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EDUCATION VULNERABILITY ANALYSIS FOR THE E&E REGION

FINAL

April 18, 2008

This report was produced for the Social Transition Team, Office of Democracy, Governance and Social Transition of the United States Agency for International Development (USAID/E&E/DGST) by Creative Associates International, Inc. and the Aguirre Division of JBS International, Inc. It was prepared under ABE Contract EDH-I-00-05-00029-00. Its author is Karen Tietjen.

**Education Vulnerability Analysis for the E&E Region:
Education Discussion Paper**

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**For:
The Social Transition Team
Office of Democracy, Governance and Social Transition
Europe and Eurasia Bureau
United States Agency for International Development**

Under the ABE Contract, SOCIAL Task Order.

April 2008

FINAL

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Executive Summary

Purpose

This study examines the educational vulnerability of the 27 countries in the Europe and Eurasia region based on the most recent data available. The purpose of this study is to measure and compare national progress in the education sector in order to identify those countries whose education systems are most fragile, at risk and in need of assistance, and ultimately to justify and inform USAID investment in the region. This study also presents a conceptual framework and indicators for evaluating the performance of the education sector to serve as an analytic tool for tracking and comparing education development trends in both individual countries and the region as a whole. It introduces a methodology for aggregating and ranking country performance overall as well as in key areas.

Analytic Framework, Approach and Methodology

The study's analytic framework is structured around four "pillars," which represent areas critical to understanding the status of the education sector. They are:

- Pillar 1 (Context) addresses the context in which the education system operates and its development takes place.
- Pillar 2 (Student Outcomes) addresses the effectiveness and productivity of the education system, in terms of producing students with desired levels of schooling and mastery of designated skills.
- Pillar 3 (System Capacity) addresses the capacity of the education system to provide the necessary quantity and quality of inputs, goods, and services to support the learning process and create an effective learning environment.
- Pillar 4 (Donor Support) addresses the amounts provided to education by non- U.S. donors.

The primary analytic tool of this study is a comparative analysis of the 27 countries in the E&E region. Sixteen indicators, corresponding to the pillars, are used to compare, contrast, and rank the countries' educational performance. Countries that were one standard deviation (1SD) from the regional mean were deemed "vulnerable." Countries that were two standard deviations (2SD) from the regional mean were deemed "highly vulnerable." To establish a vulnerability ranking for each pillar and for the pillars combined, a scoring system assigned points based on the degree of vulnerability and undesired direction of change in the change or growth rate over the period from 1998 to 2005. Countries were ranked in descending order of points, such that the higher the score, the greater the vulnerability ranking.

Vulnerability Results by Pillar

For Pillar 1 (context), comprising four economic, population, health, and corruption indicators, 10 of 27 countries were classified as vulnerable or highly vulnerable for one or more of the indicators. Kyrgyzstan suffers the highest degree of vulnerability. Seventeen countries exhibited no vulnerability.

For Pillar 2 (student outcomes), comprising nine participation, equity, attainment, and performance indicators, 21 of 27 countries were rated as vulnerable or highly vulnerable for one or more of the indicators. Tajikistan suffers the highest degree of vulnerability. Six countries exhibited no vulnerability.

For Pillar 3 (system capacity), comprising two indicators on class size and expenditure on education, 10 countries are classified as vulnerable for one or more of the indicators; none are highly vulnerable. Azerbaijan suffers the highest degree of vulnerability. Seventeen countries exhibited no vulnerability.

For Pillar 4 (donor support), comprising one indicator on donor education expenditure per capita, nine of the 12 USAID-assisted countries fall below the average. The countries that fall under the average for all three educational levels are Belarus, Kazakhstan, Moldova, Turkmenistan, and Ukraine. Countries falling under the average for basic and secondary education include Belarus, Bosnia, Croatia, Georgia, Kazakhstan, Moldova, Turkmenistan, and Ukraine.

Synthesis and Conclusions

Twenty-four of the 27 E&E countries—89 percent—exhibit vulnerability on one indicator or more. Of these, six countries—25 percent—were rated highly vulnerable on one or more indicators. Only four countries “achieved” vulnerability status on at least one indicator in all three pillars: Albania, Azerbaijan, Georgia, and Kazakhstan.

Frequency of Country Vulnerability by Pillar

All 3 Pillars	Two Pillars Only		One Pillar Only	
	<i>Pillars 1 and 2</i>	<i>Pillars 2 and 3</i>	<i>Pillar 2</i>	<i>Pillar 3</i>
Albania	Kyrgyzstan	Armenia	Bosnia-Herzegovina	Estonia
Azerbaijan	Moldova	Belarus	Bulgaria	Russia
Georgia	Romania	FYR Macedonia	Hungary	
Kazakhstan	Tajikistan	Slovenia	Latvia	
	Turkmenistan		Lithuania	
	Uzbekistan		Slovakia	
			Ukraine	
			Yugoslavia*	

*Serbia and Montenegro

The greatest area of vulnerability among the countries is in student outcomes (Pillar 2): 88 percent of countries were vulnerable for one or more of the indicators. Less than half—42 percent—displayed vulnerability for both context indicators (Pillar 1) and system capacity indicators (Pillar 3). By indicator, the area of greatest relative vulnerability was upper secondary gross enrollment ratio, or GER (33% of vulnerable countries); the area of least vulnerability was the primary completion rate (15% of vulnerable countries).

Based on the point scoring system, the most vulnerable country is Tajikistan, which not only had the highest score, but had the greatest incidences of vulnerability and figured most frequently in the highly vulnerable category. Despite its leading score, however, Tajikistan was the highest scorer for only one pillar (Pillar 2). Moreover, only one out of the eight indicators (12%) for which it was classified as vulnerable showed an unfavorable direction of change. In contrast, 66 percent of the indicators showed undesired directions of change for second-ranked Turkmenistan.

Croatia, the Czech Republic, and Poland are notable for showing no incidences of vulnerability on any of the 15 indicators used in the scoring. These are all upper-middle income countries. In

general, the degree of vulnerability appears to correlate with national per capita income: the three low-income countries in the region—Kyrgyzstan, Tajikistan, and Uzbekistan—ranked in the higher vulnerability range, while most of the upper-middle income countries ranked in the lower vulnerability range.

Many of the countries ranking higher in vulnerability do not appear to be receiving donor support on par with countries ranking lower in vulnerability. For example, Georgia, Kazakhstan, Moldova, and Turkmenistan received less than the regional average per person for donor support in basic and secondary education.

Some tentative recommendations—subject to several caveats and qualifications—for the region are:

- Intervention with assistance to the education sector in the countries ranking among the most vulnerable, particularly those with notable incidences of undesirable directions of change.
- Prioritizing assistance to those countries with a high vulnerability ranking which appear relatively underfunded by donors, specifically Georgia, Kazakhstan, Moldova, and Turkmenistan.
- Planning, aligning and conducting education programs with other sector programs (economic, growth, population, health, and democracy and governance) in countries with a higher vulnerability ranking may reduce or control threats to the education system and its development.
- The goal or strategic objective for the education program in vulnerable countries should respond to the areas of weakness in student outcomes. System capacity building is the most obvious and sustainable route, even though less than half the countries displayed vulnerability in this pillar.

However, these recommendations must be considered within the parameters of this study and the methodologies used. Specifically:

- Assessment of educational need in the relatively educationally well-off E&E countries should take into account other comparable countries and internationally accepted standards, as well as levels for educational development.
- The ranking of country vulnerability may change according to the number and types of indicators selected.
- The national-level measures used may mask regional or population group disparities or problems.
- The point scoring methodology did not weight the various indicators. Some indicators may have more value in determining fundamental weakness in education than others.

This study provides a broad ranking of countries that gives general orientation to the degree of educational vulnerability of countries relative to their regional peers. As such, it can be used to identify countries that warrant further scrutiny, general areas of weakness or vulnerability that should be further investigated, and areas of strength that may be emulated or serve as a foundation for future action.

I. Introduction

A. Background

The dissolution of the Soviet Union in December 1991 precipitated an economic crisis in the former communist bloc countries of Central and Eastern Europe and the newly established states of the former Soviet Republics, which weakened national education systems. Whereas previously near-universal access to primary and secondary education was common in the region, the transition to a market economy and democratic governance created financial and social strains that resulted in stagnating or declining school enrollment and deteriorating educational standards in most countries¹, narrowing the gap between the region's countries and other developing nations. Lack of public investment in education goods and services simultaneously led to decreased educational quality and increased household cost burdens with deleterious effects on student participation and performance.

Since 1998, however, most countries in the region have embarked on economic recovery. As more resources have become available, the education sector has stabilized and education systems have begun to experience growth. Improved living standards have also contributed to expanded educational opportunities for much of the school-aged population. All the region's countries have signed the Millennium Declaration of 2000, agreeing to strive toward the achievement of the Millennium Development Goals, among which education figures prominently. Nonetheless, many countries are still struggling to regain education ground lost, reprise the continued development, and undertake reform of their education systems, so that the region's youth acquire the critical skills and competencies needed for economic, political, and social development in today's world. While generally positive, progress in the region has been varied.

B. Purpose and Organization

This study examines the educational vulnerability of the 27 countries in the Europe and Eurasia region based on the most recent data available.² The purpose of this study is to measure and compare national progress in the education sector in order to identify those countries whose education systems are most fragile, at risk and in need of assistance, and ultimately to both justify and inform USAID investment in the region. The report reworks and updates the 2005 Education Sector Discussion Paper commissioned by the E&E Bureau. In this case, 2005 data replaces the 2002 data used in the earlier report. It also presents a slightly revised conceptual framework and adds new indicators for evaluating the performance of the education sector to serve as an analytic tool for tracking and comparing education development trends in both

¹ In 1991 the regional average GER for basic education it was 93.9; in 1998, it was 93.7. In 1991, the regional average GER for upper secondary and vocational education was 76.7; in 1998, it was 71.5. The regional average for public education expenditure as the percentage of GDP fell from 5.3 percent in 1991 to 4.6 percent in 1998.

² This paper includes the 27 countries existing in the region through 2005, the latest year for which data was available. It should be noted that since 2005, the total number of countries has changed due to the 2006 dissolution of the Union of Serbia and Montenegro, referred to as the former Yugoslavia in this paper, and the 2008 withdrawal of Kosovo from Serbia.

individual countries and the region as a whole. It introduces a different methodology for aggregating and ranking country performance overall and in key areas.

This report is organized in seven sections. The remainder of Section I (Introduction) describes the conceptual framework, approach, and methods used. Sections II through V reflect the four analytic pillars of the framework—Context, Student Outcomes, System Capacity, and Donor Support. Each section is similarly organized with a brief orientation to the pillar, sub-pillars and indicators, presentation of findings by indicator, and summaries by sub-pillar and pillar. Section VI reviews, compares, and synthesizes the results across pillars. Section VII concludes with a discussion of the final country rankings for overall vulnerability and methodological considerations. References and an annex are appended.

C. Analytic Framework

Similar to the 2005 Education Discussion Paper, this study’s analytic framework is structured around four “pillars,” which represent areas critical to understanding the status of the education sector.

Pillar 1 (Context) addresses the context in which the education system operates and its development takes place. It comprises four key factors (sub-pillars) that affect—either positively or negatively—educational performance and system capacity. They are: (i) *economic status*, (ii) *population pressure*, (iii) *health*, and (iv) *public sector corruption*.

Pillar 2 (Student Outcomes) addresses the effectiveness and productivity of the education system, in terms of producing students with desired levels of schooling and mastery of designated skills. It comprises four sub-pillars: (i) *participation* explores the extent to which school-aged children are enrolled in various levels of schooling; (ii) *equity* explores the degree to which countries have achieved parity in the major area of inequality—gender; (iii) *attainment* explores the extent to which students remain in school so that they, in principle, have sufficient instruction to acquire desired skills and competencies; and (iv) *performance* explores the extent to which students appear to have achieved the required skills.

Pillar 3 (System Capacity) addresses the capacity of the education system to provide the necessary quantity and quality of inputs, goods, and services to support the learning process and create an effective learning environment. It comprises two sub-pillars: (i) *efficiency* explores the extent to which the system is providing inputs in amounts consistent with efficiency standards, and (ii) *resources and finance* explores the extent to which the education system has been provided with the resources needed to provide quality education services and inputs. Due to the dearth of indicator data, other sub-pillars were dropped from this analysis, although they merit inclusion in an ideal framework. These are: *access* (number of schools and amount of educational services available per population or geographic unit), *equity* (the existence and prevalence of student or household support services such as tuition or fee waiver programs), and *teaching-learning quality* (teacher qualifications and availability of learning materials).

Pillar 4 (Donor Support) addresses the amount provided for education by non-U.S. donors. This pillar is not used to rank countries in terms of vulnerability, but rather to enrich understanding of those countries in need and their access to donor resource.

D. Indicators

A total of sixteen indicators have been used in this analysis (see Table I.B.1 below) and correspond to the pillars and sub-pillars. The indicators used in the various ranking exercises provide the data foundation for the study.

To determine whether additional or better indicators might be available to augment or substitute for those used in the 2005 Education Sector Discussion Paper, an expanded list of potential indicators and those typically used in the education sector was created based on discussions with E&E Bureau representatives. Ultimately, three indicators were added: the incidence of tuberculosis, gender parity for primary and secondary school (combined), and the primary repetition rate.

Reviews were conducted using multiple databases to identify and confirm the availability of indicators, including: TransMONEE, World Development Indicators, World Bank EdStats, the UNESCO Institute of Statistics (including the World Education Indicators), World Governance Indicators, the Human Development Report, UNICEF Statistics, and Source OECD Statistics. The first four databases often cross-referenced one another, such that ultimate indicator data was compiled from the following databases: TransMONEE, WDI, EdStats, and WGI. The other databases were found to have either combined data in ways not useful for this analysis (e.g., combining years or countries) or covered only some of the countries (e.g., the OECD database includes only the Czech Republic, Hungary, Poland, and Slovakia).

Indicator selection was based on three factors: the strength of the indicator as a measure of the specific concept (e.g., average student scores on validated achievement tests are a strong measure of student performance), parsimony (using as few indicators as possible, so aggregation does not become overly complex), and the robustness of the data (i.e., the number of countries for which data is available).

In the end, this third factor—availability—was the key determinant. Often the best indicators, particularly for student performance and educational quality, suffered from insufficient country coverage. A country coverage threshold was set which required that data for each indicator be reported for at least 20 of the 27 countries in the region if the indicator was to be retained and used in the analysis. For example, none of the four reported indicators for system capacity/quality provision covered more than six of the 27 targeted countries. In some countries, data for an indicator was not available every year during the targeted 1998-2005 time period. In these instances, data was used from the most recent year available.

Table I.B.1: Summary of Pillars and Indicators

Indicator	Definition	# Countries	Source
Pillar 1: Context			
<i>A. Economic status</i>			
1. GDP per capita (PPP), current international \$	Gross domestic product divided by midyear population converted to international dollars using purchasing power parity rates. PPP allows for a standard comparison of real price levels between countries, such that a representative basket of goods in one country costs the same as in another country if the currencies are exchanged at that rate. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. (Data Source: The World Bank)	26	1. TransMONEE 2007 2. WDI 2007
<i>B. Population pressure</i>			
2. % of population under 15 years	Population aged 0-14 is defined as the population (total, male, female) of a particular country aged 0-14 as proportion of total population (Data Source: The World Bank)	27	1. Edstats 2007 2. WDI 2007 3. UN HDR 2006
<i>C. Health</i>			
3. Incidence of tuberculosis	New cases of tuberculosis per 100,000 population	27	1. TransMONEE 2007
<i>D. Corruption</i>			
4. Control of Corruption	The aggregate indicators combine the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. The individual data sources are drawn from a diverse variety of survey institutes, think tanks, non-governmental organizations, and international organizations.	27	1. WGI 2007
Pillar 2: Student Outcomes			
<i>A. Participation</i>			
1. NER, Pre-primary	Number of pupils (total, male, female) in the theoretical age group (3-5/6 years) for pre-primary education enrolled in pre-primary education expressed as a percentage of the (total, male, female) population in that age group.	27	1. TransMONEE 2007 2. EdStats
2. GER, Basic Education	Number of pupils (total, male, female) enrolled in primary and lower secondary school, regardless of age, expressed as a percentage of the population (total, male, female) in the theoretical age group (6/7-14/15) for basic education.	27	1. TransMONEE 2007
3. GER, Total Upper Secondary	Number of pupils (total, male, female) enrolled in upper secondary and vocational and technical education school, regardless of age, expressed as a percentage of the population (total, male, female) in the theoretical age group for upper secondary and vocational and technical education.	27	1. TransMONEE 2007
4. GER, Tertiary	Number of pupils (total, male, female) enrolled in upper secondary school, regardless of age, expressed as a percentage of the population (total, male, female) in the theoretical age group following on from the secondary school leaving age.	27	1. TransMONEE 2007 2. WDI 3. EdStats
<i>B. Equity</i>			
5. Gender parity, primary+secondary	Ratio of the female-to-male values of the gross enrollment ratio in primary and secondary education. A GPI of 1 indicates parity between sexes. (Data Source: UNESCO Institute of Statistics)	25	1. EdStats 2. WDI
<i>C. Attainment</i>			
6. Completion, Primary	Total number of students (total, male, female) regardless of age in the last grade of primary school, minus the number of repeaters (total, male, female) in that grade, divided by the (total, male, female) number of children of official graduation age. (Data Source: UNESCO Institute for Statistics)	24	1. EdStats 2. WDI
7. School life expectancy (years)	Number of years a child (total, male, female) of school entrance age is expected to spend at school, or university, including years spent on repetition. It is the sum of the age-specific enrolment ratios for primary, secondary, post-secondary non-tertiary and tertiary education. Gross enrolment rate is used as a proxy to compensate for the lack of data by age for tertiary and partial data for the other ISCED levels. (Data Source: UNESCO Institute for Statistics)	25	1. Ed Stats
<i>D. Performance</i>			
8. Youth Literacy rate	Percentage of people ages 15 to 24 who can, with understanding, both read and write a short, simple statement about their everyday life. (Data Source: Estimates from the UNESCO Institute for Statistics)	23	1. WDI 2. Ed Stat.
9. Repetition, Primary	Proportion of pupils (total, male, female) enrolled in a given grade at a given school-year at primary level who study in the same grade in the following school-year. (Data Source: UNESCO Institute for Statistics)	24	1. TransMONEE 2007 2. WDI 3. EdStats
Pillar 3: System Capacity			
<i>A. Efficiency</i>			
1. Pupil Teacher Ratio, Basic Ed	Average number of pupils per teacher in basic education in a given school-year, based on headcounts for both pupils and teachers. (Data Source: UNESCO Institute for Statistics)	26	1. TransMONEE 2007
<i>B. Resources and Finance</i>			
2. Public education expenditure as % of GDP	Current and capital expenditures on education by local, regional and national governments, including municipalities (household contributions are excluded), expressed as a percentage of the gross domestic product. (Data Source: UNESCO Institute for Statistics)	26	1. TransMONEE 2007 2. WDI 3. EdStats
Pillar 4: Donor Support			
1. \$ Expenditure per person	Value of non-US DAC country support for education divided by number of persons in appropriately aged population and disaggregated by education level	12	1. OECD Creditors 2. TransMONEE 2007

For each indicator, comparisons are made with the global averages to identify relatively strong or weak educational performers within the E&E region and educational performance of the region as a whole. Comparable data categories include: world, high income, upper-middle income, middle income, low and middle income, lower-middle income, low income, and least developed countries. Not all indicators had the same or any comparable data. For example, EdStat does not report “least developed countries” and TransMONEE indicators for basic education and total secondary are particular to this data set; therefore, comparison group data cannot be obtained from other databases. For other TransMONEE indicators, comparison data can be derived from the WDI or EdStat databases, but its comparability (in terms of data treatment) is not clear.

E. Approach and Methodology

The primary analytic tool of this study is comparative analysis of the 27 countries in the E&E region.³ The countries’ educational performance is compared, contrasted, and ranked against the others’. As such, it is norm-referenced, meaning that it does not use established or internationally recognized standards, threshold values, or other criteria to assess country performance.

Following the recommendation of the 2005 “Defining Vulnerability Thresholds” report, vulnerability classification was based on standard deviation from the mean. Standard deviation is a common measure of statistical dispersion, measuring how widely the values in a data set are spread. The statistic itself is an average of the distance of individual data points from the mean (technically, the square root of the sum of values from their arithmetic mean). Used in isolation standard deviation can be deceptive as it expresses relativity rather than concrete thresholds. For example, if data points are close to the mean, then the SD is small; if they are far from the mean, the SD is large.

Countries that were one standard deviation (1 SD) from the mean (either above or below as the indicator dictated) were deemed “vulnerable.” Countries that were two standard deviations (2 SD) from the mean were deemed “highly vulnerable.” Countries that were within 1 SD (either above or below) were considered “not vulnerable” for the purposes of this analysis, although it should be noted that their indicator values may fall below what policy-makers or educationalists consider optimal.

For each indicator, regional averages were computed using only data from a single designated year (generally 2005). On an individual country basis, however, the latest year’s data was used to fill in missing data points. Although for most countries 2005 data was available, data from earlier years was used in some cases. Such occurrences are noted in the indicators tables, and the year for which data is used is indicated. Based on actual values for the various indicators, countries were listed in order from worst case to best, with the vulnerable and highly vulnerable countries naturally topping the list. This also shows how the other non-vulnerable countries rank among their peers in the region.

³ The 2005 Education Discussion Paper used 20 countries, omitting the “northern tier countries.”

The total percentage change and average annual change (or growth) rates for the 1998-2005 period were also calculated for each indicator to help identify trends in the various countries and the region as a whole. The total percentage change is the difference between the latest year data (generally 2005) and 1998 data divided by 1998 data value. The resulting statistic is then divided by the number of years (generally seven) in the timeframe to produce the annual change (or growth) rate for the time period. The rate of change or growth can be negative (declining over the time period) or positive (increasing over the time period). Consequently, references to “negative growth” mean that the change or growth rate during the period has declined.

Aggregation of the various countries’ ranking status on multiple indicators was a particular challenge and not addressed in the previous study. Several methods were tried to aggregate country vulnerability status by pillar and sub-pillar, but these proved unsatisfactory. Ultimately, a point scoring system was developed and applied. For each indicator, countries were assigned points according to the degree of vulnerability and an undesired direction of change in the change (or growth) rate. A “highly vulnerable” (i.e., 2 SD) classification was awarded two points. A “vulnerable” (i.e., 1 SD) classification was awarded one point. Countries classified as vulnerable or highly vulnerable were awarded an additional one-half “penalty” point if an undesired or unfavorable direction of change was exhibited, based on the total percentage change (1998-2005).⁴ For Pillars 1, 2, and 3, a total score was calculated based on the number of indicators for which the country was classified as vulnerable or highly vulnerable. Countries with the highest number of points are considered the most vulnerable. Country scores for each pillar were ranked in descending order to identify relative vulnerability, with the highest scores representing the greatest vulnerability.

To derive a picture of the overall educational vulnerability of a country (presented in the final chapter), country scores for Pillars 1, 2, and 3 were aggregated. Total country scores were then ranked in descending order, with the higher scores signifying the more vulnerable countries (i.e., the higher the score, the greater the vulnerability ranking).

⁴ An undesired or unfavorable rate of change is often, but not always, a negative value. For example, a positive value for the change (or growth) rate in grade repetition or tuberculosis incidence would be considered undesirable or unfavorable.

II. Pillar 1: Context

Educational system performance and capacity are influenced by the context in which they are situated. Multiple factors can impact both the provision of and participation in education, ranging from the economy and demographics to public health and governance. In this chapter, indicators in four context areas that can either support or threaten student outcomes and education system capacity are explored. The context areas are: economic status, population pressure, health, and corruption. While not direct measures of education, the selected indicators show the conditions with which the education system and its students must contend.

A. Economic Status

A healthy, growing economy can provide the resources for a better-funded education system to support quality services and more educational inputs.⁵ Conversely, an ailing economy and widespread poverty not only deplete the resources available to the education system, but households may be hard pressed to finance the direct, indirect, and opportunity costs of schooling. One indicator is used: GDP per capita adjusted for purchasing power parity and expressed in current international dollars to ensure comparability among countries.

1. GDP Per Capita (PPP, current international \$)

In the region as a whole, the GDP per capita has grown at about 10 percent annually since 1998, reaching a regional average of \$9,709 in 2005. Nine of the 26 countries for which there are data exceed the regional average, while 17 fall below. All countries in the region have experienced positive yearly growth, ranging from four percent in FYR Macedonia to 26 percent in Azerbaijan and Turkmenistan.

Using the standard deviation method of determining vulnerability, none of the countries are highly vulnerable or fall 2 SD from the mean. Five countries are vulnerable, falling 1 SD below the mean: Tajikistan, Moldova, Kyrgyzstan, Uzbekistan, and Georgia, generating less than \$3,595 per capita per year. Only two of these countries exhibit rates of change or growth above the regional mean: low-income Tajikistan and lower-middle-income Georgia. The other countries have rates of growth roughly between 50 and 70 percent of the mean, a sign of ongoing poverty with negative implications for education.

⁵ See Annex 1 for country income classification.

Table II.A.1: GDP per capita, PPP (current international \$)

Vulnerability Rank (worst case=1)	Country	GDP per capita, PPP (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean				
	No countries			
1 SD below mean		3,595.1		
1	Tajikistan (LI) ⁶	1,311	0.126	0.88
2	Moldova (LMI)	1,908	0.069	0.48
3	Kyrgyzstan (LI)	1,934	0.056	0.39
4	Uzbekistan (LI)	2,026	0.067	0.47
5	Georgia (LMI)	3,177	0.129	0.90
6	Turkmenistan ⁷	4,315	0.258	0.77
7	Armenia	5,013	0.198	1.39
8	Albania	5,318	0.109	0.76
9	Azerbaijan	5,607	0.257	1.80
10	Ukraine	6,804	0.124	0.87
11	FYR Macedonia	7,146	0.046	0.32
12	Bosnia-Herzegovina	7,630	0.098	0.68
13	Belarus	7,883	0.124	0.87
14	Kazakhstan	8,515	0.187	1.31
15	Bulgaria	8,794	0.098	0.69
16	Romania	9,208	0.091	0.63
17	Russia	10,897	0.120	0.84
18	Croatia	13,169	0.074	0.52
19	Latvia	13,631	0.149	1.04
20	Poland	13,980	0.075	0.52
21	Lithuania	14,382	0.108	0.75
22	Estonia	16,228	0.133	0.93
23	Slovakia	16,459	0.083	0.58
24	Hungary	18,086	0.084	0.59
25	Czech Republic	21,317	0.075	0.52
26	Slovenia	22,292	0.072	0.50
No Data	Yugoslavia (Serbia & Montenegro) ⁷	-	-	-
	EE Regional Mean	9708.6	0.104	0.73
	Standard Deviation	6113.5	0.076	0.54
	World	9528.6	0.057	0.40
	Least developed countries	1439.5	0.057	0.40
	Low income (LI)	2499.1	0.075	0.53
	Lower-middle income (LMI)	6441.7	0.101	0.70
	Low & middle income	5244.6	0.082	0.57
	Middle income	7347.9	0.088	0.62
	Upper-middle income (UMI)	11173.9	0.065	0.45
	High income (HI)	32725.5	0.046	0.32

* Latest data available for 2001.

⁶ Used throughout the document, the abbreviations LI, LMI, UMI, and HI refer to low income, lower middle income, upper middle income and high income, respectively, based on the World Development Indicator income classifications for 2005 GNI Per Capita.

⁷ In conformance with the various databases used in the preparation of this paper, statistics presented for the former Yugoslavia combine data from Serbia and Montenegro, which during the time period covered in this report were united from 1992 to 2003 as the Federal Republic of Yugoslavia and, from 2003 to 2006, as the Union of Serbia and Montenegro. In 2006, they declared their mutual independence. In 2008, Kosovo declared its independence from Serbia.

B. Population Pressure

The population pyramid (i.e., distribution of population according to age group) provides important insight into the demands that will be made on the education system. Obviously, the greater the percentage of people falling into school-age categories, the greater is the pressure on the education system to provide services. Depending on the country context, this could result in either an increase in educational expenditure to maintain per student outlays or a reduction in the quality and quantity of education services and inputs. The indicator employed is the percentage of the population age 0-14, as it captures the school age population for the present and the ensuing five or six years.

1. Percent Population 0-14

In 2005, the regional average for population under age 15 was 20 percent. This proportion had fallen steadily at 2.5 percent per year over the 1998-2005 period. The regional average compares favorably worldwide with all but the highest income group, with an average of 18 percent of the population in the 0-14 age group. In fact, more than half the region's countries (15) fall below this threshold and all countries exhibit decreasing percentages in the 0-14 age group.

Among the countries that do have high 0-14 population percentages, one country falls 2 SD below the regional mean and four countries fall 1 SD below. Tajikistan, with the highest percentage, is highly vulnerable (exceeding the low income group average) and one of lowest annual declining rates of growth. Vulnerable countries are Uzbekistan, Turkmenistan, Kyrgyzstan, and Albania. All three of the region's low-income countries are included.

Table II. B.1 : Percent Population 0-14

Vulnerability Rank (worst case=1)	Country	Percent Population 0-14 (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD above mean		33.70		
1	Tajikistan (LI)	38.98	-0.014	-0.10
1 SD above mean		26.8		
2	Uzbekistan (LI)	33.18	-0.020	-0.14
3	Turkmenistan (LMI)	31.78	-0.021	-0.06
4	Kyrgyzstan (LI)	31.46	-0.018	-0.13
5	Albania (LMI)	26.96	-0.018	-0.13
6	Azerbaijan	25.78	-0.030	-0.21
7	Kazakhstan	23.15	-0.027	-0.19
8	Armenia	20.79	-0.035	-0.25
9	FYR Macedonia	19.62	-0.022	-0.15
10	Georgia	18.90	-0.023	-0.16
11	Moldova	18.30	-0.037	-0.26
12	Yugoslavia (Serbia& Montenegro)	18.30	-0.017	-0.12
13	Lithuania	16.73	-0.027	-0.19
14	Slovakia	16.72	-0.028	-0.19
15	Bosnia-Herzegovina	16.51	-0.026	-0.18
16	Poland	16.34	-0.030	-0.21
17	Hungary	15.73	-0.013	-0.09
18	Croatia	15.52	-0.017	-0.12
19	Romania	15.44	-0.028	-0.19
20	Russia	15.28	-0.031	-0.22
21	Estonia	15.19	-0.029	-0.21
22	Belarus	15.18	-0.035	-0.25
23	Ukraine	14.86	-0.032	-0.22
24	Latvia	14.69	-0.033	-0.23
25	Czech Republic	14.63	-0.021	-0.15
26	Slovenia	13.93	-0.023	-0.16
27	Bulgaria	13.76	-0.024	-0.17
	EE Regional Mean	19.9	-0.025	-0.17
	Standard Deviation	6.9	-0.013	-0.09
	World	28.14	-0.012	-0.08
	Least developed countries	41.76	-0.005	-0.04
	Low income (LI)	36.37	-0.009	-0.06
	Lower-middle income (LMI)	25.26	-0.018	-0.13
	Low & middle income	29.95	-0.013	-0.09
	Middle income	25.04	-0.018	-0.12
	Upper-middle income (UMI)	24.15	-0.016	-0.11
	High income (HI)	18.15	-0.009	-0.06

C. Health

Morbidity and mortality due to disease, poor nutrition, and other health hazards can negatively affect both the providers and consumers of education and schooling. Ill health results in student and teacher absenteeism, and inability to concentrate on the teaching-learning process. In some parts of the world, the HIV/AIDS pandemic has ravaged the education systems (e.g., Sub-Saharan Africa), decimating the teaching force and creating millions of orphans and children made vulnerable by disease in their family, whose struggle to support themselves, as well as their siblings and ill relatives, makes attending school difficult. At present, however, the prevalence of HIV/AIDS in the E&E region is relatively low: at one-third of a percent, it is one-third the worldwide average and one-eighth the least developed country average. The greater health threat

in the E&E region is tuberculosis. Consequently, the incidence of tuberculosis (new cases per 100,000 population) is used as the measure of health status. No comparable group data was available for this indicator.

1. Tuberculosis Incidence

In 2005, the regional mean was 57.2 (out of 100,000) with the region exhibiting an overall decline in the incidence over the period 1998-2005. Nearly half (13) of the countries had incidences above the regional average, and more than half (18) enjoyed declining rates. Four countries qualified as vulnerable or highly vulnerable. Kazakhstan ranked 2 SD above the mean (highly vulnerable) and showed a positive annual growth rate. Kyrgyzstan, Romania, and Moldova are vulnerable, and the latter two also showed that TB incidence was increasing. Only in Kyrgyzstan is the incidence declining.

Table II.C.1: Incidence of Tuberculosis

Vulnerability Rank (worst case=1)	Country	TB Incidence (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD above mean		134.0		
1	Kazakhstan (LMI)	147.2	0.025	0.20
1 SD above mean		95.6		
2	Kyrgyzstan (LI)	113.3	-0.008	-0.06
3	Romania (UMI)	105.7	0.006	0.04
4	Moldova (LMI)	102.2	0.035	0.28
5	Georgia *	89.7	-0.014	-0.10
6	Ukraine	84.4	0.065	0.52
7	Russia	83.3	0.014	0.11
8	Uzbekistan	76.0	0.035	0.28
9	Tajikistan	74.4	0.101	0.80
10	Turkmenistan *	64.0	-0.026	-0.18
11	Armenia	62.3	0.083	0.67
12	Bosnia-Herzegovina**	60.2	-0.032	-0.23
13	Lithuania*	59.0	-0.037	-0.26
14	Latvia	53.8	-0.036	-0.29
15	Belarus	51.1	-0.010	-0.08
16	Azerbaijan	43.7	-0.026	-0.21
17	Bulgaria	40.1	-0.025	-0.20
18	Yugoslavia (Serbia&Montenegro)	38.9	-0.008	-0.02
19	FYR Macedonia	32.3	0.006	0.05
20	Estonia	30.1	-0.045	-0.36
21	Croatia*	29.2	-0.054	-0.38
22	Poland	24.3	-0.037	-0.29
23	Hungary	20.1	-0.061	-0.48
24	Albania	19.3	-0.008	-0.06
25	Slovenia	14.0	-0.039	-0.35
26	Slovakia	13.8	-0.053	-0.42
27	Czech Republic	9.8	-0.055	-0.44
	EE Regional Mean	57.2	-0.003	-0.03
	Standard Deviation	38.4	0.037	0.30
	World	nd	nd	nd
	Least developed countries	nd	nd	nd
	Low income (LI)	nd	nd	nd
	Lower-middle income (LMI)	nd	nd	nd
	Low & middle income	nd	nd	nd

	Middle income	nd	nd	nd
	Upper-middle income (UMI)	nd	nd	nd
	High income (HI)	nd	nd	nd

* latest data from 2004 **latest data from 2000

D. Corruption

In recent years, the prevalence, type, and impact of corruption in the education sector have been under scrutiny. Corruption diverts resources from their intended purposes and beneficiaries, increases the cost of providing or obtaining public services, and undermines confidence in government efficacy. While no indicator of corruption was available that specifically focuses on the education sector (e.g., teacher absenteeism), an indicator measuring control of corruption has been developed. This indicator, produced annually by Kaufmann, Kraay, and Mastrizzi (2007) as part of the World Bank’s Worldwide Governance Indicator Project, aggregates the multiple survey responses of a large number of enterprises, citizens, organizations, and experts about their perception of the control of corruption in their particular country. On a global scale, this indicator ranges from -2.5, the lowest level of confidence in government effectiveness to control corruption, to +2.5, the highest level of confidence. No comparable income group data was available, so country groupings with high and low income status were used.

1. Control of Corruption

The regional mean for 2006 was -0.3, comparing favorably with Sub-Saharan Africa (-0.69) and unfavorably with OECD countries (+1.66). The E&E Region follows the positive trend of both these groups showing reduced perceptions of corruption. Since 1998, the overall perception of corruption has fallen by 23 percent for the E&E region.

Nevertheless, 20 out of 27 countries exhibited negative ratings and nine showed increases in the perception of corruption over the 1998-2006 time period. Six countries are classified as vulnerable: Turkmenistan, Kyrgyzstan, Uzbekistan, Azerbaijan, Kazakhstan, and Tajikistan. All surpass the average for Sub-Saharan Africa in perceptions of corruption. Of these, three show growth in the perception of corruption, with staggering increases recorded for Kyrgyzstan, growing nearly 200 percent per year. All three of the region’s low income countries are in the list, demonstrating the positive relationship found in several studies between poor economic performance and poor governance.

Table II. D. 1: Control of Corruption

Vulnerability Rank (worst case=1)	Country	Control of Corruption (2006)	Average Annual Rate of Change (1998-2006) ⁸	Total Change (1998-2006)
2 SB below mean	No countries			
1 SB below mean		-0.90		
1	Turkmenistan (LMI)	-1.28	0.027	0.22
2	Kyrgyzstan (LI)	-1.09	1.821	14.57
3	Uzbekistan (LI)	-1.02	0.000	0.00
4	Azerbaijan (LMI)	-0.99	-0.015	-0.12
5	Kazakhstan (LMI)	-0.92	0.004	0.03
6	Tajikistan (LI)	-0.91	-0.039	-0.32
7	Belarus	-0.84	0.021	0.17
8	Russia	-0.76	-0.022	-0.17
9	Albania	-0.67	-0.047	-0.37
10	Ukraine	-0.67	-0.047	-0.38
11	Moldova	-0.65	0.101	0.81
12	Armenia	-0.58	-0.031	-0.25
13	Yugoslavia (Serbia & Montenegro)	-0.42	-0.076	-0.61
14	FYR Macedonia	-0.37	-0.020	-0.16
15	Georgia	-0.36	-0.071	-0.57
16	Bosnia-Herzegovina	-0.32	-0.017	-0.14
17	Romania	-0.18	-0.061	-0.49
18	Bulgaria	-0.05	-0.105	-0.84
19	Croatia	-0.02	-0.117	-0.93
20	Lithuania	0.11	-0.049	-0.39
21	Poland	0.14	-0.094	-0.75
22	Slovakia	0.35	-4.500	-36.00
23	Czech Republic	0.36	-0.020	-0.16
24	Latvia	0.38	0.403	3.22
25	Hungary	0.51	-0.035	-0.28
26	Estonia	0.87	0.140	1.12
27	Slovenia	0.92	0.035	0.28
	EE Regional Mean	-0.3	-0.029	-0.23
	Standard Deviation	0.6	-0.003	-0.02
	World	nd		
	Least developed countries	nd		
	Low income (LI)	nd		
	Lower-middle income (LMI)	nd		
	Low & middle income	nd		
	Middle income	nd		
	Upper-middle income (UMI)	nd		
	High income (HI)	nd		
	OECD Countries	1.66	-0.004	-0.03
	Sub-Saharan Africa	-0.69	-0.449	-3.59

⁸ Positive numbers indicate an increase in perceptions of corruption; negative numbers indicate a decrease.

E. Summary for Pillar 1 (Context)

Table II.E.1 (below) summarizes the countries' vulnerability, based on standard deviations, in terms of the demands made on and threats to the stability and development of education. Those countries appearing in bold-face type also show unfavorable directions of change.

Table II.E.1: Highly-Vulnerable and Vulnerable Countries for Pillar 1 (Context)

	A. Economic Status	B. Population Pressure	C. Health	D. Corruption
	<i>GDP per capita, PPP</i>	<i>Percent Population 0-14</i>	<i>Tuberculosis Incidence</i>	<i>Control of Corruption</i>
<i>Highly vulnerable</i>	--	Tajikistan	Kazakhstan	--
<i>Vulnerable</i>	Tajikistan	Uzbekistan	Kyrgyzstan	Turkmenistan
	Moldova	Turkmenistan	Romania	Kyrgyzstan
	Kyrgyzstan	Kyrgyzstan	Moldova	Uzbekistan
	Uzbekistan	Albania		Azerbaijan
	Georgia			Kazakhstan
				Tajikistan
<i>Missing Data</i>	Yugoslavia (Serbia & Montenegro)	--	--	--

Ten countries are classified as vulnerable or highly vulnerable for one or more of the indicators. Kyrgyzstan appears most frequently, either as highly vulnerable or vulnerable for all four indicators; in two instances, it exhibits undesirable rates of growth. It is followed by Tajikistan and Uzbekistan, which appear for three of the indicators, and Moldova, Kazakhstan, and Turkmenistan for two of the indicators. Georgia, Albania, Romania, and Azerbaijan each appear once. At present the greatest threats to education are posed by low income per capita, high 0-14 population percentages, and pervasive corruption; fewer countries fell 1 SD from the mean for tuberculosis incidence and three of the four vulnerable countries have experienced decreases in its incidence.

Using the point methodology (described in Chapter I), which assigns points per incidence of more than one standard deviation from the mean and undesired direction of change, to aggregate and score vulnerability for all the pillar indicators, Table II.E.2 shows overall country scores and ranking. Of the ten countries that were rated vulnerable on at least one indicator, Kyrgyzstan scores the highest for vulnerability. Seventeen countries exhibited no vulnerability in this pillar.

Table II.E.2: Relative Vulnerability Ranking for Pillar 1 (Context)

Pillar 1						
No.	Country	Highly Vulnerable (x2 pts)	Vulnerable (x1 pt)	Undesirable Change (x0.5pt)	Points	Vulnerability Ranking
1	Kyrgyzstan	0	4	2	5.0	1
2	Tajikistan	1	2	0	4.0	2
3	Uzbekistan	0	3	1	3.5	3
4	Kazakhstan	1	1	1	3.5	3
5	Turkmenistan	0	2	1	2.5	4
6	Moldova	0	2	0	2.0	5
7	Albania	0	1	0	1.0	6
8	Azerbaijan	0	1	0	1.0	6
9	Georgia	0	1	0	1.0	6
10	Romania	0	1	0	1.0	6
11	Armenia	0	0	0	0	Not Vulnerable
12	Belarus	0	0	0	0	Not Vulnerable
13	Bosnia-Herz	0	0	0	0	Not Vulnerable
14	Bulgaria	0	0	0	0	Not Vulnerable
15	Croatia	0	0	0	0	Not Vulnerable
16	Czech Republic	0	0	0	0	Not Vulnerable
17	Estonia	0	0	0	0	Not Vulnerable
18	FYR Macedonia	0	0	0	0	Not Vulnerable
19	Hungary	0	0	0	0	Not Vulnerable
20	Latvia	0	0	0	0	Not Vulnerable
21	Lithuania	0	0	0	0	Not Vulnerable
22	Poland	0	0	0	0	Not Vulnerable
23	Russia	0	0	0	0	Not Vulnerable
24	Slovakia	0	0	0	0	Not Vulnerable
25	Slovenia	0	0	0	0	Not Vulnerable
26	Ukraine	0	0	0	0	Not Vulnerable
27	Yugoslavia*	0	0	0	0	Not Vulnerable
Total Frequencies		2	18	5		
Total Countries		2	10	4		

*Serbia and Montenegro

III. Pillar 2: Student Outcomes

Multiple measures of student outcomes provide an overall indication of education system effectiveness and its impact in terms of reaching and teaching its school-aged population. Because these measures are expressed in terms of student units, they capture the effect of both supply (quantity and quality of system services and inputs) and demand (social, economic, and cultural environment; attitudes and behaviors) factors, but do not necessarily distinguish which has the greatest influence on student behavior, including learning. Indicators in four categories (or sub-pillars) of student outcomes are employed in this analysis: (i) participation; (ii) equity, (iii) attainment, and (iv) efficiency.

A. Participation

This cluster of indicators shows the percentage of children enrolled in the four levels of schooling—pre-primary, basic education (typically grades 1-9), upper secondary (including both general and vocational education), and tertiary or university. These indicators capture the effects of both the supply (availability and accessibility) of schooling offered and the household demand for schooling. The net enrollment rate (NER) presents the number of students enrolled in a level of schooling as a proportion of the population falling in the specified age range for the level of schooling, which eliminates over- and under-aged children. The gross enrollment ratio (GER) presents the number of students enrolled in a level of schooling as a proportion of the overall school-aged population, capturing both over- and under-aged children.

In today's world, a principal yardstick against which educational progress and human capital development is measured is that of universal primary and secondary education, which have been virtually achieved by high income countries. This is generally based on NERs, but "success" is often declared on the basis of GERs. High enrollment rates in pre-primary education and tertiary education are generally indicative of better-resourced education systems and wealthier populations. However, in some countries, these high rates can denote an investment imbalance, favoring these levels of education to the detriment of basic education, which economic analysis generally shows to have the highest rate of return.

1. Pre-Primary Enrollment

In 2005, the regional mean⁹ for the NER in pre-primary education (for children 3-5) was 50.8 percent, with an average annual growth rate of three percent since 1998. Table III.A.1 (below) shows the tremendous variation among the 27 countries, ranging from 6.2 percent NER in Bosnia-Herzegovina to 87 percent NER in Hungary. In roughly half (14) the countries, more than 50 percent of pre-school age children are enrolled in pre-primary schooling. Seven countries have NERs lower than 23 percent (1 SD below the mean) and are classified as vulnerable: Bosnia-Herzegovina, Tajikistan, Kyrgyzstan, Kazakhstan, Azerbaijan, Uzbekistan, and Turkmenistan. Most of the region's countries experienced a positive average annual growth rate of two to five percent, with faster rates of growth in the "vulnerable" countries of

⁹ The regional mean is computed using the data for 2005 only.

Kazakhstan (7%), Azerbaijan (9%), Croatia (10%), and Moldova (11%). Only in lowest-ranked Bosnia-Herzegovina has the NER declined.

Comparable data were not available by country income group for the NER, but were available for the GER. As a rule, GERs are higher than NERs, as over- and under-aged children are not excluded from the population denominator, although in practice the age range participation for pre-primary is generally self-limiting. The seven vulnerable countries, classified as low- and lower-middle income, fall notably below the averages for comparable income groups (27% and 35%), as well as the world average (38%). In fact, even the middle income countries fail to meet the lower income country average. Two of the countries—Bosnia-Herzegovina and Tajikistan—perform worse than the least developed country average (9%).

Table III.A.1: Pre-Primary Net Enrollment Rate (Participation Indicator 1)

Vulnerability Rank (worst case=1)	Country (income group)	Pre-Primary Net Enrollment Rate (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean	No countries			
1 SD below mean		22.7		
1	Bosnia-Herzegovina(LMI)	6.2	-0.02	-0.05
2	Tajikistan (LI)	6.9	0.02	0.15
3	Kyrgyzstan (LI)	11.1	0.04	0.28
4	Kazakhstan (LMI)	18.4	0.07	0.47
5	Azerbaijan (LMI)	20.9	0.09	0.62
6	Uzbekistan (LI)	21.3	0.03	0.19
7	Turkmenistan* (LMI)	21.8	0.02	0.14
8	Yugoslavia(Serbia & Montenegro)**	29.7	0.00	0.01
9	Armenia	31.8	0.05	0.34
10	FYR Macedonia	32.5	0.03	0.23
11	Georgia *	33.8	0.05	0.31
12	Albania	38.4	0.05	0.37
13	Croatia	49.3	0.10	0.67
14	Ukraine	54.8	0.03	0.23
15	Poland	55.6	0.02	0.12
16	Lithuania*	55.7	0.03	0.19
17	Moldova	67.2	0.11	0.80
18	Russia	69.6	0.01	0.08
19	Slovakia	72.7	0.01	0.07
20	Belarus	73.4	0.00	0.03
21	Bulgaria	73.7	0.02	0.13
22	Romania	73.8	0.02	0.13
23	Slovenia	79.9	0.02	0.17
24	Latvia*	80.1	0.07	0.41
25	Estonia	85.8	0.02	0.16
26	Czech Republic	86.4	0.01	0.05
27	Hungary	86.9	0.00	0.01
	EE Regional Mean	50.8	0.03	0.18
	Standard Deviation	28.0	0.02	0.13
Gross Pre-primary	World	37.6	0.02	0.08
	Least developed countries	8.9	0.01	0.06
	Low income (LI)	27.3	0.10	0.52
	Lower-middle income (LMI)	35.3	0.00	-0.01
	Low & middle income	33.1	0.02	0.11
	Middle income	39.5	0.00	0.01
	Upper-middle income (UMI)	59.4	0.02	0.10

High income (HI)	75.8	0.00	-0.01
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*Latest data from 2004 **Latest data from 2001

2. Basic Education Enrollment

Basic education typically includes first through eighth or ninth grades, and the age group six to 14 years. In 2005, the regional mean GER for basic education was 98.3 percent and increasing annually at an average rate of 0.7 percent, having grown by five percent over the seven year period from 1998 to 2005. While fourteen of the countries were below the regional mean (98.3%), only five qualified as vulnerable, falling 1 SD below the mean. These include Turkmenistan, Armenia, Albania, Bosnia-Herzegovina, and Belarus, with GERs ranging from 88.6 percent to 93.4 percent. With the exception of Armenia, these countries do not appear to be on a significant growth path: GERs in Turkmenistan, Albania, and Bosnia-Herzegovina experienced slight annual declines since 1998, and the GER in Belarus grew at only half the regional rate. In contrast, second-worst ranked Armenia’s GER grew slowly, at about one percent a year, for a total increase of eight percent between 1998 and 2005. Although not classified as vulnerable, FYR Macedonia, Georgia, Slovenia, and the former Yugoslavia (including Kosovo, Montenegro, and Serbia) also exhibited negative growth.

Comparable data was not available for basic education by country income groups, so the GER for primary education has been used for comparison. In general, it should be expected that the primary GER will be somewhat higher than the basic education GER. Nevertheless, the region does not compare favorably with the world (98% v. 107%). Nine countries, including those classified as “vulnerable,” perform worse than the least developed country average (96%), as well as comparable income groups. None of the region’s low income countries fell into the vulnerable category; all five vulnerable countries belong to the lower-middle income group, but fall 22 to 26 percentage points below the group average, which is distinguished by the highest GER (115%). It should be noted, however, that while GERs that exceed 100 percent show high participation in school, they also indicate internal inefficiencies (e.g., students not cycling rapidly through the system, over-aged children, etc.). More efficient education systems are likely to have GERs that move backwards toward 100 percent, at the same time that NERs approach 100 percent.

Table III.A.2: Basic Education Gross Enrollment Ratio (Participation Indicator 2)

Vulnerability Rank (worst case=1)	Country	Gross Enrollment Ratio, Basic Education (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean				
	No countries			
1 SD below mean		93.4		
1	Turkmenistan * (LMI)	88.6	-0.001	-0.003
2	Armenia (LMI)	89.2	0.011	0.08
3	Albania (LMI)	90.6	-0.003	-0.02
4	Bosnia-Herzegovina (LMI)	90.8	-0.001	-0.005
5	Belarus (LMI)	93.4	0.004	0.03
6	Croatia	94.5	0.020	0.14
7	Moldova	94.9	0.004	0.03
8	Yugoslavia(Serbia & Montenegro)**	95.7	-0.012	-0.04
9	Tajikistan	95.7	0.008	0.07
10	Kyrgyzstan	96.2	0.009	0.07
11	Slovenia *	96.5	-0.004	-0.02
12	Uzbekistan	96.7	0.012	0.08
13	Georgia **	97.3	-0.008	-0.03
14	FYR Macedonia	98.4	-0.001	-0.004
15	Azerbaijan	98.5	0.019	0.14
16	Bulgaria	98.6	0.006	0.05
17	Czech Republic	99.2	0.002	0.02
18	Ukraine	99.4	0.015	0.11
19	Poland	100.4	0.000	0.00
20	Hungary	100.9	0.006	0.04
21	Romania	102.3	0.007	0.05
22	Latvia	102.8	0.016	0.11
23	Lithuania *	103.8	0.007	0.04
24	Kazakhstan	104.4	0.016	0.11
25	Russia	104.7	0.009	0.06
26	Slovakia	105.8	0.006	0.04
27	Estonia	106.0	0.010	0.07
	EE Regional Mean	98.3	0.007	0.05
	Standard Deviation	4.9	-0.013	-0.09
Primary GER	World*	106.8	0.013	0.06
	Least developed countries	96.1	0.038	0.23
	Low income* (LI)	102.1	0.032	0.16
	Lower-middle income* (LMI)	115.4	0.003	0.02
	Low & middle income*	107.5	0.014	0.07
	Middle income*	113.3	0.003	0.01
	Upper-middle income* (UMI)	105.1	0.000	0.00
	High income* (HI)	99.9	-0.001	-0.01

*latest data from 2004 **latest data from 2002

3. Total Upper Secondary Enrollment

Following completion of basic education, students of countries in the E&E region who wish to continue their schooling typically have two options: (1) two to four year programs in general secondary school with an academic and preparatory orientation for higher education, or (2) three to four year programs in vocational or technical school which allows entry to tertiary education, and one to three year programs which prepare students for the labor market and excludes entry to the tertiary level. Combined enrollments for these two tracks provide an overall picture of access to and participation in secondary schooling.

Table III.A.3a (below) shows that while the GER in general upper secondary is on average higher than the GER for vocational/technical education, in 13 countries (about half) the majority of students are enrolled in vocational/technical education. Nevertheless, as a general trend, enrollments in general secondary education have grown at a faster rate than vocational/technical education (18% v. 7%), possibly at the expense of vocational education. (Seven countries had positive growth in general secondary and negative growth in vocational/technical education simultaneously.) However, the pattern reverses itself in Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan, where growth in vocational/technical education outpaced general secondary education. Bosnia-Herzegovina and the former Yugoslavia have experienced negative growth in both types of schooling over the 1998-2005 period.

Table III.A.3a: General Upper Secondary Education & Vocational/Technical Education GERs

Country	General Upper Secondary GER	% Change 1998-2005	Vocational/Technical Education GER	% Change 1998-2005	General Upper Sec GER: VocTech GER Ratio
Albania	47.3	0.32	11.4	0.84	4.14
Armenia	53.5	0.28	16.2	0.03	3.29
Azerbaijan	43.5	0.05	14.2	0.13	3.07
Belarus	62.5	0.10	17.6	-0.17	3.55
Bosnia-Herzegovina	15.3	-0.08	28.0	-0.24	0.55
Bulgaria	42.3	0.32	49.0	0.17	0.86
Croatia	23.4	0.17	62.6	0.03	0.37
Czech Republic	19.5	0.45	72.9	0.27	0.27
Estonia	64.7	0.09	29.0	-0.07	2.23
FYR Macedonia	29.0	0.43	44.4	0.05	0.65
Georgia*	46.4	0.32	17.1	-0.33	2.71
Hungary	39.6	0.48	61.0	-0.11	0.65
Kazakhstan	41.4	-0.21	39.3	0.79	1.05
Kyrgyzstan	42.8	-0.10	18.2	0.02	2.35
Latvia*	64.6	0.15	33.9	0.04	1.90
Lithuania*	79.1	0.34	26.8	-0.09	2.95
Moldova	35.9	0.15	24.7	-0.21	1.46
Poland	50.0	0.48	55.7	-0.15	0.90
Romania	27.7	0.30	51.2	0.06	0.54
Russia	36.5	0.00	43.0	0.10	0.85
Slovakia	31.9	0.41	72.2	0.05	0.44
Slovenia*	38.5	0.50	62.0	-0.08	0.62
Tajikistan	31.0	0.40	11.0	-0.05	2.83
Turkmenistan*	28.6	-0.12	8.5	0.35	3.35
Ukraine	43.6	0.12	29.3	0.02	1.49
Uzbekistan	26.9	-0.33	47.5	0.47	0.57
Yugoslavia(Serbia&Montenegro)**	13.8	-0.03	41.2	-0.05	0.33
EE Regional Mean	42.6	0.21	37.8	0.07	

*latest data from 2004 **latest data from 2002

In 2005, the combined enrollment in general secondary and vocational/technical schooling (“total upper secondary GER”) yielded a regional average of 79.1 percent, growing at an average rate of 1.5 percent per year (see Table III.A.3b below). Two countries fell 2 SD below the regional mean and 6 countries fell 1 SD below. Highly vulnerable are Turkmenistan (37.2% GER) and Tajikistan (42.0% GER); vulnerable are Bosnia-Herzegovina, the former Yugoslavia, Azerbaijan, Albania, Moldova, and Kyrgyzstan with less than 62 percent of the 15 to 18 age group enrolled in secondary and vocational/technical education programs. The GERs in five of

these countries have fallen over the 1998-2005 period, most notably in Bosnia-Herzegovina, which experienced a 16 percent decrease.

All eight vulnerable countries fall into the low income and lower-middle income groups, with two in the low income group and six in the lower-middle income group. As comparable data was not available for total upper secondary education (i.e., general upper secondary and vocational/technical schooling) by country income groups, the gross enrollment for general secondary education (i.e., lower and upper general secondary schooling) has been used for comparison. This could cause the region's countries to compare unfavorably with the global comparison groups, as the latter excludes vocational/technical education, while the secondary education structure inherited from the Soviet system emphasized vocational and technical education. Interestingly, the low income countries of Tajikistan (42%) and Kyrgyzstan (61%) do nearly as well or significantly better than low income countries in general (45%). However, all of the region's countries classified as lower-middle income perform 15 to 41 percentage points below the global mean for lower-middle income countries (76%). In the case of Bosnia-Herzegovina and Moldova, the notable declines in vocational/technical education have not been compensated by gains in the general secondary education. Additionally the negative growth suffered by Turkmenistan, Bosnia-Herzegovina, the former Yugoslavia, Moldova, and Kyrgyzstan has no precedent in comparable income groups.¹⁰

¹⁰ The slight decline in the average GER for high income countries is likely to be a result in the normalization for age group, as net enrollment approaches 100 percent.

Table III.A.3b: Total Upper Secondary Gross Enrollment Ratio (Participation Indicator 3)

Vulnerability Rank (worst case=1)	Country	Gross Enrollment Ratio, Total Upper Secondary (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean		44.9		
1	Turkmenistan * (LMI)	37.2	-0.007	-0.04
2	Tajikistan (LI)	42.0	0.035	0.25
1 SD below mean		62.0		
3	Bosnia-Herzegovina* (LMI)	45.0	-0.040	-0.16
4	Yugoslavia (Serbia & Montenegro) ** (LMI)	55.0	-0.022	-0.04
5	Azerbaijan (LMI)	57.6	0.009	0.07
6	Albania (LMI)	58.7	0.057	0.40
7	Moldova (LMI)	60.6	-0.004	-0.03
8	Kyrgyzstan (LI)	61.0	-0.010	-0.07
9	Georgia *	63.4	0.008	0.05
10	Armenia	69.7	0.030	0.21
11	Ukraine	72.9	0.011	0.08
12	FYR Macedonia	73.4	0.025	0.17
13	Uzbekistan	74.4	0.003	0.02
14	Romania	78.9	0.019	0.13
15	Russia	79.6	0.007	0.05
16	Belarus	80.1	0.004	0.03
17	Kazakhstan	80.7	0.012	0.08
18	Croatia	86.1	0.009	0.06
19	Bulgaria	91.3	0.034	0.24
20	Czech Republic	92.4	0.043	0.30
21	Estonia	93.7	0.005	0.04
22	Latvia	98.5	0.015	0.11
23	Slovenia*	100.5	0.013	0.08
24	Hungary	100.7	0.008	0.06
25	Slovakia	104.0	0.020	0.14
26	Lithuania *	104.1	0.030	0.18
27	Poland	105.8	0.009	0.06
	EE Regional Mean	79.1	0.015	0.11
	Standard Deviation	17.1	-0.005	-0.03
general secondary 1999- 2004 (WDI)	World *	65.06	0.017	0.08
	Least developed countries	32.97	0.039	0.20
	Low income * (LI)	44.67	0.030	0.15
	Lower-middle income* (LMI)	75.80	0.023	0.12
	Low & middle income*	60.93	0.021	0.11
	Middle income*	77.39	0.021	0.10
	Upper-middle income* (UMI)	86.16	0.013	0.06
	High income* (HI)	99.72	-0.002	-0.01

*latest data for 2004 **latest data for 2001

4. Tertiary Enrollment

In 2005, the E&E regional average GER for tertiary education (i.e., degree- or non-degree granting higher education programs) reached nearly 41 percent, having increased by 56 percent since 1998 and grown at an average of eight percent per year. While the regional mean approaches that percentage for upper-middle income countries (43%), there is wide variation, ranging from three percent GER in Turkmenistan (below the least developed country average of 4%) to 83 percent GER in Slovenia (surpassing the high income country average of 67%). Five countries are classified as vulnerable: Turkmenistan, Uzbekistan, Azerbaijan, Tajikistan, and

FYR Macedonia, with tertiary GERs less than 22 percent (the average for lower-middle income countries). Alarming, average annual change (or growth) rates for two of these countries—Turkmenistan and Azerbaijan—are negative, with average annual change (or growth) rates for the three other countries increasing between two and six percent, less than all other countries except the former Yugoslavia (Serbia & Montenegro), Bulgaria, Georgia, and Belarus.

Table III.A.4: Tertiary Gross Enrollment Ratio (Participation Indicator 4)

Vulnerability Rank (worst case=1)	Country	Gross Enrollment Ratio, Tertiary (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean				
	No countries			
1 SD below mean				
1	Turkmenistan* (LMI)	3.2	-0.078	-0.47
2	Uzbekistan (LI)	8.4	0.057	0.40
3	Azerbaijan (LMI)	13.1	-0.005	-0.04
4	Tajikistan (LI)	15.3	0.042	0.29
5	FYR Macedonia (LMI)	21.2	0.026	0.18
6	Albania	21.7	0.114	0.80
7	Yugoslavia(Serbia & Montenegro)**	23.9	0.004	0.01
8	Bosnia-Herzegovina	25.2	0.097	0.29
9	Armenia	26.7	0.096	0.67
10	Moldova	29.7	0.070	0.49
11	Croatia	36.3	0.064	0.45
12	Kyrgyzstan	37.2	0.071	0.50
13	Georgia *	39.6	0.042	0.25
14	Bulgaria	40.1	0.005	0.03
15	Slovakia	41.1	0.094	0.66
16	Romania	43.7	0.158	1.11
17	Kazakhstan	44.7	0.160	1.12
18	Belarus	47.0	0.041	0.28
19	Russia	47.2	0.101	0.71
20	Czech Republic	47.3	0.142	1.00
21	Ukraine	48.1	0.103	0.72
22	Poland	56.4	0.063	0.44
23	Hungary	61.2	0.169	1.18
24	Estonia	65.5	0.076	0.53
25	Latvia	72.5	0.062	0.43
26	Lithuania	74.9	0.118	0.71
27	Slovenia	83.2	0.081	0.57
	EE Regional Mean	40.6	0.080	0.56
	Standard Deviation	19.2	0.073	0.51
	World *	23.68	0.065	0.32
	Least developed countries*	3.84	0.013	0.07
	Low income * (LI)	8.51	0.069	0.34
	Lower-middle income* (LMI)	22.26	0.135	0.67
	Low & middle income*	18.15	0.094	0.47
	Middle income*	26.15	0.109	0.55
	Upper-middle income* (UMI)	42.87	0.069	0.35
	High income* (HI)	66.58	0.032	0.16

*latest data from 2004 **latest data from 2001

5. Participation Summary

Table III.A.5a (below) summarizes the countries that fall 1 or 2 SD from the mean for educational participation, and are considered vulnerable or highly vulnerable. Those countries appearing in bold-face type also show unfavorable directions of change. Thirteen countries are classified as vulnerable or highly vulnerable for one or more of the indicators. Turkmenistan appears most frequently, either as highly-vulnerable or vulnerable for all four indicators. It is followed by Bosnia-Herzegovina, Tajikistan, and Azerbaijan, which are vulnerable for three of the indicators; and Albania, Kyrgyzstan, and Uzbekistan for two of the indicators. Kazakhstan, Armenia, Belarus, the former Yugoslavia, Moldova, and FYR Macedonia are vulnerable for only one indicator. With the exception of Tajikistan, all have experienced negative (declining) growth and undesirable directions of change for one or more indicator. Probably most fragile are those countries which have been rated as vulnerable in the critical areas of basic and total upper secondary education and have experienced negative (declining) growth and undesirable directions of change in both of these educational areas: Turkmenistan, Bosnia-Herzegovina, and Albania.

Table III.A.5a: Highly Vulnerable and Vulnerable Countries for Participation in Education

	Net Enrollment Rate, Pre-Primary (2005)	Gross Enrollment Ratio, Basic Education (2005)	Gross Enrollment Ratio, Total Upper Secondary (2005)	Gross Enrollment Ratio, Tertiary (2005)
Highly vulnerable	--	--	Turkmenistan	--
	--	--	Tajikistan	--
Vulnerable	Turkmenistan	Turkmenistan	Bosnia-Herzegovina	Turkmenistan
	Bosnia-Herzegovina	Bosnia-Herzegovina	Albania	Tajikistan
	Tajikistan	Albania	Yugoslavia (Serbia & Montenegro)	Azerbaijan
	Azerbaijan	Armenia	Azerbaijan	Uzbekistan
	Kyrgyzstan	Belarus	Kyrgyzstan	FYR Macedonia
	Uzbekistan		Moldova	
	Kazakhstan			
Missing Data	--	--	--	--

B. Equity

While there are several types of inequities that plague education systems and result in a variety of underserved populations distinguished by geography, ethnicity, wealth, and urban-rural location, the one for which there is readily available data is gender. Although most student indicators are disaggregated by sex, one indicator was selected to capture the relative gender equity of the target countries—the gender parity index for the GER for primary and secondary education combined. Since the prevailing high enrollment ratios for basic education signal the likelihood of high gender parity, more variation is likely to occur if a higher level of education, where coverage is not as widespread, is included.

The gender parity index (GPI) is the ratio of girls' GER to boys' GER. Perfect parity equals one. Values less than one indicate that girls are under-represented, while values more than one show that boys are under-represented. Because the desired value ("1") is intrinsic in this indicator, the reader is cautioned that use of the standard deviation methodology sets the reference point at below parity. While this method shows the extent of country deviation from the regional norm,

it does not necessarily mean that all countries that are within one standard deviation do not suffer from gender inequity.¹¹

1. Primary and Secondary GER Gender Parity

In 2005, the regional mean GPI for primary and secondary education was 0.99, showing that a high degree of equity had been achieved, comparable to middle income countries and similarly slightly favoring boys. In 1998, a higher percentage of girls than boys were enrolled in primary and secondary education in the region, but by 2005 this trend had reversed.¹²

While six of the 27 countries achieved gender parity in 2005, the other 19 countries for which data is available show varying degrees of gender disparity, with girls being disfavored in the majority (13) of the countries.

Five countries fall one or more SDs from the regional mean. Tajikistan is classified as highly vulnerable, with the worst case of gender disparity in enrollment (0.88 GPI), where the proportion of girls enrolled in primary and secondary school is significantly lower than boys and only slightly higher than the GPI for comparable low income countries. Among the four vulnerable countries, the GPIs in Ukraine (0.94 GPI) and Bulgaria (0.96 GPI) show that girls are under-enrolled, while the GPIs in Armenia (1.03) and Moldova (1.02) show that boys are under-enrolled in relation to girls. Two of these lower-middle income countries fall below the GPI for the global lower-middle income group (0.99 GPI), showing greater disfavor of girls.

¹¹ For example, Moldova—a vulnerable country—is only 0.02 points from parity. At the same time, Albania and Azerbaijan (0.03 points away from parity) and Kazakhstan and Uzbekistan (0.2 points away from parity) are not classified as vulnerable.

¹² The reader is cautioned that rates of change must be interpreted differently for this indicator. In cases where girls were over-represented (GPI above 1.0), a negative growth rate could signify a move toward parity or gender equality; in other cases, a negative growth rate signifies a growing under-representation of girls (such cases are indicated by italicized growth rates in the table).

Table III.B.1: Primary and Secondary GER Gender Parity (Equity Indicator 1)

Vulnerability Rank (worst case=1)	Country	Primary + Secondary GER GPI (2005)	Greatest distance from parity (1)	Average Annual Rate of Change (1998- 2005)	Total Change (1998-2005)
2 SD below or above the mean		.93 or 1.05			
1	Tajikistan (LI)	0.88	-0.12	-0.004	-0.02
1 SD below or above the mean		.96 or 1.02			
2	Ukraine(LMI)	0.94	-0.06	-0.012	-0.07
3	Bulgaria** (LMI)	0.96	-0.04	-0.003	-0.02
4	Armenia (LMI)	1.03	0.03	0.010	0.05
5	Moldova (LMI)	1.02	0.02	0.003	0.02
6	Albania* ((LMI)	0.97	-0.03	0.002	0.01
7	Azerbaijan (LMI)	0.97	-0.03	-0.004	-0.03
8	Kazakhstan (LMI)	0.98	-0.02	-0.007	-0.05
9	Uzbekistan* (LI)	0.98	-0.02	-0.005	-0.01
10	FYR Macedonia	0.99	-0.01	0.002	0.01
11	Hungary	0.99	-0.01	-0.003	-0.02
12	Lithuania	0.99	-0.01	-0.002	-0.01
13	Poland	0.99	-0.01	0.000	0.00
14	Russia	0.99	-0.01	0.000	0.00
15	Slovenia	0.99	-0.01	-0.003	-0.02
16	Croatia	1.01	0.01	0.000	0.00
17	Czech Republic	1.01	0.01	-0.002	-0.01
18	Georgia	1.01	0.01	0.005	0.03
19	Yugoslavia (Serbia & Montenegro)**	1.01	0.01	0.005	0.010
20	Belarus	1	0.00	-0.003	-0.02
21	Estonia	1	0.00	0.000	0.00
22	Kyrgyzstan	1	0.00	-0.007	-0.05
23	Latvia	1	0.00	-0.003	-0.02
24	Romania	1	0.00	0.000	0.00
25	Slovakia	1	0.00	-0.001	-0.01
No Data	Bosnia-Herzegovina	--	--	--	--
No Data	Turkmenistan	--	--	--	--
	EE Regional Mean	0.988		-0.004	-0.03
	Standard Deviation	0.032		0.251	1.76
	World*	0.941		0.004	0.03
	Least developed countries*	0.854		0.005	0.03
	Low income * (LI)	0.869		0.013	0.08
	Lower-middle income *	0.991		0.002	0.01
	Low & middle income * (LMI)	0.933		0.005	0.03
	Middle income *	0.989		0.002	0.01
	Upper-middle income * (UMI)	0.990		0.001	0.00
	High income * (HI)	0.995		-0.001	0.00

*latest data from 2004 **latest data from 2001

2. Equity Summary

Table III.B.2a (below) summarizes the five countries that are considered vulnerable or highly vulnerable. All countries (appearing in bold-face type) have experienced growing gender disparity, with only Armenia and Moldova moving to favor girls over boys. Ukraine exhibits a notable degree of gender disparity (disfavoring girls), which is increasing at a faster rate than other vulnerable countries.

Table III.B.2a: Highly Vulnerable and Vulnerable Countries for Equity in Education

	Primary + Secondary GER GPI (2005)
Highly vulnerable	Tajikistan
Vulnerable	Ukraine
	Bulgaria
	Armenia
	Moldova
Missing Data	Bosnia-Herzegovina
	Turkmenistan

Other data (not shown) indicate that for all these countries, the percentage share of girls' enrollment in basic education is less than 50 percent (ranging from 47% to 49%). In upper secondary education, girls predominate, accounting for more than 50 percent of enrollments in 22 countries (with a high of 63 percent in Croatia). Exceptions are Russia, Ukraine, Azerbaijan, Tajikistan, and Uzbekistan (with a low of 39%). Not accounted for in the upper secondary figures, however, is the high and disproportionate representation of boys in vocational/technical education, which would explain why, on average, girls are still slightly disfavored in the region when both upper secondary and vocational/technical education enrollments combined are used to calculate the GERs.

C. Attainment

Children must not only enroll in school, but they also must remain in schools for a sufficient amount of time to acquire the skills and competencies needed for both individual and national economic and social development. Two indicators are used to measure educational attainment: the primary school completion rate and the school life expectancy. Both indicators show how long the students are retained in school, although they do not distinguish among the causes behind it—either the strength of the education system, the general demand for education, or some combination of the two. These two indicators may be viewed as proxies for student learning, but do not measure learning achievement and are no guarantee that fundamental skills have been mastered.

1. Primary Completion Rate

Overall, the E&E region enjoys a high primary school completion rate. Nearly 97 percent of the school-aged population completes primary school,¹³ which approaches the average for high income countries. However, over half (14) of the countries for which data is available (24) have experienced negative growth or declines in the primary school completion rate. Table III.C.1 (below) shows the wide variation among the countries, ranging from 88 percent completion in Georgia to 114 percent completion in Kazakhstan (signifying the high number of inappropriately-aged students).

Three countries fall into the vulnerable category with completion rates of less than 90 percent: Georgia, Latvia, and Lithuania. All three countries have experienced drops in the completion rate, with Latvia and Lithuania having the most precipitous declines in the region (falling eight

¹³ The formula used to calculate gross completion rates may somewhat overstate the percentage, as its numerator includes over- and under-aged children and its denominator limits the age group to children of official graduation age.

and nine percent, respectively, since 1998). Interestingly, none of the low income countries are represented in the vulnerable category, although it could be argued that countries with higher GERs (such as Latvia and Lithuania) are reaching disadvantaged populations that are at greater risk. Nonetheless, all three countries fall significantly below comparable income groups.

Table III.C.1: Primary Completion Rate (Attainment Indicator 1)

Vulnerability Rank (worst case=1)	Country	Primary Completion Rate (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean	No countries			
1 SD below mean				
1	Georgia (LMI)	86.7	-0.002	-0.011
2	Latvia (UMI)	88.55	-0.014	-0.084
3	Lithuania (UMI)	89.62	-0.016	-0.098
4	Armenia	90.69	-0.001	-0.022
5	Croatia **	91.36	0.002	0.008
6	Moldova	92.11	-0.004	-0.026
7	Hungary	93.92	-0.010	-0.070
8	Slovak Republic	93.96	-0.008	-0.056
9	Azerbaijan	94.11	0.010	0.061
19	Ukraine **	94.58	-0.002	-0.011
11	Yugoslavia, FR (Serbia and Montenegro)***	96.37	-0.004	-0.004
12	Uzbekistan *	96.70	-0.012	-0.024
13	Albania *	97.33	-0.013	-0.066
14	FYR, Macedonia	97.42	-0.008	-0.050
15	Poland	97.42	-0.020	-0.137
16	Kyrgyz Republic	97.47	0.004	0.024
17	Bulgaria	98.32	0.000	-0.002
18	Romania	99.43	-0.006	-0.037
19	Belarus	99.73	0.004	0.026
20	Tajikistan	102.14	0.013	0.080
21	Czech Republic	102.28	0.002	0.011
22	Slovenia**	102.41	0.000	0.000
23	Estonia	104.26	0.026	0.155
24	Kazakhstan	114.08	0.026	0.182
No Data	Bosnia and Herzegovina	--	--	--
No Data	Russian Federation	--	--	--
No Data	Turkmenistan	--	--	--
	EE Regional Mean	96.8	-0.006	-0.043
	Standard Deviation	6.6	-0.007	-0.049
	World**	85.0	0.007	0.026
	Least developed countries *	58.44	0.017	0.083
	Low income * (LI)	73.86	0.029	0.144
	Lower-middle income * (LMI)	96.73	-0.002	-0.010
	Low & middle income **	83.53	0.007	0.029
	Middle income *	96.04	0.001	0.006
	Upper-middle income * (UMI)	94.75	0.003	0.015
	High income * (HI)	97.26	0.001	0.003

*latest data from 2004 **latest data from 2003 ***latest data from 2001

2. School Life Expectancy

In 2005, the regional average for the number of years a student was expected (i.e., predicted) to attend school and university (including repeated years) was 13.8, surpassing that of upper-middle

income countries and exhibiting a positive average annual growth rate (.007) for an average increase of five percent over the 1998-2005 period. Only Uzbekistan and the former Yugoslavia (Serbia & Montenegro) have experienced negative growth and unfavorable directions of change.

Like other indicators, school life expectancy (SLE) is somewhat ambiguous if not placed in context. One way of doing so is to compare the years of school life expectancy with the years of compulsory education. If compulsory education years exceed school life expectancy years, then it is likely that the education system is not meeting the standards it set for itself, meaning its students are not spending as many years in school as is required to complete the compulsory grade level (assuming no repetition or skipping grades). Only in Azerbaijan does the SLE fall below compulsory education years. In the other 24 countries for which data is available, the SLE exceeds the duration of compulsory education, sometimes by as much eight years (e.g., Slovenia). While this could indicate progression to higher levels of education, it may also signal grade repetition. Review of the enrollment and repetition indicators suggest both progression to higher levels of education and grade repetition are at play, although the modest repetition rates for most countries (see next section) implies the greater influence of grade progression.

Six countries (Azerbaijan, Tajikistan, Armenia, Uzbekistan, Albania, and Moldova) are rated vulnerable, scoring 1 SD below the regional mean for SLE. Only one of the vulnerable countries, Uzbekistan, has experienced negative growth. The lowest ranked performers (Azerbaijan, Tajikistan, and Armenia) have had annual growth rates that exceed the regional average, although, as noted, the Azerbaijan SLE has not yet reached parity with the duration of compulsory education. The two low income countries, Tajikistan and Uzbekistan, surpass the SLE average for the low income country group, but the middle income countries fall below the comparable income group average.

Table III.C.2: School Life Expectancy in Years (Attainment Indicator 2)

Vulnerability Rank (worst case=1)	Country	School Life Expectancy (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)	Compulsory Education Years	Difference in Years between SLE and Compulsory Ed.
2 SD below mean						
	No countries					
1 SD below mean		12.0				
1	Azerbaijan (LMI)	10.78	0.011	0.064	11	-0.22
2	Tajikistan (LI)	10.96	0.023	0.117	9	+1.96
3	Armenia (LMI)	10.98	0.011	0.053	8	+2.98
4	Uzbekistan* (LI)	11.41	-0.001	-0.002	9	+2.41
5	Albania * (LMI)	11.43	0.006	0.032	8	+3.43
6	Moldova (LMI)	11.57	0.006	0.031	9	+2.57
7	FYR Macedonia	12.21	0.005	0.027	8	+4.21
8	Georgia	12.34	0.008	0.042	9	+3.34
9	Kyrgyz Republic	12.44	0.010	0.052	9	+3.44
10	Croatia **	12.86	0.017	0.067	8	+4.86
11	Yugoslavia (Serbia & Montenegro) ***	12.95	-0.015	-0.030	8	+4.95
12	Bulgaria	13.34	0.005	0.029	8	+5.34
13	Russian Federation	13.54	0.014	0.028	10	+3.54
14	Romania	13.56	0.026	0.130	8	+5.56
15	Ukraine	14.03	0.021	0.103	12	+2.03
16	Slovak Republic	14.44	0.016	0.112	10	+4.44
17	Belarus	14.57	0.016	0.111	10	+4.57
18	Czech Republic	14.99	0.019	0.113	10	+4.99
19	Hungary	15.14	0.018	0.123	10	+5.14
20	Poland	15.16	0.007	0.044	9	+6.16
21	Kazakhstan	15.34	0.050	0.248	11	+4.34
22	Latvia	15.50	0.022	0.131	9	+6.50
23	Lithuania	15.68	0.019	0.114	9	+6.68
24	Estonia	16.08	0.019	0.112	9	+7.08
25	Slovenia	17.03	0.027	0.136	9	+8.03
No Data	Bosnia and Herzegovina	--	--	--	--	--
No Data	Turkmenistan	--	--	--	9	--
	EE Regional Mean	13.8	0.007	0.046		
	Standard Deviation	1.8	0.875	6.122		
From 1999	World	10.92	0.018	0.109		
	Least developed countries					
	Low income (LI)	8.99	0.032	0.189		
	Lower-middle income (LMI)	11.79	0.017	0.104		
	Low & middle income	10.4	0.021	0.126		
	Middle income (MI)	12.02	0.016	0.095		
	Upper-middle income(UMI)	13.01	0.010	0.059		
	High income	15.81	0.004	0.022		

*latest data from 2004 **latest data from 2003 ***latest data from 2001

3. Attainment Summary

Table III.C.3a (below) summarizes the countries that fall 1 or 2 SD from the mean for educational attainment, and are considered vulnerable or highly vulnerable. Those countries appearing in bold-face type also show undesirable directions of change.

Nine countries are classified as vulnerable for one or more of the indicators. None are classified as highly vulnerable. Notably, there is no overlap of countries between the indicators; each appears only once. Conceptually, there should be a positive relationship between the two indicators. Oddly, both Latvia and Lithuania rank among the top performers for school life expectancy, in part due to the high enrollment rates in tertiary education and, for Latvia, the high repetition rate in primary school. This disconnect could point to inequities among different student population groups.

Table III.C.3a: Highly Vulnerable and Vulnerable Countries for Attainment in Education

	Primary Completion Rate (2005)	School Life Expectancy (2005)
Highly vulnerable	--	--
Vulnerable	Georgia	Azerbaijan
	Latvia	Tajikistan
	Lithuania	Armenia
		Uzbekistan
		Albania
		Moldova
Missing Data	Bosnia and Herzegovina	Bosnia and Herzegovina
	Russian Federation	Turkmenistan
	Turkmenistan	

D. Performance

Learning outcomes are generally considered the best indicator of an effective education system that produces students with the desired skills and competencies. Unfortunately, most countries in the region lack standardized achievement tests or do not report the data. Although some countries have been included in international testing programs (e.g., TIMMS, PISA, PIRLS), not enough have participated, the data is out-of-date, and the test years are staggered. Two proxy indicators have been used for this cluster: the youth literacy rate (YLR) and the primary repetition rate. The YLR shows the percentage of young people ages 15 to 24 who are able to read a short, simple statement. Given the high basic education GERs in the region, it can be assumed many have attended school. The primary repetition rate presents the percentage of students who are enrolled in the same grade as the previous year. It must be noted that this indicator may be a better measure of system efficiency than learning, particularly if automatic promotion policies are in effect. Moreover, it captures students that have had to drop out mid-year and re-enrolled the following year. Nevertheless, general practice is to retain students in the same grade in upper primary if it is thought that they have not mastered the material.

1. Youth Literacy Rate

In 2005, basic literacy among the 15-24 age group was almost universal: 99.7 percent of this population group was able to read a simple statement. This result even surpasses the YLR for high income countries (99.3%). Given the extra-ordinary high levels of literacy attainment in most countries in the 1998 base year, the rate has remained stable (no growth or decline) over the 1998-2005 period. Indeed, the two countries with negative (or declining) growth rates still report literacy rates of over 99 percent. There are, however, poorer performers: Romania and Bulgaria fall 2 SD below the mean (highly vulnerable), and FYR Macedonia and Slovenia fall 1 SD from the mean (vulnerable). However, the range is very narrow: between 98.7 percent and 99.36

percent, hardly major cause for concern at this point, although the YLR is a lagged indicator and for the older members of the age cohort is capturing the effects of schooling up to 10 years ago.

What is interesting is the relationship to income. None of the low income countries are vulnerable and two, Tajikistan and Uzbekistan, rank in the upper 50 percent of countries in the region. While all four vulnerable countries exceed comparable income group averages, they include upper-middle income Romania and high-income Slovenia (which also experienced a declining change or growth rate).

Table III.D.1: Youth Literacy Rate (Performance Indicator 1)

Vulnerability Rank (worst case=1)	Country	Youth Literacy Rate (2006)	Average Annual Rate of Change (1998-2006)	Total Change (1998-2006)
2 SD below mean				
1	Romania ** (UMI)	97.76	0.000	0.000
2	Bulgaria *** (LMI)	98.21	0.000	0.000
1 SD below mean				
3	FYR Macedonia ** (LMI)	98.74	0.000	0.000
4	Slovenia* (HI)	99.36	-0.002	-0.005
5	Yugoslavia (Serbia and Montenegro)**	99.36	nd	nd
6	Albania ***	99.44	0.000	0.000
7	Moldova *	99.52	-0.001	-0.002
8	Slovak Republic	99.62	nd	nd
9	Croatia ***	99.65	0.000	0.000
10	Kyrgyz Republic *****	99.70	0.000	0.000
11	Lithuania***	99.70	0.000	0.000
12	Russian Federation **	99.72	0.000	0.000
13	Latvia****	99.75	0.000	0.000
14	Estonia****	99.77	0.000	0.000
15	Belarus *****	99.79	0.000	0.000
16	Bosnia and Herzegovina ****	99.79	0.000	0.000
17	Uzbekistan	99.80	nd	nd
18	Armenia ***	99.81	0.000	0.000
19	Ukraine ***	99.81	0.000	0.000
20	Kazakhstan *****	99.85	0.000	0.000
21	Tajikistan ****	99.85	nd	nd
22	Turkmenistan	99.85	nd	nd
23	Azerbaijan *****	99.89	0.000	0.000
No Data	Georgia	--	--	--!
No Data	Czech Republic	--	--	--
No Data	Hungary	--	--	--
No Data	Poland	--	--	--
	EE Regional Mean	99.7	0.000	-0.001
	Standard Deviation	0.1	0.638	3.826
	World**	87.34	Nd	nd
	Least developed countries *	--	--	--
	Low income * (LI)	73.61	Nd	nd
	Lower-middle income * (LMI)	95.55	Nd	nd
	Low & middle income **	85.77	Nd	nd
	Middle income *	95.99	Nd	nd
	Upper-middle income * (UMI)	97.75	Nd	nd
	High income * (HI)	99.26	Nd	nd

*2004 **2002 ***2001 *****2000 *****1999

2. Primary Repetition Rate

Again, the E&E region compares favorably with other income groups around the world. In fact, the average regional repetition rate (1.2%) is half that of the best performing lower-middle income comparison group (2.7%) and appears to be slowly decreasing (one percent overall between 1998-2005). However, for some of the 20 countries that have experienced decreases, they have been dramatic—with some as large as 50, 60, 70, and 90 percent—although actual impact is small given the low repetition rates.

There are poorer performers, however. Latvia ranks as a highly vulnerable country with a repetition rate of 3.1 percent, followed by Slovakia, Bulgaria, Romania, Albania, and Hungary, whose rates range between 2.1 percent and 2.6 percent, still lower than their respective comparable income groups. Only Latvia and Slovakia have experienced increases in the repetition rates, with repetition in Latvia growing at eight percent per year. (Only FYR Macedonia exceeds this; its very low repetition rate is growing 43 percent annually, on average.)

Table III.D.2: Primary Repetition Rate (Performance Indicator 2)

Vulnerability Rank (worst case=1)	Country	Primary Repetition Rate (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD above mean				
1	Latvia (UMI)	3.05	0.081	0.488
1 SD above mean				
2	Slovak Republic (HI)	2.64	0.020	0.138
3	Bulgaria (LMI)	2.34	-0.046	-0.273
4	Romania (UMI)	2.26	-0.055	-0.329
5	Albania * (LMI)	2.15	-0.091	-0.453
6	Hungary (UMI)	2.12	-0.008	-0.054
7	Estonia	1.56	-0.062	-0.373
8	Czech Republic	1.07	-0.023	-0.137
9	Yugoslavia (Serbia & Montenegro)****	1.05	0.000	0.000
10	Russian Federation ***	0.89	-0.088	-0.350
11	Lithuania	0.70	-0.038	-0.231
12	Poland	0.69	-0.060	-0.420
13	Slovenia	0.46	-0.093	-0.558
14	Croatia **	0.37	-0.044	-0.178
15	Azerbaijan	0.29	-0.047	-0.326
16	Georgia	0.28	-0.033	-0.200
17	Moldova	0.26	-0.120	-0.717
18	Tajikistan	0.21	-0.102	-0.611
19	FYR Macedonia	0.18	0.433	2.600
20	Armenia	0.16	0.067	0.333
21	Kazakhstan	0.11	-0.115	-0.676
22	Ukraine	0.11	-0.124	-0.871
23	Kyrgyz Republic	0.09	-0.121	-0.727
24	Belarus	0.07	-0.130	-0.908
No Data	Bosnia and Herzegovina	--	--	--
No Data	Turkmenistan	--	--	--
No Data	Uzbekistan	--	--	--
	EE Regional Mean	1.20	-0.002	-0.011
	Standard Deviation	0.89	0.033	0.232
	World*	4.30	-0.099	-0.197
	Least developed countries *	11.77	-0.015	-0.077

	Low income *	6.04	-0.023	-0.116
	Lower-middle income *	2.66	-0.196	-0.393
	Low & middle income *	4.43	-0.099	-0.199
	Middle income *	2.96	-0.172	-0.343
	Upper-middle income *	4.35	-0.047	-0.237
No Data	High income *	--	--	--

*2004 **2003 ***2002 ****2001

3. Performance Summary

Table III.D.3a (below) summarizes the countries that fall 1 or 2 SD from the mean for primary school repetition and are considered vulnerable or highly vulnerable. Eight countries are classified as highly vulnerable and vulnerable for one or more of the indicators. Only Romania and Bulgaria are vulnerable for each indicator. Those countries appearing in bold-face type also show undesirable directions of change.

Table III.D.3a: Highly Vulnerable and Vulnerable Countries for Performance in Education

	Youth Literacy Rate (2005)	Primary Repetition Rate (2005)
Highly vulnerable	Romania	Latvia
	Bulgaria	
Vulnerable	FYR Macedonia	Slovak Republic
	Slovenia	Bulgaria
		Romania
		Albania
		Hungary
Missing Data	Bosnia and Herzegovina	
	Turkmenistan	
	Uzbekistan	

E. Summary for Pillar 2 (Student Outcomes)

Table III.E.1 summarizes the countries that are most vulnerable in terms of student outcomes. Those countries appearing in bold-face type show undesirable directions of change.

Twenty-one of the 27 countries in the region have been rated as vulnerable or highly vulnerable for one or more of the indicators. Those that have not been so classified are: Croatia, the Czech Republic, Estonia, Poland, and Russia (missing data on one indicator), all upper-middle income countries. Appearing most frequently in the vulnerable or highly vulnerable categories are: Tajikistan (five times); Albania, Azerbaijan, and Turkmenistan (four times); Armenia, Bulgaria, Bosnia-Herzegovina, and Uzbekistan (three times); and FYR Macedonia, Kazakhstan, Kyrgyzstan, Latvia, Moldova, and Romania (two times). Eight countries have appeared only once: Belarus, Georgia, Hungary, Lithuania, Slovakia, Slovenia, Ukraine, and the former Yugoslavia. Missing data may mask the real degree of vulnerability; for example, the number of indicators on which Turkmenistan and Bosnia-Herzegovina are vulnerable could easily increase if data were available for four missing indicators.

Table III.E.1: Countries Rated as Vulnerable or Highly Vulnerable by Indicator

	A. Participation				B. Equity	C. Attainment		D. Performance	
	<i>NER Pre-Primary</i>	<i>GER Basic Education</i>	<i>GER Total Upper Secondary</i>	<i>GER Tertiary</i>	<i>Primary+ Secondary GER GPI</i>	<i>Primary Completion Rate</i>	<i>School Life Expectancy</i>	<i>Youth Literacy Rate</i>	<i>Primary Repetition Rate</i>
<i>Highly vulnerable</i>	--	--	Turkmenistan	--	Tajikistan	--	--	Romania	Latvia
	--	--	Tajikistan	--				Bulgaria	
<i>Vulnerable</i>	Turkmenistan	Turkmenistan	Bosnia- Herzegovina	Turkmenistan	Ukraine	Georgia	Azerbaijan	FYR Macedonia	Slovak Republic
	Bosnia- Herzegovina	Bosnia- Herzegovina	Albania	Tajikistan	Bulgaria	Latvia	Tajikistan	Slovenia	Bulgaria
	Tajikistan	Albania	Yugoslavia*	Azerbaijan	Armenia	Lithuania	Armenia		Romania
	Azerbaijan	Armenia	Azerbaijan	Uzbekistan	Moldova		Uzbekistan		Albania
	Kyrgyzstan	Belarus	Kyrgyzstan	FYR Macedonia			Albania		Hungary
	Uzbekistan		Moldova				Moldova		
	Kazakhstan								
<i>Missing Data</i>	--	--	--	--	Bosnia- Herzegovina	Bosnia- Herzegovina	Bosnia- Herzegovina	Bosnia- Herzegovina	
					Turkmenistan	Russian Federation	Turkmenistan	Turkmenistan	
						Turkmenistan		Uzbekistan	

*Serbia and Montenegro

Using the point methodology, Table III.E.2 (below) shows overall country scores for Pillar 2 indicators and relative ranking. Of the 21 countries that were rated vulnerable on at least one indicator, Tajikistan scores the highest for vulnerability. Six countries exhibited no vulnerability in this pillar.

Table III.E.2: Relative Vulnerability Ranking for Pillar 2 (Student Outcomes) Pillar 2

No.	Country	Highly Vulnerable (x2 pts)	Vulnerable (x1 pt)	Undesirable Change (x0.5pt)	Points	Vulnerability Ranking
1	Tajikistan	2	3	1	7.5	1
2	Turkmenistan	1	3	3	6.5	2
3	Albania	0	4	1	4.5	3
4	Bulgaria	1	2	1	4.5	3
5	Azerbaijan	0	4	1	4.5	3
6	Bosnia-Herzegovina	0	3	3	4.5	3
7	Moldova	0	3	2	4.0	4
8	Latvia	1	1	2	4.0	4
9	Uzbekistan	0	3	1	3.5	5
10	Armenia	0	3	1	3.5	5
11	Romania	1	1	0	3.0	6
12	Kyrgyzstan	0	2	1	2.5	7
13	FYR Macedonia	0	2	0	2.0	8
14	Ukraine	0	1	1	1.5	9
15	Georgia	0	1	1	1.5	9
16	Slovenia	0	1	1	1.5	9
17	Yugoslavia*	0	1	1	1.5	9
18	Slovakia	0	1	1	1.5	9
19	Hungary	0	1	0	1.0	10
20	Kazakhstan	0	1	0	1.0	10
21	Lithuania	0	1	0	1.0	10
22	Belarus	0	0	0	0	Not Vulnerable
23	Croatia	0	0	0	0	Not Vulnerable
24	Czech Republic	0	0	0	0	Not Vulnerable

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25	Estonia	0	0	0	0	Not Vulnerable
26	Poland	0	0	0	0	Not Vulnerable
27	Russia	0	0	0	0	Not Vulnerable
Total Frequencies		6	42	22		
Total Countries		5	21	16		

*Serbia and Montenegro

IV. Pillar 3: System Capacity

Not only do effective education systems produce desirable student outcomes, but they provide services and inputs in the quantity and of the quality required to create a positive learning environment. Types of system-level inputs include: (i) access and availability (e.g., children per classroom, children per latrine post, school distance to population center); (ii) equity enhancement programs (e.g., tuition waivers or scholarships for at-risk groups); (iii) quality (teacher qualification, student-book ratio); (iv) efficiency (e.g., pupil-teacher ratio); and (v) resources and finance (e.g., per student expenditure, budget allocation). Unfortunately, several of these indicators are not included in the international data sets and the data for those that are included have proven elusive. Numerous indicators could not be used because data was available for only a very few countries. Ultimately, two indicators were employed: the student-teacher ratio and resources/finance.

A. Efficiency

There are several measures of system efficiency, some expressed in student units (e.g., repetition; see above) and some in system-specific units (e.g., cycle time or school years it takes to produce a graduate). This analysis has employed the basic education student-teacher ratio, due to its availability. Although more often used as an indicator of system quality (i.e., too many students per teacher implies lesser quality instruction), the actual situation in the E&E countries renders it more appropriate as an efficiency measure, as the student-teacher ratios are so low. Assuming that decreasing ratios (i.e., fewer students per teacher) is better, particularly when the student-teacher ratio falls below internationally-recognized threshold levels, is nonsensical. Since the highest ratio is 21 students per teacher (in Bosnia-Herzegovina), it is more appropriate that it be evaluated for its proximity and movement toward the optimal ratio, generally set at 35 students per classroom teacher in the international literature. It should be noted that in all likelihood the number of teachers used in calculating the indicator is not limited solely to those who are classroom teachers, but probably includes those with administrative assignments as well. Consequently, actual class sizes are likely to be greater. Even if the number of teachers were to be reduced by half (an unlikely scenario), the student-teacher ratios for the countries in the region would still be strikingly small, with most falling below what many consider efficient class size.

1. Student-Teacher Ratio for Basic Education

The average student-teacher ratio for the region in 2005 was 12.6 students per teacher for first through eighth or ninth grades and is falling annually in all countries except Bulgaria. This ratio is well below the 16:1 student-teacher ratio for high income countries. (Comparable data is not available for basic education, so the student-teacher ratio for primary education is used instead, with the caution that these ratios are likely to be slightly higher than for basic education.)

Six countries qualify as vulnerable, with student-teacher ratios falling below 10 students per teacher (1 SD). These are: Belarus, Azerbaijan, Estonia, Georgia, Russia, and Slovenia. Each country exhibited decreasing ratios and five of the six are significant, having declined by 15 to

23 percent over the 1998-2005 period. The ratio for each of these countries is also well below comparable income group countries.

All the vulnerable countries experience falling student-teacher ratios. Overall from an efficiency perspective, it would appear that the education systems of the countries in the region are highly inefficient. Given the reported teacher shortages in the region (which such small class sizes would belie if all these teachers were actually teaching full time), class sizes should be increased. If these data represent the true class sizes, then fewer teachers may be needed. In either case, the impact of larger class sizes on quality may be worth the trade-off, as several international studies and meta-analyses have found class-size to have little effect on student learning. Educational planners have generally adopted a norm of 35-40 pupils per class in poor countries, which is why this paper has treated declining student-teacher ratios as an unfavorable direction of change. However, these conclusions are not universally accepted. The large body of literature pertaining to the effects of educational inputs on quality and student learning includes many studies that reach different conclusions about the effects of class size and optimal class size.

Table IV.A.1: Pupil-Teacher Ratio, Basic Education (Efficiency Indicator 1)

Vulnerability Rank (worst case=1)	Country	Basic Education Pupil- Teacher Ratio (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean				
	No countries			
1 SD below mean		9.5		
1	Belarus (LMI)	8.3	-0.030	-0.21
2	Azerbaijan (LMI)	8.4	-0.021	-0.15
3	Estonia (UMI)	8.8	-0.029	-0.20
4	Georgia * (LMI)	8.9	-0.003	-0.02
5	Russia (UMI)	9.1	-0.032	-0.23
6	Slovenia * (HI)	9.5	-0.035	-0.21
7	Kazakhstan	10.5	-0.005	-0.04
8	Hungary *	10.8	-0.016	-0.11
9	Moldova	11.0	-0.023	-0.16
10	Armenia	11.2	0.012	0.09
11	Latvia	11.2	-0.015	-0.09
12	Lithuania *	11.6	0.005	0.03
13	Uzbekistan	13.0	0.010	0.07
14	Croatia	13.2	-0.028	-0.19
15	Romania	13.2	-0.015	-0.11
16	Kyrgyzstan	13.3	-0.003	-0.02
17	Bulgaria	13.7	0.000	0.00
18	Turkmenistan *	13.8	0.032	0.19
19	Poland	14.3	-0.007	-0.05
20	Czech Republic *	14.7	-0.019	-0.11
21	Yugoslavia (Serbia & Montenegro) **	15.4	-0.016	-0.07
22	Slovakia	16.1	-0.005	-0.04
23	FYR Macedonia	16.3	-0.022	-0.15
24	Tajikistan	17.1	-0.007	-0.05
25	Albania	18.2	-0.005	-0.03
26	Bosnia-Herzegovina *	21.4	-0.016	-0.10
No Data	Ukraine	-	-	-
	EE Regional Mean	12.6	-0.013	-0.09
	Standard Deviation	3.0	-0.019	-0.13
Primary Education	World*	28.7	-0.019	-0.08
	Least developed countries *	50.4	0.016	0.08

	Low income * (LI)	41.9	0.016	0.08
	Lower-middle income * (LMI)	22.2	0.005	0.02
	Low & middle income *	31.1	0.011	0.03
	Middle income *	22.1	0.006	0.02
	Upper-middle income * (UMI)	21.7	0.006	0.03
	High income * (HI)	16.0	-0.017	-0.09

*2004 **2002 ***2001 Note: assume optimal efficiency is 35 pupils per teacher

B. Resources and Finance

The resources a country dedicates to the education system can affect its ability to deliver quality services and produce positive student outcomes, as well as demonstrate both government and society's commitment to education. Several different measures are generally used in combination to determine how well-resourced a national education system is, including per student expenditure, percentage of national budget dedicated to education, percentage of education budget allocated to various levels of schooling, the percentage of recurrent budget allocated to non-salary expenditure, and percentage of GDP spent on public education. Unfortunately, it is only this last indicator for which there is data in a sufficient number of countries to permit analysis. While the percentage of GDP spent on education is a fundamental resource indicator, it does not inform about allocation among education levels, which in some countries can be skewed towards tertiary education, resulting in the under-funding of basic education.

1. Public education expenditure (as percentage of GDP)

In 2005, the countries in the region spent, on average, about 4.3 percent of GDP on public education, with wide variation ranging from 2.4 percent to 6.7 percent. Average public education expenditure for the region has fallen from a high of 5.3 percent in 1991 to 4.6 percent in 1998 and continued to decline over the 1998-2005 period. However, not all countries followed the same pattern; 12 of the 26 countries for which there is data have increased percentage GDP expenditure over the period, from one percent (Romania) to 63 percent (Tajikistan). Moreover, several countries differ from their comparable income groups. For example, Uzbekistan spends 6.3 percent in contrast to the low income group average of 3.1 percent; Ukraine spends 6.7 percent in contrast to the lower-middle income group average of 4.3 percent; and Romania spends 3.3 percent in contrast to the upper-middle income group average of 4.5 percent.

Vulnerable countries, whose educational expenditure fall 1 SD below the mean, include Kazakhstan (2.4%), Armenia (2.7%), Georgia (2.9%), Albania (3.07%), Azerbaijan (3.09%), and FYR Macedonia (3.12%). Among these, only Armenia and Georgia have experienced positive growth more than seven percent per year. GDP expenditure percentages for lowest-ranked Kazakhstan have decreased more than any other country—by six percent per year. The four (of the six) countries that have experienced negative growth in the percentage of GDP spent on public education, all are lower-middle income countries with percentage expenditures not only well below the average (4.3%) for the comparable income group, but less than the average (3.3%) for least developed countries.

Table III.B.1: Public expenditure on education as % of GDP (Resource Indicator 1)

Vulnerability Rank (worst case=1)	Country	% GDP spent on education (2005)	Average Annual Rate of Change (1998-2005)	Total Change (1998-2005)
2 SD below mean	No countries			
1 SD below mean		3.1		
1	Kazakhstan * (LMI)	2.4	-0.064	-0.38
2	Armenia (LMI)	2.7	0.074	0.52
3	Georgia * (LMI)	2.9	0.079	0.47
4	Albania (LMI)	3.1	-0.007	-0.05
5	Azerbaijan (LMI)	3.1	-0.012	-0.09
6	FYR Macedonia (LMI)	3.1	-0.026	-0.18
7	Romania *	3.3	0.002	0.01
8	Yugoslavia(Serbia& Montenegro)***	3.5	-0.110	-0.33
9	Tajikistan	3.5	0.090	0.63
10	Russia *	3.8	0.005	0.03
11	Kyrgyzstan	3.9	-0.029	-0.21
12	Slovakia *	4.0	0.003	0.02
13	Bulgaria	4.3	0.016	0.11
14	Croatia *	4.3	-0.022	-0.04
15	Czech Republic	4.4	0.012	0.08
16	Poland	5.0	0.013	0.09
17	Turkmenistan**	5.1	-0.034	-0.17
18	Estonia *	5.2	-0.031	-0.18
19	Slovenia *	5.4	0.015	-0.09
20	Hungary	5.4	0.014	0.10
21	Latvia *	5.4	-0.024	-0.15
22	Belarus	5.5	-0.016	-0.11
23	Lithuania *	5.5	-0.016	-0.11
24	Moldova	5.8	-0.025	-0.18
25	Uzbekistan**	6.3	-0.028	-0.14
26	Ukraine	6.7	0.071	0.50
No Data	Bosnia-Herzegovina	-	-	-
	EE Regional Mean	4.3	-0.008	-0.05
	Standard Deviation	1.2	-0.029	-0.20
	World**	4.66	0.031	0.15
	Least developed countries *	3.29	0.054	0.27
	Low income ****	3.09	0.048	0.05
	Lower-middle income **	4.27	0.010	0.05
	Low & middle income **	4.31	0.035	0.17
	Middle income **	4.48	0.021	0.11
	Upper-middle income **	4.60	0.028	0.14
	High income **	5.85	0.035	0.17

*2004 **2003 ***2001 ****2000

C. Summary for Pillar 3 (System Capacity)

Tables IV.E.1 summarizes the countries that are most vulnerable in terms of system capacity. Those countries appearing in bold-face type show unfavorable rates of growth. Based on standard deviation, ten countries are classified as vulnerable for one or more of the indicators; none are highly vulnerable. There is, however, very little overlap among the countries between the two indicators. Only Azerbaijan and Georgia are rated as vulnerable for both indicators. Conceptually, it is possible that the indicators are inversely related: the less spent on education, the greater the pupil-teacher ratio. However, this correlation is not readily apparent upon

scrutiny of all 27 countries, but appears to hold for the highest ranked (5 and above) vulnerable countries.

Table IV.E.1: Highly-Vulnerable and Vulnerable Countries for Pillar 3 (System Capacity)

	A. Efficiency	B. Resources and Finance
	Basic Education Pupil-Teacher Ratio (2005)	% GDP spent on education (2005)
<i>Highly vulnerable</i>	--	--
<i>Vulnerable</i>	Belarus	Kazakhstan
	Azerbaijan	Armenia
	Estonia	Georgia
	Georgia	Albania
	Russia	Azerbaijan
	Slovenia	FYR Macedonia
<i>Missing Data</i>	Ukraine	Bosnia-Herzegovina

Using the point methodology, Table IV.E.2 shows overall country scores for Pillar 3 indicators and relative ranking. Of the nine countries that were rated vulnerable on at least one indicator, Tajikistan scores the highest for vulnerability. Seventeen countries exhibited no vulnerability in this pillar.

Table IV.E.2: Relative Vulnerability Ranking for Pillar 3 (System Capacity)

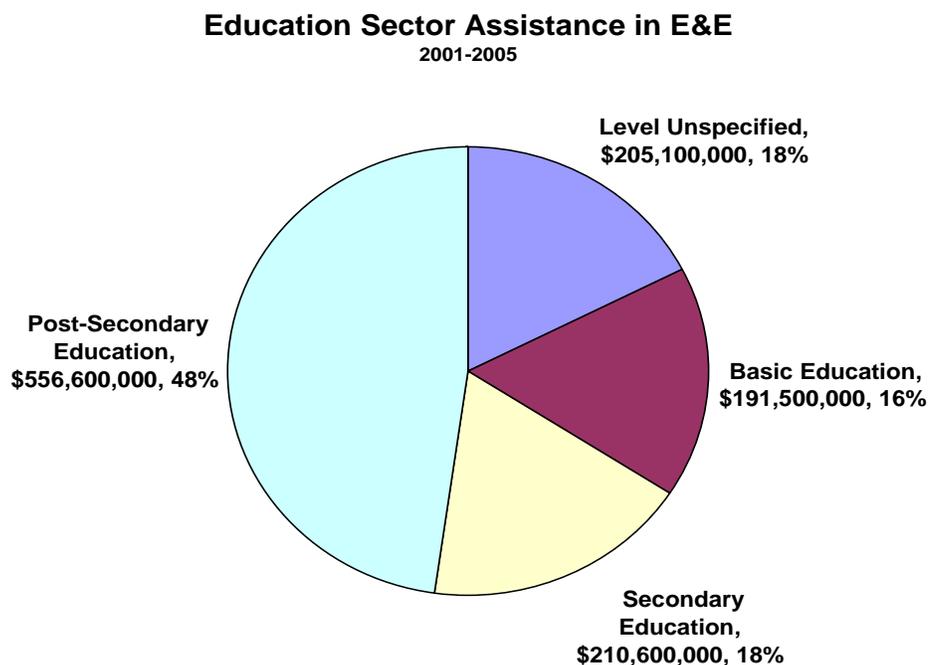
Pillar 3						
No.	Country	Highly Vulnerable (x2 pts)	Vulnerable (x1 pt)	Undesirable Change (x0.5pt)	Points	Vulnerability Ranking
1	Azerbaijan	0	2	2	3	1
2	Georgia	0	2	1	2.5	2
3	Albania	0	1	1	1.5	3
4	Kazakhstan	0	1	1	1.5	3
5	FYR Macedonia	0	1	1	1.5	3
6	Slovenia	0	1	1	1.5	3
7	Belarus	0	1	1	1.5	3
8	Estonia	0	1	1	1.5	3
9	Russia	0	1	1	1.5	3
10	Armenia	0	1	0	1	4
11	Bosnia-Herz.	0	0	0	0	Not Vulnerable
12	Bulgaria	0	0	0	0	Not Vulnerable
13	Croatia	0	0	0	0	Not Vulnerable
14	Czech Republic	0	0	0	0	Not Vulnerable
15	Hungary	0	0	0	0	Not Vulnerable
16	Kyrgyzstan	0	0	0	0	Not Vulnerable
17	Latvia	0	0	0	0	Not Vulnerable
18	Lithuania	0	0	0	0	Not Vulnerable
19	Moldova	0	0	0	0	Not Vulnerable
20	Poland	0	0	0	0	Not Vulnerable
21	Romania	0	0	0	0	Not Vulnerable
22	Slovakia	0	0	0	0	Not Vulnerable
23	Tajikistan	0	0	0	0	Not Vulnerable
24	Turkmenistan	0	0	0	0	Not Vulnerable
25	Ukraine	0	0	0	0	Not Vulnerable
26	Uzbekistan	0	0	0	0	Not Vulnerable
27	Yugoslavia*	0	0	0	0	Not Vulnerable
Total Frequencies		0	12	10		
Total Countries		0	10	9		

*Serbia and Montenegro

V. Pillar 4: Donor Support

Under this final pillar, the amount of international aid allocated to education in the region (excluding U.S. assistance) is examined. Donor support for education is an important factor in determining whether the countries' educational weaknesses and "vulnerability" are being recognized and addressed by the international community. A mismatch between vulnerability and donor support could inform future investment decisions, by USAID and others, as well as justify current investments.

Data is presented for 12 of the countries USAID currently supports in the region. It is based in part on USAID's compilation (August 2007) of DAC-member countries (U.S. excluded) education support programs from 2001-2005.



From 2001 to 2005, donor assistance for education totaled \$1,163,800,000 combined for Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Croatia, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and the former Yugoslavia. The majority was spent on post-secondary education (48%), with 18 percent allocated to secondary education, 18 percent to unspecified education uses, and 16 percent to basic education.

In order to make comparisons across countries, a common unit must be derived. Overall support for education is examined by the amount per 100 persons. Support for basic education is examined by the amount per person under age 15; secondary education per persons age 15-17, and post-secondary per persons 18-59. While obviously these population groupings will not result in accurate per person expenditure, they do provide a standard basis of comparison. Table V.1 presents the results.

Overall donor support for education in the region varies dramatically, ranging from \$10 per 100 persons in Belarus to \$5,384 per 100 persons in Albania. Nine of the countries fall below the average.

Basic education receives the least amount per person, averaging \$9 per person, although the reader is cautioned that the averages do not show actual levels. (For example, it is unlikely that much of the population aged 18 to 59 is participating in post-secondary education.) Donor support for basic education in Bosnia-Herzegovina, Croatia, Georgia, Kazakhstan, and Moldova ranges between \$1-8 per person. Belarus, Turkmenistan, Ukraine, and Uzbekistan report no support for basic education.

Because the population used is small, secondary education support per person appears the largest. This is unlikely, however, given the total figures presented in the above figure which shows 48 percent of funds going to post-secondary. Nonetheless for comparative purposes, several countries fall below the average: Croatia, Georgia, Moldova, and Tajikistan, with Belarus, Kazakhstan, and Turkmenistan receiving no donor support at this level.

For post-secondary, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Ukraine, Uzbekistan, and the former Yugoslavia fall below average, with Belarus and Turkmenistan receiving no donor support.

Countries that fall under the average for all three educational levels are Belarus, Kazakhstan, Moldova, Turkmenistan, and Ukraine. Countries falling under the average for basic and secondary education include Belarus, Bosnia, Croatia, Georgia, Kazakhstan, Moldova, Turkmenistan, and Ukraine.

It must be noted that the above observations have been conducted in a vacuum with neither reference to the different political and economic systems nor country support to education. Lower levels of donor support may have very different causes, depending on country need and priorities, as well as the donor investment agendas.

Table V.1: Donor Support for Education by Level (U.S. excluded) per 2005 population

		Overall	Basic Education	Secondary Education	Post Secondary
		per 100 persons	per 0-14 year olds	per 15-17 year olds	per 18-59 year olds
1	Albania	5384.	43	202	35
2	Armenia	1481.	16	52	10
3	Azerbaijan	441	10	0	3
4	Belarus	10	0	0	0
5	Bosnia	3259	4	nd	35
6	Croatia	1646	5	9	23
7	Georgia	2270	4	8	23
8	Kazakhstan	260	1	0	3
9	Kyrgyzstan	1082	8	23	8
10	Moldova	1028	7	4	11
11	Tajikistan	802	15	2	2
12	Turkmenistan	23	0	0	0
13	Ukraine	63	0	0	1
14	Uzbekistan	487	0	43	2
15	Yugoslavia (Serbia & Montenegro)*	2227	17	88	20
	Average	1364	9	18	12
	Total	731	5	23	6

*for 2002

VI. Synthesis

This section summarizes and synthesizes the results of the preceding analysis (by pillar) in order to identify those countries that are most “vulnerable” in terms of being able to address the educational needs of their school-age population, as well as the areas of greatest vulnerability for education relative to the region. Pillars 1 (Context), 2 (Student Outcomes), and 3 (System Capacity) are used to determine vulnerability. Pillar 4 (Donor Support) is later used to determine the extent to which needs are being addressed and signal those countries that appear to be in especial need of assistance. As in the previous chapters, vulnerability is discussed by: (1) a summary of the frequency of vulnerability, and (2) the point ranking method of aggregation.

The reader should keep in mind that both the frequency of vulnerability and ranking of vulnerability are influenced by: (i) the number of indicators used, and (ii) the availability of data for a country. The frequency of vulnerability incidence is influenced by the number of indicators in a pillar (i.e., the more indicators the greater the probability for vulnerability). Selection of the indicators (described in Chapter 1) was based on the utility and availability of data. There is no prescribed or definitive list that would set internationally-recognized parameters for assessing vulnerability. Additionally, data was not available for all countries on all indicators. In two instances, this could have a notable impact on the country ranking. Of the 15 indicators used, data are missing for six indicators for Bosnia-Herzegovina and five indicators for Turkmenistan. Given the trends exhibited by the data that is available for these countries, it is not unlikely that their vulnerability rankings would increase (i.e., they would suffer greater vulnerability than is estimated by the available data.)

A. Summary of Vulnerability by Frequency

Tables VI.A.1 (below) presents a summary of vulnerability by indicator and pillar.

Twenty-four of the 27 countries in the region were classified as vulnerable or highly vulnerable in at least one indicator per pillar, with six countries qualifying as “highly vulnerable” and 24 countries qualifying as “vulnerable” for at least one indicator.

Among the 24 countries qualifying as vulnerable or highly vulnerable on one or more indicators, Tajikistan appears most often (eight times) and also figures most frequently in the highly vulnerable category (three times). It is followed by Azerbaijan (seven times); Albania, Uzbekistan, Kyrgyzstan, and Turkmenistan (six times); Moldova (five times); Armenia and Kazakhstan (four times); Bosnia-Herzegovina, Bulgaria, FYR Macedonia, Georgia, and Romania (three times); Belarus, Latvia, and Slovenia (two times); and Estonia, Hungary, Russia, Slovakia, Ukraine, and Yugoslavia (one time).

The three countries that never fell within the vulnerability range (i.e., more than 1 SD from the mean) for any indicator in any pillar were Croatia, the Czech Republic, and Poland.

The frequencies of vulnerability suggest the areas of greatest vulnerability or poorest performance for the education sector. This can be examined by pillar and by indicator.

By pillar, the area of greatest vulnerability was in student outcomes (Pillar 2). Of the 24 countries qualifying as vulnerable or highly vulnerable on one or more indicators, 88 percent of them (21 countries) exhibited vulnerability in this pillar. Of these, 21 percent (5 countries) were highly vulnerable on at least one indicator. In contrast, only 42 percent of the countries were classified as vulnerable on one or more indicators for both Pillar 1 (Context) and Pillar 3 (System Capacity), with 10 countries in each pillar. Two of the ten countries (20%) exhibiting vulnerability for Pillar 1 were highly vulnerable on a single indicator and none of the countries exhibiting vulnerability for Pillar 3 were highly vulnerable on any indicator.

Table VI.A.1: Summary Vulnerability by Indicator and Pillar

Pillar 1: Context				Pillar 2: Student Outcomes								Pillar 3: System Capacity		
A. Economic Status	B. Population Pressure	C. Health	D. Corruption	A. Participation				B. Equity	C. Attainment		D. Performance		A. Efficiency	B. Resources
GDP per capita, PPP	Percent Population 0-14	Tuberculosis Incidence	Control of Corruption	Pre-Primary NER	Basic Education GER	Total Upper Secondary GER	Tertiary GER	Primary+Secondary GER GPI	Primary Completion Rate	School Life Expect'y	Youth Literacy Rate	Primary Repetition Rate	Basic Ed Pupil-Tchr Ratio	% GDP on education
Highly Vulnerable														
													Bulgaria	
		Kazakhstan											Latvia	
													Romania	
	Tajikistan					Tajikistan		Tajikistan						
						Turkmenistan								
Vulnerable														
	Albania				Albania	Albania				Albania		Albania		Albania
					Armenia			Armenia		Armenia				Armenia
			Azerbaijan	Azerbaijan		Azerbaijan	Azerbaijan			Azerbaijan			Azerbaijan	Azerbaijan
					Belarus								Belarus	
				Bosnia-Herz	Bosnia-Herz	Bosnia-Herz								
									Bulgaria				Bulgaria	
													Estonia	
							FYR Macedonia					FYR Macedonia		FYR Macedonia
Georgia									Georgia				Georgia	Georgia
													Hungary	
Kyrgyzstan	Kyrgyzstan	Kyrgyzstan	Kyrgyzstan	Kyrgyzstan		Kyrgyzstan								Kazakhstan
										Latvia				
										Lithuania				
Moldova		Moldova				Moldova		Moldova		Moldova				
		Romania											Romania	
													Russia	
													Slovakia	
												Slovenia	Slovenia	
Tajikistan			Tajikistan	Tajikistan			Tajikistan					Tajikistan		
	Turkmenistan		Turkmenistan	Turkmenistan	Turkmenistan									
								Ukraine						
Uzbekistan	Uzbekistan		Uzbekistan	Uzbekistan			Uzbekistan					Uzbekistan		
														Yugoslavia
Number (vulnerable + highly vulnerable) and Percentage (%) of Countries classified as Vulnerable by Indicator ¹⁴														
5+0=5	4+1=5	3+1=4	6+0=6	7+0=7	5+0=5	6+2=8	5+0=5	5+1=6	3+0=3	6+0=6	3+2=5	5+1=6	6+0=6	6+0=6
22%	21%	17%	25%	29%	21%	33%	21%	27%	15%	27%	23%	29%	26%	26%
Missing Data														

¹⁴ Percentages are calculated using a denominator based on the number of countries classified as vulnerable (24) less the number of countries for which data is missing.

								Bosnia-Herz	Bosnia-Herz	Bosnia-Herz	Bosnia-Herz	Bosnia-Herz		Bosnia-Herz
									Russia					
								Turkmenistan	Turkm'stan	Turkm'stan	Turkm'stan	Turkm'stan		
													Uzbekistan	
													Ukraine	
Yugoslavia														

Table VI.A.2 shows the frequency of country vulnerability by pillar. Only four countries “achieved” vulnerability status on at least one indicator in all three pillars: Albania, Azerbaijan, Georgia, and Kazakhstan. Relative to the region, this suggests that their under-performing (i.e., Pillar 2) and weak education systems (i.e., Pillar 3) were also threatened by contextual factors (i.e., Pillar 1). In contrast, education in six countries (Kyrgyzstan, Moldova, Romania, Tajikistan, Turkmenistan, and Uzbekistan) appeared to suffer from poor student outcomes and contextual factors, while education in four countries (Armenia, Belarus, FYR Macedonia, and Slovenia) faced relatively greater challenges in student outcomes and system capacity. Ten countries appeared vulnerable in only one area or pillar. Bosnia-Herzegovina, Bulgaria, Hungary, Latvia, Lithuania, Slovakia, Ukraine, and Yugoslavia exhibited relative vulnerability in student outcomes; Estonia and Russia in system capacity. While these frequencies may show general tendencies within the region, the reader is cautioned that this is not intended as diagnostic of the individual countries’ education sectors.

Table VI.A.2: Frequency of Country Vulnerability by Pillar

All 3 Pillars	Two Pillars Only		One Pillar Only	
	<i>Pillars 1 and 2</i>	<i>Pillars 2 and 3</i>	<i>Pillar 2</i>	<i>Pillar 3</i>
Albania	Kyrgyzstan	Armenia	Bosnia-Herzegovina	Estonia
Azerbaijan	Moldova	Belarus	Bulgaria	Russia
Georgia	Romania	FYR Macedonia	Hungary	
Kazakhstan	Tajikistan	Slovenia	Latvia	
	Turkmenistan		Lithuania	
	Uzbekistan		Slovakia	
			Ukraine	
			Yugoslavia*	

*Serbia and Montenegro

By indicator, the areas of greatest relative weakness or vulnerability for more than 25 percent of the vulnerable countries were: upper secondary GER (33% of vulnerable countries), pre-primary NER (29%), primary repetition (29%), SLE (27%), primary and secondary GER GPI (27%), basic education pupil-teacher ratio (26%), percentage of GDP spent on education (26%), and control of corruption (25%). Indicators with the lowest percentages of vulnerable countries, signifying the areas of least relative vulnerability, were the primary completion rate (15%) and tuberculosis incidence (17%). Indicators for which more than 50 percent of vulnerable countries show unfavorable change over the period are: control of corruption (66%), basic education GER (60%), total upper secondary GER (63%), primary and secondary GER GPI (100%), primary completion rate (100%), basic education pupil-teacher ratio (100%), and percent of GDP spent on education (66%).

B. Ranking of Vulnerability

Table VI.B.1 presents an aggregation and synthesis of the countries’ vulnerability, based on the point scoring method (described in Chapter 1), which assigns points for the number of times the country fell into a vulnerability category. Unlike simple frequencies, the point scoring method takes into account the degree of severity (vulnerable or highly vulnerable), as well as whether the direction of change during the 1998-2005 timeframe was undesirable, in order to produce a more nuanced vulnerability ranking.

Among the 27 countries, there were 14 different aggregate scores, so country ranking ranges from one (most vulnerable) to 14 (not vulnerable). Tajikistan has the highest aggregate score at 11.5 points, compared to the total (all countries) mean score at 2.9 points. It is also distinguished by the widest point difference from the next ranked country—2.5 points, in contrast to the 0.5-1.5 point difference between the other country ranks. Despite its leading score, however, Tajikistan was the highest scorer for only one pillar (Pillar 2). Kyrgyzstan earned the highest score for Pillar 1 and Georgia for Pillar 3.

Second-ranked Turkmenistan (9 points) received the highest score for undesirable direction of change: four out of six (66%) of the indicators on which it is rated vulnerable also changed in unfavorable directions, indicating that a relatively bad education situation has been worsening. In contrast, the education conditions in Tajikistan appear to be improving, as it shows the lowest number of incidences for undesirable change among the countries which were rated vulnerable on one or more indicators. Only one out of the eight indicators (12%) for which Tajikistan was classified as vulnerable showed an unfavorable direction of change. Among the non-zero scoring countries, only ninth-ranked Romania experienced no unfavorable directions of change for the three indicators on which it was rated vulnerable.

Table VI.B.1: Aggregate Vulnerability (Summary by Pillar)

No.	Country	Pillar 1				Pillar 2				Pillar 3				Synthesis				
		Highly Vulnerable	Vulnerable	Undesirable Change	Pts	Highly Vulnerable	Vulnerable	Undesirable Change	Pts	Highly Vulnerable	Vulnerable	Undesirable Change	Pts	Highly Vulnerable	Vulnerable	Undesirable Change	Total Pts	Rank
1	Tajikistan	1	2	0	4.0	2	3	1	7.5	0	0	0	0	3	5	1	11.5	1
2	Turkmenistan	0	2	1	2.5	1	3	3	6.5	0	0	0	0	1	5	4	9.0	2
3	Azerbaijan	0	1	0	1.0	0	4	1	4.5	0	2	2	3	0	7	3	8.5	3
4	Kyrgyzstan	0	4	2	5.0	0	2	1	2.5	0	0	0	0	0	6	3	7.5	4
5	Albania	0	1	0	1.0	0	4	1	4.5	0	1	1	1.5	0	6	2	7.0	5
6	Uzbekistan	0	3	1	3.5	0	3	1	3.5	0	0	0	0	0	6	2	7.0	5
7	Kazakhstan	1	1	1	3.5	0	1	0	1.0	0	1	1	1.5	1	3	2	6.0	6
8	Moldova	0	2	0	2.0	0	3	2	4.0	0	0	0	0	0	5	2	6.0	6
9	Georgia	0	1	0	1.0	0	1	1	1.5	0	2	1	2.5	0	4	2	5.0	7
10	Armenia	0	0	0	0	0	3	1	3.5	0	1	0	1	0	4	1	4.5	8
11	Bosnia-Herz	0	0	0	0	0	3	3	4.5	0	0	0	0	0	3	3	4.5	8
12	Bulgaria	0	0	0	0	1	2	1	4.5	0	0	0	0	1	2	1	4.5	8
13	Latvia	0	0	0	0	1	1	2	4.0	0	0	0	0	1	1	2	4.0	9
14	Romania	0	1	0	1.0	1	1	0	3.0	0	0	0	0	1	2	0	4.0	9
15	FYR Macedonia	0	0	0	0	0	2	0	2.0	0	1	1	1.5	0	3	1	3.5	10
16	Slovenia	0	0	0	0	0	1	1	1.5	0	1	1	1.5	0	2	2	3.0	11
17	Belarus	0	0	0	0	0	0	0	0	0	1	1	1.5	0	1	1	1.5	12
18	Estonia	0	0	0	0	0	0	0	0	0	1	1	1.5	0	1	1	1.5	12
19	Russia	0	0	0	0	0	0	0	0	0	1	1	1.5	0	1	1	1.5	12
20	Slovakia	0	0	0	0	0	1	1	1.5	0	0	0	0	0	1	1	1.5	12
21	Ukraine	0	0	0	0	0	1	1	1.5	0	0	0	0	0	1	1	1.5	12
22	Yugoslavia*	0	0	0	0	0	1	1	1.5	0	0	0	0	0	1	1	1.5	12
23	Hungary	0	0	0	0	0	1	0	1.0	0	0	0	0	0	1	0	1.0	13
24	Lithuania	0	0	0	0	0	1	0	1.0	0	0	0	0	0	1	0	1.0	13
25	Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 NV
26	Czech Republic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 NV
27	Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 NV
Total Frequencies		2	18	5		6	42	22		0	12	10		8	72	37		
Total Countries		2	10	4		5	21	16		0	10	9		6	24	21		

*Serbia and Montenegro

VII. Conclusions

Twenty-four of the 27 E&E countries, or 89 percent, exhibit vulnerability on one or more indicators. Of these, six countries, or 25 percent, were rated highly vulnerable on one or more indicators. Based on the point scoring system developed for aggregate ranking, the worst case of vulnerability is Tajikistan, which not only had the highest score, but also had the greatest number of incidences of vulnerability. Tajikistan also figures most frequently in the highly vulnerable category.

Croatia, the Czech Republic, and Poland are notable for showing no incidences of vulnerability; for all 15 indicators, these countries always fell within 1 SD of the mean. These are all upper-middle income countries. However, higher income status does not preclude a country from some degree of vulnerability. Slovenia, the only high income country, suffered vulnerability on two indicators (although overall it ranked low on vulnerability). In general, however, vulnerability ranking appears to correlate with national per capita income: the three low-income countries in the region (Kyrgyzstan, Tajikistan, and Uzbekistan) are all in the top range of vulnerability ranking and most of the upper-middle income countries are in the lower range.

Many of the countries ranking high in vulnerability do not appear to be receiving donor support on par with those ranking lower. Georgia, Kazakhstan, Moldova, Kazakhstan, and Turkmenistan received less than the regional average per person for donor support in basic and secondary education. Conversely, the former Yugoslavia, a country ranking relatively low in vulnerability, has received above average amounts per person, which may indeed be a reason it is relatively well-off from an education standpoint. However, Albania—relatively highly ranked for vulnerability—has also received above average amounts per person of donor support, which may also reflect donor responsiveness to its needs, among other reasons.

The greatest area of vulnerability among the countries is in student outcomes (Pillar 2): 88 percent of countries were vulnerable on one or more of the indicators, with the greatest percentage (33%) showing weakness in total upper secondary enrollments. Less than half, or 42 percent, displayed vulnerability for both context indicators (Pillar 1) and system capacity indicators (Pillar 3).

Some tentative recommendations, which are subject to several caveats and qualifications, for the region that emerge from the above observations and analysis are:

- Intervene with assistance to the education sector in the countries ranking among the most vulnerable, particularly those with notable incidences of undesirable directions of change.
- Prioritize assistance to those countries with a higher vulnerability ranking that appear relatively underfunded by donors, specifically Georgia, Kazakhstan, Moldova, Kazakhstan, and Turkmenistan.
- Planning, aligning, and conducting education programs with other sector programs (economic, growth, population, health, and democracy and governance) in countries with a

high vulnerability ranking may reduce or control threats to the education system and its development.

- The goal or strategic objective for the education program in vulnerable countries should respond to the areas of weakness in student outcomes. System capacity building is the most obvious and sustainable route, even though fewer than half the countries displayed vulnerability in this pillar.

These recommendations, however, must be considered within the parameters of this study and the methodologies used. Considerations and cautions include:

- The E&E region countries are comparatively well-off in terms of context, student outcome, and system capacity indicators. Their vulnerability is relative to the region, not the world. The E&E regional means exceeded the world means on 12 out of 13 indicators for which comparative global data is available and never fell below the means for middle income countries. On only one indicator—the percentage of GDP spent on education—did the E&E regional mean fall below the world mean. Consequently, analysis of educational need should not be assessed based only on relative status in the region, but also on other comparable countries and internationally-accepted standards and levels for educational development.
- The ranking of country vulnerability may change according to the number and types of indicators selected. As described in Chapter 1, while indicator selection was informed by best practice, it was ultimately determined by data availability. In some instances, lack of data precluded use of the best indicators or resulted in an incomplete range of indicators.
- The national-level measures used may mask regional or population group disparities or problems. A country with robust educational indicators may also have groups or sub-groups that are underserved or performing poorly.
- The point scoring methodology did not weight the various indicators. Not all indicators are necessarily equal; some indicators may have more value in determining fundamental weakness in education than others. For example, the “most vulnerable” country, Tajikistan, was rated vulnerable for pre-primary NER, total upper secondary GER, and tertiary GER, but not for basic education GER. Arguably, basic education is the most important level of education and Tajikistan does better than other “less vulnerable” countries, such as Belarus. Which country should be given priority?

Such questions show the necessity of using multiple approaches and methods to analyze country need and make regional comparisons. This study provides a broad ranking of countries that gives general orientation to the degree of educational vulnerability of countries relative to their regional peers. As such, it can be used to identify countries that warrant further scrutiny, general areas of weakness or vulnerability that should be further investigated, and areas of strength that may be emulated or serve as a foundation for future action.

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Annex 1

Country Income Classification (Source: WDI)

Income Classification	Countries (2005 GNI Per Capita)
Low Income	Kyrgyzstan
\$875 or less	Tajikistan
	Uzbekistan
Lower Middle Income	Albania
\$876-\$3,465	Armenia
	Azerbaijan
	Belarus
	Bosnia Herzegovina
	Bulgaria
	FYR Macedonia
	Georgia
	Kazakhstan
	Moldova
	Turkmenistan
	Ukraine
	Yugoslavia (Serbia & Montenegro)
Upper Middle Income	Croatia
\$3,466-\$10,725	Czech Republic
	Estonia
	Hungary
	Latvia
	Lithuania
	Poland
	Romania
	Russian Federation
	Slovak Republic
High Income	Slovenia
\$10,726 or more	