24	23
Albania	23	-1.423	<b>25</b>	<b>1</b>	22
Macedonia	24	-1.517	22	23	20
Tajikistan	<b>25</b>	-1.917	24	22	24

**Table 15:** Summary of institutions indicator and its sub-indicators, best to worst, 1998. *Source:* authors' calculations

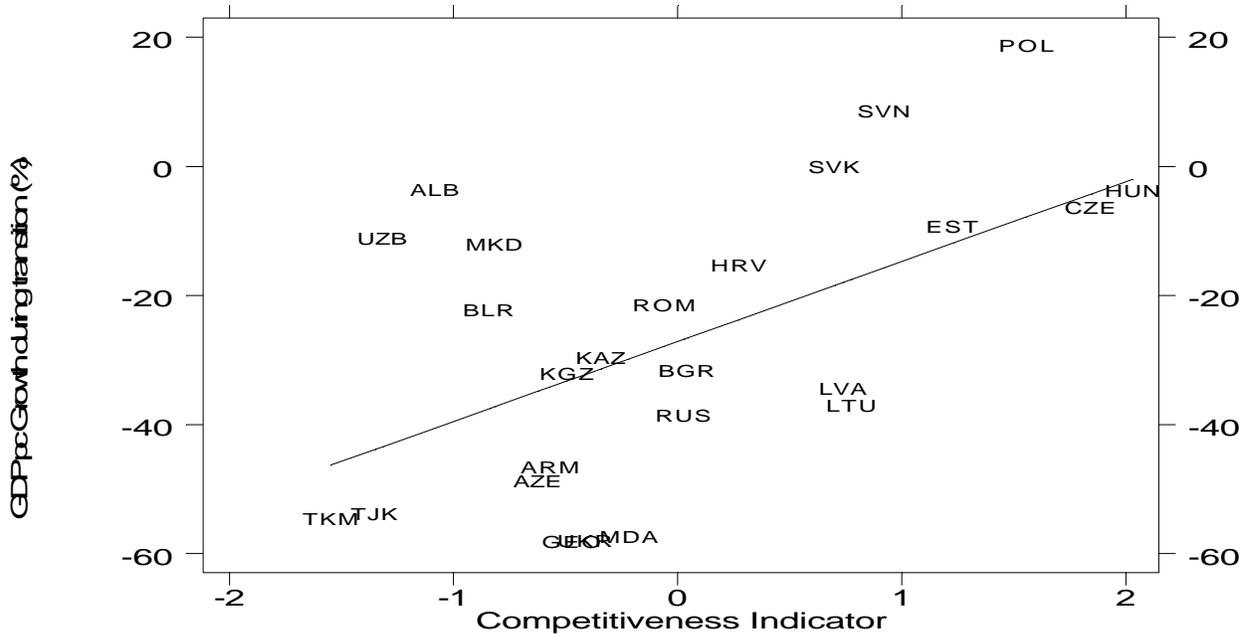
<i>Country</i>	<i>Institutions rank</i>	<i>Institutions indicator</i>	<i>Political environment</i>	<i>Rule of law</i>	<i>Competition in markets</i>	<i>Competitiveness rank</i>
Poland	<b>1</b>	1.941	<b>1</b>	2	<b>1</b>	3
Hungary	2	1.916	3	<b>1</b>	2	<b>1</b>
Czech Rep.	3	1.462	2	4	3	2
Estonia	4	1.124	6	5	6	4
Slovenia	5	1.032	5	3	10	5
Latvia	6	0.877	7	7	5	7
Lithuania	7	0.849	4	6	8	6
Slovakia	8	0.419	9	10	4	8
Bulgaria	9	0.264	8	8	12	10
Moldova	10	0.084	12	9	13	13
Russia	11	0.033	13	16	7	11
Romania	12	-0.077	10	11	18	12
Georgia	13	-0.200	16	15	15	16
Croatia	14	-0.232	15	12	19	9
Ukraine	15	-0.324	14	19	9	15
Kyrgyz Rep.	16	-0.465	19	17	16	17
Kazakhstan	17	-0.618	20	21	11	14
Albania	18	-0.625	17	22	20	22
Macedonia	19	-0.694	11	13	24	20
Armenia	20	-0.810	18	14	23	18
Belarus	21	-0.862	23	23	14	21
Tajikistan	22	-0.971	22	18	21	24
Uzbekistan	23	-1.019	24	24	17	23
Azerbaijan	24	-1.066	21	20	22	19
Turkmenistan	<b>25</b>	-2.040	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>

### *3.4 Comparisons with economic performance*

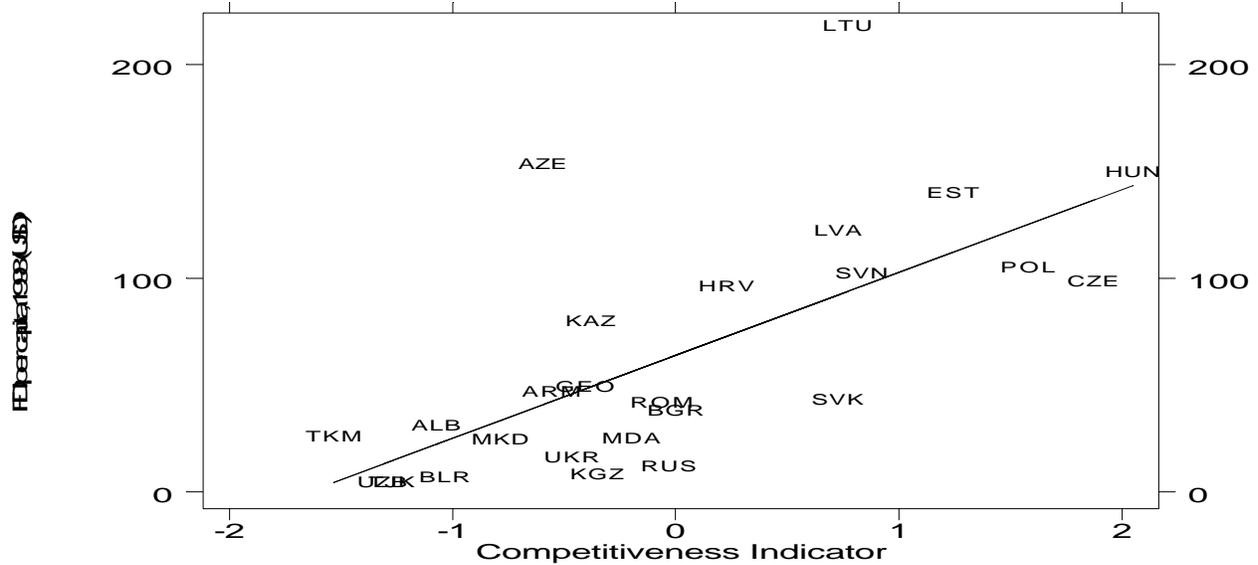
Though we hope the preceding discussion provided a feel for the nature and power of the competitiveness indicator and its sub-indicators, we round this out by comparing these indicators to better known performance measures.

Figure 6 relates competitiveness in 1998 to the cumulative growth in per capita GDP over the transition period. As is seen, a country's greater competitiveness by our indicator is associated with higher growth in per capita GDP ("recovery") over the transition period. Turning to foreign direct investment in Figure 7 reveals a similar picture, this time from the point of view of the investor. More competitive countries clearly attracted more foreign direct investment in 1998. This should not be surprising. A competitive economy provides a strong base for exports as well as offering lower production – and transactions – costs to the investor.

**Figure 6:** Competitiveness and per capita economic growth go together. *Source:* Author's calculations and WDI.



**Figure 7:** Competitiveness attracts foreign direct investment. *Source:* Author's calculations and EBRD.



## 4 Comparisons outside the transition region

While the previous sections describe in detail how the transition countries compare among themselves and between clusters, international competitiveness requires that transition economies are able to compete in the world as a whole. It is thus interesting to compare the competitiveness of transition countries to the non-transition countries.

While it would have been an additional substantial data collection effort to assemble a dataset of variables used in Table 2 through Table 8 for the non-transition countries, we have purposely designed our competitiveness indicator to obviate that need. In particular, by using the same sub-indicators as the GCR and a methodology that combines field survey data with “hard” data, there is reason to believe that the two measures are conceptually similar. This allows us to link the two ranking schemes in a two-step procedure. First, we use the fact that both schemes overlap for seven countries to line up these countries across both schemes. Then we insert the rest of the transition countries into the GCR scheme according to how they already ranked on our competitiveness indicator. The result is shown in Figure 8.

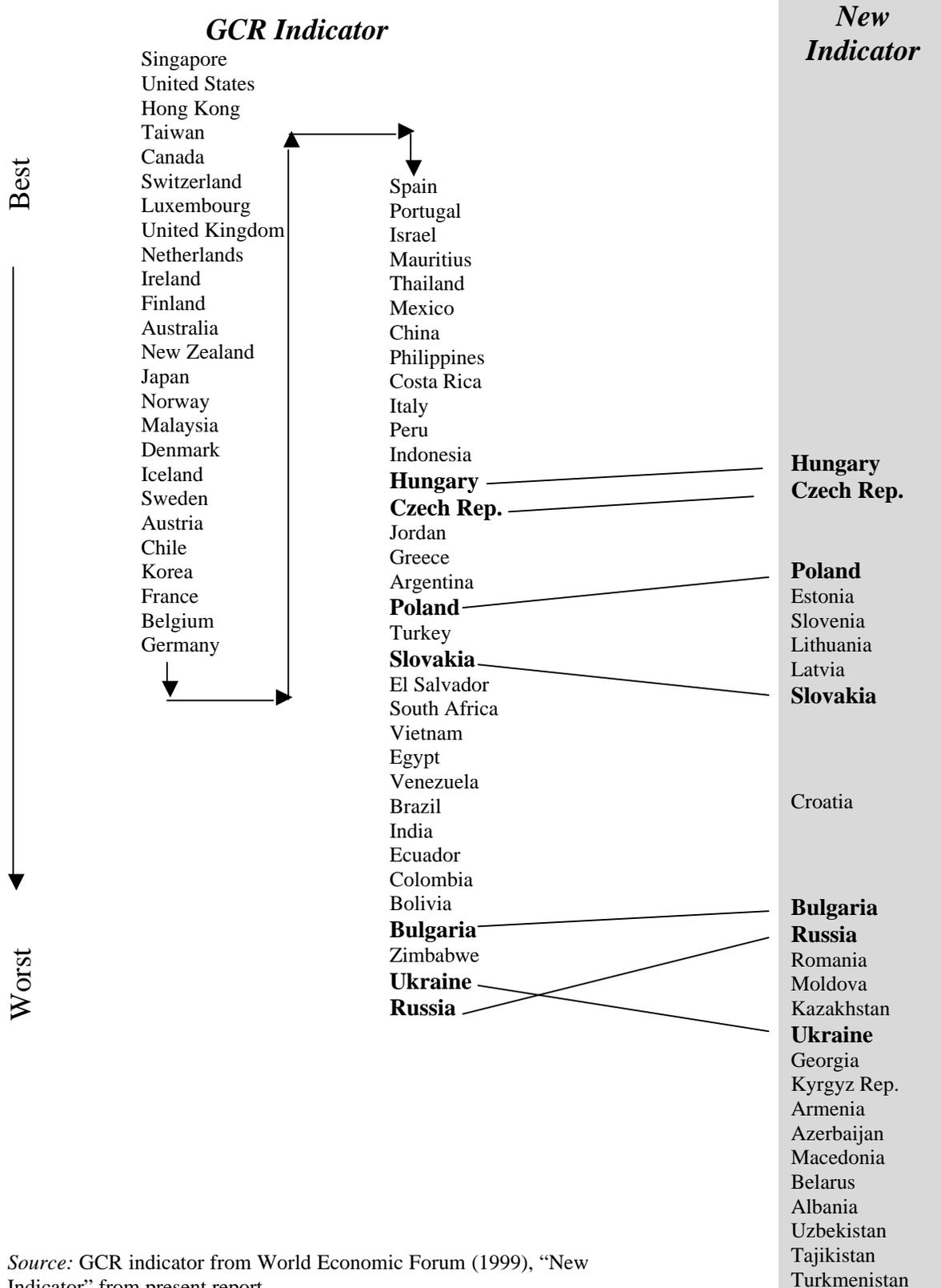
What is striking about these results is that, as hoped, the two indicator schemes rank the overlapping countries identically.<sup>24</sup> What we find is that all of the Balkans, the Caucasus, the Western FSU, and Central Asia are less competitive than the whole of the GCR sample with the exception of Zimbabwe, i.e., essentially the rest of the world except for Africa. The EU Border States (with the exception of Croatia) and Baltics, on the other hand, are in the same league as Turkey and are more competitive than the Andean Pact countries and economic powerhouses such as Brazil, India, and South Africa.

While these results are only indicative, they certainly send a strong signal and incentive to the regions involved to improve their country’s level of competitiveness if the higher incomes per capita associated with the higher rankings are desired.

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<sup>24</sup> While Ukraine and Russia appear to be exceptions, this is not quite the case since our indicator is for the period 1997-8 and in 1997 the GCR actually had these two countries’ ranks reversed.

**Figure 8:** Comparison of transition country competitiveness with the rest of the world for 1998.



Source: GCR indicator from World Economic Forum (1999), "New Indicator" from present report.

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