

## CHAPTER 6

# The day after

ECA's transition countries were well endowed with public infrastructure and workers' education and skills, but these were increasingly perceived by firms as bottlenecks to growth during the boom years 2005–2008. The economic downturn has temporarily released these bottlenecks, but they will become a priority once recovery begins.

### Questions

- What factors could facilitate greater private participation in electricity?
- What education and labor skills may have to be strengthened in some ECA countries?

### Findings

- Key to releasing bottlenecks in electricity is improving the environment for private sector involvement. This requires improving financial viability, facilitating change in the power market structure, and introducing credible regulation.
- Also important is maximizing the benefits from regional energy trading, both in the Western Balkans and in Central Asia.
- Young students in ECA do well on international tests. Improving compulsory education will require better incentives for teachers and greater control by schools over staffing decisions.
- Specializing too young (vocational and technical colleges in lieu of general secondary education) might be detrimental and needs to be reconsidered. The wage premium to tertiary education is high. Countries have successfully used the private sector to expand tertiary education—thus complementing scarce public resources.

Just as the high growth phase on the eve of the crisis revealed infrastructure and skill constraints on the horizon, the recession is likely to loosen them—but they are also likely to reappear once the economic recovery starts. This is especially likely in countries where fiscal restraint imposed during the recession restricts public investment—in other words, in most ECA countries. Reforms in electricity and education are the main subjects of this chapter, which discusses how to increase private investment.

It is worth recalling the evidence on constraints to growth as seen by firms on the eve of the crisis (chapter 5). The metric is whether a constraint is seen as above the average of all constraints comprising the business environment in that country (figure 6.1). This relative concept helps to the extent there may be a systematic variation between country tendencies to report dissatisfaction across the board—for example, reflecting particular periods of instability or economic downturns. Note that workers' education is the second highest constraint identified by firms, with electricity and corruption at broadly the same level. Courts and access to land are also important bottlenecks.<sup>1</sup>

Against this background, the chapter poses two questions. First, what could facilitate greater private sector participation in electricity—an important part of infrastructure? Second, what education and labor skills have to be strengthened in some ECA countries?<sup>2</sup>

### **Bottlenecks in electricity—an agenda for reform**

The investment needs to meet overall ECA electricity demands could be substantial. An estimate by the World Bank based on annual growth of 4.5 percent has put the investment needs of the sector at about \$1.5 trillion over the next two decades—or 1 to 1.5 percent of ECA's annual GDP. This would absorb a large share of the region's public sector investments, which now average 5.5 percent of the region's GDP. These projections also assume big improvements in energy efficiency and conservation: a decline in ECA's energy intensity from the current 0.70 tons of oil equivalent per \$1,000 of GDP to 0.35 tons of oil equivalent in 2030—marked, but still far above the 0.13 value for the EU. Of course the current global economic crisis has slowed down the demand for energy and created some uncertainty on when the electricity sector might become a bottleneck to growth. Moreover, structural factors behind ECA's investment needs are also behind these estimates; for example, about 80 percent of the region's electricity generation capacity comes from power plants built before 1980.

Since it will be difficult for the public sector to mobilize the required investment, it is imperative to create conditions for private involvement. So far, private participation in the electricity sector in ECA has been low. The private sector invested only \$36 billion (in 2007 prices; or 1.1 percent of the

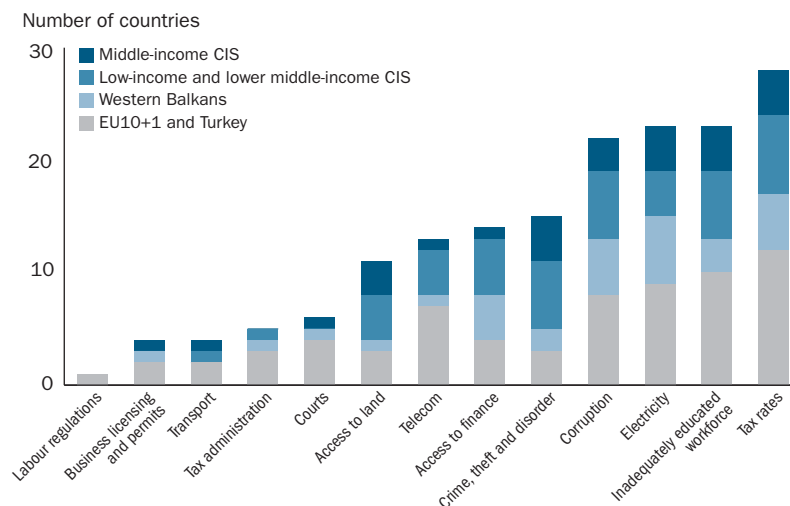
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1. As is frequently the case with enterprise surveys, tax rates are perceived as the severest constraint, though it is less clear how to interpret these answers since firms are typically not asked about the benefits of government expenditures financed by those taxes.

2. In addition to some of the findings discussed in this chapter, the World Bank is working on two flagship reports: one on energy needs and one on the skill challenges facing the region.

FIGURE 6.1

**Relative importance of constraints, by country groups**



Source: BEEPS 2008.

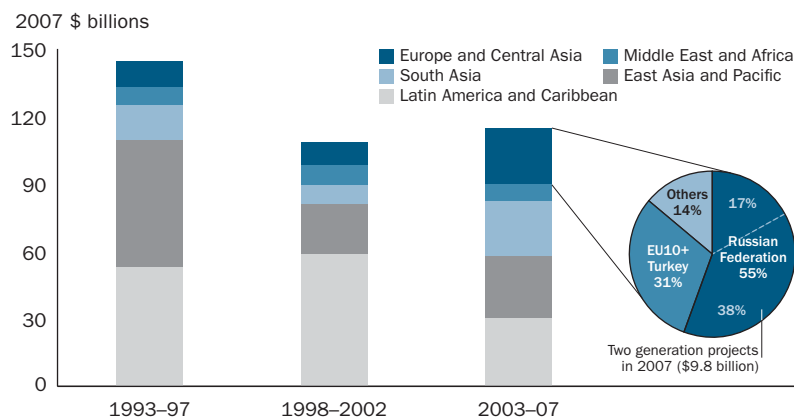
region’s GDP) in the electricity sector in ECA between 1998 and 2007 (figure 6.2).<sup>3</sup> Compare that with private participation of \$89 billion in Latin America (2.5 percent of the region’s GDP), \$50 billion in East Asia and the Pacific (1.2 percent), and \$33 billion in South Asia (2.3 percent). Although ECA’s share of total private investment commitments in electricity projects rose from 10 percent in 1998-2002 to 22 percent in 2003-07, most were in a handful of countries. The Russian Federation, the countries of the European Union, and Turkey accounted for 86 percent of total private activity. Indeed, the privatization of two wholesale generation companies in the Russian Federation in 2007 accounted for 38 percent of total private investment in ECA in 2003-07.

The economic downturn provides an opportunity for countries to accelerate reforms so that private investments can materialize before capacity becomes a bottleneck. But attracting direct private financing requires substantial efforts to improve the business environment. This section focuses on what might catalyze private investment—how to put in place a business environment that assures commercial viability. Economies of scale also play a role:

3. Investment data are from the Private Participation in Infrastructure (PPI) database, which includes projects that reached financial closure between 1993 and 2007. While the data here are in real terms (in 2007 dollars), those in the PPI database are in current dollars. For more information, see [www.ppi.worldbank.org](http://www.ppi.worldbank.org).

FIGURE 6.2

**Investment commitments in electricity with private participation, 1993–2007**



Source: World Bank and PPIAF, PPI Database.

many countries in the region are small, and resource endowments are varied. So, deeper regional cooperation is integral to a sustainable solution to electricity needs.

*Improving the business environment for private investment*

Significant private investment can be attracted if electricity utilities are allowed to operate in an environment that fosters commercial viability. This requires ensuring that electricity utilities function on a financially sustainable basis, reforming the power market structure to move toward more competitive trading, and putting in place a credible and predictable regulatory framework.

*Improving financial viability.* The financial viability of firms depends on payment discipline, technical losses, and tariff structure.

Strengthening payment discipline is the first line of action. It requires improving collection rates, defined as the ratio between cash electricity payments received and total electricity billed to users, and reducing commercial losses stemming from unbilled consumption (such as the use of artificial consumption norms for users who are not metered, as well as theft in the form of illegal connections and meter tampering).

Improving collection rates depends on the willingness of governments to introduce legislation enabling utilities to enforce payment. Public users

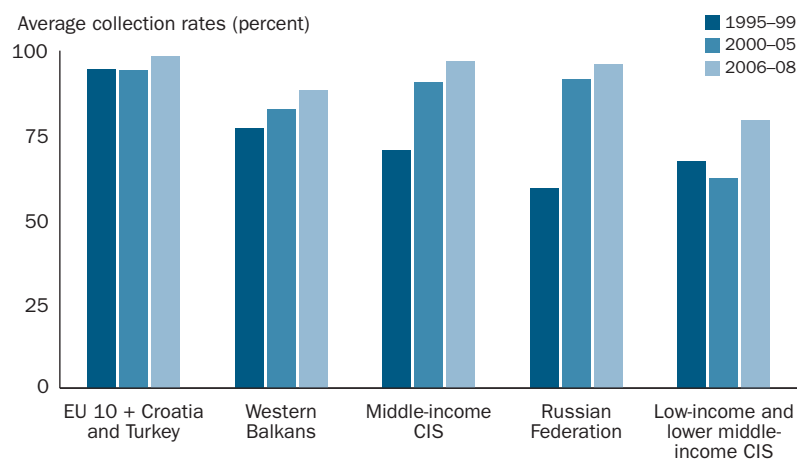
(government departments and agencies) must have adequate budget allocations for paying their service bills and be subject to the discipline of disconnection for nonpayment. Progress in ECA on payment discipline has been mixed.

- Countries in Central and Eastern Europe adopted the necessary legislation early on. By the mid-1990s, the average collection rate in Poland, Bulgaria, Hungary, and Lithuania was about 90 percent. Since then, the situation in the new EU member states has improved further: collection rates are close to Western European standards—100 percent.
- Collection rates have also improved in many CIS countries (figure 6.3). The Russian Federation’s parliament amended the necessary laws in the late 1990s, and RAO UES—the main electricity utility—improved collections on its distribution companies. Collection rates increased from 50 percent in the 1990s to 95 percent in the years before the crisis.
- Collection remains a challenge in low-income and lower middle-income countries such as Albania, Azerbaijan, Kosovo, the Kyrgyz Republic, FYR Macedonia, and Uzbekistan. Weak governance poses a significant barrier. Critical to progress and to avoiding reversals is to strengthen the legal framework that allows utilities to disconnect federal, provincial, and municipal agencies and facilities.

Financial viability is also hampered when consumption norms are used in lieu of metered systems. In many CIS countries, enterprise consumption is

FIGURE 6.3

**Evolution of average collection rates in ECA countries**



Note: The middle-income CIS group does not include the Russian Federation, which is shown separately.

Source: EBRD Transition Report 2008.

billed according to industry norms, and about 10–15 percent of the electricity is sold to households without metering, also on the basis of household norms. Overall, the actual consumption of the household is higher than the norm, which most of the time underestimates real consumption.<sup>4</sup> Other sources of commercial losses include theft of electricity through illegal connections, tampering with meters, and corruption. Theft in excess of 20 percent is reported in Georgia, Kyrgyz Republic, and Kosovo.<sup>5</sup>

Technical losses remain high, particularly in the CIS and the Western Balkans, even when compared with Central and Eastern European countries.<sup>6</sup> In centrally planned economies, technical design was optimized on the basis of artificially low administered prices of fuel, energy, and materials; thus, efficiency gains were not valued. Improvements will materialize over the long term as old assets are retired and new ones replaced them. In the short to medium term, however, technical losses can be reduced by rehabilitating the transmission and distribution systems. Investments to reduce technical losses in distribution networks have been undertaken in Georgia, Kazakhstan, Moldova, and the Slovak Republic, with notable improvement as a result.

While reducing technical losses can be an important source of revenue, it also requires investments. Incentives to reduce technical losses will depend critically on progress made in payment discipline. It is worth noting that countries in Central Europe have brought down technical losses to about 10 percent—compared with losses of less than 8 percent in the EU15 in 2007. But there is variability across the region (table 6.1).

Setting and maintaining tariffs that fully recover costs are central to ensuring the financial viability of electricity utilities. Tariffs need to recover the cost of inputs and operating and maintenance costs (short-run marginal cost) and contribute to the funds required for the capital investment needed to sustain the sector (long-run marginal cost). During the socialist period, electricity tariffs levels were far below the long-term supply cost, and the price structure was further distorted by cross-subsidies from industry and business to residential customers. This subsidy pattern has been largely maintained during the transition, particularly in the CIS countries.

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4. In Tajikistan, for example, a pilot study showed that household consumption tended to be 2.65 times the norm (Sharma 2005).

5. World Bank 2006, 2008a.

6. It is not clear exactly how much power goes into distribution networks and thus whether losses occur in transmission or distribution networks. Nor is it clear exactly how much power is consumed by end users—and thus whether losses in distribution are technical or commercial.

TABLE 6.1

**Total technical and commercial losses in ECA countries (percent)**

Total losses	Country
< 8	EU-15, Slovak Republic, Czech Republic, Slovenia
9–11	Lithuania, Poland, Romania, Bulgaria, Estonia, Hungary, Russian Federation
12–14	Belarus, Ukraine, Armenia, Azerbaijan, Georgia, Turkey, Turkmenistan
~17	Croatia, Serbia, Tajikistan, Bosnia and Herzegovina, Latvia
20–30	Kazakhstan, Uzbekistan, Kyrgyz Republic, Tajikistan, FYR Macedonia, Montenegro
> 35	Moldova, Albania, Kosovo

Note: The table consolidates technical losses in both transmission and distribution networks and commercial losses. In practice, distinguishing between these measures is difficult given the absence of metering in many countries.

Source: Kazakhstan, Tajikistan, Kyrgyz Republic, Uzbekistan, and Kosovo: World Bank staff; Montenegro: IEA 2005; all other countries: World Bank World Development Database 2006.

A rough indicative range for the long-run marginal cost of generation is 6.5–7.5 cents per kilowatt-hour.<sup>7</sup> Based on a gas fired combined-cycle power plant, this does not include transmission or distribution charges.<sup>8</sup> It is likely that this type of plant will be the marginal plant (the plant added to meet incremental demand) and so should form the basis for tariff setting, particularly with capital largely imported.

What is the evidence on electricity tariffs? The new EU member states and some Western Balkan countries appear to cover long-run generation costs in 2008 (figure 6.4). The utilities in these countries have attracted private investors. With some exceptions, such as Albania, Kosovo, and FYR Macedonia, the Western Balkans seem to be moving in that direction as well. The picture is very different in most CIS countries. In Armenia, Azerbaijan, Ukraine, and the Russian Federation, the average residential tariff is close to 5 cents per kilowatt-hour, with residential tariffs as low as 2 cents per kilowatt-hour in the Kyrgyz Republic (box 6.1). These tariffs are not adequate to cover the long-run marginal costs of electricity generation. In other CIS countries, such as Moldova and Georgia, tariffs seem to be closer to this objective.

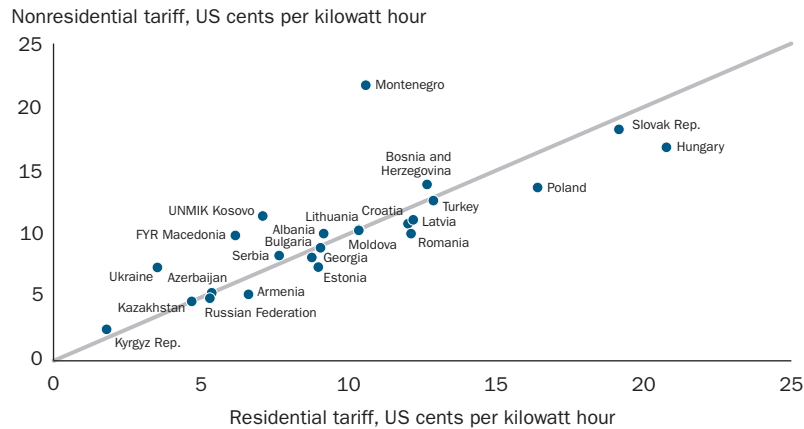
In most countries across the region, the nonresidential tariff is equal to or above that for residential consumers. The burden of tariff increases from a

7. Further work is required to establish the long-run marginal cost in the region, as it is specific to each (national or regional) power network, and depends on factors such as technology, fuel prices, and availability as well as transmission and distribution costs.

8. A gas price of \$250–300 per 1,000 cubic meters is equivalent to a crude oil market price of between \$75 and \$100 per barrel. This estimate is based on the typical indexation formula for long-term imports of gas from the Russian Federation to be delivered at Ukraine's western border. See World Bank 2008b.

FIGURE 6.4

**Weighted average electricity tariffs, 2008 (US cents per kilowatt-hour, excluding taxes)**



Source: Energy Regulators Region Association, Tariff database 2009.

pure efficiency point of view should be borne by residential consumers given that the cost of supplying nonresidential consumers is lower than the cost of supplying residential consumers—technical losses associated with supplying large consumers are low (figure 6.4). Some rebalancing of tariffs to reduce cross subsidies has taken place, and the average ratio of residential to nonresidential prices is 0.97. But more progress has been achieved in Central Europe than in other countries such as Armenia.

Appropriate sequencing of reforms is critical in the presence of weak payments discipline and low tariffs. Compared with Poland and Hungary, which focused on improving their electricity laws and the operation of their utilities before privatization, Kazakhstan, Georgia, Moldova, and Ukraine privatized some of their electricity assets without first addressing payments discipline, with mixed result on efficiency.<sup>9</sup> More recently, the Kyrgyz Republic engaged in sector unbundling, albeit in the context of extensive use of barter and off-sets in lieu of cash for the settlement of transactions. To date, tangible results of such an ambitious program have not materialized, and the level of service to the population has not improved. One of the main lessons is that power generation should not be privatized before distribution, particularly when there are severe payments problems.

9. World Bank 2003.

BOX 6.1

**Electricity tariff increases and poverty impacts**

A key challenge is to ensure that tariff reforms are accompanied by social safety nets to protect the most vulnerable from price shocks and secure social and political support. There are two ways to mitigate the impact of higher electricity tariffs: block tariff structures and targeted subsidies.

Under a block tariff structure, a basic amount of power is provided below cost, with higher tariffs for consumption beyond the specified threshold. Block tariffs are attractive because they are simple and can be designed to be revenue neutral (they do not require budget financing). But they do not exclusively target the poor, they might even unjustly punish poor families (if they use electricity for heating without any evident alternatives), and the systems can be circumvented by consumers that have numerous meters. From an energy conservation point of view, the higher marginal tariff of the highest block has the benefit of discouraging inefficient consumption through price signals.

Under targeted subsidies, an earmarked transfer is provided (such as a voucher for power consumption or a cash transfer specifically for poor consumers). Subsidies are attractive because they target the poor and do not distort resource allocation, but they require good targeting and have a fiscal impact.

Transfers to compensate the bottom quintile of the population as a result of adjustments in tariffs are not that large. The calculations in box table 1 are based on household consumption of utilities, which includes not only electricity consumption but also charges for district heating and water consumption. The estimated figures therefore overestimate the impact of changes in electricity tariffs alone, unless district heating charges—the other main item in utility expenditure—are also adjusted in the process.

As an example, an adjustment in tariffs of 50 percent in Armenia, Azerbaijan, Kazakhstan, the Russian Federation, and Ukraine—where tariffs are in the

BOX TABLE 1

**Percentage of GDP needed to compensate the bottom quintile**

	Tariff increase	
	50 percent	70 percent
Armenia	0.10	
Azerbaijan	0.12	
Kazakhstan	0.11	
Ukraine	0.29	
Russian Federation	0.11	
Kyrgyz Republic	0.28	0.39

Note: Utilities include both direct consumption of electricity by households as well as district heating charges.

(continued)

BOX 6.1 (CONTINUED)

#### Electricity tariff increases and poverty impacts

range of 5 cents per kilowatt-hour—will need a transfer ranging from 0.11 percent of GDP in the first four countries and a much larger amount of about 0.28 percent of GDP in Ukraine. The reason for the higher figure for Ukraine is a higher share spent on utilities but particularly a higher share of income of the poorest quintile in total GDP. In the Kyrgyz Republic, the transfer would have to be 0.28 and 0.39 percent of GDP for tariff increases of 50 and 70 percent respectively; these figures also influenced by the high share of income of the poorest quintile in total GDP. Adding the second quintile to the compensation scheme increases the cost of the transfer by about 2.5 times in most countries. To help place these amounts in perspective, it is worth comparing them with what countries spend on safety nets, ranging between 1 and 2 percent of GDP (chapter 4).

*Reforming the power market structure and trading regimes.* An enabling environment for private participation also requires unbundling the energy sector to create more transparency and competition. The traditional prescription is to transform vertically integrated utilities into separately managed companies. The application of such prescriptions would lead to full vertical unbundling (separation of the state-owned power company into generation, transmission, and distribution entities) and horizontal unbundling of electricity supply (separating power generation companies with a view to deepening competition, and separating distribution companies to support liberalization).

The varied experience in the developing world suggests that power supply reform needs to be adapted to country-specific conditions. The relevant factors to decisions on vertical and horizontal unbundling are power system size, resource endowment, and country institutional capacity to manage complex trading mechanisms.<sup>10</sup> In medium to large power markets with strong institutional capacity, full horizontal and vertical unbundling is generally preferred. For small markets, horizontal unbundling into small entities generally would not make sense. But some vertical unbundling would increase the transparency of operations and facilitate regional trade. Figure 6.5 describes progress toward sector unbundling in the region.

Motivated by the requirements set by EU Directives,<sup>11</sup> countries that recently joined the EU are among those that have unbundled the most. These

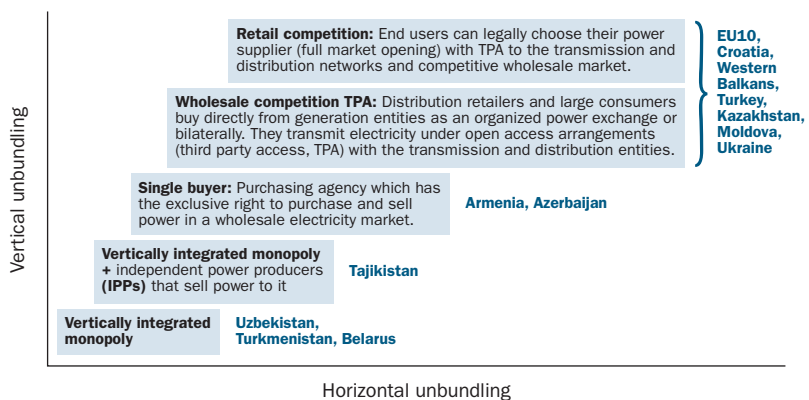
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10. ESMAP 2006.

11. The EU Directive on the creation of an integrated electricity market (EU 2003) focuses on breaking up vertically integrated supply chains to allow competition in the power market, regulated third-party access to the power network, coexistence of regulated and competitive markets side by side, and allowing consumers to choose suppliers.

FIGURE 6.5

**Present structure of ECA electricity markets**



Source: Based on Besant-Jones 2006 and Bank staff.

countries have unbundled their transmission entities, implemented third-party access to their networks, and opened, to varying degree, their retail market to competition.<sup>12</sup> But progress has also taken place elsewhere in the region.

- The three biggest generators control more than 70 percent of generation capacity in the Czech Republic, Estonia, Latvia, Lithuania, the Slovak Republic, and Slovenia. Concentration in the retail market is even higher. Further market restructuring is expected with the implementation of the proposed third legislative energy market package.<sup>13</sup>
- In Turkey, substantial progress in sector restructuring, in line with relevant EU legislation, has enabled private participation. In 2008, four regional distribution companies have been privatized (with total receipts from the privatization estimated at about \$2.4 billion). Bidding for the privatization

12. Third-party access is to grant open access for parties other than a vertically integrated power utility to use its transmission and distribution network for a fee. It is the most tangible way of creating a real level playing field between the incumbent and new project developers to reach customers directly.

13. The proposal for the third direction concerning common rules for the internal market in electricity and gas (EU 2007) includes the following measures: effective separation of supply and production activities from network operation; further harmonization of the powers and enhanced independence of the national energy regulators; establishment of an independent mechanism for cooperation among national regulators; creation of a mechanism for transmission system operators to improve the coordination of networks operation and grid security, cross-border trade and grid operation; and greater transparency in energy market operations.

of the next three distribution companies is under way and expected to be completed in 2009.

- The Western Balkans have also adopted some relevant EU legislation in the sector and advanced fairly quickly in vertical unbundling. They have unbundled transmission systems, implemented third-party access to networks, and partially opened their retail market to competition. But the small size of these markets limits the competition that can be expected in each market. Thus, the development of competitive electricity markets will come from cross-border trade.
- Some CIS countries have also taken important steps, such as establishing a wholesale electricity market, as in Kazakhstan, Moldova, and Ukraine.

*Credible and predictable regulatory framework.* A credible and predictable regulatory framework is also necessary in any strategy to attract private investment. When such a framework is in place, utilities and new investors can predict with some confidence that tariffs will generate enough revenue to cover cost. Otherwise, private financing would be attracted only on costly terms, which would result in high rates of return sought by investors, take-or-pay contracts as used in independent power producers, or investors insisting on sovereign or third party guarantees. Effective regulation, together with competitive markets, can encourage cost reductions and mitigate some of the adverse affordability impacts of tariff increases. Some of the options and factors to be tackled include:

- Establishment of an independent, sector-specific regulatory authority. Independence is required to ensure that regulatory decisions critical to investors—from awarding licenses to setting tariffs—are based on technical factors and relatively immune to political and bureaucratic interference. There are various criteria for assessing whether a regulator is independent. Four dimensions are crucial: the independent regulator should be separate from the government, appointed for a fixed term, funded by the regulated industry (through, for example, license fees), and have the power to approve tariffs without requiring approval from government officials. Table 6.2 shows the extent of progress along these dimensions.
- Regulatory reform has progressed significantly in the region over the past five years because of both widespread privatization and EU accession.<sup>14</sup> Indeed, a totally independent regulator (the first four columns of table 6.2) is now present in 10 ECA countries (Albania, Bosnia, Georgia,

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14. The Power Directive of the European Union requires that regulatory bodies be established, and that they have the authority at least to fix or approve tariff methodologies for power transmission and distribution, and ideally to set tariff levels (EU 2003).

TABLE 6.2

## Regulatory institutions in ECA countries

	Separate regulator	Fixed-term appointment	Industry funding	Full tariff-setting power	Transparency	Redress
South East Europe						
Albania	✓	✓	✓	✓	✓	✓
Bosnia & Herzegovina	✓	✓	✓	✓	✓	✓
Croatia	✓	✓	✓	x	✓	✓
Macedonia, FYR	✓	✓	✓	✓	✓	✓
Montenegro	✓	✓	✓	✓	✓	✓
Serbia	✓	✓	✓	x	x	✓
EU countries						
Bulgaria	✓	✓	✓	x	✓	✓
Czech Republic	✓	✓	x	x	✓	✓
Estonia	✓	x	x	✓	✓	✓
Hungary	✓	✓	✓	x	✓	✓
Latvia	✓	✓	✓	✓	✓	x
Lithuania	✓	✓	x	✓	✓	✓
Poland	✓	✓	x	✓	x	✓
Romania	✓	✓	✓	✓	✓	✓
Slovak Republic	✓	✓	x	✓	✓	x
Slovenia	✓	✓	✓	✓	✓	x
Black Sea and Belarus						
Armenia	✓	x	x	✓	✓	x
Belarus	x	x	x	x	x	x
Georgia	✓	✓	✓	✓	✓	✓
Moldova	✓	✓	✓	✓	✓	✓
Ukraine	✓	✓	x	✓	✓	x
Turkey	✓	✓	✓	✓	✓	x
Central Asia						
Azerbaijan	✓	x	x	x	x	✓
Kazakhstan	✓	x	x	✓	✓	✓
Kyrgyz Republic	✓	✓	x	✓	x	✓
Tajikistan	x	x	x	x	x	x
Uzbekistan	✓					
Turkmenistan	x	x	x	x	x	x

Latvia, FYR Macedonia, Moldova, Montenegro, Romania, Slovenia, and Turkey) compared with only three in 2003.<sup>15</sup> Countries such as Albania, Romania, and FYR Macedonia have made significant progress in

15. A survey carried out in 2003 by EBRD and the World Bank found that only three countries (Latvia, Moldova, and Slovenia) demonstrated total regulatory independence as defined above (Kennedy 2003).

conjunction with the privatization of their distribution companies. In the Russian Federation and in Central Asia, with the exception of Tajikistan and Turkmenistan, separate regulatory bodies have been set up, even though they cannot yet be regarded as fully independent.

- To the extent possible, an independent regulator should retain control over tariff setting, but practice in the region has been mixed. In Bulgaria, Croatia, the Czech Republic, Hungary, and Serbia, tariffs are recommended by the regulator but must be approved by the government (see table 6.2). In Bulgaria and Romania, the tariff methodology must be approved by the government. Such arrangements can limit the economic and technical information on which tariffs decisions should be based. Provisions for the government to approve tariff setting might be appropriate for an interim period while a regulator establishes a track record. For example, the staff of newly formed regulatory office often come from the power companies, and the risk of capture is thus real. This would warrant greater government involvement because an effective regulator needs to be independent of both political and industry interference. But as the regulator establishes its credibility as an independent agent, tariff setting should be separated from government decisionmaking.
- Although an independent regulator must be isolated from the political process, regulatory discretion opens the door to regulatory interference. Regulatory discretion can be mitigated by making the regulators more accountable for their actions. This can include substantive reporting and audit obligations, a high level of transparency in regulatory decisions and their justification, and appeal rights for parties believing that their interests have been harmed by regulators' decisions not following the law. Independent regulators in almost all countries in ECA are now legally obliged to present an annual report on their activities to the legislature or the executive branch. The publication of rules, regulations, and decisions is now common in most countries. Transparency has significantly improved recently as the consultation process, an element in improving accountability, plays an increasing role in regulatory decision-making.
- Regulated companies in nearly all countries must have recourse to the judicial system to seek redress. The local judiciary is unlikely to have the requisite expertise and may not be perceived by regulated companies or investors as impartial (see table 6.2). Recourse to national courts is enforced in Azerbaijan, Georgia, Kazakhstan, Montenegro, Poland and Romania. Additional procedures of redress through international arbitration have proved useful, particularly where privatization has taken place, as in

Kazakhstan and Moldova.<sup>16</sup> In EU member states, potential recourse to European courts may also provide adequate investor security.

- It will take time before the new regulatory system becomes fully functioning and credible—and the lack of track record may still inhibit private investment. This is the situation in some countries in the region. Regulatory institutions are sometimes too new to develop a good track record, and the new regulator lacks the experience with private sector operators. In such cases, governments may wish to consider temporary risk-mitigation instruments to facilitate the mobilization of commercial debt or equity. Some of the risks that private investors are not willing to take can be transferred, at a price, to third-party official institutions, such as multi-lateral or bilateral agencies, that are capable of taking such risks. These have proved useful to facilitate a smooth transition to a credible regulatory framework while a track record is being developed. For example, Romania and Albania successfully privatized their distribution companies and significantly diminished the cost of capital by using the World Bank's partial risk guarantee.

#### *Deepening regional cooperation and trade*

Expanding power trade in the ECA region is an untapped option that could yield significant economic savings and boost security of supply. Trading can be either short- or long-term. Short-term trade allows countries to change dispatch patterns opportunistically. Long-term trade, by contrast, affects both dispatch and system expansion and involves firm commitments to international trade. Almost all ECA countries exchange electricity on a short-term basis. Some are now considering deeper trade as they develop their institutional capacity and as confidence strengthens in cross country arrangements for regional cooperation.

The main drivers of long-term trade in the region are large mismatches between electricity demand and resource endowments. For example, central Asian countries could exploit coordination between thermal and hydropower production between the summer and winter seasons. Developing and inter-connecting a largely thermal power system in Uzbekistan and Kazakhstan with the largely hydropower systems of Tajikistan and the Kyrgyz Republic would allow energy banking. This is also an important option for small countries rich in coal (such as Kosovo) where power markets are too small to

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16. Private investors in Kazakhstan and Moldova initially sought recourse to international arbitration, as allowed under their privatization contract, to solve disputes related to tariff-setting; in the end, resolution was reached without arbitration.

exploit substantial economies of scale. Increased cooperation and trade would secure access to export markets and export revenues to support their energy export-led growth. Further economies are possible where utilities face different system load shapes or experience peak loads at different times of the day or year. In this situation, the output of peaking plants can be shared between countries. When networks are interconnected, as opposed to operating independently, power supply reliability can be achieved with a lower reserve margin in generation capacity.

Two untapped electricity trade arrangements opportunities exist in the ECA region: the South East Europe regional integrated electricity market, and electricity projects based on seasonal and endowment features in Central Asia.

*South East Europe regional electricity market.* Recognizing the potential gains from increased energy trade, the EC and the countries of Southeastern Europe subscribed in 2006 to the Energy Community Treaty.<sup>17</sup> The Treaty contains a commitment to market reforms and the operation of an integrated regional electricity and gas market, compatible with the internal energy market of the EU.<sup>18</sup> This helps offset the disadvantages of small market size, which together with a dominant national generator tend to create isolated markets with weak competition. The Treaty also establishes a mechanism for cooperation and dialogue among governments, regulatory authorities, industry and international donors. Network unbundling and third-party access are generally well advanced (table 6.3).

Even so, an integrated regional electricity market still faces major obstacles. One of the most critical areas is market opening. Except in Romania and Bulgaria, most countries need to set a calendar and take concrete measures to open the market and allow competition in both household and nonhousehold electricity markets. In most countries, wholesale market activity remains low—the result of national markets dominated by a single, generally state-owned, generator that supplies at regulated rates to tariff customers. Another problem is that cross-border trade is hampered by the lack of harmonization of congestion management and cross-border capacity allocation mechanisms.

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17. The Energy Community Treaty created the Energy Community of South East Europe with the following parties: the EC and the Western Balkans (Albania, Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro, Serbia and Kosovo). Romania and Bulgaria joined the EU in January 2007 and are classified as “participants.”

18. The Generation Investment Study (EU 2004) estimated that operating the South East Europe power system as a single, fully interconnected network would reduce investment requirements and save approximately €3 billion.

TABLE 6.3

**Implementation of the directive 2003/54/EC in the contracting parties to the treaty establishing the energy community, December 2008**

	Albania	Bosnia and Herzegovina	Croatia	Macedonia, FYR	Montenegro	Serbia	UNMIK Kosovo
Public service and customer protection							
Monitoring security of supply							
Technical rules (grid code, distribution code)							
Authorization for new generation capacity							
Unbundling provisions							
Third-party access to networks							
Electricity market opening							
Cross-border trade							
	All provisions available	Some provisions available	Some provisions missing	Bottlenecks to progress			

Source: Energy Community Secretariat 2009.

Although the possibility of secondary trading of cross-border capacities exists in a few cases, these markets do not function well.

*Developing energy trade in Central Asia.* Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan, possess complementary natural resources. For example, hydropower exported from the Kyrgyz Republic and Tajikistan during summer months is cheap relative to thermal power generated in Kazakhstan and Uzbekistan. In contrast, the economic costs of hydropower generation in the Kyrgyz Republic and Tajikistan during the winter are substantial. The Kyrgyz Republic and Tajikistan could meet their energy needs far more efficiently using coal and gas imported from Kazakhstan and Uzbekistan. But the inability of the Kyrgyz Republic and Tajikistan to access these fuels and the lack of their own thermal generation capacity are causing them to use and develop hydropower to avoid endemic power shortages in the winter. Unfortunately,

TABLE 6.4

**Features of electricity systems in Central Asia**

	Cash collection (percent of billing)	System losses (percent)	Tariff (percent of cost recovery)	Regulatory codes and institutional structure
Kazakhstan	~85	~20	100	Reasonable
Kyrgyz Republic	94	35	~55	Inadequate
Tajikistan	85	19	~58	Inadequate
Uzbekistan	~70	23	90	..

.. is not available.

Source: World Bank staff.

water released in winter can cause flooding and compromise the availability of water to meet irrigation needs in downstream countries in the summer.

The potential economic savings from committing to long-term framework agreements on electricity and water exchange are large. But in part because of each government's post-independence apprehension of being dependent on outside sources for energy, such agreements have not been put in place. National policies so far have favored self-sufficiency and substitution even at the expense of trade and rationalization of energy use. The failure to move to new agreements has left energy trade in a complex structure of state-to-state barter arrangements that are neither efficient nor able to meet the changing needs of each country.<sup>19</sup> As noted before, countries exhibit large sector losses, non-billing, and non-payment. Electricity tariffs are below cost-recovery in the Kyrgyz Republic and Tajikistan (table 6.4), and this has led to financial and physical deterioration of the sector and excessive demand for power by consumers. In addition, efforts to restructure electricity supply by utilities have been limited.

The Central Asian countries, supported by an alliance of major multilateral development institutions, have announced initiatives to encourage energy trade but with limited impact so far. The Central Asia Regional Economic Cooperation program, initiated in 1997, may hold some promise. It focuses

19. In 1998, upstream (Kyrgyz Republic and Tajikistan) and downstream (Kazakhstan, Uzbekistan) riparian countries concluded an agreement on the water and energy resources of the Syr Darya River. It sought to compensate the upstream states for water storage services through the purchase of surplus summer electricity from the Kyrgyz Republic and the supply of fossil fuels needed for Kyrgyz winter needs by the downstream states. The agreement weakened when Uzbekistan's interest in importing electricity in the summer declined and when it insisted on cash for its gas rather than electricity and the benefits of water storage and seasonal release. The agreement is no longer functional.

on key investment projects, such as improvements in power transmission systems, and provides technical assistance to promote discussions on power sector reform and analysis of electricity export potential, and is also developing the Water-Energy initiative. Azerbaijan, China, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan signed a memorandum of understanding establishing the CAREC Members Electricity Regulators Forum in 2005. The Forum is designed to help members capitalize on their shared experiences as they seek to reform their power sectors and identify possibilities for energy trade. In another initiative, Tajikistan and Kyrgyz Republic, with Afghanistan and Pakistan, are developing a Central Asia South Asia Regional Electricity Market. The objective is to exploit and monetize Central Asia's hydroelectric power surplus during the summer.

### **The education and skills agenda—making the grade**

For the first time since BEEPS started a decade ago, firms are identifying workers' education and skills as a major impediment to their growth prospects. Until 2005, this was not an area typically identified by firms as a constraint, though the gap between transition countries and nontransition countries had largely disappeared among the high-income transition countries. As mentioned in Chapter 5, firms were surveyed in 2008—at the eve of the present crisis—and had very different perceptions about labor as an impediment to growth.

About 30 percent of firms (unweighted average) considered education and skills to be a major or severe constraint (figure 6.6). Most dissatisfaction is among the middle-income CIS countries—more than 40 percent of firms are dissatisfied. In contrast, there is less dissatisfaction in the Western Balkans and significant variability in the EU10 plus Turkey.

The share of firms assessing the availability of the “right” workers as either no obstacle or a minor obstacle has declined in the last three years (figure 6.7). Negative values mean that a smaller share of firms were satisfied in 2008 than in 2005. For example, if the share of satisfied firms in a country declined from 0.50 to 0.25 between 2005 and 2008, the country would be in the -0.2 to -0.3 range of the figure. Except for one country, all magnitudes are negative. The worst deterioration has taken place in the middle-income CIS countries. But even in a large number of new EU members and other CIS countries, the reduction in satisfied firms is between 0.2 and 0.3.

What attributes are firms valuing when they refer to educated labor and skills? Are they valuing specific technical knowledge, or are they valuing more general attributes associated with years of schooling, such as adaptability,

FIGURE 6.6

**Worker education: percentage of firms considering it a “major” or “very severe” constraint in 2008**

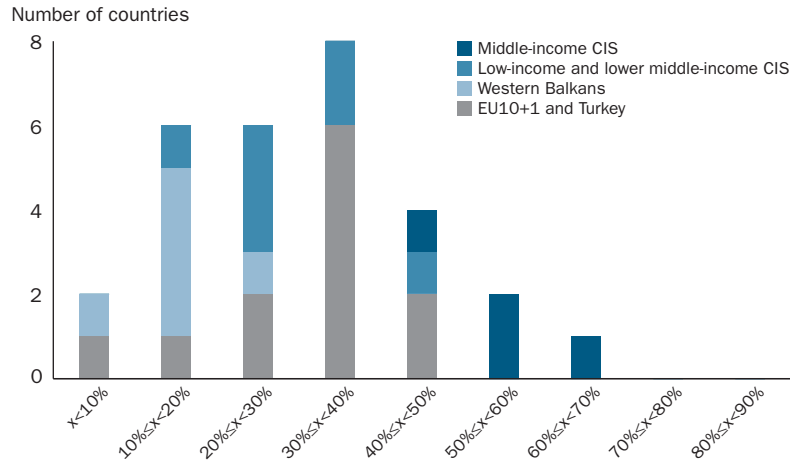
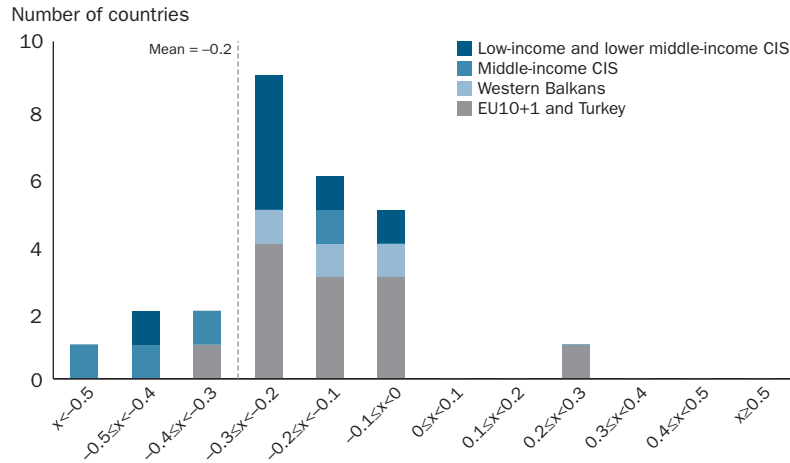


FIGURE 6.7

**Worker education: change in the frequency of satisfied firms between 2005 and 2008**



overall analytical thinking, and communication skills? Will simply adding years of schooling be the solution? Or does the type of education matter (such as general or vocational education)? Is tertiary education crucial, and, if so, in which fields? How important is the curricular content as a substitute for simply more years of schooling?

### *Evidence from students tests—youngsters do well internationally*

Young students in ECA countries generally do better in international tests than those with similar incomes. The recently published 2007 Trends in International Mathematics and Science Study (TIMSS) is the fourth of a series of international comparisons of young students at grades 4 and 8. For the first time, this study measures separately the knowledge of the curricula (content tests) from applications of that knowledge to real life problems (cognitive tests) (figures 6.8 and 6.9). Generally, ECA countries perform very well at grade 4 relative to countries with similar per capita incomes. These patterns hold for both mathematics and science and for both mastery of curricula and applied knowledge. These TIMSS results at grade 4 also echo results from the Progress in International Reading Study, another international assessment measuring students' reading abilities. Some country patterns emerge from figures 6.8 and 6.9.:

- Students from the CIS and the Baltic states perform particularly well.
- ECA countries perform better than their peers in math, but in science, Georgia, Turkey, and Romania are slightly below the line.
- Students in the Russian Federation still perform quite well in grade 8—there is no clear signal of a deterioration of their relative position between grades 4 and 8.<sup>20</sup>

The TIMSS results can be compared with results from the 2006 OECD Program for International Student Assessment (PISA). These tests are taken at a later age and measure more general competencies of students and their ability to apply knowledge (capturing education imparted at grades 9 and 10). For example, the PISA mathematics test asks students to apply their mathematical knowledge to solve problems set in various real world contexts. The comparison of PISA scores of ECA students is relative to peers in countries with similar per capita incomes. Again, the majority of students in ECA perform well relative to peers (figure 6.10). The relative position of ECA students remains rather invariant, either using TIMSS or PISA. Two additional countries are in the PISA sample: Azerbaijan and Kyrgyz Republic. Azerbaijan does extremely well in mathematics—far above the comparators. In science, however, its position is below the comparators.

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20. The 1997 Report on Education by the Public Chamber of the Russian Federation points out that although Russian elementary school graduates do better than the world average in knowledge in math and natural science, they do start to lag behind their peers at grades 5–9 (lower secondary) in their ability to apply their knowledge (Public Chamber of the Russian Federation Report 2007). A more recent study on the Russian Federation's education system also advances the notion that Russian schools may place greater emphasis on acquisition of encyclopedic knowledge over problem solving, particularly as education evolves from primary to upper secondary schools (Kapelyushnikov 2008).

FIGURE 6.8A  
**2007 TIMSS—mean content scores in grade 4 math**

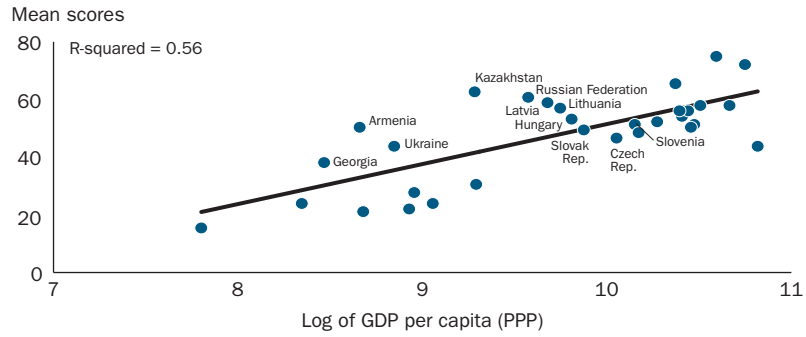


FIGURE 6.8B  
**2007 TIMSS—mean cognitive scores in grade 4 math**

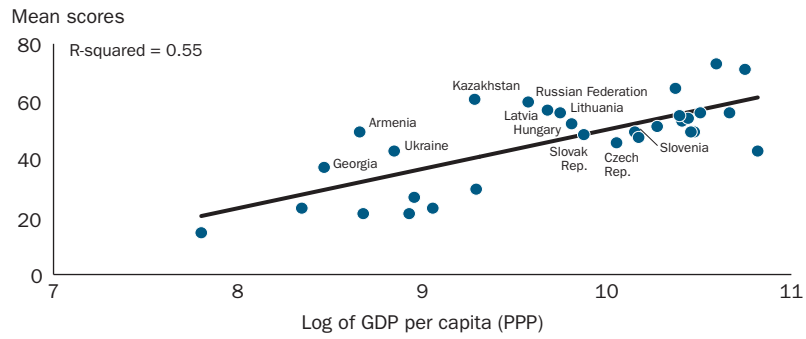


FIGURE 6.8C  
**2007 TIMSS—mean content scores in grade 4 science**

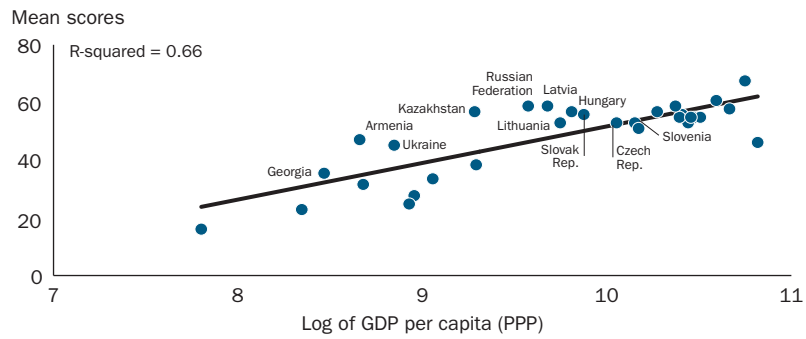


FIGURE 6.8D  
**2007 TIMSS—mean cognitive scores in grade 4 science**

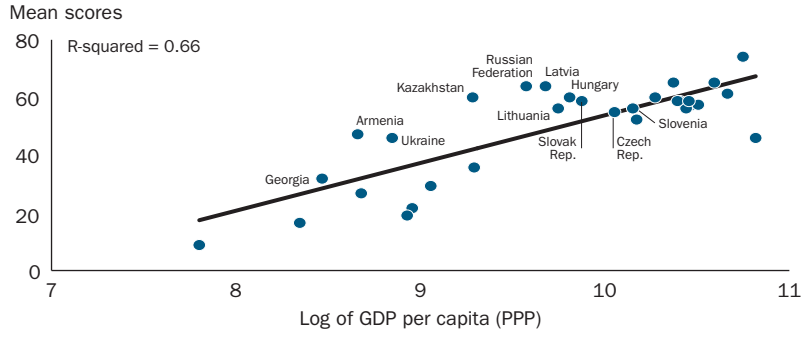


FIGURE 6.9A  
**2007 TIMSS—mean content scores in grade 8 math**

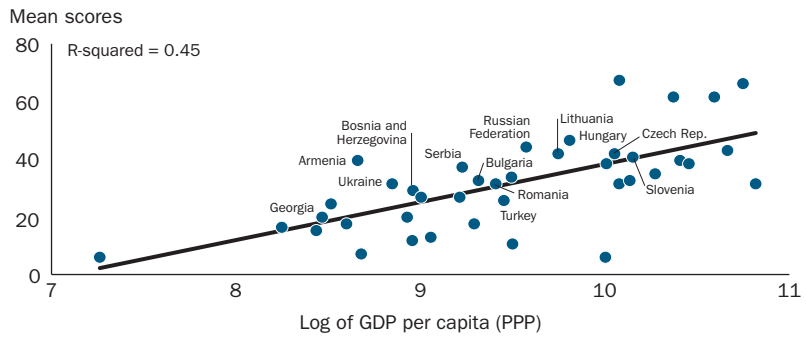


FIGURE 6.9B  
**2007 TIMSS—mean cognitive scores in grade 8 math**

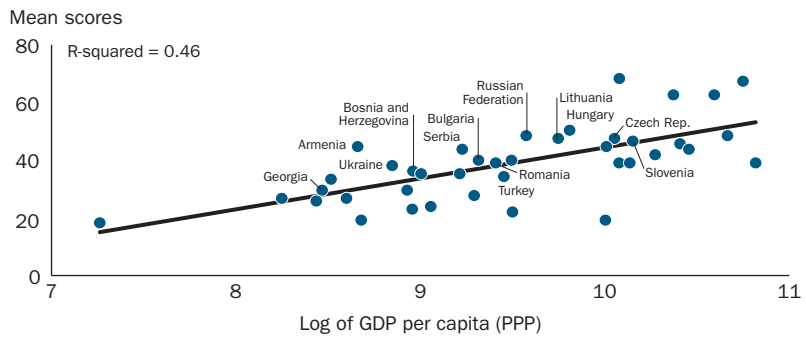


FIGURE 6.9C  
**2007 TIMSS—mean content scores in grade 8 science**

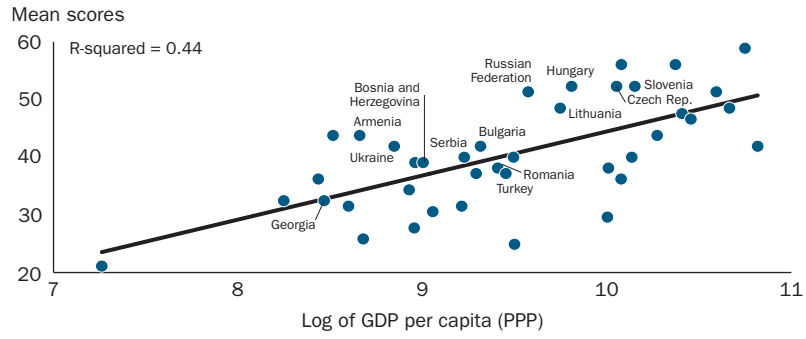


FIGURE 6.9D  
**2007 TIMSS—mean cognitive scores in grade 8 science**

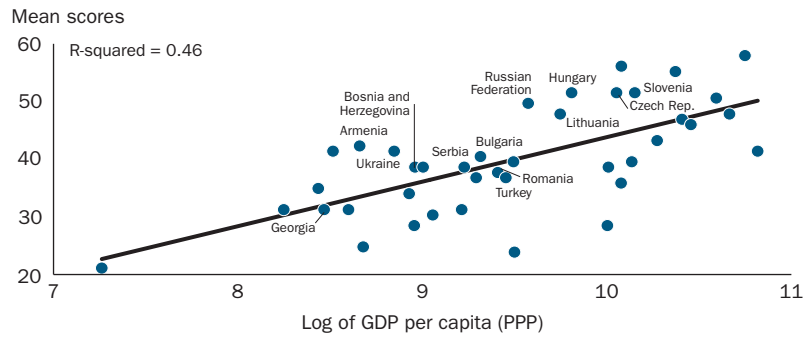


FIGURE 6.10A  
**PISA math scores**

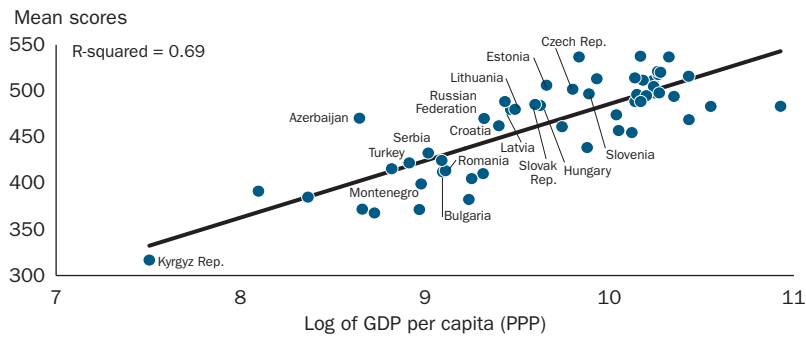
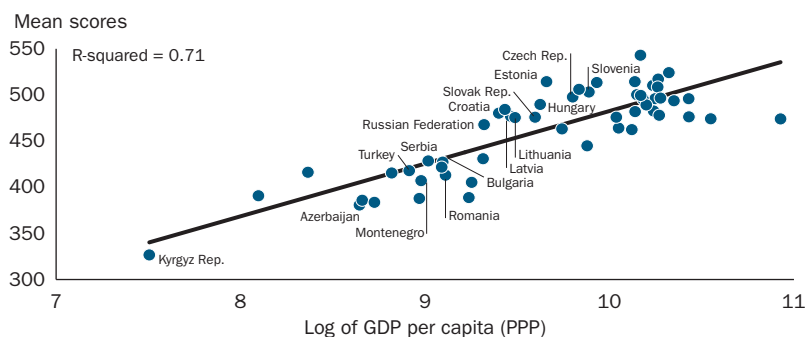


FIGURE 6.10B

**PISA science scores**



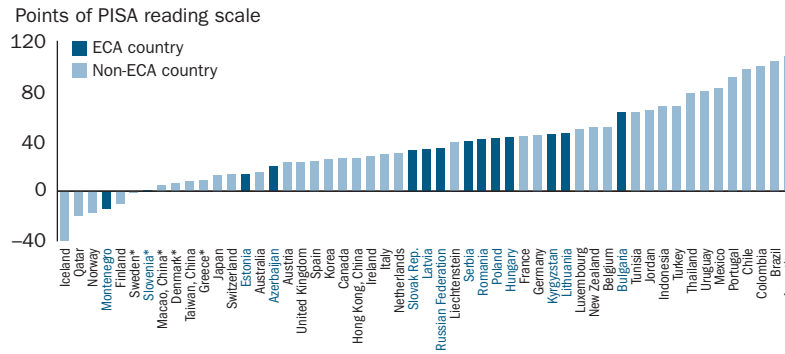
Interestingly, the PISA study allows computation of an index of economic, social, and cultural status (ESCS) comprising parents' education, occupational status, and possessions in the home. It allows classifying students in quintiles according to the level of the ESCS index, thus allowing comparisons on how students in one quintile perform against those in another quintile. Implicitly, it assesses how well the educational system has compensated for such ESCS differences.

The main conclusion is that differences in test scores across socioeconomic groups are similar to those observed in many OECD countries. Figures 6.11a and 6.11b show for several countries the difference in students' scores between the highest and lowest ESCS quintiles. Countries are ranked according to the magnitude of such differences. Positive values indicate that students in the highest ESCS quintile performed better than those in the lowest quintile. Negative values mean students in the lowest ESCS quintile performed better than students in the highest quintile. The figures show ECA countries to be roughly in the middle of the distribution, at par with many OECD countries. For most ECA countries, the (positive) differences are lower than those observed in the United States, France, Germany, and Belgium. Thus, at least on an international basis, it is not obvious that ECA countries participating in these programs have a distinctive distributive issue regarding the performance of students with different socioeconomic status. This depends on how the ESCS index is measured, of course, but the results provide a benchmark that may encourage further work in this area.

*Evidence from labor markets—changing structure of occupations and wages*

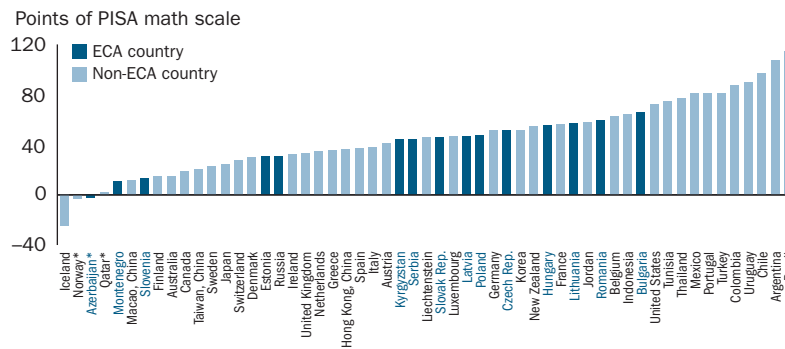
Most ECA countries have experienced strong changes in the structure of output as results of market liberalization and more open trade regimes. Job

FIGURE 6.11A  
**PISA reading scores—difference between quintile 5 and quintile 1**



Note: Differences are statistically significant unless indicated by \*.

FIGURE 6.11B  
**PISA math scores—difference between quintile 5 and quintile 1**



Note: Differences are statistically significant unless indicated by \*.

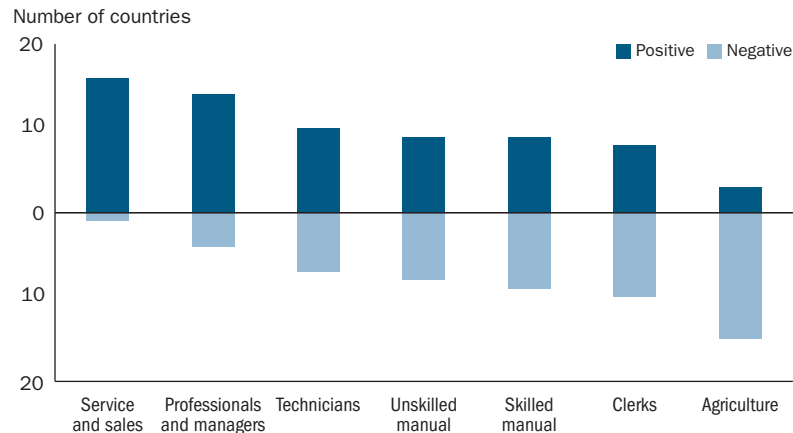
growth has been greatest in the service sector, with strong reallocations within manufacturing as a result of more open trade. New firms have been a significant force for job creation, while job contractions have taken place in large state owned and newly privatized firms.<sup>21</sup>

How have labor markets responded to these developments—and what do these changes suggest in terms of education and training systems? Figure 6.12 shows the number of countries where the percentage participation of different occupations increased or declined during the last decade. The definition

21. Mitra 2008.

FIGURE 6.12

**Positive and negative shifts in employment participation in 1995–2006, by occupation**



of occupations is quite broad and follows the one-digit ISCO/ILO classification.<sup>22</sup> Four patterns are worth highlighting:

- Occupations in the service sector and retail have expanded—areas that were held back under central planning, as noted in chapter 5.
- Managers and professionals have also expanded, in all likelihood, linked to the transformation of the enterprise sector.<sup>23</sup>
- Agricultural employment has shrunk.
- For a mix of middle level and manual labor occupations, the picture is more diverse. In about half the countries, these occupations have expanded, while in the other half they have decreased. These are occupations where changes are very country-specific and sensitive to finer adjustments in the subsectoral structure of the economy, as in the structure of manufactured exports.

Have wage premia to skills embodying different levels of schooling (or different types of schooling) changed? Wage premia and rates of returns have increased since the start of transition—particularly in the earlier periods of liberalizing the wage setting mechanism.<sup>24</sup> By the early 2000s, rates of return to an average year of extra schooling (across levels) was comparable to that of developed economies. They varied significantly, from 4–6 percent in Romania, Slovak Republic, Tajikistan, and Ukraine to 8–11 percent in Hungary,

22. The discussion in this section is based on work by Rutkowski (2009).

23. Professionals are individuals with a degree or training in tertiary education.

24. Rutkowski 2009.

TABLE 6.5

**Russian Federation—wage premia for additional schooling (percent)**

	2003	2007
<b>Complete tertiary over:</b>		
Incomplete tertiary	14%	47%
Technical college	36%	56%
Vocational schools	63%	63%
General secondary	63%	57%
<b>Technical college over:</b>		
Vocational schools	5%	5%
General secondary	20%	0%
<b>Vocational schools over:</b>		
Primary education	54%	25%
<b>General secondary over:</b>		
Primary education	36%	30%

Source: Kapelyushnikov 2007.

Kazakhstan, and Poland. In the Russian Federation, they increased sharply from about 4 percent in the early 1990s to about 9 percent in the early 2000s. Comparing studies across countries and over time requires some caution because they may use different concepts of earnings (including some returns to capital), types of schooling, and different estimation techniques.

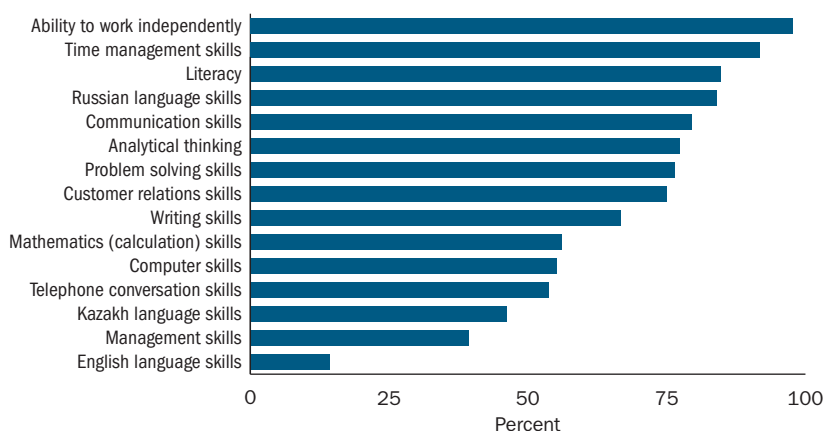
A major shortcoming in this area is the absence of more recent wage data that would allow an assessment of how wage premia has evolved during the last decade. However, a study based on two of the most representative nationwide surveys in the Russian Federation provides information on wage developments.<sup>25</sup> Table 6.5 shows how the Russian wage premium has evolved between 2003 and 2007, a period when GDP growth was sustained at about 7 percent a year:

- Just completing tertiary education has a strong premium, increasing sharply between 2003 and 2007 from 14 percent to 47 percent. Perhaps completing tertiary and the associated certification is signaling other elements of student's personalities and competencies (beyond pure additional training) that are highly valued by employers. This has also been found in other labor market studies in developing countries, attesting to the strong screening effect that employers may give to the certification effect of completing tertiary education.

25. NOBUS 2003 and OZPP 2007.

FIGURE 6.13

**Kazakhstan survey of firms, 2008: importance of general competencies and technical skills**



Note: The figure shows the percentage of firms reporting a specific skill to be important or very important for specialist/skilled workers.

- The premium to technical college was small, and relative to general secondary education, it disappeared completely in 2007.
- The premium to vocational school over primary education was reduced by half—from 54 to 25 percent.
- The premium to general secondary education over primary is roughly constant.

The importance of general competencies more than narrow technical training is confirmed by a recent survey of entrepreneurs in Kazakhstan. Kazakhstani firms highly value general competencies—such as the ability to work independently, time management, literacy, and language and communications skills (figure 6.13). Math and computer skills were singled out less frequently.<sup>26</sup> On the other hand, unemployment indicators across ECA provide a mixed picture in this area. In 2006, about half of ECA countries reported higher unemployment rates for workers with vocational education, and half reported higher unemployment for general secondary graduates.<sup>27</sup>

What are the implications of this evidence on labor markets—while acknowledging its fragmentary nature and its reliance on only a few countries? First, there is an increase in demand for individuals with completed

26. Ivaschenko 2008.

27. Mertaugh (forthcoming).

degrees in tertiary education, but it is not as obvious what attributes firms are valuing or how they are enhanced by tertiary education—this requires additional research. Second, the lower premia on specific technical degrees and the fact that management occupations have increased suggest that general competencies that may be associated with completing tertiary education are valued more than specific technical knowledge. Third, the low returns to middle technical education observed in the Russian Federation, the mixed picture of the expansion of technicians as occupations, the increased share of services, the survey in Kazakhstan—all point to the importance of a secondary education that imparts a minimum set of general competencies. This is consistent with the discussions in ECA countries on the role of vocational education and on avoiding situations where students enter a narrow career path too early. Finally, the ability to adapt, retrain and absorb on-the-job training may be increasingly critical as the composition of output and employment changes. Education has more impact when it allows workers to cross sectors and occupations.

#### *Issues to focus on*

As mentioned earlier, the review of issues in education is based on incomplete evidence. ECA has a large variability of country situations calling for careful country taxonomies—which are absent here. But some areas appear common to most countries.

*Compulsory education (primary and secondary): the critical role of teachers.* Most students in early grades seem to be performing well in international tests, and the information available reveals no major differences in performance between children of different socioeconomic status as measured by PISA data. It is important for these gains to be preserved—and accelerated in countries that are lagging. Assuring that minorities or more disadvantaged children in poorer rural areas have access to high quality schools remains a challenge.

A specific problem, particularly but not exclusively in the CIS countries, is the coexistence of three developments. First, student-to-teacher ratios in the CIS countries are lower than other countries. For example, in Ukraine the student-to-teacher ratio is 9.5–60 percent of the OECD average. And these ratios are expected to fall with declining enrollment ratios and shrinking school age cohorts. Second, there is evidence that the teaching profession has become less attractive: the average age of teachers is rising rapidly, teachers are working fewer hours, and wages are low relative to other professions.

TABLE 6.6

**Students tutored by their own teachers**

Country	Percent of students
Tajikistan	51
Kazakhstan	40
Kyrgyzstan	39
Lithuania, Slovak Rep., Bosnia and Herzegovina, Georgia, Ukraine	<20.0
Croatia, Poland	<10.0

Source: Silova, Budiene, and Bray 2006.

## BOX 6.2

**Ukraine norms for education facilities**

- 1 deputy school director per 11 class groups.
- 1 managing director, if the village has more than 600 people (regardless the total number of children in the school).
- 1 pedagogue per 8 class groups (regardless of the number of children in the school).
- 1 extracurricular activities group leader per 16 class groups (regardless of the number of children in the school).
- 1 cleaner per 500 square meters (0.5 per 250 square meters).
- 1 coat room attendant per 200 coat spots in school.
- 1 yard keeper per 1.5 hectares in each school.

Third, payments by households to obtain additional tutoring from their own teachers seem to have become important (table 6.6).

The combination of excessive numbers of teachers, fewer hours taught at school, and parents having to purchase additional tutoring services is consistent with poor incentives for teachers. But aggregate spending in education does not seem to be the problem—in fact, spending in many countries has increased, but these resources have not been targeted to increasing the remuneration of highly qualified teachers. Spending on other inputs arise from centrally determined norms that prevent reallocation. For example, overmanning and rigid input mixes characterize the education system in Ukraine.<sup>28</sup> Specifically, the input mix is set centrally according to specific norms (in rigid ratios), and many norms are set per unit of physical facility, independent of demand and enrollment (box 6.2). The result is a high ratio of nonteaching

28. World Bank 2008c.

staff to teaching staff—ranging from 0.7 in secondary schools to 1.5 in pre-schools. Such coefficients—added to the already low student-teacher ratio— increase the cost per child.<sup>29</sup>

*Specializing too young and too narrowly?* In a large number of ECA countries, vocational education gives lower secondary graduates (usually age 15) the choice of moving to this stream rather than continuing into upper secondary education. This choice allows students to complete grades 10 and 11 in vocational schools. Historically, this type of education has been important in the ECA countries. In fact, about 15 percent of the labor force in the Russian Federation in the mid-2000s had vocational education as the highest level of school attained. The figure for upper secondary graduates in the labor force was basically the same—about 16 percent.

Vocational school enrollments have fluctuated widely among countries and across periods. During the first decade of transition (1989 to 1999), enrollments declined sharply across all countries, from 60 to 40 percent of total enrollment at the upper secondary level—the rest being general upper secondary enrolment. During the next decade, vocational enrollments stabilized in most countries. This was a natural reaction by students to the first decade of transition, given that vocational schools were quite specialized and historically tuned to the technological needs of the past industrial structure. And this is consistent with the sharp decline in premia still observed in the Russian Federation.

Countries are making vocational education less narrow and more adaptable to changing circumstances. Poland has postponed by a year the time for graduates to move from lower secondary to vocational education, allowing students to absorb more general knowledge and avoiding excessive early specialization. In several countries vocational education is treated as a default option for weak-performing students—who are redirected into vocational schools rather than finishing upper secondary education. The performance of these students may be the result of having attended poor quality elementary schools and of their families' socioeconomic background. To reduce the implicit income-based selection into vocational schools, it is critical to even out the quality of primary schools and lower secondary schools.

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29. Simulations show that reforms that simultaneously address low student-teacher ratios, reduce non-teaching personnel, and allow flexibility of norms (including consolidation of facilities) could save 1 percent of GDP in Ukraine. These resources could then be used to increase the wages of teachers willing to go through training and certification and work normal hours at schools.

*Tertiary education.* The most salient feature of education in ECA countries has been the massive enrollment increase in tertiary education. Some experts believe this is one of the fastest expansions of higher education in recent history.<sup>30</sup> And this happened across countries of very different development levels and economic structure. During the last decade, enrollment has more than doubled in Hungary, Kazakhstan, and Romania, and increased by more than 75 percent in Armenia, Kyrgyz Republic, Lithuania, the Slovak Republic, Tajikistan, and the Russian Federation. In some cases, the additional enrollment exceeded the flow of graduating students from secondary education—signaling the enrollment in tertiary education of individuals already in the labor force.

This massive increase in enrollment was financed by the implicit liberalization of private financing. In some countries, private institutions emerged, and in others, public institutions simply started charging tuition and mobilizing private contributions. In countries as diverse as Georgia, Kazakhstan, and Poland, at least a third of students are enrolled in private schools. That figure is now one-fifth in Azerbaijan, Estonia, Latvia, and Romania.<sup>31</sup> In many ECA countries, public institutions have been given significant latitude to raise funds through tuition—and are charging fees to at least 50 percent of their students.<sup>32</sup> Much of the expansion in private schools was a response to a sharp increase in demand in specific areas not requiring expensive investments, (such as law, business, accounting, languages, economics, and management).

In many countries, the authorities have provided tertiary schools with greater autonomy in their choice of personnel, programs, and tuition charges. Most progress has taken place in the new member states of the European Union and less in the CIS, with the exception of Kazakhstan. A recent study summarizes trends in competition, state regulation, and governance of institutions.<sup>33</sup> Poland and the Czech Republic seem to have progressed significantly in both competition and autonomy. No change is reported for Bulgaria, Croatia, and Slovenia. In most other ECA countries, improvements have been more modest.

Tertiary education can adapt to changing labor market conditions if the system is more demand-driven. Allowing the private sector to enter the sector

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30. Usher 2009.

31. For a comparative discussion of the role of the private sector in higher education in the Baltic countries and Belarus, see Vanags and Hansen 2005.

32. Usher 2009.

33. CHEPS 2006.

and help mobilize resources and know-how could help—particularly in periods of fiscal stringency. Public resources could flow to public institutions on the basis of per-student enrolled formulas, and these institutions could have more autonomy in curriculum changes and hiring and firing. Loans or grants for lower income students who are accepted under a competitive process are an important complement. Many countries have experimented with various options, particularly Hungary, Kazakhstan, Latvia, and Turkey.

Many governments are concerned about allowing private institutions unless a good system of accreditation and monitoring of quality is in place. There is some concern about the transparency and objectivity of existing accreditation systems in several ECA countries. These are genuine concerns, but some good practice models are emerging. One is Chile, where new private institutions need to “earn” their right to full autonomy through a 10-year probation period of monitoring and self-evaluation.<sup>34</sup>

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34. Since its creation in 1990, the new regulatory regime granted autonomy to 26 universities and 13 professional institutes for successfully completing their period of supervision while closing down 16 private universities and 21 professional institutes for poor academic performance, financial distress, or poor governance. Thus as many institutions were closed as created.