

## Education

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Providing educational opportunities to the population is a critical task for all governments and is essential for economic growth. Indeed, education is the one category of spending that is confirmed by all empirical studies to be positively associated with growth rates. However, more spending is not the answer by itself—the efficiency of spending is as important as the amount of spending. While research is clear that a more educated population leads to rapid economic growth, higher levels of public spending are not always associated with better educational outcomes. The efficiency and effectiveness of education spending varies widely among countries. Some of the Europe and Central Asia (ECA) region and non-ECA comparator countries covered in this study have better educational outcomes (whether enrollment rates, average years of schooling, or learning scores) than would be expected given their levels of per capita income or public spending on education, while others have worse outcomes than would be expected.

Although many factors other than public spending influence educational outcomes, clear policy choices also affect the efficiency of public spending. As discussed in greater detail in this chapter, many ECA countries need to deal with excessive numbers of teachers and classrooms as well as low pay scales for teachers, both of which skew

public spending toward salaries and away from complementary inputs such as books and supplies while also demotivating teachers. A move toward capitation financing can help spur school consolidation, but it needs to be accompanied by a loosening of labor and wage regulations to facilitate needed restructuring of expenditures. ECA countries have also inherited from socialism a legacy of expensive technical and vocational education at the secondary level, while the trend in other high-growth countries is to move toward greater integration of technical and vocational education with general education streams. Moreover, ECA countries are seeking to enhance efficiency by taking decentralization further than the deconcentration of the socialist era, as well as by greater reliance on private delivery of education services and on private financing, particularly at the tertiary level.

### Education and Economic Growth

An extensive body of research exists on the links between education and economic growth. For individuals, research on the value of schooling focuses on the economic returns to differing levels of school attainment, following the analyses of human capital by Mincer (1970, 1974), which consider how investing in differing amounts of schooling affects individual earnings. Over the past 30 years, hundreds of such studies have been conducted around the world (Hanushek and Wössmann 2007) and they have shown that more schooling is associated with higher individual earnings, with a rate of return across countries of roughly 10 percent per additional year of schooling (Psacharopoulos and Patrinos 2004). These basic estimates of the Mincerian earnings models are typically interpreted as the private returns to schooling, with social returns exceeding the private returns as a result of positive externalities, for example, the positive effects of education on crime reduction (Lochner and Moretti 2004), improved health (Currie and Moretti 2003), and increased citizenship participation (Dee 2004).

Moving beyond the microeconomic evidence of the productivity-enhancing effects of education to the macroeconomic perspective of long-run economic growth of countries, there are at least three mechanisms through which education may affect economic growth (Hanushek and Wössmann 2007). First, education increases the human capital in the labor force, which increases labor productivity and thus transitional growth toward a higher equilibrium level of output (as in the augmented neoclassical growth theories, for example, Mankiw, Romer, and Weil [1992]). Second, education may

increase the innovative capacity of the economy, and additional knowledge on new technologies, products, and processes promotes growth (as in theories of endogenous growth, for example, Lucas [1988]). Third, education may facilitate the diffusion and transmission of knowledge needed to understand and process new information and to successfully implement new technologies devised by others, which again promotes economic growth (for example, Benhabib and Spiegel [2005]).

Thus, most cross-country empirical studies of long-run economic growth now include some proxy for human capital, and these are invariably significant. The standard method to estimate the effect of education on economic growth is to estimate cross-country growth regressions where countries' average annual growth in GDP per capita over several decades is expressed as a function of measures of schooling and a set of other variables deemed to be important for economic growth (Hanushek and Wössmann 2007). Following the classical contributions by Barro (1991, 1997), a vast early literature of cross-country growth regressions has tended to find a significant positive association between quantitative measures of schooling and economic growth (for an extensive review, see Sianesi and Van Reenen [2003]). Indeed, an extensive robustness analysis by Sala-i-Martin, Doppelhofer, and Miller (2004) of 67 explanatory variables in growth regressions on a sample of 88 countries finds primary schooling to be the most robust influence factor (after an East Asian dummy) on growth in GDP per capita during 1960–96.

Yet questions persist about the interpretation of such relationships. A substantial controversy has emerged in the economics literature about whether it is the *level* of years of schooling (as would be predicted by several models of endogenous growth) or the *change* in years of schooling (as would be predicted by basic neoclassical models) that is the more important driver of economic growth (Hanushek and Wössmann 2007). While recent research tends to find a positive effect of schooling quantity on economic growth, it seems beyond the scope of current data to draw strong conclusions about the relative importance of different mechanisms for school quantity to affect economic growth. Even so, several recent studies suggest that education is important in facilitating research and development and the diffusion of technologies, with initial phases of education more important for imitation, and higher education more important for innovation (Vandenbussche et al. 2006).<sup>16</sup> But reverse causation running from higher economic growth to additional education may be at least as important as the causal effect of education on growth in the cross-country association (Bils and Klenow 2000). It is also important—for economic

growth—to get other things right as well, particularly the institutional framework of the economy (Pritchett 2001, 2006).

Investigations of growth have employed various measures of formal schooling activities as proxies for relevant human capital, the most frequently used measures being either the primary- or secondary-school enrollment rate (Barro 1991; Mankiw, Romer, and Weil 1992; Levine and Renelt 1992).<sup>1</sup> See table 5.1. Generally speaking, both the ECA and non-ECA countries demonstrate near-universal primary enrollment rates (only Croatia, Turkey, and Ukraine have primary net enrollment rates below 90 percent); secondary enrollment rates are slightly lower but remain high, and tertiary enrollment shows a wider variation.

The share of secondary enrollments in the academic versus the vocational or technical track provides an interesting insight. As table 5.2 shows, of the ECA focus countries, only Poland and Ukraine have secondary enrollments roughly evenly split between the academic and the vocational tracks. Among the other countries, Albania, Armenia, Georgia, and the Kyrgyz Republic have a substantially higher

**TABLE 5.1**  
**Enrollment Rates, 2004**

Country	Primary		Secondary		Tertiary
	Gross	Net	Gross	Net	Gross
<b>ECA focus countries</b>					
Albania <sup>a</sup>	104.2	95.6	77.8	73.9	16.4
Armenia	100.9	93.7	91.4	88.7	26.2
Croatia <sup>a</sup>	94.4	87.3	88.2	85.0	38.7
Georgia	95.1	92.8	82.3	80.7	41.5
Kyrgyz Republic	98.0	90.1	88.0	—	39.7
Poland	98.9	97.3	96.7	90.0	61.0
Romania	106.5	91.9	85.1	80.8	40.2
Slovak Republic	99.1	—	94.2	—	36.1
Turkey	93.3	89.3	79.2	—	29.0
Ukraine	94.8	82.1	92.9	83.5	65.5
ECA average <sup>b</sup>	103.6	90.4	90.5	—	49.8
<b>Comparator countries</b>					
Chile	103.7	—	89.1	—	43.0
Ireland	106.5	96.4	111.6	86.5	58.5
Korea, Republic of	105.1	99.6	90.9	88.3	88.5
Spain	107.7	99.4	119.1	96.7	65.7
Thailand	98.5	—	77.3	—	41.0
Uganda	125.4	—	18.6	15.1	3.4
Vietnam	98.0	—	73.5	—	10.2

Source: World Development Indicators.

Note: — = Not available.

a. 2003 data.

b. Includes all ECA countries (not only the focus countries) where 2004 data are available.

TABLE 5.2

**Upper Secondary Education Enrollment, Percentage Share of Gross Rate, 2004**

Country	General or academic	Vocational or technical	Country	General or academic	Vocational or technical
<i>ECA focus countries</i>			<i>Comparator countries</i>		
Albania	83.3	16.7	Chile	—	—
Armenia	75.8	24.2	Ireland (2001–02)	100.0	0
Croatia	26.6	73.4	Korea, Republic of	—	—
Georgia	2.8	27.2	Spain (2001–02)	62.0	38.0
Kyrgyz Republic	72.1	27.9	Thailand	—	—
Poland	46.7	53.3	Uganda	—	—
Romania	34.5	65.5	Vietnam	—	—
Slovak Republic	38.2	61.8			
Turkey	—	—			
Ukraine	52.7	47.3			

Sources: TransMONEE 2006 Database, UNICEF IRC, Florence; European Commission 2005.

Note: — = Not available. The gross enrollment rate for ECA countries is calculated using the population ages 15–18, except in the case of the Slovak Republic, where it is those ages 14–17.

share of enrollments in the academic track, while the opposite is true for Croatia, Romania, and the Slovak Republic. The two European comparator countries are yet different: Ireland has no vocational or technical track in upper secondary, and in Spain the academic track accounts for roughly two-thirds of upper secondary enrollment.

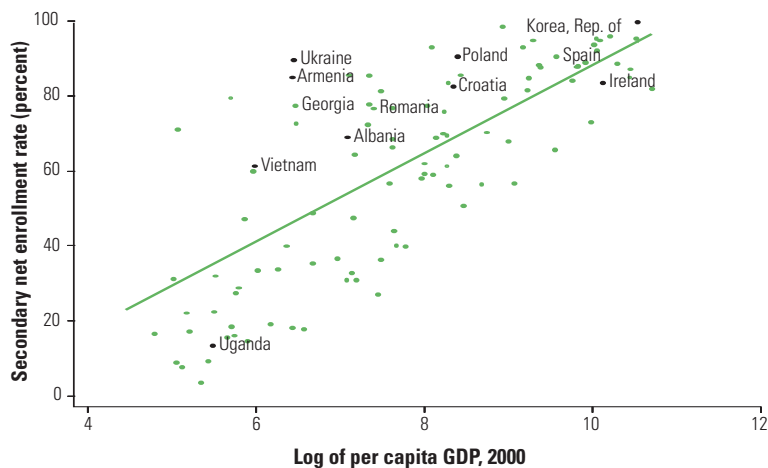
Bearing in mind the above-cited evidence on the link between education and growth, a simple scatter plot of secondary net enrollment rate against GDP per capita for 116 countries (figure 5.1) shows the expected positive correlation. All ECA focus and most comparator countries (with the exception of Ireland and Uganda) lie above the regression line, that is, they demonstrate relatively high secondary net enrollment rates for the level of GDP per capita. However, thinking about causality flowing in the opposite direction, that is, the effect of education on growth, then countries above the regression line have relatively low GDP per capita for their level of secondary enrollment. In other words, they do poorly in translating their secondary education into economic growth. Furthermore, among the ECA focus countries, Ukraine, Armenia, and Georgia, all countries where secondary enrollments are more biased to the academic track, have the largest gap between their enrollment rates and GDP per capita. This would imply a tighter link between enrollment in vocational and technical education and economic growth than enrollment in the academic track. A similar scatter plot of tertiary gross enrollment rate against GDP per capita (figure 5.2) shows again a positive relationship between the two but this time the performance of the ECA focus

countries is closer to the regression line. That is, the ECA focus countries do better in translating their tertiary education into economic growth.

Notwithstanding the fact that growth regressions tend to include schooling flow variables such as net or gross enrollments rates as proxies for human capital, arguably these do not accurately represent the relevant stock of human capital. To deal with this problem Barro and Lee (1993) pioneered the development of better schooling stock variables through the use of individual country survey and census data. A plot of the mean years of education of the population ages 25 years and older against per capita GDP (figure 5.3) shows the familiar positive correlation again. Although data are only available for five of the ECA focus countries, Romania and Turkey are farthest from the regression line, with Romania demonstrating lower than expected GDP per capita, and Turkey higher than expected, given their populations' mean years of education.

A challenging problem made clear by the alternative of using mean years of education, however, comes from the lack of adjustment for schooling quality. It seems beyond doubt that the amount of knowledge acquired in one year of schooling is not independent of the qual-

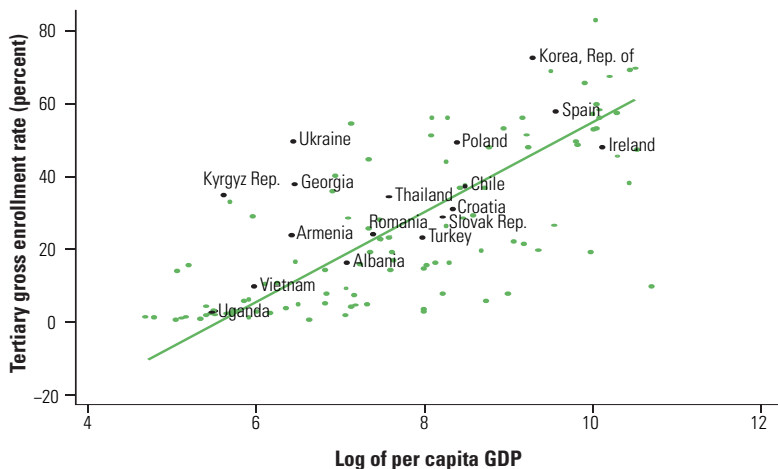
**FIGURE 5.1**  
**Secondary Net Enrollment Rate and Per Capita GDP, 2000**



Source: World Development Indicators.

Note: The line corresponds to the predicted enrollment rate from a weighted regression on log per capita GDP and a constant, with the weights given by population in a country. The sample size for the regression is 105 countries. Only the ECA focus and comparator country names are included. Data are provided for 2000 for consistency purposes because the latest data on mean years of education available from Barro and Lee (2001), which will be used in figure 5.2, are for 2000.

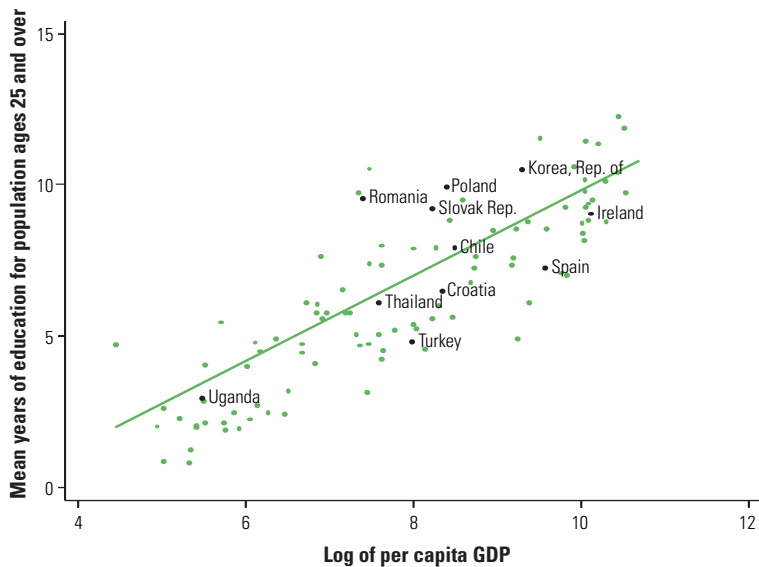
**FIGURE 5.2**  
**Tertiary Gross Enrollment Rate and Per Capita GDP, 2000**



Source: World Development Indicators.

Note: The line corresponds to the predicted enrollment rate from a weighted regression on log per capita GDP and a constant, with the weights given by population in a country. The sample size for the regression is 120 countries. Only the ECA focus and comparator country names are included.

**FIGURE 5.3**  
**Mean Years of Education and Per Capita GDP, 2000**



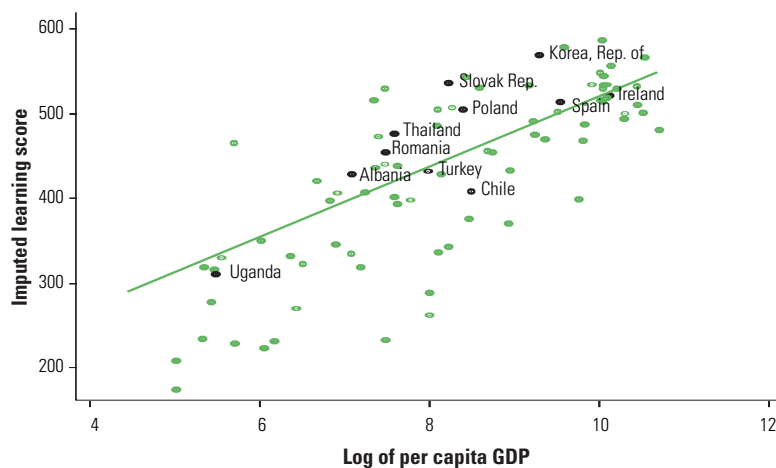
Sources: WDI; Barro and Lee 2001.

Note: The line corresponds to the predicted years of education from a weighted regression on log per capita GDP and a constant, with the weights given by population in a country. The sample size for the regression is 106 countries. Only the ECA focus and comparator country names are included.

ity of the education system in which it takes place. Different increases in skills depend on the efficiency of the education system in which the schooling takes place, the quality of teaching, the educational infrastructure, and the curriculum. Thus, rather than counting how long students have sat in school, how much students have learned while in school would seem to determine the effect of education on economic growth. Indeed, when using data from international student achievement tests through 1991 to build a measure of educational quality, Hanushek and Kimko (2000) find a statistically and economically significant positive effect of the quality of education on economic growth over 1960–90 that dwarfs the association between quantity of education and growth.

Crouch and Fasih (2004) address lack of a common measure of learning (and therefore education quality) across many developing countries by constructing an imputed learning score that uses the overlap between various international assessments to assign a likely value to those countries that only participated in one assessment on a scale equivalent to the 1999 application of the Trends in International Mathematics and Science Study. Figure 5.4 shows the positive correlation between this imputed learning score and GDP per capita.

**FIGURE 5.4**  
**Correlation Between Imputed Learning Score and GDP Per Capita, 2000**



Sources: World Development Indicators; Crouch and Fasih 2004.

Note: The line corresponds to the predicted learning score from a weighted regression on log per capita GDP and a constant, with the weights given by population in a country. The sample size for the regression is 86 countries. Only the ECA focus and comparator country names are included.

Although again the coverage of ECA focus countries is limited, it is arguably the case that both the focus and comparator countries are quite clustered around the regression line. Turkey, in particular, lies far closer to the regression line than when mean years of education alone were considered, so that correcting this stock variable for its quality leads to a smaller gap between education and expected GDP per capita.

Turning to the comparator countries, the Republic of Korea represents a clear outlier with higher education outcomes than its GDP per capita would predict, or conversely, lower GDP per capita than its education measures would predict. The other countries lie close to the regression line, with the exception of Ireland and Chile, which demonstrate somewhat higher GDP per capita than their education measures would indicate. Indeed, OECD (2000) reports that the improvement in human capital seems to be a common factor behind the growth process of the past decades in all Organisation for Economic Co-operation and Development (OECD) countries, but especially so in Italy, Greece, Ireland, and Spain, where the increase in human capital accounted for more than half a percentage point acceleration in growth in the 1990s compared with the previous decade.

## Public Education Spending and Education Outcomes

Given the link between education outcomes and economic growth outlined above, the issue of how to achieve better education outcomes—and the role public education expenditures play—becomes important. Indeed, public education expenditures constitute a significant outlay on the part of governments, averaging 5.5 percent of GDP and 13.3 percent of total public spending in OECD countries in 2003 (OECD 2006a). Turning to the ECA focus and comparator countries, with the exception of Poland and Ukraine, the percentage shares of public education expenditures in GDP are lower than the 2003 OECD average (table 5.3). The shares for Armenia and Georgia are particularly low at 2.1 and 2.9 percent, respectively. However, the OECD share of public education expenditures in total government expenditures is surpassed by several of the focus and comparator countries, including Chile, Korea, Thailand, Uganda, and Ukraine.

In contrast to the general finding that education has a positive effect on growth, many studies show that the relationship between public spending for education and measures of education attainment is weak (Flug, Spilimbergo, and Wachtenheim 1998; Landau 1986; Mingat and Tan 1992, 1998; Noss 1991). Instead, other variables have

TABLE 5.3

**Total Public Education Expenditure, 2003**

Country	GDP	Total public expenditure	Country	General or GDP	Total public expenditure
<i>ECA focus countries</i>			<i>Comparator countries</i>		
Albania	3.1	—	Chile	4.1	19.1
Armenia	2.1	—	Ireland (2001–02)	4.4	13.2
Croatia	4.7	—	Korea, Republic of	4.6	16.1
Georgia	2.9	13.1	Spain (2001–02)	4.5	11.2
Kyrgyz Republic	4.4	—	Thailand	4.2	27.5
Poland	5.8	12.7	Uganda	5.2	18.3
Romania	3.6	—	Vietnam	—	—
Slovak Republic	4.4	11.0			
Turkey	3.7	—			
Ukraine	5.6	19.8			
Europe and Central Asia	4.4	—			

Sources: World Development Indicators, Eurostat, and TransMONEE databases.

Note: — = Not available.

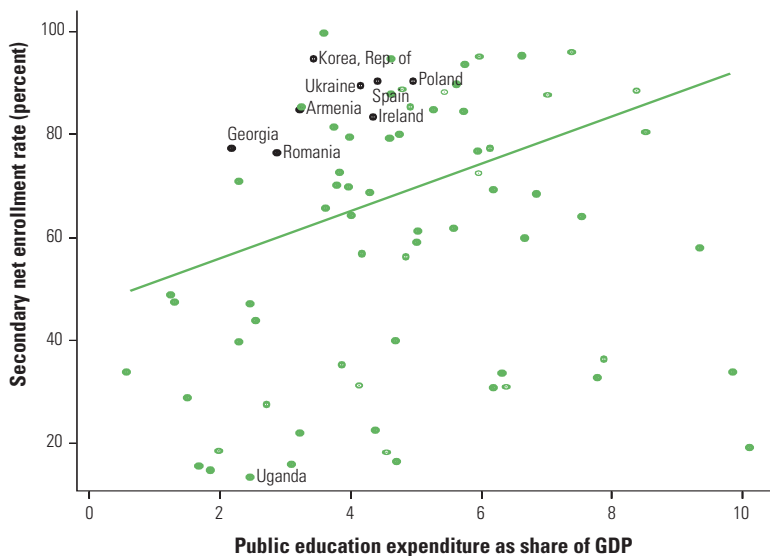
been found to be important in explaining education attainment, including per capita income (Flug, Spilimbergo, and Wachtenheim 1998; Mingat and Tan 1992), the age distribution of the population (Mingat and Tan 1992), and family background or parental education (Appleton and Mackinnon 1996). As figures 5.5 and 5.6 show, the correlation between different education outcomes and the share of public education expenditure in GDP is weak (the scatter plots do not reveal a clear pattern). This is true when considering secondary net enrollment or tertiary gross enrollment rates. Nonetheless, insofar as one is able to comment on the performance of the ECA focus and comparator countries in these figures, it is the case that, with the exception of Uganda, they tend to show better enrollment rates than would be expected given their levels of expenditure.

While Hanushek and Kimko (2000) find that labor-force quality has a strong relationship with economic growth, they further find that quality differences are not necessarily related to the resources devoted by a country to schooling. Indeed, the scatter plot for imputed learning score (Crouch and Fasih 2004) and public education expenditures as a share of GDP (figure 5.7) reveals no relationship between the two. Nonetheless, most of the ECA focus and comparator countries, with the exception of Turkey, Chile, and Uganda, are in the upper hemisphere of the scatter plot.

In the United States, the Coleman Report (Coleman et al. 1966) is credited with launching an explosion of studies estimating the relationship between educational outcomes and school inputs, including

FIGURE 5.5

### Correlation Between Secondary Net Enrollment Rate and Public Education Expenditure as Share of GDP, 2000



Source: World Development Indicators.

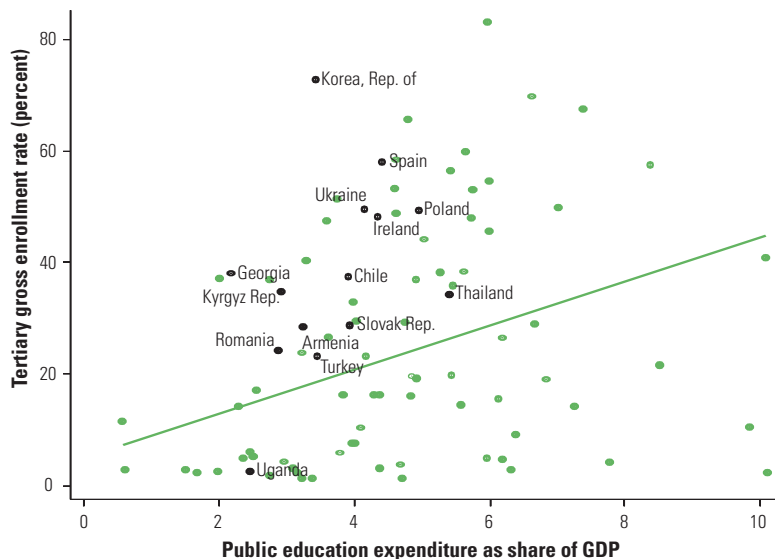
Note: The line corresponds to the predicted enrollment rate from a weighted regression on percentage share of public education expenditure in GDP and a constant, with the weights given by population in a country. The sample size for the regression is 76 countries. Only the ECA focus and comparator country names are included.

resources. The general objective was to sort out the causal impacts of school factors (that is, aspects that can potentially be influenced by policy) from other influences on student achievement, including family background, peers, neighborhood influences, and the like. The report was broadly interpreted to find that schools do not matter and that family background and peers explained most of the variation in education outcomes. By the mid-1980s, Hanushek (1986) included 147 studies in a survey of the literature relating educational outcomes to school inputs. Ten years later, Hanushek (1996) found more than double the number of studies to survey. The reviews and conclusions of Hanushek's analyses reinforced the findings of the Coleman Report. As Hanushek (1997) wrote, "Simple resource policies hold little hope for improving student outcomes."

However, using more sophisticated meta-analytical techniques than Hanushek's simple "vote counting," Hedges and Greenwald (1996) concluded that among the studies surveyed in Hanushek (1989), per pupil expenditures, teacher experience, and teacher-pupil

FIGURE 5.6

### Correlation Between Tertiary Gross Enrollment Rate and Public Education Expenditure as Share of GDP, 2000



Source: World Development Indicators.

Note: The line corresponds to the predicted enrollment rate from a weighted regression on percentage share of public education expenditure in GDP and a constant, with the weights given by population in a country. The sample size for the regression is 90 countries. Only the ECA focus and comparator country names are included.

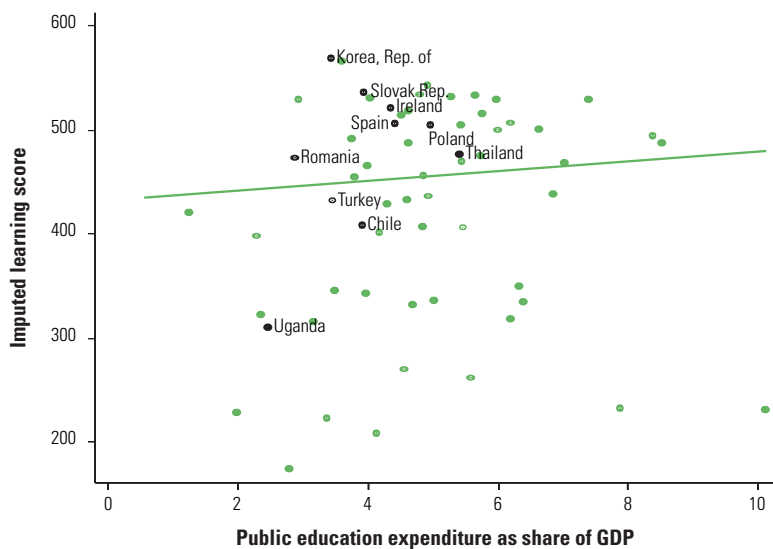
ratios are positively related to student outcomes. They also found that the sizes of the effect of per pupil expenditures were large and educationally important. Other analyses of the link between public education expenditures and education outcomes highlight the importance of one or more of the following attributes of education spending: (a) efficiency of public spending, (b) intrasectoral allocation of public spending, (c) private education spending, and (d) governance.

### Enhancing the Efficiency of Education Spending

Governments of developing and transition countries typically spend resources equivalent to between 15 and 40 percent of GDP. Hence, small changes in the efficiency of public spending could have a significant impact on GDP and the attainment of the government's objectives. The first challenge faced by stakeholders is measuring and

FIGURE 5.7

### Correlation Between Imputed Learning Score and Public Education Expenditure as Share of GDP, 2000



Sources: World Development Indicators; Crouch and Fasih 2004.

Note: The line corresponds to the predicted learning score from a weighted regression on percentage share of public education expenditure in GDP and a constant, with the weights given by population in a country. The sample size for the regression is 62 countries. Only the ECA focus and comparator country names are included.

scoring efficiency. A study by Herrera and Pang (2005) estimates efficiency of public spending on education as the distance between observed input-output combinations and an efficiency frontier (defined as the maximum attainable output for a given level of inputs). Both input inefficiency (excess input consumption to achieve a level of output) and output inefficiency (output shortfall for a given level of inputs) are scored in a sample of 140 countries using data from 1975 to 2002. The study uses nine indicators of education output: primary school enrollment (gross and net), secondary school enrollment (gross and net), literacy of youth, average years of school, first level complete and second level complete (as a share of those ages 15 years and older), and learning scores (the Crouch and Fasih [2004] dataset discussed above).

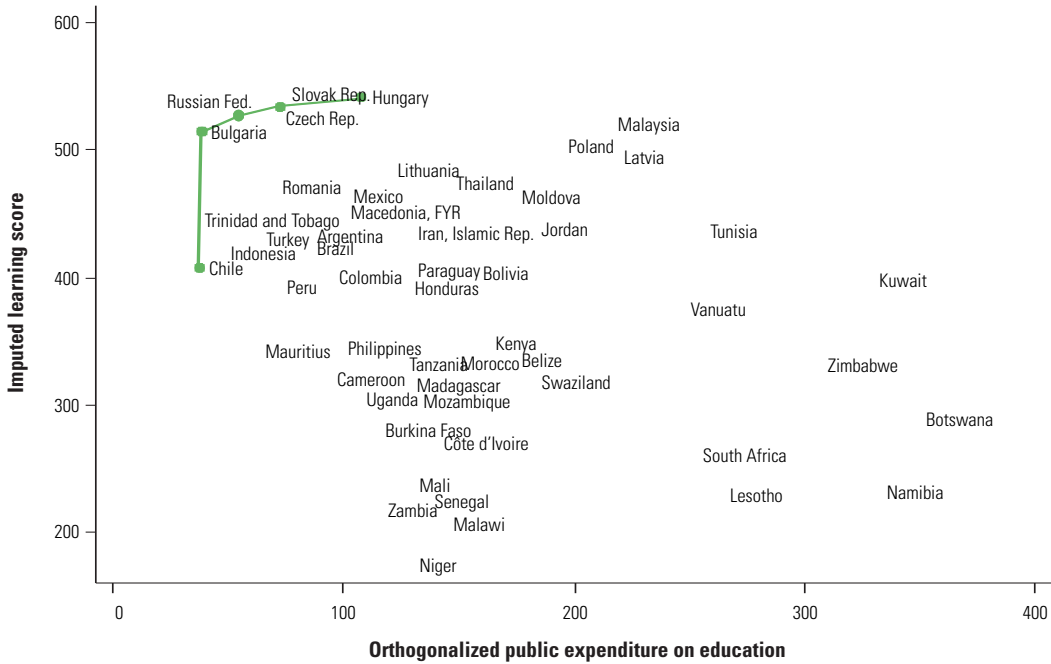
When the analysis is conducted for learning scores on a sample of developing and transition countries only, several ECA countries appear on the efficiency frontier (Bulgaria, the Czech Republic,

Hungary, and Russia) as well as the comparator country Chile (see figure 5.8). However, when the sample includes developed countries, as in figure 5.9, this is no longer the case. And though Chile appears to be efficient, with learning scores of about 400 points, the country could still achieve higher learning scores of over 500 points at the cost of additional public spending, assuming it moved along the efficiency frontier to the higher target output level. In other words, the fact that Chile is spending efficiently does not necessarily imply that it is achieving high-quality education.

### Decentralization

In 1980, Chile’s military government (1973–90) launched a profound market-based education reform (Delannoy 2000). Its objective was to promote greater efficiency through administrative decentralization, capitation-based financing, labor deregulation, and open competition between public and privately administered schools. The expected

**FIGURE 5.8**  
**Learning Scores Efficiency Frontier: Developing and Transition Countries Sample**

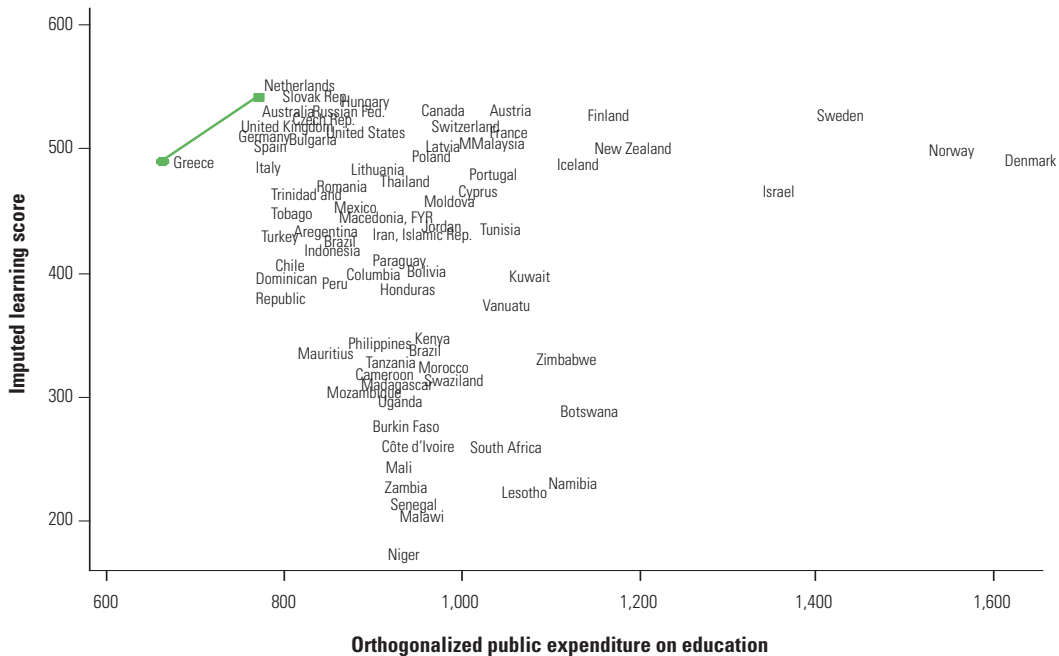


Source: Herrera and Pang 2005.

benefits of decentralization included increased efficiency in the production of services, improved decision making with the use of local information, greater accountability, and improved responsiveness to local needs and conditions. Some evidence indicates that Chile may have increased public sector efficiency through implementing decentralization policies, because total expenditures fell while output measured by average achievement scores did not decline (Parry 1997; also see below).

Subnational governments are an important part of the public sector in ECA countries. They provide basic public services both in the social sectors (education, health, and social assistance) and in infrastructure (water supply, sewerage, and transport). For example, they account for about one-quarter of government spending in the EU-8 countries<sup>2</sup> (Dillinger 2006). According to conventional economic theory, the primary aim of a system of local government finance is to promote efficiency in the allocation of resources. Theory argues that if the benefits of particular services are largely confined to local juris-

**FIGURE 5.9**  
**Learning Scores Efficiency Frontier: Developing, Transition, and Developed Countries Sample**



Source: Herrera and Pang 2005.

dictions, welfare gains can be achieved by permitting the level and mix of such services to vary according to local preferences.

In ECA countries, education is the largest single item of local government expenditure. It accounts for one-quarter to one-half of total local government expenditure in the EU-8 countries, for example. By the same token, local governments dominate the provision of primary and secondary education. As table 5.4 shows, local governments account for roughly two-thirds of total public spending on education in all ECA focus countries (where data are available) with the exception of Croatia. This is not true for the comparator countries for which data are available, with Ireland's and Spain's shares at 25 percent and 4 percent, respectively.

However, despite the prominence of local governments in financing primary and secondary education, the incentives of the pretransition period were such that planners determined wages, subsidies, and prices using a complex system of centrally mandated input norms that were in many instances adopted in the 1930s (Berryman 2000). Space norms resulted in wasted space—for example, large lobbies and highly specialized laboratories and workshops that were and remain underutilized. Staffing norms encouraged inefficiencies: for example, resources were allocated by classroom with each class getting a teacher and teaching aids. Schools were therefore encouraged to minimize class size to maximize the number of teachers and teaching aids. As a result, the fact that local governments generally accounted for the majority of public sector spending on primary and secondary education did not translate into improved efficiency of spending.

The post-socialist era systems of education financing, therefore, reflect an acute desire to encourage efficiency in the use of education funding, often by taking decentralization further than the deconcen-

**TABLE 5.4**

**Share of Local Government in Total Public Education Spending**

Country	Local share of total public education spending (%)	Country	Local share of total public education spending (%)
<i>ECA focus countries:</i>		<i>Comparator countries:</i>	
Croatia (2003)	24	Ireland (2004)	25
Georgia (2005)	73	Korea, Republic of	—
Poland (2005)	72	Spain (2004)	4
Romania (2002)	56		
Slovak Republic (2005)	67		
Turkey	—		
Ukraine (2005)	63		

Source: Government Finance Statistics Yearbook 2006.

Note: — = Not available.

tration of the socialist era. All the EU-8 countries, for example, use some method to constrain the demand for transfers for central government support. One particular focus has been on spending on underenrolled schools. In the case of the EU-8 countries, an overdimensioned system of primary and secondary education is part of the inheritance from the Soviet era. Schools were designed for an expanding population and one that was still to a large extent rural, but the number of school-age children has dropped precipitously in the EU-8 countries, and in rural areas more so than in urban ones. As a result, ministries of education confront an oversupply of school rooms and teachers. The education financing system of most EU-8 countries now reflects attempts to address this problem using fiscal instruments.

### **Capitation Financing**

Hungary, Lithuania, the Czech Republic, as well as the focus countries Poland and the Slovak Republic, now employ some form of capitation-based financing for primary education.<sup>3</sup> The distribution of funding for education on a per pupil (capitation) basis allows local governments considerable discretion over how these funds are used. In theory, this approach has several advantages. It ensures a minimum level of education financing in all jurisdictions while allowing the central government to ration the level of such spending through its control over the per capita amount. At the same time, it permits local governments to find the most efficient means of providing education within this overall spending envelope. In particular, it imposes efficiency measures on jurisdictions with underenrolled schools. Under a capitation-based formula, falling enrollment will cause a drop in school funding, forcing local governments to close schools they can no longer afford.

None of the five countries employs a single, nationally uniform amount. Instead, capitation rates are adjusted to reflect ostensible differences in the costs of providing education. In Poland, for example, rural schools receive a 33 percent supplement over the basic per capita amount. Towns with populations under 5,000 receive an 18 percent supplement. Hungary also supplements its standard per capita amount with additional funding for primary education in villages with populations of 3,000–3,500 and those with fewer than 3,000 inhabitants. In the Czech Republic, capitation figures distinguish among different levels and forms of education as well as among regions. Regional variations are intended to reflect variations in labor costs, and therefore favor rather than discriminate against Prague. These differentials have

been used, in part, to soften the impact of the switch to capitation-based financing in rural areas. Additional transitional arrangements have had to be introduced to smooth the adjustment process. In Poland, for example, the initial weights reflected teacher characteristics so that places with unusually high wage levels did not experience extreme cuts (this provision has since been phased out).

An important issue threatens the success of capitation-based financing: the inability of local governments to dismiss staff. While falling enrollment triggers a drop in funding, local governments often lack the legal authority or political will to make corresponding cuts in staff. In Poland, for example, school directors are, in theory, free to make their own decisions about staffing levels. However, regulations constrain dismissals: although a teacher may be dismissed when a school is totally or partially liquidated, a municipality must provide six month's severance pay and re-employ the teacher at the first opportunity (see box 5.1). Similar constraints on downsizing exist in Lithuania and Hungary. Political constraints appear to be particularly acute in municipalities where downsizing implies the closure of entire schools. It is therefore arguably the case that attempts to use the system of intergovernmental relations to encourage greater efficiency in the production of public services have not been very successful. While the majority of the EU-8 countries now finance education on a capitation basis, this has often not been sufficient to prompt the closure of underenrolled classrooms or schools.

### **Teaching Wage Bill**

The ability to right-size the teaching force is particularly important given the finding that spending tends to be more inefficient in countries in which the wage bill represents a higher fraction of total expenditure (Herrera and Pang 2005). Mingat and Tan (1998) also point to the importance of teachers' salaries in increasing the cost of education in low-income countries. They estimate that 50 percent of the difference in education attainment between high-income and low-income countries can be attributed to lower teachers' salaries in high-income countries, which release resources for nonwage inputs such as textbooks.

Table 5.5 shows that staff costs represent roughly 70 percent of total education expenditures in several ECA focus as well as comparator countries. This share is on the low end compared with the salary bill for teachers across a sample of 47 countries in six regions, including ECA (Bruns, Mingat, and Rakatomalala 2003). In that study, the teaching bill represented more than 70 percent of recurrent

**BOX 5.1****Poland: The First Decade of Capitation Financing in Education**

Between the fall of communism in 1989 and 2000, Poland transferred responsibility for the management of some 35,000 preschools, primary schools, and secondary schools to democratically elected local governments. At the same time, the national government significantly changed the structure and content of primary and secondary education, and reformed the way it regulated and financed the sector. However, the assignment of managerial and financial responsibilities to local governments remained confused. It was unclear who was responsible for setting and financing teachers' wages (the national government or local governments) and who was responsible for hiring and firing them (local governments or school directors). Initially, amendments to the Teachers' Charter made in 1990 simply transferred the national government's wage and benefit obligations to teachers to local governments. The only significant right given to local governments with respect to teacher employment was the right to provide teachers with motivational bonuses beyond those mandated by the law. But the charter did not specify employment standards for teachers such as pupil-teacher ratios or class sizes. Instead, these kinds of norms were contained in a variety of other ordinances and expressed as pedagogical minimums, not employment standards. This meant that while it was possible to determine the minimum number of teachers needed to teach any given grade level, there was no easy way to determine the maximum number of teachers that should be employed in any given school or, for that matter, in any given jurisdiction. At the same time, the law guaranteed that the national government would provide local governments with the financial resources necessary to realize their education responsibilities, including teachers' pay and the maintenance of schools. Without the specification of employment norms, this legal guarantee became an unconditional promise by the national government to fully fund the hiring practices of school directors and local governments.

This division of labor worked reasonably well during the first half of the 1990s, because transfers by national to local governments for education were generally in line with the basic operating costs of schools and local governments were, in fact, primarily concerned with improving school infrastructure. With time, however, the division of labor became an increasing problem for three reasons. First and most important, the demographic decline radically increased the per pupil costs of small rural schools, costs that the national government was unwilling to finance fully. Second, the national government increased teachers' wages without increasing commensurately the transfers it provided to local governments. Third, popular pressure on local governments to improve and restructure their school systems not only forced them, given falling state transfers, to contribute increasingly significant shares of their general revenues to the sector, but also to become concerned with what their resources were actually buying in the way of educational quality.

Source: Levitas and Herczynski 2002.

spending in the education sector in virtually all countries and as much as 95 percent in some. In addition, a wide variation in average annual salaries was observed across the 47 countries, ranging from 0.6 times to 9.6 times per capita GDP. In the Sahelian African countries, for example, the average is more than six times per capita GDP, while in ECA countries the average is less than per capita GDP. The observed average in the highest primary-completion countries in the sample is, by contrast, 3.3. times per capita GDP. Thus, the fact that the teaching wage bill is at roughly 70 percent in ECA countries, despite the relatively low average teacher salary, is a reflection of the excess numbers of teachers.

Indeed, Bruns, Mingat, and Rakatomalala (2003) document that the core service delivery parameters in Armenia, Georgia, and Moldova (the three ECA low-income countries that had not achieved universal primary completion) all deviate sharply from the benchmarks in a pattern common to ECA countries: the number of teachers employed (relative to the student population) is far higher than in other countries and the average teacher salary is far lower. In a simulation for determining the Education For All financing gap conducted by, Bruns, Mingat, and Rakatomalala, that takes into account improving both quality and efficiency of service delivery, the average teacher salary in Armenia would increase dramatically, from 0.6 to 3.5 times per capita GDP, as a quality measure in the simulation. As a corresponding efficiency measure, the 13:1 pupil-teacher ratio would rise to 40:1, also a tremendous adjustment. Given the projected low growth of the school-age population, the clear implication is that the number of teachers employed would decline significantly. The authors acknowledge that the realism of such dramatic shifts is questionable, but they point out that “the simulation serves to illuminate

TABLE 5.5

### Distribution of Total Annual Expenditure in Public-Sector Education Institutions by Functional Classification (Preprimary through Tertiary), 2001

Country	Capital expenditure	Current expenditure	
		Staff	Other
<i>ECA focus countries</i>			
Poland	6.7	68.6	24.7
Romania	8.6	66.0	25.4
Slovak Republic	6.2	68.1	25.7
<i>Comparator countries</i>			
Ireland	12.6	68.0	19.4
Spain	8.9	77.7	13.4

Source: European Commission 2005.

the root causes of Armenia's key educational issues: excess staffing, low teacher motivation, absenteeism, and informal shifting of costs to families, linked to inadequate salaries; and high operating and maintenance costs for an inefficient number of schools and classrooms, which divert resources from other needed areas such as modernization of curriculum and learning materials, teacher retraining, and system management" (Bruns, Mingat, and Rakatomalala 2003: 79).

Nor has the move to capitation financing necessarily facilitated the process of increasing teachers' salaries. While the post-socialist era systems of education financing sought to improve efficiency of expenditures, a first priority was to ensure a basic level of education financing in all jurisdictions, regardless of the strength of their local tax bases. This resulted, for example, in countries financing the largest component of education spending—teachers' salaries—through some form of intergovernmental transfer. At the same time, with the implementation of capitation financing, central governments showed unwillingness or inability to increase the level of capitation transfers to reflect centrally mandated increases in costs. For example, the principal determinant of costs—the wage level—is largely determined by the central government in the EU-8 countries. In Lithuania, the national civil service laws sets out a structure of pay scales for municipal employees, based on grade, years of employment, and—in the case of teachers—class size and number of classes taught. The pay structure is expressed as a multiple of the so-called basic wage. As a result, government changes in the basic wage trigger automatic increases in salaries. In Poland, similarly, teachers' salaries are determined on the basis of the Teacher's Charter and annual ministerial regulations on the remuneration of teachers (Fiszbein 2001). Yet, the level of central funding is determined as a fixed percentage of total projected government expenditure.

### **Vocational versus Academic Upper Secondary Track**

Table 5.2 showed that vocational education plays a varying but important role in upper secondary education in all of the ECA focus countries. A key issue in the efficient delivery of secondary education is the balance between academic and vocational education. Fewer technical tracks, more emphasis on general skills, and better links with higher technical education can make vocational education more cost effective (Di Gropello 2006). A review of 24 studies on 20 countries in Africa, Asia, Latin America, and the United States shows that unit costs of vocational and technical schools are 1.14 to 7.20 times higher than those of academic schools (Tsang 1997). Middleton,

Ziderman, and Van Adams (1993) described why the unit costs in vocational and technical education are generally higher than unit costs in academic schooling. First, student-teacher ratios tend to be smaller in vocational and technical schools because of a more segmented curriculum and smaller classes due to training workshops. Second, though this varies across countries, the policy in most countries requires a certain level of experience or license-based skills to teach vocational and technical courses, and thus schools compete against industry to hire qualified teachers, which leads to increases in teachers' salaries. Third, vocational and technical education requires specialized equipment and facilities to meet the level of technology that is used in industries, and the need for up-to-date equipment and facilities increases the costs of vocational and technical education continuously.

However, current technical and vocational education trends can potentially decrease unit costs and improve quality and relevance. In particular, a more integrated general-technical curriculum could result in less separation between tracks and schools and therefore improve economies of scale in the use of teachers and equipment, as well as yield higher-quality technical education. A recent comparison of mean efficiency scores across technical-vocational and general education schools in the comparator country Korea shows no or little difference in cost effectiveness (Di Gropello 2006). The good efficiency results of the Korean vocational schools, at least concerning human resources, can be related to the country's successful vocational education framework. In 1991, the government pushed forward new policies to increase the share of students attending vocational schools to half of total upper secondary enrollment. Subsequently, the country made substantial efforts to improve curricula (with an emphasis on general skills) and link vocational high schools with technical colleges so that rather than providing terminal degrees, vocational high school became a prerequisite for advanced studies.

Another efficient and innovative case of reform of vocational education occurred in the comparator country Chile (Di Gropello 2006). The reform proceeded gradually by education level (starting with primary in 1992 and extending to higher education in 1998). It is now fully framed in a lifelong learning perspective, providing strong links between secondary and higher education levels, and these levels and the productive sector (through formal and informal training), which allows continuity and flexibility in the delivery of technical education. The Chilean vocational education system is also an efficient one, composed now of only 13 vocational categories compared with 400 training specialties before the 1980s.

## The Intrasectoral Allocation of Public Spending

Gupta, Verhoeven, and Tiongson (2002) reassess whether increased public spending on education matters using a comprehensive data set of public spending and social indicators for 50 developing and transition countries. Their results indicate that in education, both the overall level of public spending and intrasectoral allocation matter. In particular, shifting spending toward primary and secondary education is associated with improvements in widely used measures of education attainment. The authors argue that if expenditure allocations for education are to boost economic growth and promote the well-being of the poor, policy makers in many developing and transition countries need to pay greater attention to allocations within the sector. Baldacci, Guin-Siu, and de Mello (2003) find that the ratio of public spending per pupil in tertiary education to that in primary education, measuring the intrasectoral composition of education spending, correlates negatively with both primary and secondary enrollment rates.

Table 5.6 shows expenditures per tertiary student as a percentage share of expenditures per primary student, both measured as a percent of GDP per capita. Comparator countries have ratios that are close to or smaller than the OECD average (with the exception of Uganda), and ECA focus countries have ratios higher than the OECD average (with the exception of Poland and Croatia). Korea has one of the lowest ratios worldwide of public expenditure per tertiary student to primary student. In most of the economies of East Asia, the excess demand for secondary and tertiary education (generated by rapid attainment of universal primary education) has been met largely by a combination of expansion in the public secondary system, meritocratic entrance requirements, and a self-financed private system (World Bank 1993). This stands in stark contrast to many other low- and middle-income economies, which have stressed public subsidies to university education. Indeed, as table 5.6 further shows, there is a clear correlation between the ratio of expenditures on tertiary relative to primary students and the share of public funds in expenditures on tertiary education: the lower the ratio, the lower the share of public funds. For the two ECA focus countries where data are available, Poland and the Slovak Republic, the difference is between 69 percent of expenditures on tertiary education being publicly funded in Poland versus 86 percent in the Slovak Republic.

A recent World Bank report on reforms in the financing of higher education in the countries of Central and Eastern Europe and the Baltics (Canning, Godfrey, and Holzer-Zelazewska 2006) documents

how participation rates in higher education began to rise immediately following transition, fueled by evidence that a university degree offered a greater chance of employment in an increasingly uncertain labor market. Expansion of access to higher education became a priority for governments. Throughout the 1990s, the difficulty of centrally managing a growing and more diversified higher education system became increasingly clear. Inevitably, increased participation began to raise questions about the sustainability, equity, and quality of the systems. In most countries, private provision of higher education services emerged in response to the need for system expansion. By the middle of the 1990s, new forms of allocating finances to universities had emerged, such as block grants (Czech Republic), normative financing based on the number of students and on norms for research and maintenance (Hungary), and performance-related financing (Estonia). The economic reality of the need to attract more private financing into the system to offset the limitations in state funding had become clear.

Canning, Godfrey, and Holzer-Zelazewska (2006) further report on the share of financial aid to students as a percentage of total public expenditure on education. Poland stands out in this regard, with merely 0.4–0.5 percent of education expenditures in 2001 dedicated

**TABLE 5.6**  
**Intrasectoral Composition of Public Education Spending**

Country	Tertiary student expenditure as % of primary student expenditure (average for 1998–2004)	Share of public sources in expenditures for tertiary education (2003)
Korea, Republic of	42	23.2
Poland	80	69.0
Spain	118	76.9
Chile	128	—
2003 EU-19 average	129	84.3
Croatia	144	—
2003 OECD average	148	76.4
Thailand	189	—
Ireland	247	83.8
Slovak Republic	275	86.2
Romania	281	—
Kyrgyz Republic	320	—
Ukraine	364	—
Turkey	393	95.2
Albania	470	—
Armenia	639	—
Uganda	1,675	—

Sources: World Development Indicators; OECD 2006.

Note: — = Not available.

to financial aid in primary, secondary, and higher education. This compares to an EU-8 average of 5.8 percent for primary and secondary students, and 12.8 percent for students in higher education institutions. At the same time, Poland is an outlier among the EU-8 countries with regard to its share of its university students in private institutions (close to 30 percent). Although the Polish constitution guarantees free higher education to all who achieve entry level qualifications, in fact over 50 percent of all students pay some form of tuition fees, including both those attending private higher education institutions and extra-mural, part-time, or evening students who can be charged tuition fees. As a result, there is a 17 percentage point difference between the education enrollment rates of 19–24 year-olds of the richest and poorest consumption quintiles (table 5.7) although the level is still quite high for the latter. Thus, although Poland's intra-sectoral allocation of resources in education may indicate the highest impact on growth, there are equity considerations that must also be taken into account.

### The Role of Private Spending

Herrera and Pang (2005) find that countries in which public financing is a larger share of total expenditure on health services also register lower efficiency scores. However, the data set available for the health sector is not available for education, so they do not provide parallel analysis for the education sector. Nonetheless, table 5.8 shows that for both ECA and comparator countries where data are available, the overwhelming share of education expenditures are public, except in Korea, where expenditures are more evenly distributed between public and private.

TABLE 5.7

#### Poland: Age-Specific Enrollment Rate by Household Consumption Quintile, 2003 (percent)

Quintile	Age group				
	3–6	7–10	11–15	16–18	19–25
Poorest quintile	4.6	94.7	99.6	90.9	36.2
II	3.8	95.0	99.7	96.1	46.6
III	4.2	95.2	99.9	97.2	52.6
IV	2.0	94.1	99.4	97.9	55.0
Richest quintile	3.3	96.4	100.0	97.3	52.6
Overall	4.1	94.9	99.7	94.7	47.4

Source: Canning, Godfrey, and Holzer-Zelazewska 2006.

**TABLE 5.8**  
**Public and Private Education Expenditure, 2002**

Country	Public	Private	Country	Public	Private
<i>ECA countries</i>			<i>Comparator countries</i>		
Poland	89.2	10.8	Ireland	93.5	6.5
Slovak Republic	95.3	4.7	Korea, Republic of	59.2	40.8
Turkey	88.8	11.2	Spain	88.9	11.1

Source: OECD 2006.

Most developing countries provide public education without charge or at minimal cost to their citizens (Glewwe and Patrinos 1999). Fiscal constraints, however, prevent many developing countries from relying solely on government revenues to finance desired educational expansion. To solve this problem, many countries adopt policies to (a) charge tuition fees to recoup part of the cost of providing public education services or (b) encourage development of private schools to handle at least part of the expansion. There are several potential advantages to increased user fees. In principle, charging fees can increase educational spending per student enrolled. It can also improve equity by allowing the public sector to target subsidies more effectively to students from poor families. Moreover, increased cost recovery can improve school accountability to parents. Finally, selective charges on some learning inputs can increase the effectiveness of service delivery. For example, charging for books improves the on-time delivery of materials.

In Asia, the more that costs are financed through student fees, the greater is the overall coverage (as measured by the gross enrollment rate) of the education system (Mingat and Tan 1992). In other words, private funds can increase enrollment, whether they are used at private or publicly provided institutions. Focusing on the comparator country Korea in particular, Mingat and Tan (1992) find that Korea's mid-1980s average of 3.4 percent of GNP spent on public education was in line with the regional average, as it had been in previous decades. What differentiated Korea from other Asian economies (except for the Philippines) was the amount of private spending on education: 2.5 times more than the Asian average, according to Mingat and Tan's index of private financing in higher education. Thus, according to data collected by the Korean Education Development Institute, when private spending on education is included, the country's total was 10 percent of GNP in 1990.

The comparator country Chile is also of particular interest. While evidence on the extensive voucher system in Chile is less uniform,

## BOX 5.2

**Chile and Privatization**

The Chilean education system features a high degree of private sector participation (see table below). Out of a total of 10,600 schools in 1998, parents had the option of placing their children in (a) public schools managed since 1980 by the municipalities (55.1 percent of 1998 enrollment); (b) private schools subsidized by the government on the basis of enrollment (34.1 percent); (c) fully private schools (9.2 percent); and (d) private technical-vocational schools run by private businesses or corporations (1.5 percent).

Chilean spending on education (percent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Public education spending/GDP	2.6	2.7	2.9	3.0	3.1	3.1	3.4	3.5	3.9
Private education spending/GDP	2.0	2.0	2.2	2.4	2.5	2.5	2.8	2.9	3.1
Total education spending/GDP	4.6	4.7	5.1	5.4	5.6	5.6	6.2	6.4	7.0

Source: Table I, page 2, Delannoy 2000.

The primary motive for privatization is to improve responsiveness in service delivery and to raise the quality of output by forcing providers to survive in a competitive market. In addition, the profit motive in the private sector is expected to improve efficiency as entrepreneurs search for lower cost production. Private schools are in much greater supply in urban, upper-middle-income areas and are relatively rare in rural areas. Not only do low-income students have less opportunity to attend private schools, but many schools have also raised entrance barriers. Private schools have always been more likely to use entrance exams or minimum grades to select their students, and the better public schools have also succumbed to this practice. Furthermore, although it is difficult to make reliable comparisons across time, national average scores have not risen even though private provision of education has expanded dramatically while public education has waned. Both decentralization and privatization have resulted in greater inequity in expenditures and in the performance of students from different income groups.

Sources: Delannoy 2000; Parry 1997.

**BOX 5.3****A New Beginning for Georgia's University Admissions**

Transparency International's Corruption Perception Index 2004 listed Georgia among 60 countries suffering from serious corruption. The government that came to power after the Rose Revolution of November 2003 declared that the fight against corruption was one of its central priorities. The education sector, where corruption had previously been widespread, was among the first sectors to be targeted for reform. The higher education system in Georgia has traditionally been plagued by corruption. Until 2004, students were able to purchase not only their university admissions, but also passing grades and eventually a diploma. Individual universities administered their own admissions exams. Admissions bodies, composed of university lecturers, would sit in on oral exams and grade written papers. No independent observers were allowed to monitor the process. Previously, there were two ways of obtaining a university place. The first involved students in their final year of secondary school taking private classes offered by the same lecturers who sat on the admissions body at his or her chosen university. The second required the parents of a university applicant simply to bribe the admissions body before the entrance exams. In both instances, students would be asked previously agreed on questions in the oral exam and given advance warning of the subjects in the written exam.

Corruption in Georgia's education system is commonly associated with Soviet and post-Soviet styles of governance and was partly the result of the low salaries paid to administrators and teachers. There is now a strong desire to return to an educational system that commands respect and truly facilitates future employment prospects. It was in this context that parliament adopted a new Law on Higher Education in 2004. The law targets specific reforms in the higher education system:

- Improvements in administration and governance at all levels (including removing elements of corruption lingering from the previous system)
- Decentralization to address the diversity of local needs and promote fiscal and administrative accountability

(continued)

the most elaborate studies tend to suggest that it had positive effects on students' performance. Mizala, Romaguera, and Farren (2002) find that private fee-paying schools are the most technically efficient ones in Chile, followed by private subsidized and public schools. However, as box 5.2 highlights, the equity implications of Chile's privatization of its education system were adverse. In addition, it is not clear that privatization leads to better quality education as a result of the presumed higher accountability of educators to parents.

### BOX 5.3 (continued)

- In-service training for teachers and administrators to reform instruction
- Parent education to encourage community engagement
- Ongoing student assessment and program evaluation for multilevel accountability
- Standardization in testing toward grade promotion, 11th grade graduation, and university admission

In 1999, the Ministry of Education began to implement the Georgian Education System Re-alignment and Strengthening Program, as part of which the National Assessment and Examination Center (NAEC) was established in July 2002 to develop new exams for university admission that guarantee objectivity in selecting entrants and reduce corruption. In 2005 for the first time, 31,174 applicants sat for the new university admission exam, which consisted of three mandatory exams and one optional exam, all administered nationwide. To assess the transparency of the new process, Transparency International Georgia conducted a monitoring project during the period May–August 2005. Its monitors were present during the exam at all 14 sites for the first two days of the examination process, on July 11 and 12. The NAEC and the Ministry of Education were found to have invested significant effort into informing university entrants, parents, teachers, and exam administrators about the new examination process. The examinations were well-organized and transparent, and the appeal process was meticulously planned and objective.

Source: Karosadnize and Christensen 2005.

## Governance

Given that the proportion of the national budget devoted to education is significant for both developed and developing countries, it is essential that public funds be directed effectively and used for the purposes for which they are allocated. Rajkumar and Swaroop (2002) find that public health spending lowers child and infant mortality rates in countries with good governance, and that as countries improve their governance, public spending on primary education becomes effective in increasing primary education attainment. In addition, several studies conducted in the last decade have clearly emphasized the negative impact of corruption on the economic, political, and social development of countries. It has been observed that corruption increases transaction costs, reduces the efficiency and quality of services, distorts the decision-making process, and undermines social values. Recent surveys conducted on the impact of corruption on the provision of social services—including education—suggest that illegal payments for school entrance and other

hidden costs help explain low school enrollment and drop-out rates in developing countries, and that bribes and payoffs in teacher recruitment and promotion tend to lower the quality of public school teachers (Hallak and Poisson 2005). On the one hand, ongoing trends such as decentralization and privatization in education may help to reduce corrupt practices (box 5.3). On the other hand, increased complexity in the sector may create new opportunities for corruption.

The move to capitation financing in ECA should help to improve governance because a funding formula is an agreed-on rule for allocating resources to operational units such as schools that is universally applied to all schools of a given type within an education jurisdiction. In a study focusing on school funding formulae used as part of a decentralized system of school finance for public schools, Ross and Levacic (1999) identify the main features of formula funding that should reduce opportunities for corruption as

- transparency, because the amount each school should receive is calculated objectively and can be made available to the public and openly published; and
- incentives at school level to manage resources efficiently, which can be enhanced by parental choice of school.

However, formula funding can create its own opportunities for corruption unless measures are put in place to minimize these. Schools have an incentive to inflate data that trigger funding in the formula, although this can be prevented by external checks and sanctions and by selecting indicators that the school cannot influence. Managing finances at the school level also gives more people the opportunity to misuse small sums of money, compared to a centralized system where fewer officials have scope to misuse larger sums. Financial management at schools must, therefore, be accompanied by comprehensive and enforced financial regulations and external auditing of school accounts.

The study findings indicate the importance of legal requirements for publication of financial information and training in financial management for school personnel if formula funding is to gain its full potential for enhanced transparency. Furthermore, the trade-off between the more complex formulae required for equitable allocations among schools and simpler formulae for greater understanding and hence greater transparency is not easily resolved. This is illustrated by the example of Poland, where simple per pupil formulae require differential school funding outside the formula to tackle school-based cost differentials, which does not aid transparency.

However, no such funding outside the formula is needed in Victoria, Australia, but the formula itself is very difficult for most education stakeholders to understand, so that transparency is also not fully achieved.

The Polish example sheds further light on the complex relationship between formula funding of schools and transparency. Indeed, there are two sides to transparency: public availability of information and public scrutiny of school finances as well as the simplicity and transparency of the financing mechanisms themselves. The introduction of formula funding alone is not sufficient to ensure transparency and the involvement of local education stakeholders in the budgeting process. Two Polish cities that did introduce a radically simple voucher system failed to fully involve teachers and parents. One of them did not even routinely publish school budgets. While they proudly present their innovative budgeting procedures at the national level, for instance, to the Association of Polish Cities, their message does not get through to their electorates.

## Conclusions

This chapter has surveyed the relationships between educational outcomes, public spending on education, and economic growth, and it has explored how transition countries might enhance the impact of public spending on education levels and thus economic growth. Several key points emerge. First, better education in a population clearly leads to faster economic growth, but more spending on education does not necessarily lead to better educational outcomes. The latter link depends on several attributes of the spending itself.

Second, transition countries compare favorably in educational outcomes and efficiency indicators with developing countries, but they have a way to go to match OECD levels.

Third, transition countries have undertaken a variety of reforms to enhance the efficiency of public spending on education, including taking decentralization further than the deconcentration of the socialist era and adoption of per capita financing formulae that provide incentives for efficient use of facilities. However, these reforms have not yet gone far enough in most countries. As a result of rigid salary rules, most systems still have too many teachers with salaries that are too low to motivate good performance. Too high a share of spending tends to be allocated to tertiary as opposed to primary and secondary levels, in part reflecting insufficient reliance on private financing at the tertiary level. And vocational education, which has a far higher

unit cost than the academic track, is not adequately integrated with general education or with tertiary and lifelong learning opportunities.

In sum, further reforms in education policy and in resulting patterns of public education spending are needed to improve education outcomes and foster continued economic growth. Although details vary from country to country, the general direction of needed reforms is similar across the ECA region. Fast-growing countries in other regions, most notably Korea and Chile, offer valuable lessons for ECA.

## Notes

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1. Education systems in ECA countries generally are not classified into a primary and secondary cycle but rather into a basic and upper secondary cycle. However, to be able to make comparisons with countries in other regions, the more common terms of “primary” and “secondary” are used here.
2. The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia.
3. The discussion in this section relies heavily on Dillinger (2006).