DIRECTIONS IN DEVELOPMENT
Human Development

Meeting the Challenges of Secondary Education in Latin America and East Asia

Improving Efficiency and Resource Mobilization

Emanuela di Gropello, Editor

THE WORLD BANK

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Acronyms and Abbreviations

ADB	Asian Development Bank
AFED	Association of Formidable Educational Development
ANOVA	analysis of variance
CCT	conditional cash transfer
CIEP	*Centre International d'Etudes Pedagogiques*
CONAFE	National Council to Promote Education
DAC	Development Assistance Committee
DEA	data envelopment analysis
EAP	East Asia and the Pacific
ECLAC	Economic Commission for Latin America and the Caribbean
EFA	Education for All
ENEM	exit examination
ESA	education savings account
FDH	free disposable hull
FUNDEF	Fund for the Maintenance and Development of Basic Education and Teacher Appreciation
FyA	*Fe y Alegria*
GDP	gross domestic product
GER	gross enrollment rate
GTZ	*Gesellschaft für Technische Zusammenarbeit*
ICETEX	Colombian Institute of Educational Credit

ICL	income-contingent loan
ICT	information and communication technology
IFPRI	International Food Policy Research Institute
ILA	individual learning account
ILO	International Labour Organization
INA	*Instituto Nacional de Aprendizaje*
INEP	National Institute for Educational Research
IPAR	Institute of Policy Analysis and Research
IRI	interactive radio instruction
IZA	Institute for the Study of Labor
LAC	Latin America and the Caribbean
LAEBA	Latin America and Asia-Pacific Economics and Business Association
LLECE	*Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación*
MoEYS	Ministry of Education, Youth and Sport
NBER	National Bureau of Economic Research
NER	net enrollment rate
OECD	Organisation for Economic Co-operation and Development
PACES	*Programa de Ampliación de la Educación Secundaria*
PEC	Quality Schools Program
PER	Public Expenditure Review
PETI	Program to Eradicate Child Labor
PETS	Public Expenditure Tracking Surveys
PISA	Programme for International Student Assessment
PPP	purchasing power parity; also public-private partnership
PREAL	*Programa de Promocion de la Reforma Educativa en America Latina y el Caribe* (Education Reform Project for Latin America)
PROMODE	Modernization and Decentralization Program
SAEB	Basic Education National Evaluation System
SAT	Tutorial Learning System
SBM	school-based management
SEIA	Secondary Education in Africa
SENAI	*Serviço Nacional de Aprendizagem Industrial*
SEP	*Secretaría de Educación Pública*
SNED	National System of School Performance Assessment
TIMSS	Trends in International Mathematics and Science Study
TVET	technical and vocational education and training
UNESCO	United Nations Educational, Scientific and Cultural Organization
VTE	vocational-technical education
WIDER	World Institute for Development Economics Research

Executive Summary

While policy makers in many World Bank client countries have shown an increasing interest in expanding and strengthening their secondary education systems, many challenges remain. As many developing countries have boosted primary school enrollment rates to nearly universal coverage, the number of children seeking secondary education has soared. Yet secondary education must fill dual roles: providing skills, knowledge, and technical training for youth planning to enter the labor force, while at the same time preparing others for continuing their studies in higher education. Unfortunately, secondary education often fulfills neither role. A shortage of schools, as well as demand-side constraints such as the inability to pay for education, have slowed the expansion of secondary education coverage, and the quality of secondary schooling often is poor.

The report focuses on the following questions: How can countries address the multiple challenges they face in secondary education? How can they grow their education systems responsibly and efficiently? How do the challenges vary with countries' different development levels? How can countries with different technical and financial capacities address those challenges? The report uses experiences and

data from East Asia and Latin America to explore these overarching concerns.

Latin America and East Asia face key challenges in secondary education and offer a broad range of policies and programs to address these issues. Secondary education has long been the neglected child in the development of public education systems in both regions. Primary school is associated with basic education and socialization, while national development and competitiveness are tied to tertiary education. As understanding grows that secondary education is necessary for a citizen's fundamental education, many countries in these two regions have passed laws making lower secondary—and occasionally upper secondary—part of mandatory education requirements. However, low access to education, unevenness of quality, and differences in access and graduation rates persist.

During the 1990s, many Latin American countries implemented significant reforms to improve the coverage, equity, and quality of their secondary education systems, with an emphasis on innovations in service delivery, such as decentralization and demand-side financing. East Asia, too, has been pushing secondary education expansion more aggressively, with comprehensive education reforms based on effective supply-side policies in the areas of resource mobilization, and efficient and high-quality use of resources, such as creating efficient public-private partnerships and enhancing the relevance of technical and vocational education.

Why analyze the two regions together? Latin America and East Asia offer a similarly broad range of challenges, experiences, policies, and programs, providing the study team with more "degrees of freedom" for analyzing issues and finding solutions than would be found in the study of any one region. In addition, each region is genuinely interested in learning from the other, and a joint study would allow this with economies of scale. Finally, the two regions include countries that vary greatly in economic and social development levels, ranging from the upper- or middle-upper-income countries of the Republic of Korea, Malaysia, Mexico, and Chile, to the lower-income countries of Vietnam, Cambodia, and Bolivia, allowing us to formulate policy options suitable to very different settings.

What are the challenges for the mobilization and use of resources for secondary education? This report centers on access, quality, and equity issues for secondary education in the two regions, while identifying the

main constraints to its expansion and improvement, as well as policy options to address them. Most of these countries allocate too few resources to secondary education and fail to use resources as efficiently as they could to improve coverage and quality, as illustrated by the following: persistent constraints in household demand for education, low accountability for service delivery, poor teacher performance, and costly curricular structures. At the same time, countries in these two regions offer a broad range of policies and programs to address these constraints. The report reviews promising policies for the mobilization and use of resources such as public-private partnerships, revenue decentralization, cross-sectoral funding, school self-financing, demand-side interventions, school-based management, and technical and vocational reforms. In addition, drawing on a few countries that have demonstrated notable advances in addressing secondary education challenges, the report provides additional insights on key policies and how they can be combined and sequenced to effectively expand secondary education. Finally, whenever possible, suggested policies are region- and income-level specific.

Addressing Secondary Education Challenges

Substantial unsolved challenges remain in secondary education in both East Asia and Latin America. Despite many positive changes and an average gross enrollment level of about 80 percent in Latin America and about 70 percent in East Asia, secondary enrollment rates in many countries remain well below average for their level of GDP per capita. In addition, only a little more than half of the children who start primary school complete their secondary education; quality is low; and noticeable income and urban-rural disparities exist. In their efforts to expand secondary education, both regions must strive to ensure equity and quality.

Although these challenges are present to some extent in all countries, their relative importance varies somewhat by country, region, and income level.

From a regional perspective, both regions suffer from internal efficiency problems, with high primary overage enrollment ratios and low secondary completion rates, but typically these problems are more acute in Latin America. Higher pervasive overage enrollment in primary education, which is associated with increased repetition, affects both

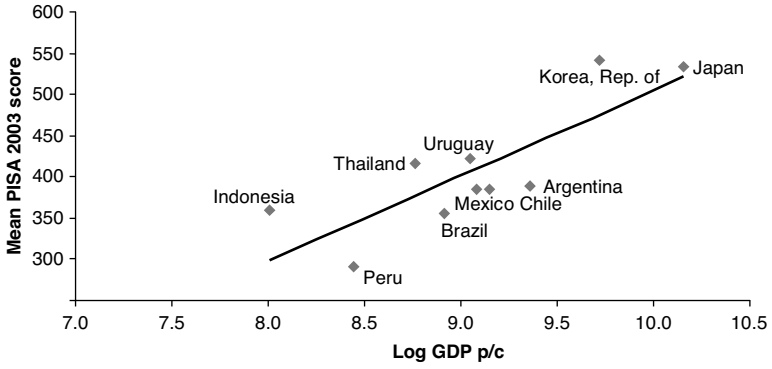
the transition to secondary education and its completion, because older students are less likely to remain in school.

At the same time, the poor quality of primary and secondary education leads to lower secondary school graduation. The quality problems result in academic failure, lack of interest in staying in school, and lower expected income from future professions.

Secondary education quality is of great concern in both regions. Test scores demonstrate that a majority of students fail to acquire basic knowledge and skills. Programme for International Student Assessment (PISA) results, although available for only a few countries, underscore the fact that quality problems are more acute in Latin America, given the countries' income levels (figure ES.1). However, even in countries such as Indonesia and Thailand, which are better performers in relation to their income levels, 50 percent to 80 percent of students perform at or below the first proficiency level in math.

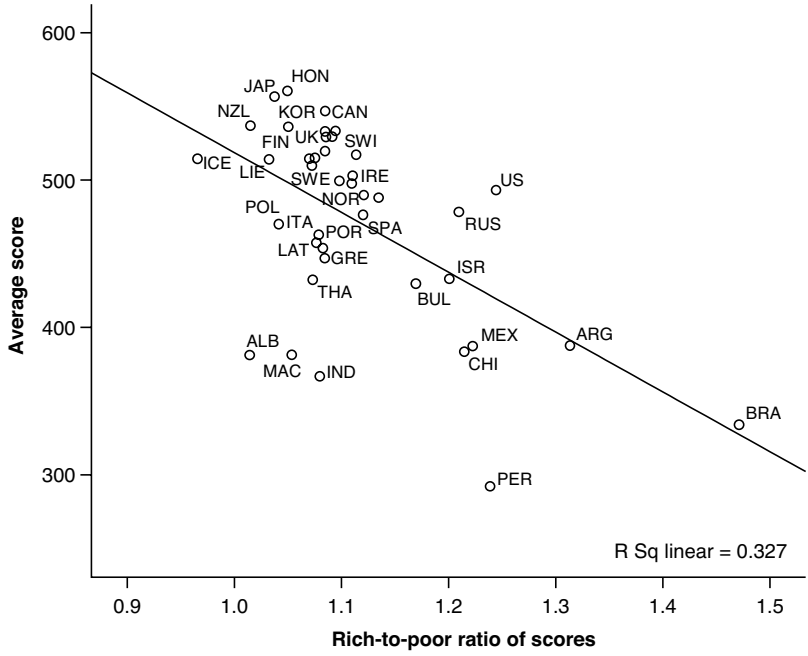
Marked equity gaps based on the urban-rural divide and income inequality are prevalent in both regions. However, income plays a more important role in Latin America. Income inequity is particularly apparent in secondary graduation rates and test scores, showing a strong relationship between efficiency and quality. Figure ES.2 illustrates inequity levels in test scores, showing particularly high inequity in Latin

Figure ES.1. Trend Line of PISA Test Scores against Log GDP per Capita for East Asian and Latin American Countries



Sources: PISA 2003, 2000; WDI 2004 (World Bank 2004f).

Figure ES.2. Performance and Inequality in PISA Scores (Math)



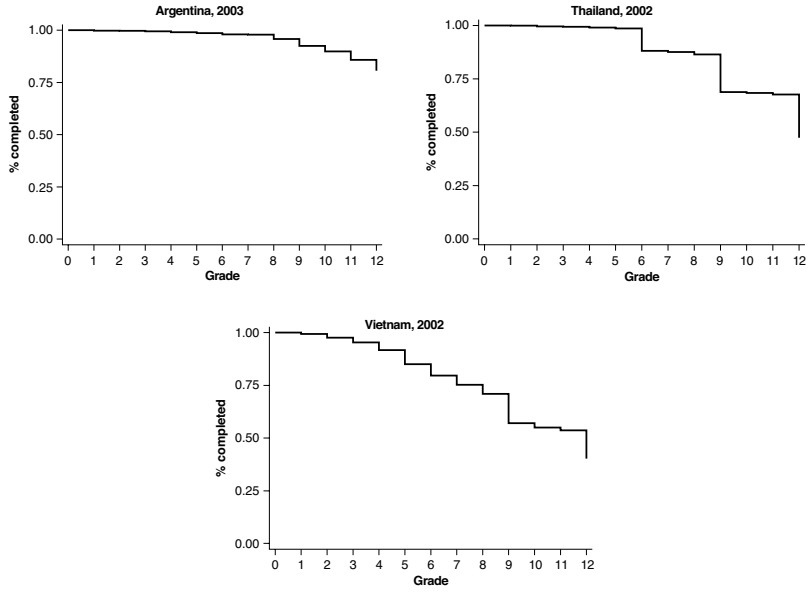
Source: PISA 2000.

America. Interestingly, it also shows that there is a significant negative relationship between average performance and performance inequality. Other reasons for the higher inequity in Latin America will be explored below. East Asian countries such as Indonesia, Vietnam, and China have particularly acute equity gaps between urban and rural areas.

Low overall quality, combined with the inability in many cases to produce strong secondary school graduates who come from disadvantaged environments, is a key issue for Latin America. East Asian countries face substantial challenges in expanding secondary education enrollment (with higher equity in access), while increasing quality and reducing persistent inequities in secondary graduation rates.

From an income perspective, country income is clearly and positively associated with access to, and quality of, secondary education, although the strength of this association varies. Lower- and lower-middle-income countries lag in relation to secondary gross and net enrollment rates and graduation rates. (Figure ES.3 illustrates how graduation rates vary across

Figure ES.3. a, b, and c: Estimated Graduation Rates for Children Aged 13–19



Sources: Argentina Household Survey 2003; Thailand SES 2002; Vietnam LSMS 2002.

countries of different income level.) The widest gap in test scores occurs between upper-income countries and all the others, indicating an important quality gap between what are considered developed, or wealthy, countries, such as Japan and Korea, and the more advanced of the developing countries, such as Mexico and Chile (this gap is visible in figure ES.2).

Inequity in secondary education, however, does not follow clear income lines within countries. There are lower-income, lower-middle-income, and middle-upper-income countries that have high inequity. This suggests that there is a pervasive equity problem even in relatively more advanced economies.

Below, we review some of the main constraints the countries of both regions face as they address access, quality, and equity challenges.

Key Constraints in Access, Quality, and Equity

Both supply- and demand-side constraints for secondary education will need to be addressed. In rural areas in particular, where many students

drop out across education cycles, a lack of schools and specialized teachers can be constraints, creating a possible shortfall in basic access to secondary education. These constraints occur more often in lower- and lower-middle-income countries.

Widespread drop-out rates at all grades of secondary education in both urban and rural areas suggest that constraints go beyond a school shortage and become stronger as basic supply-side constraints are addressed. Once the basic infrastructure is in place, specific measures may be needed to attract the youth who are still not in school. Concerns about school quality and school efficiency come into play.

Chapter 2 shows that demand-side constraints are pervasive, particularly for lower-income households. These constraints are related to uncertainty about labor market returns that might derive from receiving a higher education, the lack of information about schools, and credit limitations.

Private returns to secondary and, particularly, tertiary education, are quite high in both regions, which means they carry a high earning premium. Also, the demand for postprimary education workers is strong and continues to grow across the board. For Latin American and Caribbean countries, skill-biased technological change and domestic market liberalization policies are the main drivers behind the increasing demand for workers with postprimary and, in particular, tertiary education.

Increased labor market demand for postprimary education needs to be matched by an increased supply of graduates. Although there is debate on how elastic, or reactive, the supply of students is to increased returns, the report makes it clear that household demand for postprimary education is key to ensuring a strong supply of graduates. Household demand can be constrained by several factors.

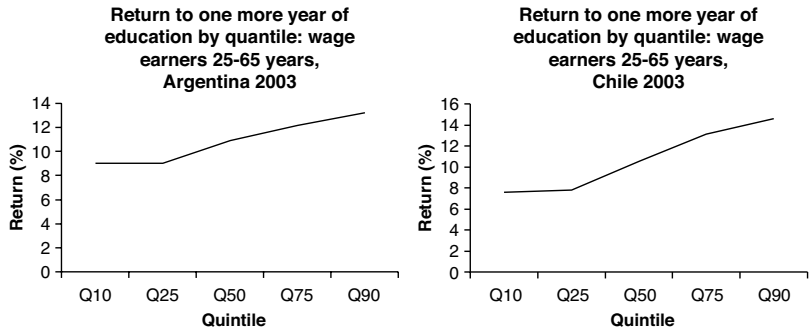
First, young people and their families may underinvest in education and make short-sighted choices about schooling due to uncertainty about future labor market returns that can be achieved by attaining a higher education. They also may lack information about schooling options. These constraints, which are stronger for lower-income youth, will need to be addressed by providing information on labor market opportunities and payoffs, and educational options.

Second, education returns are not necessarily the same across income levels. The report shows that returns tend to be lower for lower-income

households than for upper-income ones in Latin American countries and upper-income East Asian countries (see figure ES.4). This can be the result of public and private sector pay and employment policies and their influence in the labor market. However, at least in Latin America, some evidence presented in the report suggests that this trend may also be the result of socioeconomic segmentation across schools, with the poor attending those of lower quality. This is particularly pronounced between public and private schools.

Access to lower- quality schooling for the poor in Latin America points to a major reason for the higher inequity levels in that region. The political elite in East Asia seems to have made a stronger commitment to providing a good education through a well-functioning public system. Beyond the political elite, having the whole society attach a high value to education makes it easier to provide a more uniform, good-quality education. In Latin America, the low value that society places on education has been addressed to some extent by the private sector, which generally has been much more elite-focused, as illustrated by much more restrictive admission practices, constraining the poor to a low-quality public sector education. Combined with higher uncertainty on returns, the low quality of schooling helps explain the lesser demand for education from the poor, and their lower educational attainment. These results suggest that greater and more equitable access to high-quality schools, whether public or private, is a priority for Latin America.

Figure ES.4. Returns to One More Year of Education by Quintile in Selected LAC Countries



Source: Household Surveys.

Finally, young people struggle with insufficient resources to finance education. In making education decisions, youths and their families face a budget constraint—their school-related expenditures and their investment of time in relation to forgone income. Completion rates are far lower for young people from lower income levels, the direct costs of schooling can be substantial in some countries, and a notable number of youth have to work while they study, or they drop out for work-related reasons.

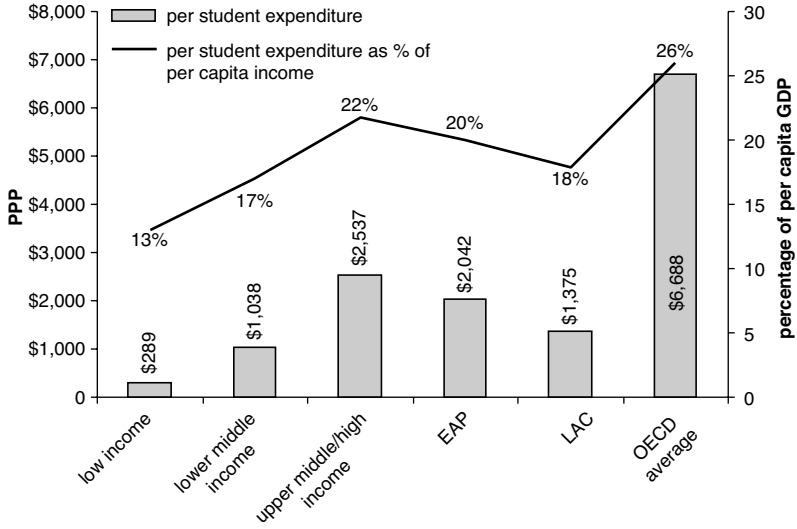
Although other factors have an impact, lack of private resources is a key determinant of access to, and completion of, secondary education. Direct costs are potential constraints to schooling in both regions, although willingness to pay for these costs varies somewhat (appearing to be stronger in East Asian countries). Direct costs represent, for instance, about 22 percent of per-capita household income in Bolivia and 20 percent to 30 percent in China.

Constraints related to forgone income from work are stronger among the poor and in lower- and lower-middle-income countries. For instance, although the percentage of working children and youth is 2 percent in Argentina and Chile, it exceeds 30 percent in Bolivia, Guatemala, Vietnam, and Indonesia, and reaches an astonishing 54 percent in Cambodia. A combination of school and work responsibilities tends to be more common in Latin American countries. Credit constraints can be addressed through targeted grants (e.g., scholarships, conditional cash transfers [CCTs], vouchers) at the lower secondary level, and a combination of well-targeted grants, loans, and savings schemes at the upper secondary and tertiary levels.

Financing constraints at the country level are also pervasive. Although enrollments have increased markedly, education funding has not always followed. As a result, secondary education tends to be underfunded in relation to its share of GDP expenditure per student, and expenditure per student in proportion to GDP per capita (see figure ES.5). These constraints are stronger in Latin America and in lower- and lower-middle-income countries. Expenditure per student in proportion to GDP per capita in lower-income countries is half that of OECD countries. Although quality is much more than an issue of resources, achieving a high-quality education despite such low unit costs is likely to be difficult.

Resources may become an even larger constraint as countries plan to expand and improve their secondary education systems. The growth in

Figure ES.5. Secondary per Pupil Expenditures ($PPP), as percent of per Capita Income, 2002–03 School Year



Sources: OECD 2004; UIS; World Bank 2005h; Yilmaz 2005.

demand for secondary graduates will amplify the need for additional funds to accommodate and attract more students, and expenditure per student may need to rise to address the pervasive quality gap and increasing household demand constraints.

Simulation analyses, assuming unit costs benchmarked at the OECD level (26 percent), show that reaching a target enrollment rate of 85 percent by 2015 (which may still be lower than that demanded by the labor market) would require the regions to double their secondary education share in relation to GDP (table ES.1). The current resource allocation would result in an average fiscal gap of about 1.2 percent of GDP. Low-income countries will face a much tougher financial challenge during the next decade compared with middle-income countries, as illustrated by a large fiscal gap of about 2.3 percent of GDP. These scenarios are somewhat upper-bound estimates because OECD unit costs in proportion to GDP per capita are assumed, whereas somewhat lower unit costs may be enough to achieve important quality improvements. However, resource constraints may become increasingly grave in the future.

This report provides insights into the main options for mobilizing additional resources for secondary education. To finance secondary

Table ES.1. Estimated Expenditure Need at GER2 = 85% and Expenditure per Student as a Percentage of GDP = 26%

	Number of countries	*2003 Resources (% GDP)*	*2015 Needed (% GDP)*	*Annual funds (% GDP)*
Low income	3	0.52	2.84	0.19
Lower-middle income	11	1.09	2.41	0.11
Upper-middle/high income	8	1.65	2.30	0.06
EAP	5	0.78	2.50	0.14
LAC	17	1.34	2.41	0.09
Two regions combined	**22**	**1.21**	**2.43**	**0.10**

Source: Yilmaz 2005.

education, countries can expand public funds, encourage contributions from the private sector, or ask the international community for greater assistance.

The main justification for public financing relies on the "positive externality" argument. Other arguments are based on the equity rationale. Paychecks do not fully reflect the direct and indirect benefits of education, particularly the important social benefits of schooling,[1] and therefore individuals consume "too little" education. Because inequity is potentially quite high in secondary education and is bad for societal development and growth, it makes sense to decrease it through public intervention. This can be done through measures such as easing borrowing constraints and improving the quality of schooling for the poor.

Private financing, however, has a key role to play. Financing from both private institutions and households is crucial (particularly when there is pressure to expand access quickly), and the options reviewed reveal that new financing mechanisms increasingly blur the boundaries between public and private funding. In fact, in many countries, household financing has played a key role in maintaining stable service delivery. At the upper secondary level, there is clearly increasing scope for private financing because of the notable rates of return, which make it a worthwhile investment, and because this education level helps to develop skills and competencies that are of value to private industry. Indeed, private financing is typically greater in upper secondary education.

All countries also face efficiency constraints. Not only could they be spending more on secondary education, but they could be using their

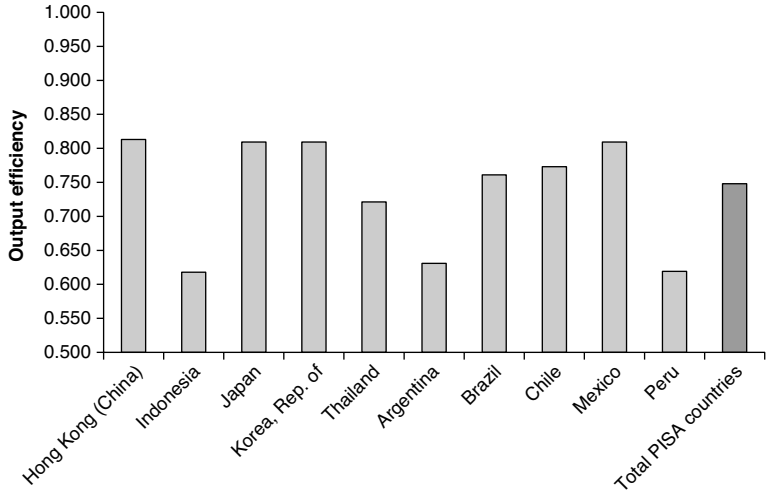
resources more efficiently. To measure how efficient countries or schools are in converting inputs into a set of outcomes, we must analyze the efficiency, or cost-effectiveness, of education resources. This typically requires us to compare the outcomes of the production process (such as academic achievement and educational attainment), with the inputs that are invested. Efficiency in education spending can be analyzed through the use of a production frontier. A production frontier is derived from observing the most efficient operations of countries or schools, demonstrating relatively high output for input. All other observations are then located on the same chart. The further they are from the efficiency frontier, the more inefficient they are.

Output efficiency is particularly useful because it measures the gap between the potential output that could be produced from a given level of resources, and the actual output. Not surprisingly, most countries or schools could be producing more from what they invest. Input efficiency measures how much less countries or schools could hypothetically invest in education and still reach the same output level. This concept is less applicable because system rigidities generally make it more difficult to save on resources, such as teachers or salaries. Instead, it is more relevant to think about using the existing teachers more efficiently. In addition, in this study we are more interested in seeing how we can improve performance rather than save on resources to achieve a similarly unsatisfactory performance.[2]

The efficiency score analysis shows substantial margins for improvement in the two regions. In particular, by controlling for socioeconomic status, schools could, on average, reach academic achievement and grade attainment levels about 15 percent higher for the quantity and quality of teachers employed. In Brazil and Indonesia, for example, these levels could be improved by about 22 percent and 19 percent, respectively. Margins for output efficiency improvements are even more significant when only test scores are considered (figure ES.6), suggesting that it is more difficult to aim for higher academic performance. Finally, there is even more room for achieving higher outcomes with fewer resources.

When examining efficiency results regionally, we find that, in general, Latin American countries have more scope for improving output efficiency than East Asian countries (with Mexico as a clear exception). Secondary education systems in Latin America seem to be both under-funded and inefficient. Many East Asian countries are also constrained by a lack of

Figure ES.6. Output Efficiency (in Terms of Academic Performance) in Selected EAP and LAC Countries—PISA 2000



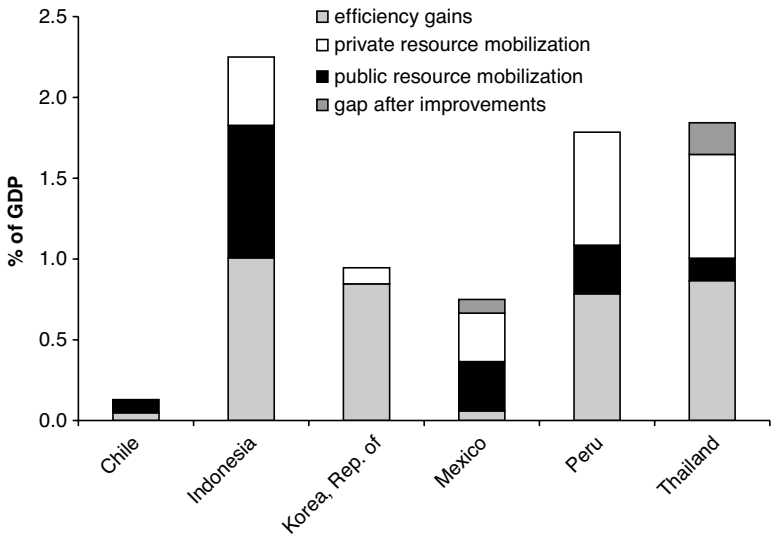
Source: Author's elaboration on the basis of Wilson (2005).
Note: Maximum output efficiency = 1.

resources and, like Indonesia and Thailand, inefficiencies in the way they use them. In general, East Asian countries have more room for improving input efficiency.

Simulation results show that by combining the potential for additional public and private resources[3] with the potential for output and input efficiency improvements,[4] all countries for which we can undertake these simulations would completely or nearly close their fiscal gaps.[5] These results, shown in figure ES.7, must be considered with care, particularly when determining how difficult it could be to save on resources. But they help to make the point that if efficiency gains were realized, countries could keep their resource mobilization efforts reasonable and still be able to reach or come close to ambitious enrollment targets.

There are several key underlying reasons for inefficiency in the two regions: (1) national budget compositions biased toward higher salary shares, with little left for nonsalary items such as learning materials and teacher training activities; (2) weak public management expenditure systems that translate into delays and leakages in the transfer of budgets or inputs to the schools, leading to further underinvestment in certain key inputs, such as textbooks; (3) technical and vocational education systems

Figure ES.7. Reducing Fiscal Gaps through Additional Resources and Efficiency Gains



Source: Author's elaboration on the basis of Yilmaz (2005) and Wilson (2005).

that often are too costly and rigid; (4) poor alignment between curricula and other parts of the system, such as selection mechanisms, student and teacher assessments, textbooks, and teacher training, which hampers instructional improvements; (5) lack of effective use and dissemination of student evaluations; (6) centralized labor market systems; and (7) weak internal and external accountability for service delivery.[6] The seriousness varies by region and income level. From a policy perspective, we will review below several types of interventions that can be efficiency enhancing, although they may not necessarily solve or address all the core constraints.

The next two sections review policy options based on studies of a few key countries, literature reviews, and analytical findings presented in the report. The first section explores policy mixes and sequencings in successful countries; the second provides a more general menu of policy options, with an in-depth review of some.

Different Routes to Secondary Education Development: Learning from Successful Country Cases

A variety of routes to secondary education development exist. Countries prioritize different outcomes as they develop their secondary education

sectors. Many consider educational access and educational quality to be trade-offs. Countries that are expanding access, it is commonly thought, will experience quality declines as ministries of education focus on providing education to more children and stretch to provide teachers, classrooms, and materials, and as more children from less-advantaged backgrounds enter the school system. That, in turn, is thought to reduce completion rates. Conversely, it is thought that countries that focus on providing top-quality schooling may do so at the expense of limiting access. This scenario occurs frequently at the tertiary level, with public funds supporting excellent universities that are available to a relatively small, elite sector of the population.

Countries should aim for broad-based lower secondary education. The dilemma described above fits into the broader debate on whether secondary education should be expanded on a mass scale or should produce an elite group capable of succeeding in tertiary education. Evidence is mounting that a strict access/quality trade-off may not exist, particularly at the lower secondary level. Recent secondary education reforms have tended to defer specialization and selection until upper secondary school or later. They have also increased the duration of compulsory education to cover lower secondary school. Analysis of international test score data shows that early tracking significantly increases inequality in learning achievement and (weakly) reduces mean learning performance, which suggests that there does not appear to be any equity/quality trade-off. The negative impact of early tracking contrasts with the positive effects of compulsory schooling. The practice of limiting secondary school entry through meritocratic exams in Tanzania and Tunisia created overcrowding in primary school and led to more student failures. Countries should therefore opt for broad-based lower secondary education, in which the positive externality argument based on mass literacy is the strongest and the quality/access trade-off is weak.

A trade-off may be more likely to appear between broad-based access to upper secondary education and education excellence, but options exist that could address both concerns, at least in the longer term. Many Latin American countries with upper secondary enrollments exceeding 60 percent do less well on the quality side (both in average performance and equity of performance). An option could be to introduce a high-stakes exam at the beginning of upper secondary, resulting in rationing according to ability, as countries such as Malaysia now, and Korea and

Thailand in the past, have attempted to do, with varying levels of success. Although this could foster elite formation and even promote more equitable quality outcomes if well implemented, it would have negative consequences on access. In addition, the case of Mongolia shows that merit-based selection at the upper secondary level can be very regressive, which reflects in part the fact that the poor attend lower-quality schools, with negative consequences on equity of graduation.

Whenever selection is merit based between lower and upper secondary school, alternative learning options, such as vocational education, could be provided for those who do not make the cut. These vocational tracks should not be dead ends, and students should be allowed to gain access to higher education if they so desire and qualify. Case studies show that an education system that combines selectivity in accessing institutions offering higher-order skills, with more open admission to other higher education institutions, serves the dual role of fostering excellence and guaranteeing coverage and equity. Alternatively, to the extent that selection into upper secondary school responds to fiscal constraints, conditions for private sector participation could be eased and public-private partnerships implemented to decrease the need for selection on fiscal grounds, while quality is preserved or even improved through well-selected, quality-enhancing policies. Korea, for instance, is a good example of a country that managed to produce both mass secondary schooling and education excellence through gradually expanding access to both lower and upper secondary education levels with the help of the private sector.

The comparative nature of this study allows us to informally test the validity of the quality/access trade-off hypothesis. Table ES.2 characterizes Latin American and East Asian countries by their current secondary gross enrollment rates, and their standing when it comes to international assessments and completion rates. This is a static depiction of whether countries tend to fall into high-enrollment/low-quality or high-quality/low-enrollment molds. Figure ES.8 similarly characterizes countries by their enrollment and quality levels, but in a dynamic form. Countries are placed in the table according to whether, since the mid-1990s, they have improved their enrollment rates, and have improved their test scores and/or completion rates. This figure shows whether countries fall into low-quality/high-access or high-quality/low-access patterns *across time*. Equity performance is also considered. The analyses are expected to produce different results because countries with higher and more equitable quality and coverage levels may have less favorable dynamic patterns

Table ES.2. Static Categorization of Countries by Enrollment and Measures of Education Quality*

		Quality (test scores and/or completion)	
		Above average	*Below average*
Enrollment (GER)	**Above average**	Korea, Rep. of Hong Kong [China]	Mexico, Argentina** Chile,** Bolivia,** Philippines, Brazil,** Peru
	Below average	Thailand, Colombia, Malaysia	Indonesia, Vietnam Cambodia, Guatemala

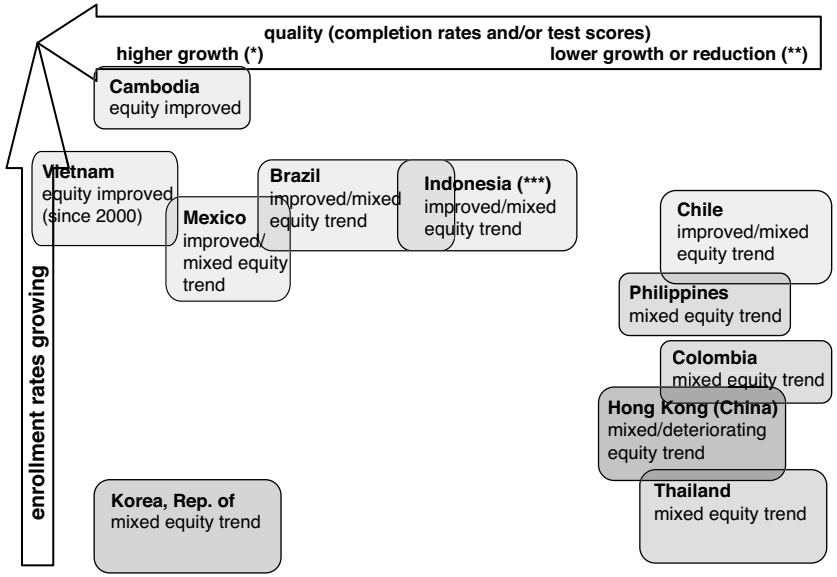
Source: Author's elaboration.
*Each country's performance is compared with the average performance for the whole sample. Average GER is taken to be 77 percent, average 2000 PISA test scores are taken to be 410 (math) and 425 (language), and average completion rate is taken to be 57 percent. TIMSS data were used to rank Malaysia and the Philippines. National information was used to complement information on completion rates and test scores when necessary.
**Above-average completion, but below-average test scores.

(such as Korea and Hong Kong [China]) as it is more difficult to make substantial progress when initial performance is higher. However, both sets of results are included because we are interested in countries that have done well not only in the longer run, but also more recently.

Many Latin American and East Asian countries of all income levels appear to have good results either in access or quality (table ES.2). Latin American countries have achieved more in regard to access. This is also clear from the previous analysis, which shows that Latin American countries have higher enrollment rates than East Asian countries, but also generally have higher primary overage ratios and lower completion rates and test scores for their income level. East Asian countries such as Malaysia and Thailand have achieved more in terms of quality. Although secondary completion and test scores tend to be complementary—that is, countries with high test scores tend to also have high secondary completion rates—it is notable that countries such as Chile, Argentina, Bolivia, and Brazil have relatively high enrollment and completion rates, but relatively low test scores.

However, countries such as Korea and Hong Kong (China) show that the trade-off between quality and access is not absolute; and other evidence that the quality/access trade-off can be overcome emerges from the dynamic analysis of country performance since the mid-1990s. Korea and Hong Kong (China) have high enrollment, test scores, and completion rates, and are also performing reasonably well

Figure ES.8. Dynamic Categorization of Countries by Progress since the Mid-1990s in Enrollment and Measures of Quality



Source: Authors' elaboration.
(*) High growth is taken to be increases higher than 2 percent yearly in the completion rate, or PISA test scores increasing between 2000 and 2003 in at least math or reading, or both. Specific country ranking within the high-growth category is arbitrary.
(**) Low growth is taken to be increases lower than 2 percent yearly in the completion rate, or math and reading PISA scores decreasing by at least 1 percent between 2000 and 2003, or both. National data used for Chile. Specific country ranking within the low growth category is arbitrary.
(***) Indonesia is in the middle because it experienced an evolution of completion rates lower than 2 percent yearly.

in educational equity (table ES.2).[7] Vietnam, Cambodia, Mexico, Brazil, and Indonesia have done well on most counts, showing progress in enrollment, and completion and/or test scores (figure ES.8). The dynamic analysis also confirms that measures of test scores and completion, as well as measures of equity and average quality performance, tend to move in the same direction. Clear inequity reductions are visible between genders in Cambodia; income levels in Vietnam, Brazil, and Mexico; and urban-rural areas in Mexico. Inequity reductions have in turn fostered further improvements in enrollment and quality indicators in these countries.

Korea: high priority on education and effective public-private partnership. Korea's achievements in secondary education rest largely on four interrelated characteristics. First, from the early 1950s, the Korean government viewed building a strong education sector as an integral part of the country's economic development strategy. The high stakes associated with expanding education led to prompt implementation of education policies by dynamic, motivated institutions. Second, motivated by the desire to develop skilled, educated workers, the government focused its secondary education policies on quality, relevance, and access from the earliest days. It did so for all sections of the society, finding innovative ways to involve the private sector in the expansion of secondary education, assigning a key role to technical and vocational education, and implementing key quality-/efficiency-enhancing measures. If there were trade-offs between access and quality, they were only short term. Third, the high value that Korean society placed on education helped push forward expansion efforts: In pursuit of the prestige that education brought to the family, parents willingly took on some education costs (e.g., through private tutoring). Consequently, Korean education policies, which focus mainly on supply-side constraints at the secondary level, achieved considerable success compared with many other countries that followed similar paths. Fourth, between the 1950s and 1990s, the country expanded education cycles one at a time, starting with primary education. Specifics on the policies pursued are provided in table ES.3.

Brazil: focus on lower secondary education and innovative policy mix. Although Brazil still appeared to have a fairly cost-ineffective education system in 2000, plagued by poor and inequitable academic achievement, significant improvements have been achieved recently. Not only has secondary gross enrollment continued to increase steadily (after high growth throughout the 1980s and early 1990s), but from 1996 to 2000 the country also attained widespread reductions in grade repetition, the biggest source of inefficiencies in the Brazilian education system. Since 2000, Brazil has shown clear signs of improved education quality and equity in lower secondary. Brazil's recent achievements appear to lie on four main pillars: renewed priority given to education since the 1980s; strong prioritization of efficiency, quality, and equity from 1996, after a heavy focus on access throughout the 1970s and 1980s; sequencing by education level in the 1990s, with a strong focus on lower secondary education; and an innovative policy mix to address existing constraints since 1996, introducing demand-side policies after basic supply-side policies were put in place (see table ES.3).

Table ES.3. Priorities and Policies of Countries That Have Addressed or Are Addressing Trade-Offs

	Priority Sequencing	*Broad Policy Mix and Sequencing*	*Main Policies*
Korea, Rep. of	• Quality, access, and equity together since the 1950s • Gradual expansion by education level (primary, lower secondary, upper secondary)	• Mostly supply-side policies	• Public-private partnerships • Quality assurance • Private tutoring • TVET reforms (more academic curricula, link with technical colleges) • Increase in public financing, with high nonsalary shares • School-based management • Curricular reform (life-long skills, individualized learning)
Vietnam	• Access and quality together since 1986; equity since 2000	• Mostly supply-side policies	• School self-financing (semipublic schools, private schools) • Cost recovery • Improved school governance • Effective textbook supply • Focus on teacher training and competencies • Recent efforts to eliminate fees
Brazil	• Access in the 1970s and 1980s; quality, efficiency and equity since 1996 • 1990s improvements focused largely on lower secondary	• Combination of supply- and demand-side policies (demand-side policies introduced more recently)	• FUNDEF (financing reform tying municipal and state funds to enrollment to equalize spending) • Focus on teachers' qualifications (including measures such as distance teacher training) • Focus on national testing (SAEB, ENEM) • National minimum curricular standards • Policies to reduce repetition (accelerated instruction, flexible promotion, etc.) • Bolsa Escola, PETI (CCTs for poor families)
Mexico	• Access before the 1980; access and quality since 1992; equity and quality since late 1990s • 1990s improvements focused largely on primary and lower secondary; more focus on upper secondary in 2000	• Combination of supply- and demand-side policies (demand-side policies introduced more recently with equity focus)	• Federalization of primary and lower secondary education (resulting in increased resources) • Telesecundaria (distance secondary) • Curricular reform (including measures such as extension of school year and competency-based secondary curriculum) • New teacher career framework (*Carrera Magisterial,* with performance incentives) • Oportunidades (CCT for poor families) • PEC, CONAFE (compensatory interventions for low quality schools).

Source: Author's elaboration.

Mexico: innovative policy mix and consistency of reforms. Although the 1970s and 1980s were characterized by limited education reforms (with a focus largely on access), and a still heavily centralized education system, the 1992 Agreement for the Modernization of Basic Education began a set of aggressive and diverse education reforms. These resulted in substantial enrollment and secondary completion increases, with decreasing inequity levels. The Mexican reform process was marked by three key characteristics. In the early 1990s, there was a clear focus on quality and access, followed by a focus on equity in the late 1990s. There was also a sequencing by education level from the 1990s, starting with improved quality of primary education and greater access to lower secondary education, and then the efforts extended to boosting the quality of secondary education from 2001 to 2006. And, as in Brazil, there was an innovative mix of supply- and demand-side policies (see table ES.3). Reforms have been fairly consistent since the early 1990s. In particular, the 2001–2006 National Education Program scaled up equity programs and extended quality improvements to the entire education sector. Mexico still has to address key challenges in academic achievement, secondary completion, and equity, which will require sustaining, or even intensifying, the current efforts, particularly in regard to the quality of secondary education.

Vietnam: school self-financing strategies. Although Vietnam is still overall a poor performer, its performance has been dramatically improving since the early to mid-1990s in secondary enrollment and completion. In 1986 the government launched *doi moi*, a broad economic reform that effected the transition from central planning to a market-based economic system. Although the education system was adversely affected during the initial phases of the transition, since 1992 Vietnam has displayed laudable progress in education. Key to this success has been a clear focus on access to education and its quality, implemented through extensive resource mobilization and governance policies, which culminated in a new system of cost sharing or "socialization" of education, including the emergence of semipublic,[8] people-funded private schools, and the introduction of an official fee system at the upper primary and lower secondary levels. These policies were successful in increasing access to secondary education, as well as in mobilizing additional resources that were used for quality-enhancing purposes and improving further governance of the education sector. However, the resulting financial burden on the poor and near poor has been heavy, especially at the secondary level, explaining the persistently high inequity levels along the lines of income, gender, ethnicity, and

province. That led to a recent focus on equity, with national policies identifying the elimination of fees in primary and secondary schools for poor children as a core objective, and concrete efforts to eliminate all types of fees for basic education. As a result, equity has improved significantly since 2000. The country's current priority is to restructure the composition of budgetary allocations in the sector, channeling more public resources toward secondary education to sustain equity improvements, while continuing to raise the quality and internal efficiency of service delivery. Public subsidization of private schools, accompanied by a strengthened quality-assurance system, could also be encouraged.

Can we draw some basic conclusions from these case studies? First, as illustrated by Korea, education systems can address both quality and access issues from early on if good education is highly valued by the state and families alike, and there is sequencing by education level. Under those conditions, opening up access will not necessarily result in decreased quality: In Korea, the state was careful to protect or even increase quality, and when this was insufficient, families invested in private tutoring. This strategy will be easier if countries proceed one education level at a time. Although a latecomer vis-à-vis Korea, Vietnam also illustrates the importance of having a high social value placed on education through its broad and innovative cost-sharing policy in secondary education, which allowed the country to make substantial progress in access and quality (although equity is now at stake).

A sequential approach to objectives will lead to imbalances that will need to subsequently be addressed. In contrast to Korea and Vietnam, Brazil and Mexico, by long choosing to focus largely on access to all educational levels, are more imbalanced. Their more recent prioritization of quality and equity issues and sequencing by education level (with a focus on lower secondary) is, however, starting to bear fruit. It is also important to note that the new focus on quality and equity is in turn having a positive impact on access, as illustrated by the case of FUNDEF in Brazil, which, by providing more resources to poor municipalities, has led to substantial enrollment gains in lower secondary.

At the opposite end of the spectrum, Thailand's heavy focus on quality in the 1970s and 1980s through high school fees, selection exams, diversified technical and vocational schools, and curriculum design reform, with a focus on access since 1992 (with expanded basic education from six to nine years, and accompanying measures to expand primary

schools), has determined the country's stronger performance in quality than in access. It is a bit worrisome that, after a very good enrollment performance up to the mid-1990s, access is stagnating and quality is stagnating or even dropping.

Second, each region can learn much from the other on how to address imbalances. From East Asian countries, Latin America could learn how to design and implement effective quality-enhancing supply-side policies, including innovative resource mobilization. East Asian countries can learn from the recent Latin American experience in designing and implementing demand-side policies (and other equalizing interventions) to increase enrollment of the poor and mitigate some of the undesirable equity effects of resource mobilization policies.

Third, if countries face both supply- and demand-side constraints, ultimately they will probably have to introduce a mix of policies in which measures to improve the quality of schooling for the poor are accompanied by demand-side subsidies. This combination is having a positive impact in Mexico and Brazil, leading to increased equity in completion and quality.

Finally, there is no magic bullet to address secondary education challenges and constraints, but consistency is important. Some countries have concentrated on a few key policies that have allowed them to have a positive impact on more than one challenge (access and/or equity and/or quality), such as Korea's involvement of the private sector and Vietnam's school self-financing and cost recovery, but these policies have also required immediate adjustments (such as Korea's need for a strong quality-assurance system and private tutoring) or longer-term adjustments (such as Vietnam's need for reduced fees for the poor, along with increased public financing). Some other countries, such as Brazil and Mexico, have applied a wider combination of policies, accompanying increased decentralized financing and changes in funding formulas with a variety of quality-enhancing reforms (focused largely on improving teachers' qualifications and incentives, and on curricular improvements) and, at a generally later stage, demand-side interventions (CCTs). Consistent policies are important so they strengthen and complement, rather than undermine, one another. Mexico's continuity in reforms, for instance, is part of the explanation for its recent satisfactory performance, and Korea generally has been very consistent in its reform approach since the 1950s. In contrast, reform inconsistencies probably help explain why Chile, which tried almost all possible education policies, is

experiencing flat graduation rates and test scores, although access is increasing. Examples of its inconsistencies include promoting competition while rewarding poorly performing schools, and introducing automatic promotion in grade 1 before implementing major quality-enhancing programs.

Policy Alternatives to Address Constraints and Challenges

Countries that want to expand and improve their secondary education systems would be well advised to consider a wider range of policy options, which would allow them to pick the policies most suitable to their needs. This section provides a more general menu of policy options by building on country case studies, literature reviews, and analytical findings presented in the report, with an in-depth review of some options (table ES.4).

The menu ranks policy options by main constraints and the challenges they seek to address. A country mainly facing quality challenges and subject to strong demand-side and financing constraints would, for instance, be advised to invest in improving the quality of the schools the poor attend; experiment with vouchers; and apply resource mobilization strategies likely to improve incentives for quality education. In contrast, a country facing mainly coverage challenges and subject to, say, financing and efficiency constraints, should experiment with wider resource mobilization strategies, including increasing tax revenues, and mobilizing resources across sectors, while also improving expenditure allocation and curriculum design; developing nontraditional models of secondary education; and reducing repetition to accommodate new students. In many respects, this is a simplified analysis because it is often difficult to link policies with specific challenges, as they often address multiple issues.

Policy options will need to be both relevant and applicable. The menu also attempts to characterize the policy options by income level and region. Two broad factors are taken into account when making this classification: the applicability of the policy to that particular context, and the need for and relevance of the policy. If one aspect is missing (or less evident) the policy is not highlighted. Both aspects will vary according to income and/or region.[9] Lower-income countries, for instance, are bound to face the toughest institutional constraints regarding regulatory frameworks, information systems, labor market characteristics, and the

Table ES.4. Policy Alternatives by Constraint, Challenges, Income Level, and Region

	Challenge addressed		*Relevance and applicability by income level*			*Relevance and applicability by region*	
Policies to address demand-side constraints	*Coverage*	*Quality*	*Lower Income*	*LMI*	*UM/UI*	*LAC*	*EAP*
Disseminate information on returns and schooling options	X	X	X	X	X	X	X
Target the poor, combining the information above with mentoring and financial incentives (loans)	X				X	X	X
or just mentoring	X		X	X		X	X
Improve quality of schools attended by the poor (report cards, teacher management decentralization, compensatory programs a la *CONAFE* in Mexico)	X	X	X	X	X	X	
Offer vouchers to create choice for the poor (access to good-quality private schooling)	X	X		X	X	X	
Offer Income-Contingent Loans and Individual Learning Accounts	X				X	X	X
Offer Conditional Cash Transfers	X			X	X	X	X
Experiment with nontraditional modalities, such as distance schooling	X	Can move either way	X	X		X	X

(*Continued*)

Table ES.4. Policy Alternatives by Constraint, Challenges, Income Level, and Region (*Continued*)

	Challenge addressed		*Relevance and applicability by income level*			*Relevance and applicability by region*	
Policies to address financing constraints	*Coverage*	*Quality*	*Lower Income*	*LMI*	*UM/UI*	*LAC*	*EAP*
Reallocate resources from tertiary education	X		X	X		X	
Increase cross-sectoral funding for education	X		X	X	X	X	X
Increase tax revenues in proportion to GDP	X		X	X		X	X
Decentralize revenue generation (also using property taxes)	X Be aware of implications on equity	X		X	X	X	X
Introduce taxes earmarked for TVET	X	X		X	X	X	X
Apply formula funding (example: FUNDEF in Brazil)	X	X		X	X	X	X
Promote public-private resource mixes through community schools.	X	X	X	X	X	X	X
School self-financing schemes, and cost recovery	X Be aware of implications on equity	X	X	X	X	X	X
Encourage private tutoring (example: Rep. of Korea)		X		X	X	X	X

Table ES.4. Policy Alternatives by Constraint, Challenges, Income Level, and Region (*Continued*)

	Challenge addressed		*Relevance and applicability by income level*			*Relevance and applicability by region*	
Policies to address efficiency constraints	*Coverage*	*Quality*	*Lower Income*	*LMI*	*UM/UI*	*LAC*	*EAP*
Increase non-salary budget share	X	X	X	X		X	X
Encourage larger secondary schools when possible	X	X	X	X	X	X	X
Apply performance-based salary incentives (examples: *Carrera Magisterial*, SNED)		X		X	X	X	X
Encourage more integrated general-technical curriculum, fewer technical tracks, and links with higher technical education		X	X	X	X	X	X
Improve curricular relevance and make sure curricular reforms are fully applied throughout the system (example: Malaysia)		X	X	X	X	X	X
Encourage government-subsidized private schools	X LAC/EAP	X LAC	X To increase coverage	X	X	X	X To increase coverage
Encourage school decision making in budget generation and composition		X		X	X		X
Encourage school decision making in teacher management		X	X	X	X	X	

(*Continued*)

Table ES.4. Policy Alternatives by Constraint, Challenges, Income Level, and Region (*Continued*)

	Challenge addressed		*Relevance and applicability by income level*			*Relevance and applicability by region*	
Policies to address efficiency constraints	*Coverage*	*Quality*	*Lower Income*	*LMI*	*UM/UI*	*LAC*	*EAP*
Experiment with nontraditional modalities, such as distance schooling	X	Can move either way	X	X		X	X
Reduce repetition by applying a combination of promotion targets and quality improvements (examples: Chile and Cambodia)	X	X	X	X	X	X	
Improve institutional frameworks (information, regulation/quality assurance, public expenditure management, social monitoring, etc.)	X	X	X	X	X	X	X

Source: Author's elaboration.
Note: LMI = lower-middle-income countries; UM/UI= upper-middle- and upper-income countries.; LAC= Latin America & and Caribbean; EAP = East Asia & Pacific.

design and implementation of accountability mechanisms for decentralized service delivery. Caution is suggested in applying some of the policies even though they may be needed, unless these broad constraints are addressed. Similarly, East Asian countries may have certain advantages in terms of better regulatory and quality-assurance frameworks and more flexible labor market structures, which can make it easier to apply certain policies, but also make them less necessary.

In light of evidence in the report, most of the policy options presented in the table can be further characterized according to their basic features and how they could be implemented, giving rise to more concrete policy recommendations. We focus on some of the most promising or innovative ones.

⇨*Options to address demand-side constraints*

Some promising or innovative options to address demand-side constraints, which include both supply- and demand-side actions, are reviewed below.

An approach combining information, mentoring, and financial incentives can be used to address the poor's low demand for education. Young people, particularly the disadvantaged, face multiple constraints, and policies must address their needs in an integrated manner. This is often not fully appreciated by policy makers, who tend to apply piecemeal approaches to foster investment in education from the poor. It is important to understand that lack of decision-making skills, information, and financial resources are apt to be complementary, requiring policies that integrate information, mentoring, and financial incentives. Experience with these policies is lacking in the developing world, but an increasing number of programs in developed countries combine all the above plus academic support, and are targeted toward disadvantaged youth in secondary school to help them go to college and succeed. Generally, these programs have strong positive impacts on academic performance and attendance. Although combined programs seem to be most effective, they may require too many resources to be fully applicable in lower- or lower-middle-income countries. In that case, school-based career guidance services alone—comprised of information about education and job market opportunities, guidance, and counseling—have been applied with some success in certain middle-income and transitional economies.

Improving the quality of schools attended by the poor in Latin America is crucial to address demand-side constraints. For reasons explained above, an integrated approach to address underinvestment by the poor

will require tackling the low quality of schools they attend. Two main options are improving the quality of public schools or creating opportunities in higher-quality private schools. We will analyze this second option in more detail below. How to precisely improve public schooling for the poor in Latin America is generally beyond the scope of our report, but it provides some insights into two interrelated factors: the importance of disseminating information about school performance and of decentralizing more responsibilities to the schools for managing teachers. Evidence about poor rural schools in Honduras and El Salvador suggests that this form of decentralization can compensate for lower school socioeconomic levels, and recent cross-country evidence on PISA test scores confirms its effectiveness. Public schooling also can be improved by implementing compensatory programs that provide, among other things, additional teaching materials and teacher training for vulnerable schools, together with promoting increased parental involvement in school administration (see, for instance, the case of CONAFE in Mexico illustrated in table ES.3).

Introducing vouchers can help address liquidity constraints and poor quality. School vouchers are designed to address these issues by altering the relative price of schooling options. School vouchers are publicly provided funds that students can use to enroll in the school of their choice. Vouchers have been implemented in a few developing countries, including Chile and Colombia. The evaluation of Colombia's PACES program, which offered vouchers to poor individuals to attend private schools, provides robust evidence for the positive impact of targeted vouchers on enrollment and educational attainment, and useful insights on how to implement a program of this sort (box ES.1).

Voucher programs probably will be more effective in middle- or upper-income countries with sound administrative systems and stronger school quality assurance, and capacity to monitor students and schools. Although these programs could apply to East Asia, they seem more promising in Latin American countries as a means to foster higher quality for everybody (through choice and competition), or more specifically for the poor, because of the low quality of public schooling and the existence of a larger pool of high-quality private schools.

Introducing conditional cash transfer (CCT) programs is a promising way to increase the demand for schooling, both by direct means and by reducing the incidence of child and youth labor. CCTs provide cash to

Box ES.1

Lessons from the Colombia-PACES Program

Key factors of success of PACES were: (a) the sound criteria in the selection of the participating municipalities, such as limited public school capacity and excess private sector capacity; (b) the participation of private schools with educational quality generally higher than or comparable to public schools; and (c) the effective targeting of vouchers to poor communities, with the introduction of performance incentives for participating beneficiaries.

However, this type of program can be demanding to implement in terms of administration and monitoring. PACES faced serious delays in disbursement, failure to keep up with the increasing costs of delivery, and difficulties ensuring consistent school quality as new private schools entered the program and the vouchers' relative value decreased. Additionally, political considerations must be taken into account: Teachers' union opposition hampered development and sustainability.

Source: Yilmaz 2005.

poor students or their families, conditional on school attendance or other desired outcomes. CCTs can increase the demand for schooling directly by providing additional resources to poor individuals, as well as indirectly by compensating individuals for the forgone product from their work. Initial evaluations of these programs in Latin America reveal significant effects on school enrollment. The best documented in this family of programs is *Oportunidades*, which has been shown to increase secondary school attendance rates, transition to secondary school, and grade attainment. The impact on enrollment is due mainly to funding based on attendance. The keys to success are well-designed conditionality, good monitoring and evaluation systems, sound targeting methodology, and satisfactory supply and quality of schools. CCTs would be relevant for countries of all income levels (particularly lower income and lower-middle income because of the higher incidence of work), but implementing effective targeting and monitoring systems can be challenging for low-income countries. In addition, CCTs alone do not appear to be enough to reduce work significantly. Evidence from a Program to Eradicate Child Labor in rural Brazil (the so-called PETI program) suggests that after-school programs may be a good complement. Alternative models for secondary schooling, such as the Tutorial Learning System (SAT) in Colombia, are designed specifically to make school more compatible

with work. Students define the schedule, and instruction can occur in different places. Students' academic performance was higher than that of students in traditional schools in the same municipalities. However, in most cases alternative models are more successful in ensuring higher enrollment than good quality (see below).

⇨*Options to address financing constraints*

Countries should diversify their resource mobilization strategies. The options to expand and improve secondary education shown in table ES.4 include a variety of public and private financing choices, whose boundaries are often blurred.

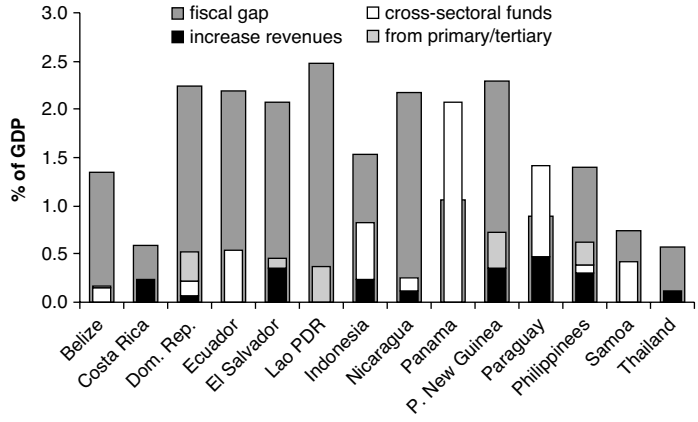
Although public finance is likely to remain the main mode of resource mobilization, some limitations and problems are associated with its use, and some advantages arise from increasing the share of private funds. Increasing public funding could be the easiest way to enhance access to secondary education, and with careful policy design it could also improve the system's quality and efficiency. This is particularly true for countries whose total commitments to secondary education, per-pupil expenditures, and gross enrollment rates are low. However, public funding cultivates a large bureaucratic machine and strong interest groups whose lobbying could result in ineffective education programs and inertia in the education sector; political pressures can lead public sources to overpromise (e.g., opening schools with inadequate resources and underpaid staff); and the funding could be erratic, especially during times of economic crises, shortening planning horizons for schools and students. Complementing public with private funding will therefore be an advisable strategy. In particular, empirical evidence suggests that household financing of secondary education is relatively stable, and may increase the reliability of services, especially during times of political unrest.

Some countries could substantially decrease, or even close, their fiscal gaps through additional public and private resources. Figures ES.9 and ES.10 present back-of-the-envelope calculations of the extent to which additional public and private resources could help close the fiscal gap that some countries in the two regions are likely to face in the next 10 years.[10] We assume that during the next decade, countries will increase their tax revenues to 17 percent of their GDP (this is the current average in the two regions), reassign funds from other sectors so

education expenditures equal 20 percent of all government expenditures, and reallocate funds from primary and tertiary education toward secondary education if they exceed 50 percent and 20 percent of total education expenditures, respectively. Finally, we assume that countries whose private share in education is below the OECD average can achieve that average.[11]

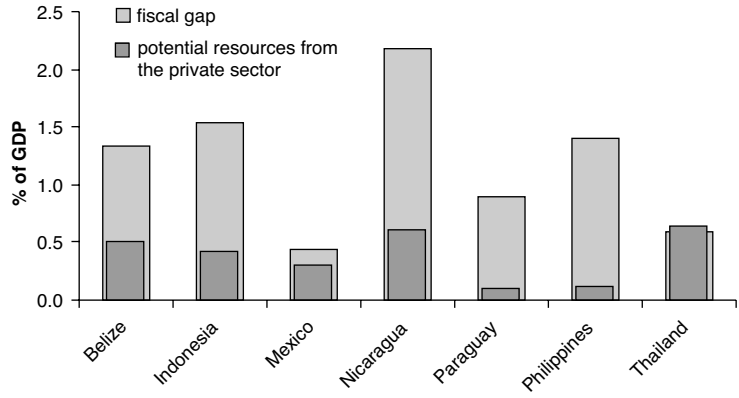
Panama, for example, could close its gap by diverting some existing government expenditures into education, and Paraguay could do so by shifting

Figure ES.9. Closing the Gap with Public Resources



Source: Yilmaz 2005.

Figure ES.10. Closing the Gap with Private Resources



Source: Yilmaz 2005..

government expenditures and increasing tax revenues. The criteria adopted for assessing the potential of the different measures are somewhat conservative; raising additional tax revenue would allow the countries to fill more of their gaps with public resources. In general, lower- and lower-middle-income countries appear to have more room for boosting revenues and shifting resources from tertiary and primary to secondary education.[12] If Thailand were to reach the OECD private expenditure benchmark during the next 10 years, it could cover its entire need, whereas Mexico could make up almost 80 percent of the gap.

Options to increase public and private financing are discussed in more detail below, making use of literature reviews and case studies.

The first potential public source for secondary education is transfers from other education levels. especially tertiary education, in which cost recovery through charges and fees could replace public subsidies. The scope for reallocating funds from tertiary education is stronger in lower- and lower-middle-income countries and Latin America. Nicaragua and Guatemala are two examples in which tertiary spending far exceeds secondary school spending. Timor-Leste is another country that spends a large share of education resources on universities and scholarships. Although the idea of shifting resources is attractive, reducing tertiary funding could be politically difficult because university students are a formidable group: they belong to politically connected families, are generally well organized, and are willing to protest policies that reverse historically free services. Even when political forces permit wide-scale cost recovery programs at the tertiary level, primary education, as well as other government sectors, bid on these resources.

Cross-sectoral funding for secondary education should also be encouraged. Shifting resources from other government sectors is a daunting task, subject to many political objections. Nonetheless, governments must consider generating additional public resources for secondary education by encouraging social programs with pro-education components. Welfare programs, counseling, anti-drug and violence programs, lifelong learning programs, and infrastructure development could create a larger impact on secondary school access and enrollment. In addition, cross-sector funds could help provide ancillary services, such as meals, health programs, school uniforms, and other in-kind transfers, which could increase the demand for secondary education, especially among the very poor.

Mobilizing additional resources may require increasing overall revenue-raising efforts in Latin America and East Asia. The effort to generate tax revenues in these regions generally lags behind world averages, even when controlling for income level differences. This could stem from economic, political, or historical reasons. Sometimes, the formal sector is small and governments are committed to debt financing. Other times, no history of revenue-generating institutions exist, especially in countries that recently moved to market-based models, such as China, Lao People's Democratic Republic, and Mongolia. Generally, tax revenue as a percent of GDP is more of an issue in lower- and lower-middle-income countries (in which it is lower than 15 percent of GDP).

Although prescribing tax reforms is beyond the scope of this study, a promising strategy is the decentralization of revenue-generation powers. Taxing locally could greatly enhance the revenue raised. Resources collected locally are less susceptible to political swings that typically affect transfers from the central government, therefore allowing for better fiscal planning and accountability, while encouraging spending decisions that cater to local needs and preferences. Decentralization may, however, have a negative impact on the equity of delivery, which may require equalization policies (intergovernmental transfers, targeted subsidies, etc.). China is illustrative of a country that has undergone a fundamental structural change from a centralized system with a narrow revenue base to a decentralized, diversified revenue base, with a resulting increase in funds for education (but also large disparities in per-student spending across areas and regions, which the country is trying to address).

Introducing revenues earmarked for secondary education is also promising, particularly for technical and vocational education. Targeted taxes generate funds specifically from those who are the main beneficiaries of an educated workforce. The most widespread forms of targeted taxes in East Asia and Latin America are payroll levies on employees and corporate taxes. These payroll levies vary from 0.5 percent to 2 percent and typically fund vocational and technical programs, especially in Latin America. In Korea, companies with more than 300 employees must contribute to vocational schools by conducting in-house training or through payroll taxes. In Beijing, all salaried employees contribute 2 percent of their paychecks to capital investments for schools. In addition, 2 percent to 5 percent of the turnover or profits of state enterprises go to education funds. However, even earmarked revenues are susceptible to political

manipulation and can fall disproportionately on government employees. In China and, to some extent in Korea, payroll levies and taxes on profit are hard to enforce on privately owned businesses.

Private funding sources should also be explored, with schools encouraged to generate their own resources. Shifting part of the responsibility to raise and manage funds to schools could increase the overall resources available to the secondary sector, improve school performance and efficiency, and help relieve strained public finances.

In both Latin America and East Asia, community schools run by local or religious organizations may have an advantage in eliciting funds from parents and local businesses. These schools rely on various funding formulas, with governments typically funding recurring expenditures and communities financing capital expenditures and additional recurring expenses. Community schools arise to meet excess demand for education, and as they create capacity they mobilize local funds into the school system. Evidence from a small number of studies suggests that these schools have better parental participation and student attendance than private schools.[13] Although community schools increase funding and accountability, if not guided and controlled they may exacerbate regional and socioeconomic inequalities. Local elites might monopolize management decisions, obstructing genuine community involvement. Therefore, community financing programs must institute mechanisms to ensure that neither levies nor corruption prevents the poor from accessing the school.

A recent promising trend is self-generated resources from off-budget items. As funds become scarcer, many public schools are moving into self-financing schemes, including running businesses, asking teaching staff to take on consultancy positions, leasing school properties, and fund-raising. Critics argue such revenue-raising activities could increase inequality by placing additional burdens on parents who must already pay for direct and indirect expenses, and evidence from Vietnam confirms that risk. Others complain that off-budget revenue activities will distract the managers from focusing on education delivery and turn them into businessmen. If well implemented, self-financing schemes can be effective, as in the case of China (see box ES.2) and Vietnam, but countries need to be aware of the possible negative implications for equity in the medium run.

Box ES.2

Self-Financing Arrangements in China

In China, in the face of growing demand for secondary education, especially in urban areas, schools must often rely on off-budget revenues because their funding from city and local governments cannot catch up with the growth in recurrent expenditures, especially increased salaries. For example, schools in Beijing's Haidan district use the budgeted funds from the city almost entirely to pay salaries, and rely on school-run businesses, renting out space (labs, classrooms for night school), fees for an optional foreign language program, and increased tuition collections from foreign students and nonlocal students who come from outside the catchment area for other expenses. Revenues from such activities could reach half the budgeted funds. In another district, schools charged higher fees to students with low entrance examination scores and sought cash and in-kind donations from local benefactors. Elsewhere, schools run cafeterias and use buildings for discos and other revenue-earning entertainment.

A review of schools engaged in off-budget revenue raising shows that those with favorable locations, good reputations, excess land or buildings for rent, and have entrepreneurial management, did very well. The off-budget revenues increased perpupil expenditures significantly—largely boosting teachers' salaries. Finally, the ability to collect fees and cash based on reputation increased interschool competition and improved quality. However, equity concerns related to self-financing policies are leading the government to put renewed emphasis on public funds.

Source: Lewin et al. 2001.

⇨*Options to increase efficiency of delivery*

This section reviews some promising or innovative options for addressing efficiency constraints. It focuses on specific policies to improve education management and technical-vocational education systems, and on efficient ways to provide secondary schooling to disadvantaged target populations. Public-private partnerships and school-based management can be effective for tackling some inefficiency issues, such as centralized labor markets, unsatisfactory public expenditure management systems, and poor accountability. However, other broader policies to improve public institutional frameworks will also be needed.

Encouraging public-private partnerships (PPPs) can be an efficient policy. PPPs can take several forms and serve different purposes. Table ES.5

attempts to present a typology of PPPs according to those two criteria. We have already mentioned two types of PPPs: vouchers for poor students and community schools. Other types include concession schools (as defined in table ES.5) and publicly subsidized private schools. Chile illustrates a large-scale experience with publicly subsidized private school, introducing per-capita public subsidies for all municipal schools and non-fee-charging private schools in 1981. These were designed to promote competition among schools and lead to higher quality and enrollment. The benefits of competition are being debated, with some studies finding no evidence that Chile's universal voucher scheme improved average educational outcomes. However, there is evidence that when schools are put on equal footing, not only can they deliver high-quality services, they also can compete for good students, improving opportunities for both the poor and the rich. Other examples of public-subsidized private schools can be found in several East Asian cases (such as Korea), where private schools have been used to expand enrollment capacity.

Table ES.5. Typology of Public-Private Partnerships in East Asia and Latin America

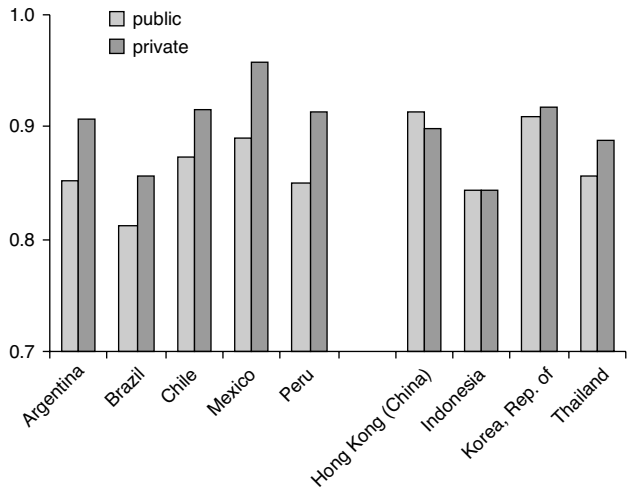
Type of PPP	*Example*	*Purpose*
Management and operational contracts: a private provider is contracted to manage an existing government service.	Concession schools in Colombia.	Improve quality and efficiency of delivery by taking advantage of specialized skills
Service delivery contracts: The government contracts with a private provider to deliver specified services. Different financing mixes are possible. Typically, the government pays teachers and the private sector covers capital costs, with non-salary recurrent costs split between the two. Private schools can finance additional teachers or additional teacher income.	Vouchers for secondary schools in Colombia	Use private sector to provide the poor with access to quality schooling
	Voucher scheme for municipal and private schools in Chile	Improve coverage and quality through school competition
	Education Service Contracting Scheme in the Philippines. Government-subsidized private schools in Thailand, Hong Kong (China), and Republic of Korea.	Use private sector to expand enrollment capacity
	Community schools	Use private sector to expand enrollment capacity, raise additional resources

Source: Author's elaboration.

On strict quality grounds, there is more reason for encouraging PPPs in Latin America, where there is a substantial quality and efficiency gap between public and private schools (see figure ES.11).[14] Public financing of private schools can help lead to both equitable coverage (if poor students are given increased access) and improved quality for similar levels of resources in Latin America. This effect will be all the stronger if there is a larger efficiency gap with public schools, or if private schools have greater capacity to enroll new students. Middle-income countries that have better private schools and quality-assurance systems will probably benefit more from the standpoint of quality. PPPs will remain a relevant means to increase enrollment capacity at a reasonable cost in East Asia.

Increased decision-making autonomy for schools can increase efficiency by taking advantage of the superior knowledge that schools have of conditions, needs, and preferences of families and students, and of their greater accountability to families. In all cases of school-based management, participatory decision making is essential to enhance cost-effectiveness through a clearer expression of preferences and needs, and strengthened monitoring and oversight. Evidence from Central American countries shows that school-based management with strong community participation generates efficiency gains by using teachers and schools in poor, rural settings more intensively. However, little evidence is available about the merits and limitations of school-based management in secondary schooling, although this model is

Figure ES.11. Output Efficiency Scores by Public and Private Management



Source: PISA 2000.

being increasingly applied in both regions. The analysis undertaken in the report allows us to test the impact of autonomy in several key areas (budget generation and management, teacher management, and pedagogical/curricular decisions) on the efficiency of delivery. We find that providing schools, and especially principals, with more autonomy in generating and managing budgets works well in East Asian countries (through higher accountability to communities for results, and higher shares of funds spent on non salary items, such as textbooks and training). However, pedagogical autonomy may decrease efficiency if countries opt to diversify course offerings, hire more teachers, or hire more highly qualified teachers, with little in return. The impact of decentralization is quite different in Latin America. There, transferring decision-making responsibilities for teacher management to schools enhances efficiency, probably because centralized bureaucracies are particularly inefficient in allocating teachers and holding them accountable. This illustrates the importance of regional and national differences in determining the effects of school-based management.

A key issue in the efficient delivery of secondary education is the balance between general and technical education. Fewer technical tracks, more emphasis on general skills, and better linkages with higher technical education can make Technical and Vocational Education and Training (TVET) more cost-effective. Traditionally in both regions, vocational schools have been separated from general secondary schools, with fairly different curricula. 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. 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, economies of scale in the use of teachers and equipment, as well as higher-quality technical education. A recent comparison of mean efficiency scores across technical-vocational and general education schools in Korea and Uruguay shows no or little difference in cost-effectiveness. The good efficiency results of Korean vocational schools are due to their emphasis on general skills and the increased linkages between vocational schools and technical colleges. Another innovative case of TVET reform occurred in Chile, where there are strong links between secondary and higher education, and between these levels and the employment sector. This allows continuity and flexibility for technical education. The Chilean system is

also efficient, comprised of only 13 vocational categories, compared to 400 technical specialties prior to the 1980s.

Alternative secondary models can be cost-effective for expanding education if the right balance is found between costs and quality. Often, alternative models such as distance education are designed for those who could not succeed or take part in conventional schools (e.g., rural populations in which youth have little or no access to nearby schools, or economically disadvantaged youth who work during school hours). They seek to address common weaknesses in conventional secondary schools, such as curricula that are irrelevant for these populations, insufficient access, and high per-pupil costs in rural areas. Their most common primary objective is to expand access at a low per-student cost, but they can also improve education quality and completion. A review of alternative programs indicates that they have lower delivery costs than traditional programs for similar target populations,[15] but their test score and completion rate results are mixed. For instance, on average in Colombia, participants in SAT, an education program provided by facilitators on a flexible time schedule, have higher test scores on a national exam than students in traditional schools in the same municipalities. In Indonesia's Open Junior Secondary Schools, an education program provided through TV, radio, and special printed materials, 92 percent of participants who took the national exit exam passed, and there was no significant difference in academic performance when compared to traditional school students. However, recent evidence about Mexico's Telesecundaria shows reading and science test scores are below those of traditional lower secondary programs, which may be a sign that the program's quality is decreasing as access increases.

Frequently, alternative programs are designed to have lower per-student costs than conventional programs, and tend to serve students who have acute learning needs and populations that may have little voice in society. This combination makes these programs very vulnerable to becoming second-rate schooling options. The right balance needs to be found between costs and quality. There is growing consensus on some of the keys to reaching this balance: sustained political commitment and will, knowledge of needs and contexts of target populations, appropriate design regarding the choice of technology and content for particular populations, well-trained facilitators or teachers, sufficient face-to-face contact between participants and facilitators, minimum complexity in design, and popular sentiment that the quality is comparable to conventional programs.

Notes

1. Advantages of mass literacy include a healthier society, fewer social problems, fewer individuals tapping into public safety nets, a stronger democracy; and potential for knowledge creation and, therefore, innovation and growth. The "positive externality" argument may be somewhat easier to make for primary education, in which the impact on mass literacy is clearer, or tertiary education, in which the impact on knowledge creation, and therefore innovation and growth, is stronger. However, the many similarities between lower secondary and primary education, combined with low literacy levels achieved at the end of primary school, suggest that the "mass literacy" argument should also apply to lower secondary education, justifying public financing at that level. Public financing of upper secondary education may be justified on two grounds: the potential to build the skills desired for innovation and growth, and the need to "bridge the gap" between lower secondary and tertiary education.
2. Although, in theory, saving resources should allow us to reinvest them in better outputs at another time.
3. We assume that countries' potential for additional public and private resources depends on the set of criteria developed in the policy alternative section.
4. To make this exercise more realistic, rather than the theoretical efficiency frontier, we take Mexico as the input efficiency benchmark and Korea as the output efficiency benchmark. For each country, we add the two sources of efficiency gains.
5. The fiscal gap is the one obtained with the dynamic simulation analysis shown previously with, however, a 95 percent target enrollment rate.
6. Too many levels of government exist, with blurred functions, insufficient information and regulatory capacity, and limited community participation.
7. Admittedly, these are upper-income East Asian countries, which are generally better positioned than most to achieve higher outcomes and have had their own specific political and institutional characteristics. Korea, however, started from much lower levels not long ago.
8. Semipublic schools use public infrastructure such as classrooms and facilities, but self-finance for most of their recurrent expenditures, such as salaries for new-hire teachers and increasing salaries for experienced teachers. Semipublic schools accounted for 47 percent of total upper secondary enrollment in 2004.
9. Although a country by country analysis will also be necessary.
10. The fiscal gaps are the ones obtained with the dynamic simulation analysis shown in the section on constraints, with the same 85 percent target enrollment rate. They are smaller than in figure ES. 7 due to the lower target enrollment rate.

11. We take the OECD average as benchmark due to the limited amount of regional observations. The OECD benchmark for private sector contributions (excluding household expenditures) is 0.7 percent of GDP.
12. This generalization needs to be taken with care because of the limited country sample, which tends to be biased toward poorer countries.
13. A study of *Fe y Alegria* schools (a sectarian, nongovernmental organization controlled by the Jesuit Order of the Catholic Church, and which operates at all education levels in the poorest communities) in nine Latin American countries shows that when one factors in community contributions, the unit costs in FyA schools were higher than in public schools; but with these higher costs, the FyA schools achieved better results in terms of repetition and dropout rates.
14. The results reported in the figure control for schools' socioeconomic status and these results are maintained when controlling for student selection.
15. This is generally due to instructional systems that operate at lower cost than conventional schools (generally by using fewer teachers, and instead using volunteers, tutors, etc; or capital costs, either by using existing infrastructure or less infrastructure than traditional models).

Introduction

Context, Purpose, and General Approach

In the past half century, many developing countries have increased primary school enrollment rates to near universal coverage, so that potentially the number of children who are seeking secondary education has greatly increased. At the same time, these countries are concerned about whether those who proceed to secondary education are learning skills that are useful to them and are in demand in the economy. In this technological age countries compete in part on the basis of the access to and creation of knowledge. To succeed in an increasingly knowledge-based global economy, workers must have the skills and training necessary to use and generate new technologies. To achieve those ends, a high percentage of the population must master higher-order mathematics and communication skills that cannot be learned in primary school alone. Well-paying jobs in the manufacturing and service sectors increasingly require secondary education. Students who never complete secondary school cannot compete for such jobs and are unable to continue their studies at the tertiary level.

Policy makers in many World Bank client countries are indicating an increasing interest in expanding and improving their secondary education systems. But how can countries address the multiple challenges they face in secondary education? How can they grow their education systems responsibly and efficiently? How do the challenges vary with different development levels, and how can countries with different technical and financial capacities address those challenges? Those are the overarching questions that this report seeks to address. The answers to the questions are not the same as those to questions about primary education, for several reasons. The production technology at the secondary level is usually different; one important example of this is that teachers are expected to have more specialized skills and pupil-teacher ratios are smaller. There are also many more competing choices for secondary education students: they can choose between going to school, working, or both (issues relating to school-to-work transition are more important), between general and vocational-technical education (VTE), and between public and private schools (in many countries, the role of government as provider is smaller at the secondary level, with private providers enrolling a larger proportion of students).

This study proposes to address these overarching questions about secondary education[1] using the experiences, analytical findings, and data from countries in two regions, East Asia and Latin America,[2] and to do so as a joint study rather than as parallel studies. **Why these two regions? These regions allow us to exemplify the many challenges faced by secondary education systems.** In the development of public education systems in both Latin America and East Asia, secondary education has been for long neglected, filling neither the basic education and socialization role assigned to primary school nor the national development and competitiveness role associated with tertiary. Historically, secondary schools were viewed primarily as a conduit for tertiary education with little merit of their own. By the mid-20th century, however, technological advancements and increasing globalization resulted in a growing recognition that secondary education, in and of itself, could advance the skills and knowledge of young adults, many of whom would not continue on to tertiary education. Thus secondary school began to be linked not only with tertiary education, but also with primary school's function of providing basic education. As a consequence, secondary education is seen as filling dual roles: providing skill, knowledge, and technical training for youth planning to enter the labor force and preparing others for continued studies in higher education.

With the growing understanding of secondary as a necessary part of a citizen's fundamental education, many developing countries in East Asia and Latin America passed laws making lower secondary and occasionally upper secondary part of mandatory education requirements. Unfortunately, in many countries, the new recognition of secondary remained largely at the level of law and rhetoric. Coverage of secondary education is increasing, but slowly, in many countries owing to both supply and demand constraints. Clearly, an adult with the Latin America average of 5.8 years of schooling or the East Asia average of 6.2 years does not have the skills or knowledge to compete with other potential employees around the world for high wages. The quality of secondary schooling is also low in many East Asian and Latin American countries. Major equity gaps exist in the access to and completion of secondary education in nearly all East Asian and Latin American countries, and investment in secondary education in many countries is insufficient.

These regions offer a broad range of policies and programs to address secondary education challenges. Indeed, during the 1990s many Latin American countries implemented significant reforms to improve the coverage, equity, and quality of their secondary education systems, with emphasis on innovations in service delivery, such as decentralization and demand-side financing. East Asian countries too have been pushing secondary education expansion more aggressively, with comprehensive education reforms based on effective skill building, resource mobilization, and efficiency-enhancing policies.

Finally, the countries in these regions face a variety of challenges related to their different development levels. Their economic and social development levels range from the upper- or upper-middle-income countries of the Republic of Korea, Malaysia, Mexico, and Chile, to the lower-income countries of Vietnam, Cambodia, and Bolivia, which allows us to analyze challenges and policies in very different settings.

Why a joint regional study? There are several reasons: (1) The two regions together offer a similarly broad range of challenges, experiences, policies, and programs, providing the study team with more "degrees of freedom" for analyzing issues and finding solutions than would any one regional study. (2) There is genuine interest in each region to learn from the other, and a joint study would allow this with economies of scale. East Asian countries, among them Indonesia and the Philippines, look toward

Latin American countries for innovations in delivering education, especially to needy groups. Innovations that have attracted attention are the Escuela Nueva model in Colombia, decentralization to the subnational and school level, and programs for needy families such as Oportunidades in Mexico and Bolsa Escola in Brazil. As countries in East Asia decentralize their education sectors, they are eager to examine the lessons learned in Latin America to avoid some of the pitfalls of that system reform. Likewise, Latin American countries have looked to East Asian countries, such as Korea and Singapore, for comprehensive education policies that promote rapid economic growth. (3) A joint study would create a special forum for Bank staff in both regions to benefit directly from a closer exchange of knowledge and country experiences. A joint study, rather than two parallel studies, can provide not only the space but also the drive for interaction. (4) Similarly, a joint study would create structured opportunities to bring policy makers from the two regions together to discuss issues and experiences, as well as solutions, for secondary education.

Specific Focus, Conceptual Framework, and Methodological Approach

Focus on resources. The report addresses the overarching questions by focusing on resources. There are two key questions: How can we mobilize resources for secondary education? How can we use these resources efficiently? These questions are, in turn, addressed by assessing bottlenecks, opportunities, and policy options at different levels (household, country, school). The report identifies demand-side factors that can constrain household demand, as well as strategies to circumvent them; analyzes efficiency constraints at the school level and suggests strategies to make better use of resources at that level; and assesses financing constraints at the country level and proposes innovative resource mobilization policies. In addition to looking at a broad range of policy options to mobilize and improve resource use, the report will focus on a few countries that have been successful in addressing multiple challenges, analyzing their policy mix, and sequencing.

Understanding supply- and demand-side constraints and planning for effective interventions. Although the expansion of secondary education may be directly constrained by basic supply-side factors such as the lack of schools, it may also be constrained by demand-side factors coming into

play at the household level. In particular, low perceived rates of return on secondary education, liquidity constraints, and the related competing options to secondary education (such as work) can lead households, and particularly poor ones, to underinvest in secondary education. A diagnostic of the secondary education market, understanding the relevance of supply- and demand-side constraints, with particular focus on how household demand can constrain secondary education expansion, is therefore a first step in planning for successful policy interventions in secondary education. Policy interventions can be wide ranging and include both demand- and supply-side interventions.

Understanding financing constraints and planning for resource mobilization strategies. Addressing secondary education challenges also requires careful resource mobilization policies at the country level. Many countries underinvest in education and more particularly secondary education, which is the case in many Latin American and East Asian countries. A careful diagnostic at the country level includes not only public funds for education but also the role of private financing, an analysis of the extent of and scope for private schooling, and the contributions of households and civil society. It would be useful to establish a menu of resource mobilization options and a set of criteria to help tailor this menu to the specific countries' financing characteristics and needs.

Understanding efficiency constraints and planning for efficiency-enhancing policies. Generally, resource mobilization strategies will need to be accompanied by measures to improve the efficiency of the education production process at the country and school level. Countries could undertake major resource mobilization efforts with relatively little impact if resources are spent inefficiently or, vice-versa, enhance their resource mobilization efforts if efficiency is achieved. It is therefore imperative to understand whether more could be achieved with similar resource levels, and it is even more important to identify policies, such as better budget allocations, management reforms, curricular changes, and technological innovations, that could potentially improve resource use.

This framework should be a tool for systematically examining a broad range of policy options to expand and improve secondary education. It could help identify ways of involving and gaining the support of the fundamental stakeholders of education, ensure that no strategic resource mobilization and efficiency-enhancing opportunities are inadvertently

missed, and lead to a coherent overall strategy for mobilizing and using resources. In addition, when possible, the study will provide ways to adapt the framework to the characteristics and needs of countries of different economic levels. Through deeper discussions with policy makers and experts in selected countries in the two regions, it would also be interesting to arrive at more concrete, feasible strategic options for the development of secondary education in two of the countries, illustrating how the proposed framework can be used in practice.

Because of the diversity in challenges, capacities, and constraints across countries, the study will distinguish among groups of East Asian and Latin American countries. Grouping the countries recognizes that education systems face different challenges in relation to coverage and quality; they face different financing, efficiency, and institutional constraints in addressing these challenges; therefore, they possibly require different policy combinations. The primary grouping that the study will consider is done according to the per capita income of each country (distinguishing between upper-income, upper-middle-income, lower-middle-income, and lower-income economies); other patterns of economic development will also be considered when possible. We have seen that Latin America and East Asia contain countries that vary widely in their economic and social development levels.

The study draws on the findings from a long list of related past and ongoing studies, literature reviews, and original data analysis and qualitative case studies. Data analysis will make intensive use of household surveys and educational performance databases, such as PISA,[3] to carry out comparisons between completion and educational performance indicators, rates of return, efficiency ratings, and so on. Analytical findings will be duly complemented by literature reviews and informative case studies.

Structure of the Report

The first chapter of the study examines the state of secondary education in Latin American and East Asian countries. By using regional and national data, the chapter will analyze and summarize the trends and gaps in secondary education enrollment, completion, student learning achievement, and equity indicators. It will also present evidence on the state of

service delivery in the two regions, focusing on basic supply and governance characteristics and demand-supply imbalances. The chapter will show substantial challenges in the two regions, but also cases of countries that have had or are having success in addressing those challenges.

Chapters 2 through 4 focus on the constraints and policy options involved in addressing secondary education challenges at three main levels of analysis—household, country, and school. Chapter 2 focuses on the demand for secondary education, highlighting labor market trends, but also, in particular, demand-side constraints at the household level, which are found to be pervasive. The chapter also suggests policy options to address these constraints. Chapter 3 analyzes financing issues at the country level, comparing financing needs in the two regions and reviewing education financing strategies. Financing needs are found to be substantial, and a menu of resource mobilization strategies involving public and private stakeholders is presented. Chapter 4 analyzes efficiency issues at the country and, particularly, the school level, measuring efficiency gaps and suggesting efficiency-enhancing interventions. Efficiency gaps are also found to be pervasive in some countries, suggesting a need for better capacity utilization, budget reallocations, and management and curricular reforms. Finally, between the chapters, we spotlight four countries that have had or are having success in addressing multiple challenges, analyzing their policy mix, and sequencing.

Notes

1. For purposes of the study, secondary education will refer both to lower and upper secondary education and to general and vocational education.
2. Although when highly relevant information from other countries is available and appropriate, such information will be included also.
3. The OECD Program for International Student Assessment (PISA), which measures content "literacy" at the age of 15.

CHAPTER 1

Trends and Challenges in Latin American and East Asian Secondary Education

Introduction

This chapter provides a broad overview of the state of secondary education in Latin America and East Asia. The purpose is to provide basic data and analysis on a wide range of Latin American and East Asian secondary education systems so that the reader will have a foundation for the subsequent chapters on more specific issues concerning secondary education. In the chapter we compare regions and individual countries by income level. The income level groupings follow those laid out by the World Bank and detailed in table 1.1 and the corresponding footnote. These comparisons bring to light many interesting patterns, and they reinforce the heterogeneous nature of the East Asian and Latin American regions and the vast diversity and uniqueness of the countries there.

The absence of overly predictable patterns between regions and income groups and the existence of country outliers are a testament

to the promise and potential of national education policies and the power of national contexts beyond those of mere regional characteristics and macroeconomics. Student achievement as measured by scores on international examinations reveals that certain countries score systematically higher than others even with similar or superior per capita GDP. Similarly, educational equity, as measured by the likelihood that different groups of children **will complete secondary education** (poor/rich, rural/urban, female/male), also varies in ways that cannot be easily categorized by GDP or region. Mexico, Vietnam, and

Table 1.1. World Bank Categorization of East Asian and Latin American Countries by Income Group as Used in This Report[1]

Region	*Low income*	*Lower-middle income*	*Upper-middle income*	*High income*
Latin America and the Caribbean	Haiti Nicaragua	Bolivia Brazil Colombia Dominican Republic Ecuador El Salvador Guatemala Guyana Honduras Jamaica Paraguay Peru Suriname Venezuela, R. B. de	Antigua and Barbuda Argentina Barbados Belize Chile Costa Rica Dominica Grenada Mexico Panama St. Kitts and Nevis St. Lucia St. Vincent and the Grenadines Trinidad and Tobago Uruguay	
East Asia and the Pacific	Cambodia Lao PDR Mongolia Papua New Guinea Solomon Islands Timor-Leste Vietnam	China Fiji Indonesia Kiribati Marshall Islands Philippines Samoa Thailand Tonga Vanuatu	Malaysia Micronesia Palau	Japan Korea, Rep. of Hong Kong (China) Singapore

Source: World Bank.

Indonesia, for example, fall into different income groupings and regions, but they have all reduced educational inequalities in recent years.

Many patterns do emerge, however, and unfortunately, but not surprisingly, many of these patterns parallel the relative wealth of countries. Wealthier countries in both East Asia and Latin America are more likely to have more students entering secondary, are more likely to have students completing secondary, are more likely to score higher on international assessments, and are less likely to be plagued by high repetition and dropout-reentry patterns.

In other cases, contrasting patterns between the two regions appear. East Asia, for example, tends to score higher on international assessments, once controlling for per capita GDP, than Latin America. Latin America also suffers much more from inefficiency, as measured by overage students, than does East Asia.

The chapter is organized into nine main topics: (1) the structure of secondary education systems; (2) modalities of secondary education, including vocational education and private secondary schools; (3) educational governance at the secondary level; (4) coverage and access in secondary; (5) internal efficiency; (6) indicators of secondary school quality; (7) validity of trade-offs between access and quality; (8) issues of equity in secondary education; and (9) supply-and-demand constraints and opportunities for secondary education.

Secondary Education Structure

Tables 1 and 2 in annex 1.1 illustrate the structure of primary and secondary education in Latin America and East Asia, respectively. As is evident from the tables, education structure is relatively similar in the two regions although some notable differences are present, both between and within regions, especially in regard to the duration of, number of levels or cycles in, compulsory nature of, and age of entry into secondary.

In Latin America, several countries incorporated the traditionally lower grades of secondary education into the primary cycle, creating what is known as "basic" education cycles. These countries include the Dominican Republic, Bolivia, Brazil, El Salvador, and República Bolivariana de Venezuela. This basic education cycle lasts eight or nine

years. The remaining Latin American countries have shorter primary cycles of five to seven years combined with two secondary cycles, lower and upper.

In East Asia, the primary cycle lasts between four and six years, and secondary cycles last between four and seven years. In Asia, as in Latin America, countries differ as to whether they have one or two secondary cycles, although most have two cycles.

The two regions also differ in whether all or part of the secondary cycle is compulsory. In Costa Rica, Cuba, the Dominican Republic, República Bolivariana de Venezuela, and Ecuador some or all of secondary schooling is mandatory; in Brazil, Bolivia, and El Salvador the basic education cycle (including lower secondary) is compulsory. But in the remaining 13 countries, governments demand only that children complete primary schooling. In East Asia a larger proportion of countries make at least part of secondary mandatory, but still most countries do not. Overall, however, the average number of years of compulsory schooling is higher in Latin America, 8.35 years, than it is in East Asia, 7.70 years, in part as a result of the creation of the basic education cycle, and because youth begin compulsory schooling at a slightly younger age in Latin America.

Provision of Secondary Education: Public and Private, Academic and Technical/Vocational

Secondary education, like primary, can be provided publicly or privately and can be general or technical-vocational.[2] It is not theoretically clear whether the private role in secondary schooling should be greater or smaller at the secondary level than at the primary level. On one hand, secondary schooling develops skills and competencies that are of value to private industry and graduates who work in it, suggesting a sizable role for the private sector. On the other, the role of secondary education in economic growth and labor market outcomes for the poor implies significant public interest in secondary school provision, creating a strong argument for public sector involvement. Generally, economic theory argues that because of empowered principal agents and a more efficient communication of signals, the private school environment should be more conducive to learning, but evidence based on actual implementation is mixed.[3] Private schools may spring up to provide high-quality schooling to underserved students, or they may be valued by religious

groups or educated elite families. Private schooling is also affected by the predominant institutional environment. Central and public regulation and oversight clearly can affect private provision of education, as does the reach, quality, and content of public schooling. All of this suggests that private secondary provision will have different functions in different countries.

Great variation exists between countries in the proportion of secondary students enrolled in private schools (annex 1.2). Large proportions of students attend private secondary schools in Chile, Guatemala, and Indonesia, whereas nearly none attend in the Lao People's Democratic Republic (PDR), Mongolia, or Jamaica. It appears that on average, a slightly greater percentage of students attend private schools—both secondary and primary—in Latin America than in East Asia, and in both regions more students attend private secondary schools than attend private primary schools. In Latin America 25 percent of secondary students are enrolled in private schools. In East Asia the corresponding figure is 19 percent.

The Programme for International Student Assessment (PISA) permits a more detailed investigation of some of the characteristics of private schools in participating countries in Latin America and East Asia. In Latin America, Argentina, Brazil, Chile, Mexico, Peru, and Uruguay participated in the assessment. In East Asia, Korea, Hong Kong (China), Indonesia, and Thailand participated. The Latin American countries listed are more representative of their region than are the East Asian countries listed as indicated by an average private enrollment closer to that of the region as a whole.[4] Characteristics of private secondary schools for these countries are shown in table 1.2.

In the Latin American countries private secondary schools are predominantly to exclusively academic. Brazil and Uruguay have no private technical or vocational education and training (TVET) secondaries, and in Mexico 15 percent are TVET. The private school sector in East Asia appears much more diverse. In Korea, Indonesia, and Thailand, 20 percent to 30 percent of private secondary schools are TVET, whereas in Hong Kong (China) almost 100 percent of participating private schools were academic in nature.

Countries also vary widely in regard to sources of funds for private secondary schooling.[5] There is variation between countries and

Table 1.2. Characteristics of Private Secondary Schools in PISA-Participating Latin American and East Asian Countries

	PISA Year	% of total secondary enrollment	Orientation		Funding source	
			Academic	Vocational	Public	Fees
Latin America and the Caribbean average 2003/2000						
		23.9	**95.2**	**4.7**	**23.9**	**72.3**
Argentina (UM)	2000	29.2	—	—	55.7	47.5
Brazil (LM)	2003	14.9	100	0	0	81.5
Chile (UM)	2000	51.1	—	—	58.4	36.1
Mexico (UM)	2003	10.7	85.8	14.2	1.8	96.2
Peru (LM)	2000	17.7	—	—	27.5	74.2
Uruguay (UM)	2003	19.8	100	0	0	98.5
East Asia and the Pacific average 2003						
		46.4	**77.7**	**22.3**	**50.8**	**42.7**
Hong Kong (China)(U)	2003	88.8	90.4	9.6	89.1	9.5
Indonesia (LM)	2003	30.9	72.4	27.6	12.3	79.6
Korea, Rep. of (U)	2003	55.3	79.5	20.6	55.3	35.2
Thailand (LM)	2003	10.7	68.5	31.5	46.3	46.6

Source: Marshall 2005b.
—. Not available.

regions, but East Asian countries tend to give more public funds to private secondaries than do Latin American countries. Three of the four East Asian countries receive roughly half or more of their funds from public sources, the exception being Indonesia. In Latin America, two of the six countries—Chile and Argentina—collect half of their resources from public sources; whereas in three of the six countries private secondaries receive virtually no public funding. In all countries, funds that are not publicly derived come almost exclusively from student fees. The different funding structure is one reason that private secondary schools serve a more elite population in Latin America than in East Asia, although in Chile and Argentina less wealthy students may have more access to private schools, whereas in Indonesia private schooling can be quite expensive, providing less access to the nonwealthy. No clear trends are present for source of funding along country income grouping.

The PISA questionnaires asked students to identify the reasons for attending their school and asked school principals the factors that go into student selection for their school (analyzed but not reported in table 1.2). In Latin America, private school students are more likely to stress the

quality of the school and religion as reasons for attending; factors such as location matter less. Private school admissions policies are also less based on residence and more concerned with the students' background, their parents, and recommendations.

Much greater variation between countries exists in East Asia. In all countries except Thailand, school location is the largest specific factor students report as determining their enrollment in a particular school. Better quality, however, is reported less frequently in private schools than in public schools in both Hong Kong (China) and Indonesia. In regard to school admission factors, private secondaries in Indonesia and Thailand are more likely to report selection based on students' academic records or recommendations, whereas in Korea and Hong Kong (China) public schools appear to have more stringent student-background-based admissions policies.

Compared with Latin America, East Asian countries appear to have a much wider variety of admission factors, suggesting that they cater to a more diverse student body. In sum, the PISA data tell a fairly consistent story about private secondary schools in Latin American and East Asia. In Latin America private schooling is clearly an entity enjoyed by the wealthiest, and perhaps most-motivated, families. In East Asia much less consistency is present, suggesting that the private school sector is heavily dependent on local factors.

Annex 1.3 shows the share of total secondary enrollment attending technical or vocational education or training schools. A great deal of attention has been focused on whether general academic education is more effective, more cost efficient, or more productive than TVET. Similar to most such divides, this duality is somewhat artificial. As countries universalize lower secondary schooling in response to increases in attainment at the primary school level, they face difficult questions about the proposed structure of the upper secondary school programs. Rather than refer in broad terms to either vocational or secondary schooling, countries are returning to developing systems that meet a wide range of needs in society for the content of schooling. As Holsinger and Cowell (2000) note, countries are pushed toward investing in diversified secondary schooling that bridges both academic and practical content as a result. At the same time, TVET is increasingly being offered at the postsecondary level and privately either by employers or through TVET businesses.

Roughly 13 percent of secondary students in Latin America and 11 percent of students in East Asia are currently enrolled in TVET schools, which provide focused preparation for a career track (Baker 1996; de Moura Castro et al. 2000; Filmus 2001). Globally, and in the Latin American and East Asian regions, this proportion has decreased during the past several decades as more vocational enrollment is moved to postsecondary and private programs (Benavot 1983). In the past few years, however, TVET enrollment rates appear to have increased modestly at the regional level in both regions, although with great variation between countries.

Annex 1.3 also shows the percentage change in overall TVET enrollment between 1998–99 and 2002–03. Overall, we see increases in the numbers of students enrolled in vocational or technical education in eight of the nine East Asia and the Pacific countries with at least two years of enrollment data. Similarly, in Latin America and the Caribbean countries we see growth between 1998 and 2002 in the number of students in 12 of the 18 nations with data. The Latin America and the Caribbean region, in particular, saw some fairly dramatic shifts in the actual number of youths enrolled in secondary vocational schooling, although in several instances this may be due primarily to nominal rather than substantive changes in actual TVET enrollment.[6] In contrast, the East Asian countries with relevant data did not see such large changes in vocational enrollments, particularly among the larger nations.

Both within and outside the secondary level, TVET is increasingly considered a potentially useful tool for improving the labor market–education linkage. China has made a substantial commitment to vocational and technical schooling at the level of firm-oriented training (Fallon and Hunting 2000), El Salvador is creating Megatec networks that link secondary and tertiary TVET with specific regional industries, and the Korean government is focusing increasingly on vocational training for the unemployed and underemployed rather than traditional schooling (Lee 2000).

As is evident in annex 1.3 countries vary greatly as to the relative size of the TVET secondary sector. Half or more of the included countries in each region have 6 percent or fewer of secondary students enrolled in TVET. At the same time 15 percent of students are enrolled in TVET in Korea and more than 30 percent and 40 percent are TVET students in Argentina and Panama, respectively. Much of this difference may derive from the historical development and use of TVET in each country as well as current

conceptions of the labor market–education connection. Countries also vary in regard to the regulatory body that oversees TVET secondary schools. In some countries TVET is regulated through the Ministry of Education, in others through the Ministry of Labor. Countries also vary in whether TVET schools are primarily government institutions or are delivered by nonpublic institutions and in how close the linkages are between TVET schools and the private sector. For example, there is wide variation in the degree to which TVET curricula respond to employers' needs, in part leading to widely varying private and social returns to the TVET sector.

In conclusion, few clear patterns in the relative significance of TVET across regions or income groups are present. Rather, the role of TVET may have more to do with the historical development of the sector, how well the sector responds to employers' needs, and therefore how TVET is perceived and used by potential students.

Governance[7]

Education governance has considerable implications for the substance, quality, and equity of schooling systems. Although often framed in a simple centralization versus decentralization framework, careful examination of the governance structures of education systems reveals that they are dramatically more complex. Multiple systems need to be put in place (regulation, quality assurance, information, and service delivery systems, among others), many different layers of educational governance exist and interact, multiple stakeholders participate at each of these layers, and we can have widely varying loci of decision making depending on the type of decision. Often, separate education levels are delivered differently. El Salvador, for example, has a strong school-based management governance system at the primary school level, but secondary education is much more highly centralized. Making matters even more complex, de jure and de facto management responsibilities can be very different. In one study in Nicaragua, for example, schools involved in a school-based management program were found to report less autonomy than a group of schools not participating in the reform (King et al. 2001).

In the past few decades countries have increasingly looked to incorporate more actors and levels into decision-making processes. This trend is called decentralization although it rarely fits easily into that term. Indeed, simple characterizations of centralization and decentralization are rarely, if ever, accurate. In China, for example, national policy stipulates multiple

layers of educational supervision involving the central government as well as corresponding agencies in local governments. At the same time, county governments have the responsibility for running secondary schools, and the village governments for running primary schools (Hawkins 2000).

Many challenges emerge in the effort to involve multiple levels of government in numerous areas of decision making. These include ensuring appropriate delineation and alignment, coordination, coherent policies, information sharing about decisions taken, and a smoothly functioning education system. Although the same challenges may have existed before the current "decentralization" trends, the pressure to address these issues has intensified. Frequently tensions, duplications, and inconsistencies emerge within countries' governance systems.

In this section, focusing on decentralized service delivery, we explore education governance through two sources. The first is through surveys and reviews of the literature and legislation to gain a macrounderstanding of what management level has primary decision-making power in a number of areas. The second involves principals' perceptions of local and national/subnational control through the PISA 2003 school questionnaire. These two sources are, to a certain extent, measures of de jure and de facto governance, the first being de jure in the sense that it reports on what governance systems are supposed to be, and the second being de facto in the sense that it reports what principals consider governance to be in practice.

In most instances centers of decision-making power can be characterized as existing at the national level, the subnational level, the local level, and the school level. Tables 1.3 and 1.4 characterize East Asian and Latin American countries, respectively, by the locus of key de jure decision-making areas based on surveys, legislation, and secondary sources. Table 1.4 attempts to show those areas in which responsibilities are shared between levels, whereas table 1.3 shows only primary responsibility. Although not evident in table 1.3, East Asian countries, like Latin American countries, have certain responsibilities shared between management levels. Several patterns are evident from these tables.

Across decision-making areas, Cambodia and El Salvador stand out as having relatively more centralized governance structures. Indeed, smaller countries may be more likely to entrust more responsibilities to the national government, whereas large countries such as Brazil, Argentina, and China assign the bulk of responsibilities to state or local authorities.

Table 1.3. Locus of Key Decisions in Lower Secondary Education in Select East Asian Countries in 2003

	Cambodia	*China*	*Indonesia*	*Philippines*	*Thailand*
Pedagogical/instructional					
Instructional time	■	■	■	■	■
Design of programs of study	■	■	■	■	■
Definition of course content	■	■	■	■	■
Choice of textbooks	■	▲	◆	■	◆
Teaching methods	◆	▲	◆	●	●
Mode of grouping students	◆	◆	◆	■	●
Additional support activities for students	■	●	●	●	●
Creation/closure of a school	●	●	●	■	■
Creation/abolition of a grade	■	■	●	■	■
Setting of qualifying exams	■	●	■	■	●
Credentialing	■	●	●	●	
Assessment methods of students' work	■	●	●	■	●
Personnel management					
Hire teachers	■	●	●	●	■
Hire principals	■	●	●	●	■
Fix teacher salaries	■	●	■	■	■
Fix principal salaries	■	●	■	■	■
Career of teachers	■	●	●	●	●
Career of principals	■	●	●	●	■
Resources					
Allocation to school for teaching staff	■		■	■	■
Allocation to school for nonsalary current expenditure	■	●	●	■	■
Allocation to school for capital expenditure	■	●	●	●	■
School use for capital expenditure	■	●	●	■	■

Sources: King and Guerra (2004); World Bank survey, 2003.

■ National; ● subnational; ▲ local; ◆ school.

Some countries, however, do not fall into this pattern. Nicaragua, for example, has a highly decentralized secondary governance structure in several decision-making areas.

More specifically, pedagogical and instructional decisions tend to be determined at the national level. In both regions there is a reluctance to delegate the setting of standards and decisions about core curricula to local governments or to schools, reflecting the widely held belief that the education system helps to promote a national identity as well as shared

Table 1.4. Locus of Decision Making in Lower Secondary Education in Select Latin American Countries, 2000s

	Argentina	*Bolivia*	*Brazil*	*Chile*	*Colombia*	*El Salvador*	*Mexico*	*Nicaragua*
Pedagogical/instructional								
Choose subject area content	●		■/◆				■	■
Define curriculum	■	■	■/◆	■	■	■	■	■
Design program's subject areas	●	■					■	■
Determine course content	◆						■	■
Select textbooks/teaching materials	◆	■		◆	■/▲			■/◆
Decide on student promotion	◆			■				■
Choose teaching methods	◆	■		◆	■		◆	◆
Test and evaluate students	■			■		■	■	■
Personnel management			●/■					
Hire and fire principals	●			▲	■/●/▲		●	◆/●
Hire and fire teachers	●			▲	■/●/▲		●	◆/●
Hire and fire general staff	●							◆/●
Fix principals' salaries	●	■		■	■	■		■
Fix teachers' salaries	●	■		■	■	■	■	◆/■
Decide on evaluation methods/supervision	●			◆	●		◆	◆
Decide on promotion								
Determine training	■/●	■		◆			■/●	■
Certify staff		■				■		■
Resources			●/■					
Allocation to school for salaries and benefits	●			▲		■		■
Allocation to school for nonsalary current expenditure	●			▲	●/▲	■/◆	●	■
Salaries and benefits					●/▲		●	■/◆
Teacher incentives		■					■	◆
Allocation to school for capital expenditure	●	▲		▲	▲	■/◆		■
Define/establish budget	●							◆

Source: Authors' elaboration.

■ National; ● Subnational; ▲ Local; ◆ School.

values and culture. One exception is that many Latin American countries locate substantial decision-making power at the school level in regard to teaching methods. Curriculum, on the other hand, is determined nationally in all the countries shown in both tables.

Decisions about staffing can be made by different levels of government, often leading to confusion and inefficiencies. The decisions range from teacher training to recruitment, deployment, performance evaluation, human resource databases, payroll, and redeployment. In some cases, some functions are decentralized to lower levels of government (such as the hiring and firing of teachers), but others (such as setting compensation levels) are still effectively centralized. In Indonesia, for example, personnel management and the payroll function take place at the district level, but the recording of such actions, necessary to trigger the payroll, is still centralized and, according to the civil service law, the central government retains much authority over teachers' wages.

Education finance may be the most decentralized area of decision-making authority because countries have sought to mobilize local funds for schools. Initial enthusiasm to grant revenue-raising authority to local governments, however, has been dampened by resulting inequalities, and the trend has, in many instances, been replaced by attempts to rein in the tendency of local governments to impose new taxes. Nonetheless, declines in subsidies from the central government and emerging fiscal gaps have forced communities and schools to seek supplementary funding, often by raising user charges. Fiscal decentralization was a key feature of a recent education reform in China; the central government reduced its subsidies to local schools, and local governments intensified their efforts to find alternative funding for basic education, through raising taxes, community contributions, and income from enterprises (Hawkins 2000; Tsang 2002). As the central government reduced school subsidies, the share of nongovernmental sources of financing rose from 19 percent in 1993 to 24 percent in 2000 (Hawkins 2000).

Frequently, these finance-related decisions take place at the subnational or local level in the countries shown in the two tables. One exception is Nicaragua, in which participation is at the school level in making decisions about the allocation of funds (particularly those funds collected locally).

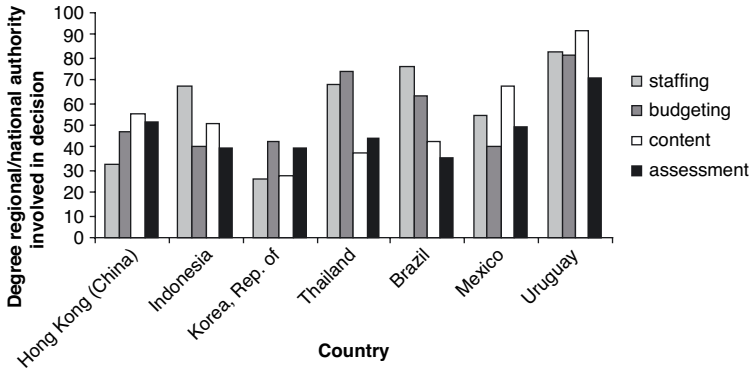
Under decentralization, the central authority needs to redefine its role and to reform its structures and processes so that it can fulfill evolving

core functions. Lower levels of government have little incentive to carry out some policies and programs because they cannot fully capture the returns on these programs, they are unable to carry them out well because of a lack of economies of scale, or they do not have sufficient resources to undertake the policies or programs. These include setting goals for and standards of service provision, experimenting when needed, rewarding innovations from other parts of the system, disseminating information widely and regularly, establishing a transparent regulatory framework and enforcing it, and ensuring more equitable education spending. Brazil's recent finance reform, FUNDEF, is an example of the central government taking on a regulatory role to ensure greater educational equity in what otherwise is a highly decentralized system in which state and municipal governments have significant decision-making power. FUNDEF guarantees a minimum per pupil expenditure in primary schools throughout the country and partially equalizes per pupil funding within states.

Figures 1.1 through 1.4 use the questionnaires given with the PISA exam to investigate de facto education governance in select East Asian and Latin American countries as seen from the perspectives of school principals. Figure 1.1 shows the proportion of respondents who indicated that regional or national education authorities "exert a direct influence on decision making" in four key areas: staffing, budgeting, course content, and student assessment practices. Thus, this graph is a measure of perceived national and subnational authority. Respondents could also report that other management levels had "direct influence" over the same areas; therefore, a high proportion in figure 1.1 does not necessarily mean that lower management levels such as parent groups or principals do not have decision-making power in those same areas. The figure illustrates large variation between countries in all four decision-making areas.

Overall, Hong Kong (China) and Korea report the least centralized control, and Uruguay reports the most. But other countries report high levels of central control in certain areas and less in others. Thailand and Brazil, the countries with the greatest variation, report relatively little content and assessment centralization and much greater staffing and budgeting centralization. Note that this is somewhat different from the trend identified in table 1.3 and table 1.4, which suggested that instructional content tended to be centralized whereas budgeting was more likely to be decentralized.

Figure 1.1. Influence of Regional and National Decision Making in Staffing, Budgeting, Content, and Assessment-Related Decisions



Source: PISA 2003.

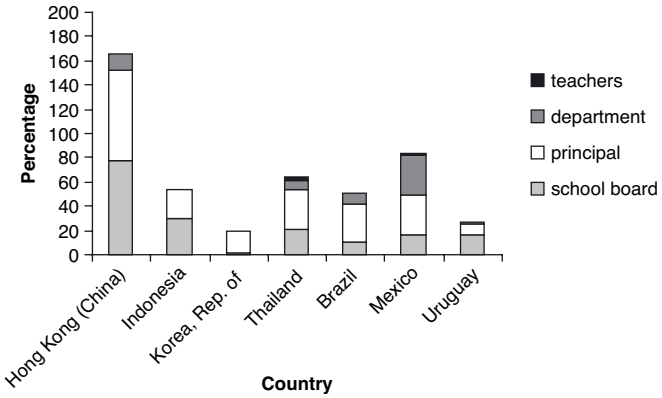
This discrepancy may indicate that although curriculum and even teaching methods may be established centrally, schools and teachers may have a high degree of independence in the extent that they implement them in the classroom.

Figures 1.2 through 1.4 reflect principals' perceptions of what, if any, school-level stakeholder has "main" responsibility over hiring teachers, allocating budget, and determining course content, respectively. These figures, therefore, give a sense of the level and distribution of decentralized decision-making authority. The height of the bar gives a general sense of overall school- and local-level influence over the activity, and the segments of each bar delineate the influence of each of the groups of decision makers.

In these three areas principals report that the highest school-level authority is again in the area of course content. Budget allocation also has fairly high levels of perceived local control, whereas hiring teachers is very rarely controlled locally, as reported by principals, except in the case of Hong Kong (China) and to a much lesser extent, Mexico.

Predictably, of the school-level stakeholders, principals are most likely to have decision-making power in the areas of budget allocation and the hiring of teachers, whereas teachers themselves are most likely to wield power in the area of course content. School boards also have a considerable

Figure 1.2. Responsibility of School-Level Actors for Decisions on Hiring Teacher



Source: PISA 2003.

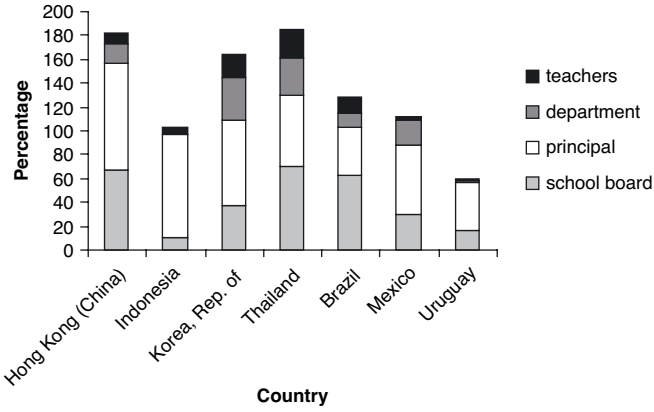
proportion of the perceived local control in relation to hiring and budget decisions.

Principals in Hong Kong report high levels of local control in all three areas, suggesting a highly decentralized governance structure. Thailand also reports high local control, at least in relation to budget and instruction. Uruguay, and to a lesser extent Indonesia, seem to have the least local control at least in these three important areas; Mexico, Korea, and Brazil have mixed or medium levels of local control.

Salient regional or income-grouping patterns are not found. It does appear that East Asian and, in particular, upper-income East Asian countries (Hong Kong [China]—here treated as a country—and Korea) may tend to have higher levels of local control compared with Latin American and lower-income East Asian countries. No clear cross-regional income patterns are present, however. The three lower-middle-income countries participating in the PISA 2003 assessment were Thailand, Indonesia, and Brazil, which all report very different levels of local control. Uruguay and Mexico, two upper-middle-income countries, also have very different levels of reported local control.

In sum, governance structures are complex with multiple levels participating in different kinds of decisions in different ways. Some evidence shows that smaller countries may be more centralized, on average, and

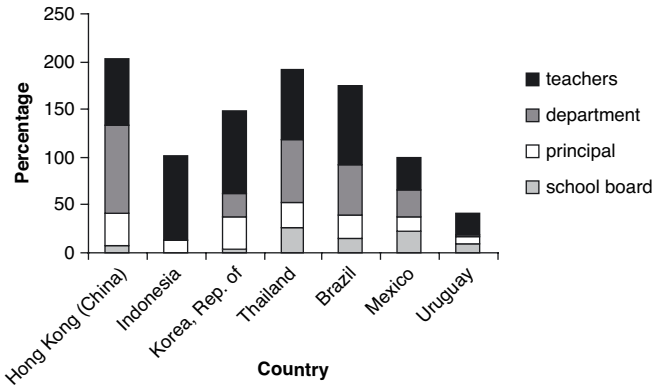
Figure 1.3. Responsibility of School-Level Actors for Decisions on Budget Allocation



Source: PISA 2003.

that East Asian countries—particularly wealthier ones—may have more school-level decision-making power than Latin American countries. There is mixed evidence as to the areas of decision-making power that are most likely to be decentralized. It appears that de jure governance structures may tend to centralize instructional and human resource decisions and decentralize budgetary decisions, but de facto evidence suggests that there are high perceived levels of local control over curriculum.[8]

Figure 1.4. Responsibility of School-Level Actors for Decisions on Course Content



Source: PISA 2003.

Secondary Education Coverage[9]

Secondary gross and net enrollment rates in the two regions are relatively low, particularly in low- and lower-middle income countries (annex 1.4). In lower-income countries one-half of secondary-age youth are not in secondary schools. In lower-middle-income countries in the two regions, one of four secondary-age youth are not in secondary schools. Several countries stand out as facing severe challenges in secondary enrollment. In Cambodia, only one of every four secondary-age youth is enrolled in secondary school, and both Guatemala and Lao PDR have secondary gross enrollment rates of just above 40 percent. Many of the Caribbean countries, in contrast, have very high net and gross enrollment rates.

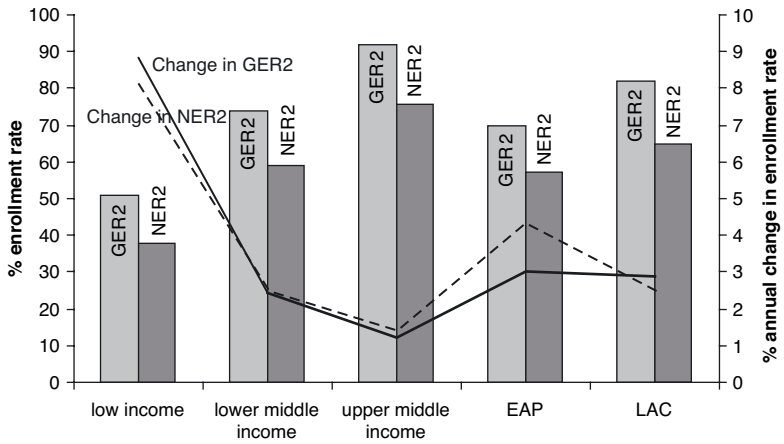
Interestingly, secondary gross enrollment is significantly higher in Latin America than it is in East Asia (12 percentage points higher), but the difference in net enrollments is lower (8 percentage points). Because gross enrollment rates are the ratio of all students to the student-age population, continued or new enrollment of overage students leads to gross enrollment rates greater than 100 percent. The larger gap between gross and net enrollment rates in Latin American countries indicates that these countries have larger portions of overage students enrolled in secondary schools. These could be individuals who dropped out of school and returned later as adults, but the bulk of these students are likely to be slightly older youth and young adults who repeated multiple grades. In El Salvador, for example, more than 26 percent of secondary students are two or more years overage (World Bank 2005b). High repetition rates and high proportions of overage students suggest that Latin American secondary schools, more than East Asian ones, may suffer from efficiency and quality problems. Overage enrollment will be discussed at more length later in the chapter.

Countries have demonstrated different trends in enrollment growth. Figure 1.5 compares the enrollment rates and trends for Latin American and East Asian countries by region and income group for the 2002–03 school year, based on the average rate of change between 1998 and 2003. Low-income countries maintain the lowest enrollment rates, with gross enrollment at 51 percent, but demonstrate the greatest improvement in gross enrollment, increasing at a rate four times faster than the lower-middle- or upper-middle-income countries. One explanation for

this rapid growth is that many formerly out-of-school students in low-income countries are returning to school. As countries become wealthier, enrollment rates increase and enrollment numbers decrease correspondingly. Interestingly, net enrollment rates (NERs) increased faster in East Asian than in Latin American countries between 1998 and 2002–03 even though gross enrollment rates increased equitably in the two regions. The faster NER growth rate in East Asia may be due to continuing internal inefficiency in Latin America. For all countries, changes in gross and net enrollment rates are lower than 10 percent annually.

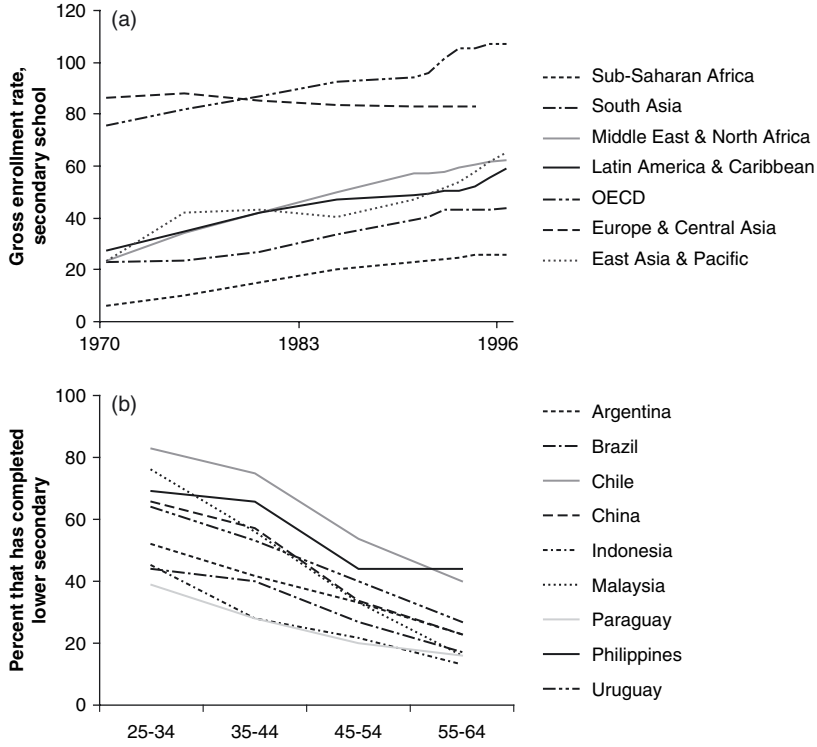
Overall however, secondary enrollment is increasing rapidly throughout Latin America and East Asia. Indeed, in most regions of the world, secondary school gross enrollment rates doubled or tripled in the past decades (see figure 1.6a).[10] The stock of people who completed at least lower secondary has also grown dramatically. In most Latin American and East Asian countries, the portion of people ages 25 to 34 in 1997 with at least a lower secondary education was at least twice the proportion of the 55–64 age group that completed lower secondary (see figure 1.6b). Of the countries depicted in figure 1.6b, Chile and Malaysia improved most rapidly, and Paraguay and Indonesia had among the slowest rates of increase.

Figure 1.5. 2002–03 Secondary Gross and Net Enrollment and Annual Average Rate of Change



Source: UIS.

Figure 1.6. (a) Secondary Gross Enrollment Trends across Time and (b) Lower Secondary School Completion Rates in 1997



Source: WDI 2004 (World Bank 2004f).

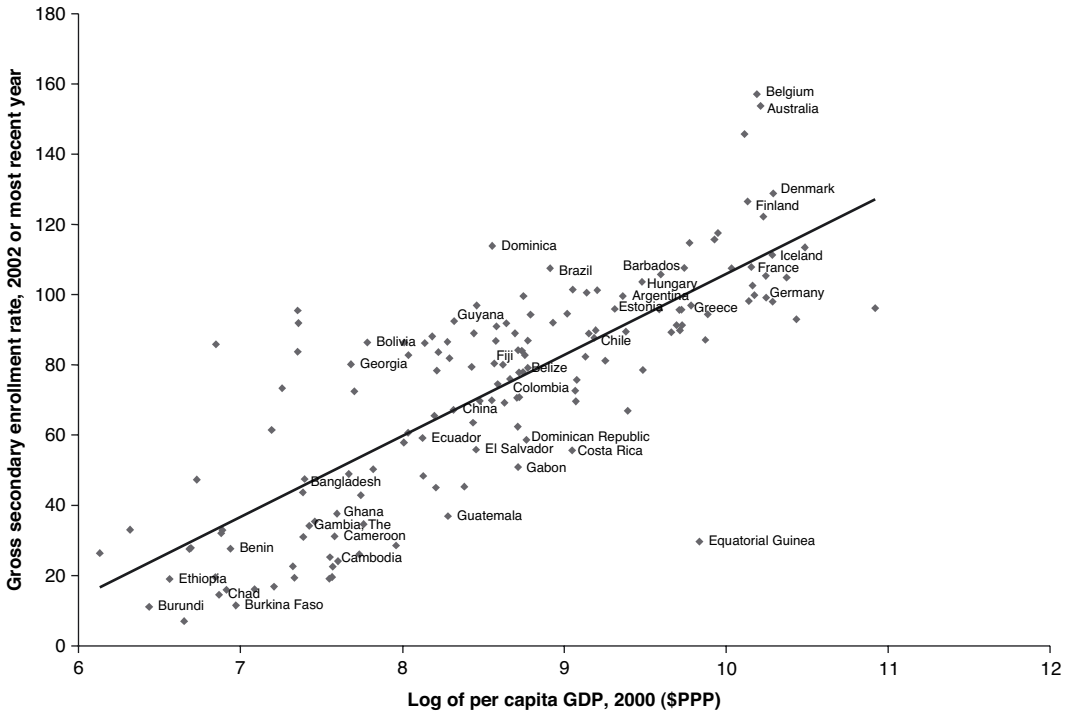
Despite this progress, data from World Development Indicators (World Bank 2004f) show that secondary enrollment levels in many Latin American and East Asian countries are below typical levels, given national income. Figure 1.7 illustrates a linear trend of enrollment rates by per capita GDP. Some of the largest countries—Argentina, Brazil, China, Chile, and several others—have enrollment rates at or above average, given national income. But a host of other countries—particularly Cambodia, Guatemala, Costa Rica, Malaysia, and Macao (China)—have substantial enrollment deficits. Heterogeneity appears among all income groups. Lower-income countries have high variability: Guatemala and Cambodia have substantial deficits, whereas

Lao PDR has near mean predicted enrollment, and Bolivia has far above predicted enrollment. In the higher-income range, Argentina, Uruguay, and Brazil meet or exceed predicted enrollment whereas Mexico and Malaysia fall short.

Net enrollment data are available for fewer countries, but show a more severe deficit. De Ferranti et al. (2003) calculated a regionwide secondary net enrollment deficit of 18.7 percent in Latin America. In other words, given GDP per capita in the region and global trends in secondary enrollment, an additional 18.7 percent of secondary-school-age children should be enrolled in school. Guatemala, which has the least impressive education indicators of any country in the Western Hemisphere besides Haiti (World Bank 2003b), with a net secondary enrollment rate of 26 percent, is lower than Ghana's net secondary enrollment rate of 31 percent, even though Guatemala's per capita GDP is two times the size of Ghana's per capita GDP. The poorest countries in East Asia have considerably low secondary enrollment rates as well. Papua New Guinea, with a GDP four times that of Guatemala, maintains a net secondary enrollment rate below that of Guatemala, at 24 percent, and Cambodia with a per capita GDP twice that of Guatemala has a secondary net enrollment rate of 18 percent.

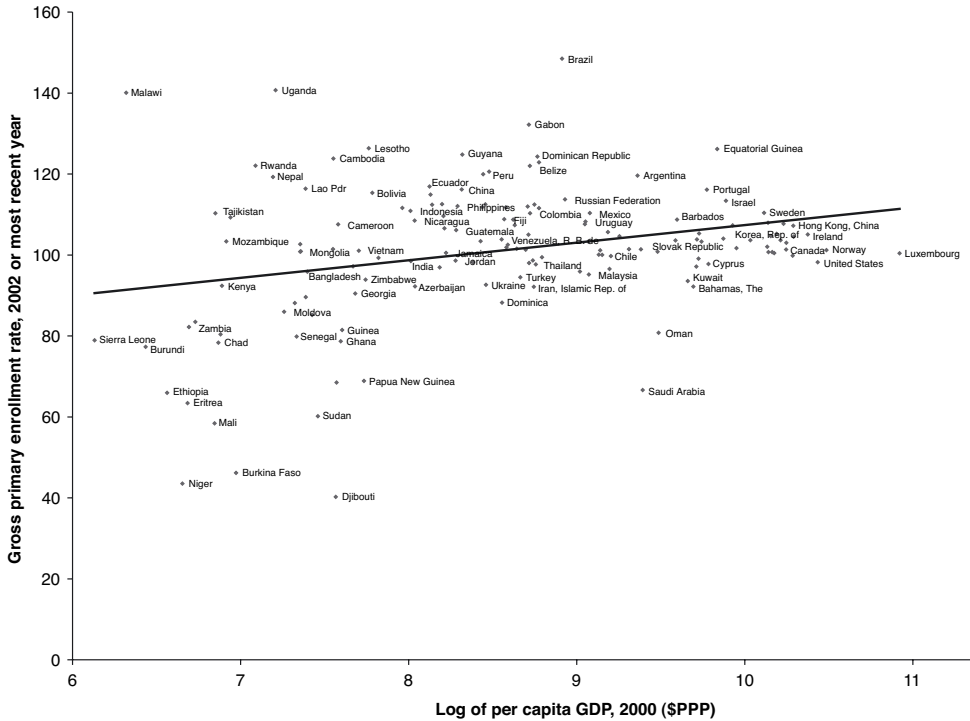
The deficit in secondary education enrollment in the regions contrasts sharply with the success of Latin American and East Asian countries in increasing primary school enrollments during the past 20 years. Net primary enrollment rates average 94 percent in Latin America and 92 percent in East Asia. Most countries in Latin America show gross primary enrollment rates at or above 100 percent (figure 1.8). Dominica and Papua New Guinea have the most noticeable primary school enrollment deficits. Part of the high rates in figure 1.8 can be attributed to overage enrollment. Brazil, Uruguay, China, Cambodia, and Peru all portray gross primary enrollment rates substantially higher than 100 percent, even though not all primary-school-age children are enrolled in primary school. The differences between countries' general success at achieving nearly universal primary net enrollment and their continuing challenges in enrolling all children in secondary highlight the differences between these two cycles and the fact that progress in primary education cannot be equated with overall educational success.

Figure 1.7. Secondary Gross Enrollment: Much of Latin America and East Asia Is Low Given National Income



Source: WDI 2004 (World Bank 2004f).

Figure 1.8. Primary Gross Enrollment Rates by Log per Capita GDP



Source: WDI 2004 (World Bank 2004f).

In conclusion, both Latin American and East Asian countries have expanded coverage at the secondary level significantly in the past 30 years. Both flow and stock show signs of rapid improvement. Yet both regions lag behind other regions given per capita income. Latin American countries also appear to have larger efficiency problems than East Asian countries do as secondary gross enrollment rates are well above net enrollment rates in the region.

Internal Efficiency

Internal efficiency in the education context refers to the relationship between the inputs into the education system and the outputs from the system. A perfectly efficient system is one in which 100 percent of students that begin primary education go on to complete secondary education in a timely fashion. In reality, two important phenomena block full efficiency in education systems: dropout and repetition. Very inefficient systems have substantial numbers of students dropping out and repeating, which produces much lower proportions of timely completion. Repetition and dropout are interrelated phenomena. Students who repeat grades—because they fall behind their peers and face growing opportunity costs—have a greater tendency to drop out and to not continue to subsequent education cycles. This implies that by reducing repetition, dropout should also decrease. Also, both repetition and dropout are closely related to education quality. Low levels of learning in some cases force and in other cases encourage students to repeat and drop out. Thus improving education quality should also diminish both repetition and dropout.

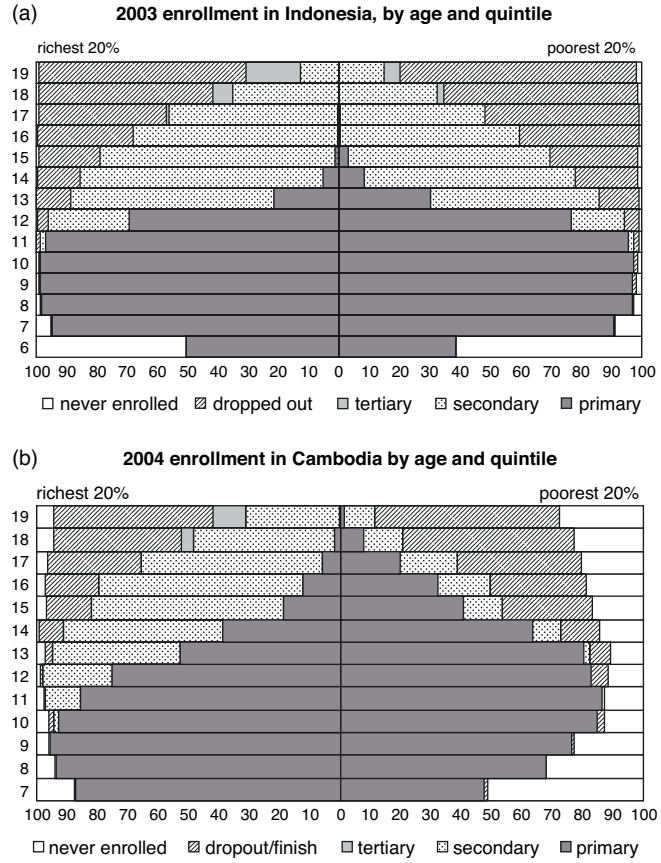
Improving internal efficiency, therefore, depends on reducing repetition and dropout, as well as on improving education quality. This section will examine two indicators related to internal efficiency: (1) rates of overage primary school students (indicative of late entry into the education system and/or primary student repetition) which, following the reasoning above, are directly related to secondary enrollment, dropout, and completion; and (2) completion rate profiles, which measure students' progression through the entire instructional cycle, capturing late entrance, repetition, dropout and, indirectly, quality as well as other policies and cost- and supply-related factors associated with late entrance, repetition, and dropout.

In examining overage enrollment in 12 countries in Latin America and East Asia (see annex 1.5),[11] it appears that overage enrollment is more prevalent in Latin American and Caribbean countries than in East Asian countries. Income variation between and within countries is a good predictor of overage enrollment in East Asia. Low-income countries are more likely to experience overage primary enrollment than are middle- or upper-income countries. In low-income countries in East Asia, students in the poorest quintile are also more likely to be overage than are students in the richest quintile.[12] Countries from all income levels experience overage enrollment in Latin America. Wealth in Latin American countries is a greater factor in determining the likelihood of overage enrollment than the income level of the country as a whole.

Indonesia, Cambodia, and the Republic of Korea illustrate wide differences between East Asian countries in the proportion of overage primary school students (annex 1.5 and figures 1.9a and 1.9b)**.** In all three countries the official age for the last year of primary school is 11 or 12, meaning that by age 13, students in all three countries should have completed primary. In Korea, an upper-income country, only 1.7 percent of 13-year-olds were still enrolled in primary school in 2004, demonstrating that almost all children are completing primary at the appropriate age. Furthermore, the transition rate to secondary school in Korea was greater than 90 percent. Household data from Indonesia in 2003, however, show that roughly 30 percent of 13-year-olds were still enrolled in primary school. Thus, 3 of every 10 primary school students were at least one year behind in school. Interestingly, little variation in Indonesia exists between the richest 20 percent of the population, or highest quintile, and the poorest 20 percent, or lowest quintile (figure 1.9a).

Of even more concern is the low-income country of Cambodia. In 2004 approximately 70 percent of 13-year-olds were still attending primary school. A significant portion of overage enrollment appears to stem from late primary school enrollment: less than 70 percent of children age 7 (the official age for second grade) were enrolled in primary school. When students enter school late, they are more likely to drop out early for a variety of reasons including higher opportunity costs, feeling different from the rest of the students, and disinterest. This may be one factor for explaining a 24 percent secondary net enrollment rate in Cambodia. Unlike in Indonesia, income is a more important determinant of overage

Figure 1.9. Enrollment by Age and Quintile in Two East Asian Countries: (a) Indonesia and (b) Cambodia



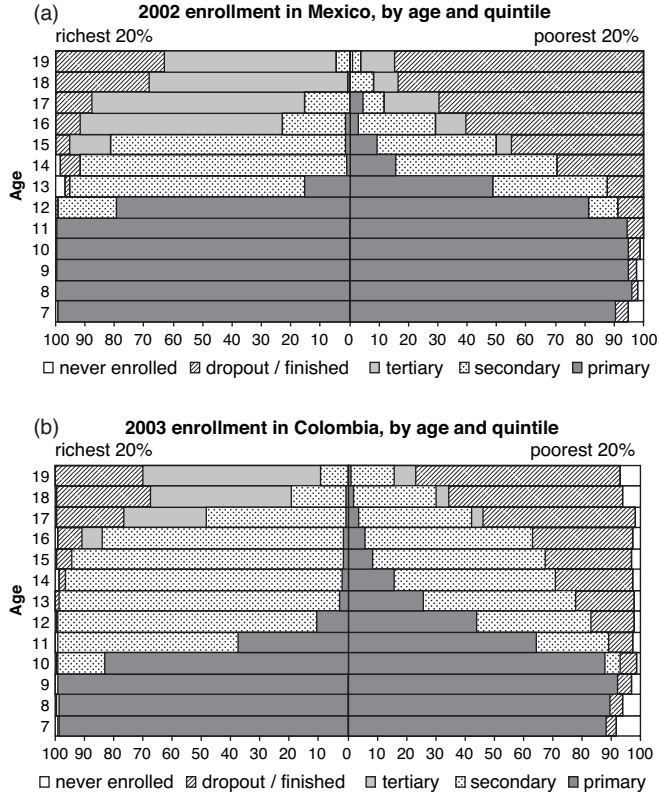
Source: WDI 2004 (World Bank 2004f).

enrollment in Cambodia, with more than 80 percent of 13-year-olds from the poorest quintile still enrolled in primary school, whereas only about 50 percent of 13-year-olds from the richest quintile are still enrolled in primary school, representing a 30 percent differential between the richest and poorest quintiles (figure 1.9b).

Although not as dramatic as the low-income country of Cambodia, Latin American countries of all income levels struggle with overage primary school enrollment, with intracountry wealth acting as a significant

factor in overage enrollment. Typically, primary school in Mexico is completed by age 12. In 2002 more than 50 percent of 13-year-olds in the poorest quintile remained in primary school, whereas less than 20 percent of their counterparts in the richest quintile were still attending primary school (figure 1.10a). Similarly in Colombia, with children scheduled to complete primary by the age of 11, in 2003 more than 40 percent of 12-year-olds in the poorest quintile attended primary school, whereas less than 10 percent of children in the richest quintile were enrolled in primary school (figure 1.10b). Unlike in East Asia, where the problem of high overage enrollment is confined largely to lower-income countries, both lower- and upper-middle-income

Figure 1.10. Enrollment by Age and Quintile in Two Latin American Countries: (a) Mexico and (b) Colombia



Source: WDI 2004 (World Bank 2004f).

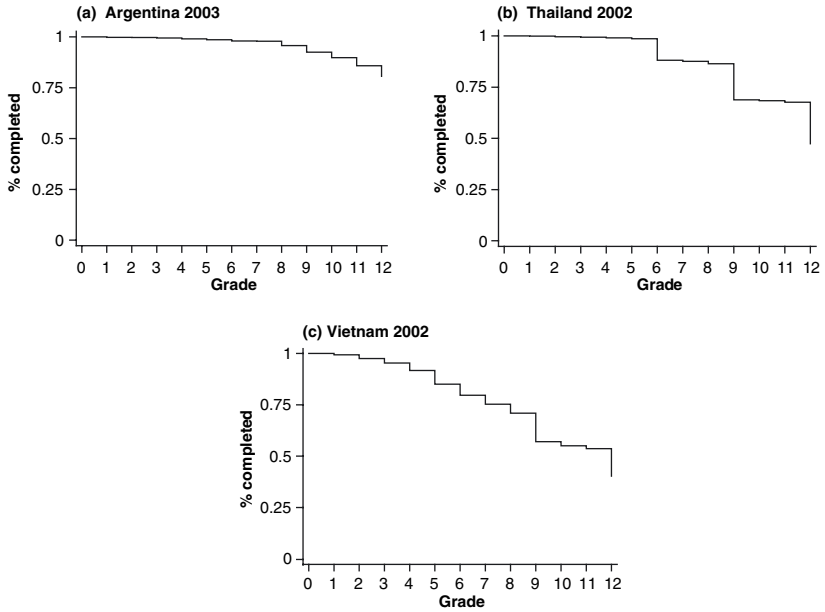
countries in Latin America continue to face large inequities in overage enrollment.

The ability of education systems to progress students through the entire instructional cycle (measured by the survival, or completion, rates) is the key measure of internal efficiency. Generally, low secondary completion is associated with high primary overage ratios and/or high secondary repetition and dropout and, indirectly, with low-quality schooling. Figures 1.11a, 1.11b, and 1.11c show completion rate profiles for Argentina, Thailand, and Vietnam (annex 1.6 shows the complete set of graphs from which this analysis is done).

Overall, both regions have average secondary completion rates of about 55 percent. This figure is particularly low for Latin American countries if one considers that the average income level of the six Latin American countries we analyzed is higher than that of the East Asian countries. A 55 percent secondary completion rate means that 1 of every 2 children who start primary will not complete secondary. Unsurprisingly, both regions exhibit an evident pattern between middle-income and lower-income countries, with middle-income countries, whose per student expenditure is typically larger than low-income countries, experiencing broadened and higher survival rates than low-income countries.

The upper-middle-income country of Argentina, for example, experiences a relatively flat estimated completion rate when graphed, with almost 98 percent of students transferring to secondary school, 86 percent transferring to upper secondary, and approximately 81 percent completing upper secondary school (figure 1.11a).[13] The lower-middle-income country of Thailand, although maintaining a broad estimated completion line, experiences a greater drop in student completion between school cycles. In 2002, of children ages 13 to 19 in Thailand, 98.6 percent were estimated to complete primary school, but only 88 percent transferred to lower secondary and 69 percent continued to upper secondary. In contrast to the experience of upper- and lower-middle income countries, estimated completion in low-income countries, such as Vietnam, portray a much steeper completion graph, with children exiting the system at all grades. Not surprisingly, overall survival in middle-income countries tends to be higher than in lower-income countries. Furthermore, roughly 70 percent of students completed 12th grade in Thailand in 2002, compared with about 50 percent in Vietnam the same year (figures 1.11b and 1.11c). Finally, in general, completion rates have

Figure 1.11. Estimated Completion Rates for Children Aged 13 to 19: (a) Argentina 2003, (b) Thailand 2002, and (c) Vietnam 2002



Sources: Argentina Household Survey 2003; Thailand SES 2002; Vietnam LSMS 2002.

increased for all countries for which we possess past data, with the exception of the Philippines and Colombia.

Overall, the efficiency of the education systems, as demonstrated through overage primary enrollment and completion rates, varies by region and income level. Internal efficiency tends to be lower in Latin American countries, particularly considering regional income. In Latin America, overage enrollment affects countries of all income levels, but a particular student's income quintile largely determines whether he or she is older than expected for a specific grade. In contrast, the income level of the country in East Asia is a greater determinant as to whether overage enrollment is a factor in the education system. In both regions, the income level of the country appears to influence the rate of completion. For reasons mentioned above, completion is related to quality. The next section reviews the available evidence on quality measures in Latin American and East Asian countries.

The Quality of Secondary Education

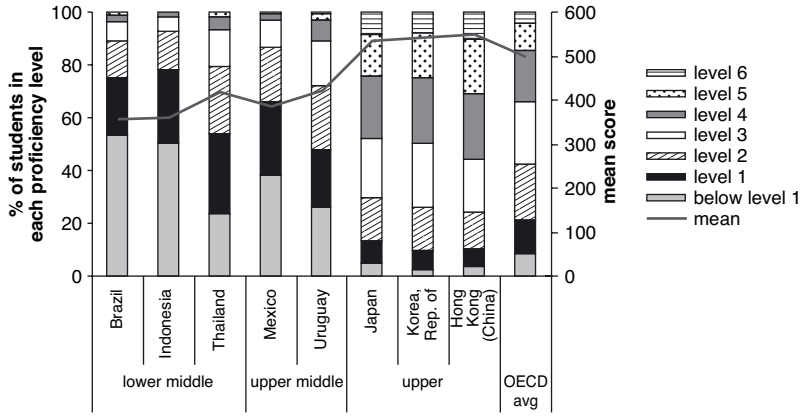
The concept of education quality is complex and subjective. It is a difficult concept for even one school to define or measure, much more so for one country, and exponentially more so for an international and cross-regional comparison such as this one. In recent decades, however, a number of international efforts and initiatives toward understanding and improving education quality have taken place. The Education for All goal is one well-known example. UNESCO has defined education quality according to four areas: (1) learning to *know*; (2) learning to *do*; (3) learning to *live together*; and (4) learning to *be* (UNESCO 2005). As is clear from the definition, education quality encompasses multiple areas of learning, ranging from content knowledge of both external and local or indigenous subjects; skills to apply what is learned in the larger society and labor market; qualities to build more cohesive, peaceful, and equitable societies; and opportunities to develop personally.

Unfortunately, many of these areas of education quality are difficult to assess, measure, or compare. Because of this, most research is confined to the more conventional area of content knowledge; and as UNESCO states, "It could be judged unfortunate that the quantitative aspects of education have become the main focus of attention in recent years for policy makers." International assessments are attempting to ameliorate this weakness, at least partially, by testing skills and practical applications of content rather than content alone. One of the principal international assessments, the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA), does this by measuring content "literacy," a concept that encompasses how students apply knowledge and skills; how they identify, solve, and interpret problems; and how they analyze, reason, and communicate.

Both PISA and the Trends in International Mathematics and Science Study (TIMSS) are international assessments that test secondary-school-age youth. As such, the tests are two of the most important ways of measuring education quality comparatively across countries. Figures 1.12 and 1.13 report PISA results.

This section uses international assessments to analyze education quality in Latin America and East Asia. Four main conclusions are made: first, national GDP is a strong predictor of education quality, as measured by

Figure 1.12. PISA 2003 Test Score Results in Mathematics Literacy



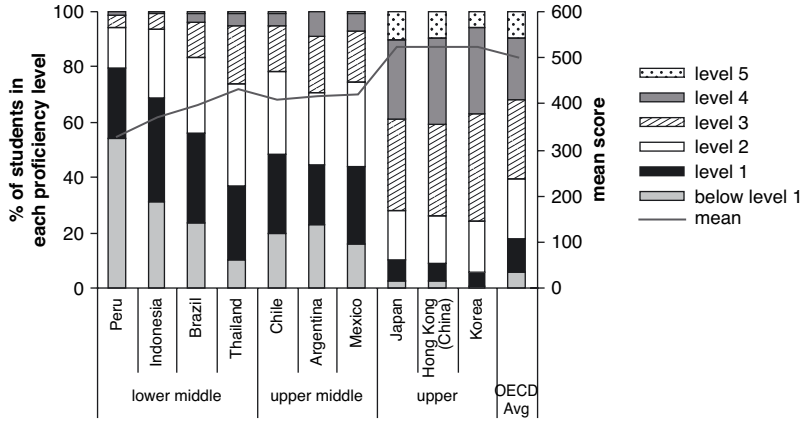
Source: PISA 2003.

international assessments; second, education quality is an urgent problem in both regions in non-upper-income countries; third, non-upper-income countries exhibit greater variation in testing outcomes than do upper-income countries, suggesting that some countries have been more successful than others at providing quality education; and fourth, in general, East Asian countries perform better than Latin American countries on international assessments given their income level, again suggesting variation in education quality even among poorer countries and, in addition, suggesting that East Asia, overall, may offer a higher-quality education than does Latin America.

The bars in figure 1.12 show the proportion of students in participating East Asian and Latin American countries divided into PISA's six proficiency levels (six being the highest) for the PISA 2003 exam in mathematics literacy. The line running through the figure shows the mean test score for each country. The figure groups countries according to the World Bank's income groupings. Figure 1.13 shows the same information, but for the PISA 2000 exam in reading literacy. The only difference in the 2000 test is that students' scores were divided into five rather than six proficiency levels. Several lessons can be gleaned from these two graphs.

In both years and in both subjects a clear trend of lower-income countries scoring below higher-income countries is present. This is not at

Figure 1.13. PISA 2000 Test Score Results in Reading Literacy



Source: PISA 2000.

all surprising because the average 2003 PISA test score for lower-middle-income countries (381) is more than 150 points below that of upper-income countries (542). Interestingly, the average test score for upper-middle-income countries (403) is much closer to the score for lower- and lower-middle-income countries than to upper-income countries. This indicates a real quality gap between what we consider developed, or wealthy, countries such as Japan and South Korea, and the more advanced of the developing countries, such as Mexico and Uruguay. The same pattern is true for PISA 2000, in which lower-middle- and upper-middle-income countries have somewhat close averages, 385 and 417, respectively, whereas the upper-income countries are more than 100 points higher, at 524. Upper-income East Asian countries in both exams performed just slightly above the OECD average, whereas Latin American and East Asian lower- and upper-middle-income countries performed considerably below the OECD average.

In upper-income countries, including Japan, Hong Kong (China) (here treated as a country), and Korea, there is very little variation among countries in mean test scores or proficiency-level distribution. In contrast, much greater variation exists between countries in the lower-income groupings. On the 2003 exam, for example, Mexico and Uruguay are classified as upper-middle-income countries, but Uruguay performed significantly better on the exam than did Mexico. The same variation is seen in

the performance of Indonesia, Brazil, and Thailand, which are all classified as lower-middle-income countries; Thailand performed more than 50 points above the other countries.

The same variation or lack thereof in the 2003 exam holds true for the 2000 reading literacy results. There is substantial congruence of results among more affluent countries (including both upper- and upper-middle-income countries), whereas there is much wider variation among poorer countries. A greater than 100-point difference exists between the mean scores of Peru and Thailand, both lower-middle-income countries, whereas no greater than a 3-point difference is present between any of the upper-income countries. This observation suggests that among poorer countries, some countries are more successful at providing quality education—at least as is measured by the skills and contents of the PISA exam—than other countries with similar incomes. Among wealthier countries much less variation in education quality is prevalent, that is to say, countries appear to be equally successful at providing quality education.

Another interesting lesson that can be learned from the graphs above is that except among upper-income countries, very few children score in the top proficiency levels. This pattern is pronounced in both regions, both years, and both subjects. No more than 10 percent of students score in levels 4, 5, and 6 combined for 2003 or levels 4 and 5 combined for 2000 in any year or subject in non-upper-income countries. This is in stark contrast to all three upper-income countries, in which roughly 50 percent of students in 2003 and 40 percent in 2000 scored in these levels.

In all participating non-upper-income countries, nearly half or more students are performing below acceptable proficiency levels. In Indonesia and Brazil in 2003 nearly 80 percent of students scored at or below the first proficiency level in math. In 2000 in Peru, 80 percent of students scored at or below level 1 in reading. Even higher-achieving countries such as Thailand, Uruguay, and Mexico have 50 to 60 percent of students performing at or below level 1. This contrasts greatly with the upper-income countries in which only about 10 percent of students score at or below level 1, suggesting that nonwealthy countries in both East Asia and Latin America face the immediate challenge of large proportions of students functioning at or below the most basic level of language and mathematics ability.

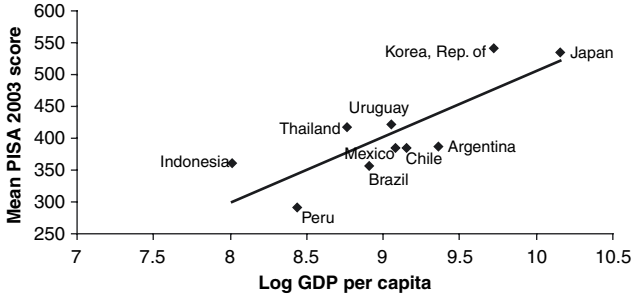
In sum, PISA results suggest that there are urgent problems with education quality in Latin America and East Asia, and that these problems correspond directly with the income level of the country. Even more worrisome is the fact that no low-income countries participated in the PISA exam, and based on the trend, we would expect low-income countries to have even more grave problems with student learning. This is confirmed by the results of the regional exam LLECE carried out by UNESCO in Latin America, which show lower performance for lower-income countries.

Up to this point no clear trend between education quality in East Asian and Latin American regions is present. But, when regressing mean test scores against log GDP, a trend becomes visible. Figure 1.14 shows math scores for all participating Latin American and East Asian countries in the 2003 PISA exam. Those countries (Argentina, Chile, and Peru) that participated in the 2000 math exam but not the 2003 exam are also included because the tests are designed to be comparable across time.

The graph shows that with the sole exception of Uruguay, Latin American countries perform below what would be expected given their GDP, whereas all East Asian countries perform above what would be expected. It appears, therefore, that at least for the kind of knowledge and skills that the PISA measures, East Asian countries tend to have education of a higher quality than do Latin American countries.

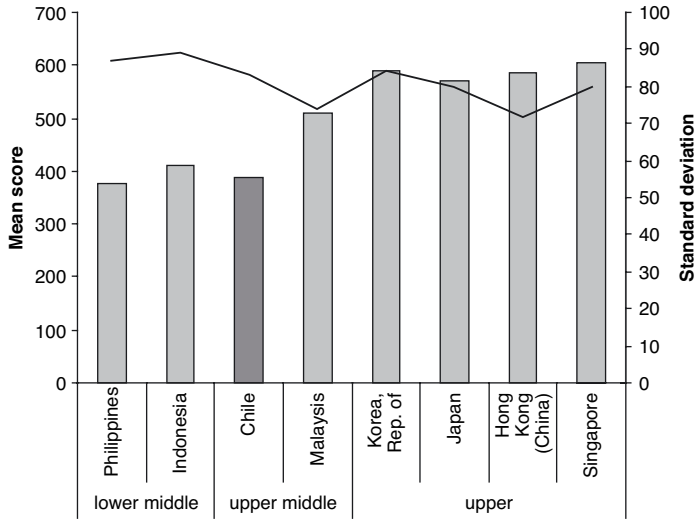
Further evidence of this gap between Latin America and East Asia in education quality is visible in the TIMSS mathematics and science results, shown in figure 1.15 and figure 1.16. TIMSS is an international assessment

Figure 1.14. Trend line of PISA Test Scores against Log GDP per Capita for East Asian and Latin American Countries



Sources: PISA (2000, 2003); WDI 2004 (World Bank 2004f).

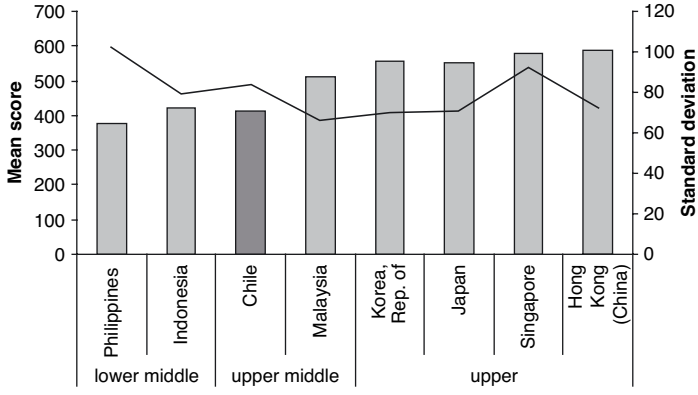
Figure 1.15. 2003 TIMSS Math Scores



Source: TIMSS 2003.

that tests students' ability in mathematics and science. In the last round of TIMSS only one Latin American country, Chile, participated. The bars in figure 1.15 and figure 1.16 represent national average scores on the exam; the line reflects the standard deviation around the mean for each country.

Figure 1.16. 2003 TIMSS Science Scores



Source: TIMSS 2003.

Chile had average scores roughly 100 points below the other upper-middle-income participant, Malaysia, despite the fact that Chile's GDP is actually larger than Malaysia's and Chile is one of the highest performing Latin American countries (according to the LLECE exam). Chile's national average was, in fact, in line with the two lower-middle-income countries participating in the test, the Philippines and Indonesia.

Among East Asian countries, however, we see the same clear trend of lower-income countries having lower test score results. Results are less clear in regard to standard deviations around the mean, although the graphs illustrate that lower-income countries tend to have higher standard deviations, meaning there is more dispersion around the mean or greater inequality in test scores within each country. Interestingly, a fair amount of inconsistency in standard deviation level between math and science results exists, suggesting that countries may have more equitable results in certain subjects and less equitable results in others.

In summary, we can identify four main observations about education quality in Latin America and East Asia. (1) In both regions, scores are strongly linked to national income level. (2) Lower-, lower-middle-, and upper-middle-income countries in both regions exhibit extreme quality problems in which a majority of students are not learning the most basic skills or content knowledge. (3) Greater variation in education quality is prevalent in lower-income countries than in upper-income countries, suggesting that some lower-income countries are finding ways to have a certain degree of success in schooling outcomes. (4) East Asian countries tend to have higher outcomes on international assessments than do Latin American countries, even when considering GDP, suggesting that the quality problem is especially severe in Latin America.

Quality and completion are positively related. Comparing the secondary completion profiles with test scores as measured through the PISA assessment for the five countries for which we have both types of information (Indonesia, Mexico, Argentina, Thailand, and Brazil), we find confirmation that in general higher secondary completion is related to higher quality (as illustrated by a correlation coefficient of .6).

The Validity of Access and Quality Trade-Offs

A variety of routes to secondary education development exist. Countries have prioritized and are prioritizing different outcomes as they develop

their secondary education sectors. Educational access (or coverage) and educational quality are considered by many to be trade-offs. Countries expanding access, it is commonly thought, will experience declines in education quality as ministries of education focus on providing education to more children; as they stretch to provide teachers, learning spaces, and materials for more children; and as more children from less-advantaged backgrounds enter the schooling system. Completion rates are also thought to potentially suffer as systems expand because of the decline in education quality and the changing composition of students. Conversely, it is thought that countries that focus on providing excellent quality schooling may do so at the expense of having limited access. This scenario occurs frequently at the tertiary level, at which public funds support excellent universities that are available to a relatively small, elite sector of the population.

Aiming at broad-based lower secondary education. The dilemma above fits into the broader debate on whether secondary education should be expanded on a mass scale or should produce an elite capable of integrating tertiary education. Recent secondary education reforms have tended to defer specialization and selection (through, for example, entrance and school exiting examinations) until upper secondary school or later. They have also increased the duration of compulsory education to cover lower secondary school. Analysis of international test score data shows that early tracking significantly increases inequality in learning achievement and (weakly) reduces mean learning performance, which suggests that there does not appear to be any equity-quality trade-off.[14] The findings on the negative impact of early tracking contrast with the positive effects of compulsory schooling laws.[15] The practice of limiting secondary school entry through meritocratic exams in Tanzania and Tunisia created overcrowding in primary school and led to more student failures.[16] Countries should therefore opt for broad-based lower secondary; the positive externality argument based on mass literacy is the strongest, and the quality-access trade-off should be, at most, weak at that level.

Where a trade-off may be more likely to appear is between broad-based access to upper secondary education and excellence, but options exist that could address both access and quality challenges, at least in the long run. As we will see below, many Latin American countries, with upper secondary enrollments higher than 60 percent, do less well on the quality side (both in average performance and equity of performance). An option could be to introduce a high-stakes exam at the beginning of

upper secondary to generate rationing according to ability, as countries such as Malaysia have attempted to do, with varying levels of success. However, although this could help elite formation and even promote more equitable quality outcomes, it would have negative consequences on access. In addition, as shown by the case of Mongolia, merit-based selection at the upper secondary level can also be very regressive,[17] which reflects in part the fact that the poor attend lower-quality schools than the rich, with negative consequences on equity itself.

Whenever selection between lower and upper secondary school is merit based, for instance, alternative learning options, such as vocational education, could be provided for those who do not make the cut. These vocational tracks should not be dead ends, and students should thus be allowed to gain access to higher education if they so wish and can qualify. Case study evidence shows that a higher-education system that combines selectivity in accessing institutions offering higher-order skills with more open admission to other higher-education institutions serves the dual role of fostering excellence while guaranteeing coverage and equity.[18] Alternatively, to the extent that selection into upper secondary school responds to fiscal constraints, conditions for private sector participation could be eased and public-private partnerships fostered to decrease the need for selection on fiscal grounds, at the same time quality is preserved or even improved through well-selected quality-enhancing policies. Korea (see spotlight 4), for example, is a good example of a country that managed to produce both mass secondary schooling and education excellence. It did so by gradually opening up access to all secondary education levels through the help of the private sector, at the same time keeping education excellence as a strong priority through the education system's high responsiveness to the country's economic needs, maintaining strong quality-assurance systems and, when needed, using private tutoring. That was more recently accompanied by increased linkages between education levels and a curriculum centered on lifelong skills. If there were trade-offs in Korea, they were only short term.

The comparative nature of this study allows us to informally test the validity of the quality/access trade-off hypothesis. Table 1.5 characterizes Latin American and East Asian countries by their current secondary gross enrollment rates and their standing on international assessments and completion. This is a static depiction of whether countries tend to fall into high-enrollment/low-quality and high-quality/low-enrollment molds. Figure 1.17 similarly characterizes countries by their enrollment and

Table 1.5. Static Categorization of Countries by Enrollment and Measures of Education Quality (*)

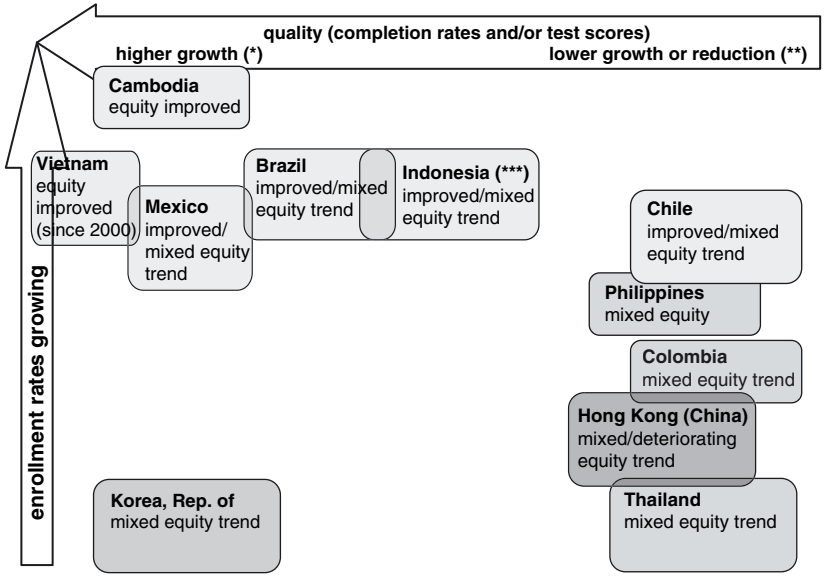
		Quality (test scores and/or completion)	
		Above average	*Below average*
Enrollment (GER)	*Above average*	Korea, Rep. of Hong Kong (China)	Mexico, Argentina (**) Chile (**), Bolivia (**), Philippines, Brazil (**), Peru
	Below average	Thailand Colombia Malaysia	Indonesia Vietnam Cambodia Guatemala

Source: Authors' elaboration.
*Each country performance is compared with the average performance for the whole sample. Average GER is taken to be 77 percent; average 2000 PISA test scores are taken to be 410 (math) and 425 (language); and average completion rate is taken to be 57 percent. TIMSS data are used to rank Malaysia and the Philippines. National information used to complement information on completion rates and test scores when necessary.
**Above average completion but below average test scores.

quality levels but in a dynamic form. Countries, thus, are placed in the figure according to whether, since the mid-1990s, they have improved their enrollment rates, and whether they have improved their test scores and/or completion. Equity performance is also considered. It is expected that these analyses will produce different results because countries with higher and more equitable quality and coverage levels may have less favorable dynamic patterns (such as Korea and Hong Kong [China]). We report, however, both sets of results because we are interested in countries that have done well in the longer run but also more recently.

Many countries, both Latin American and East Asian, and of all income levels, appear to have good results in regard to either access or quality, but Latin American countries, in particular, have achieved more in regard to access (table 1.5). This is also clear from analysis earlier in the chapter, which shows that Latin American countries have higher enrollment rates than East Asian countries but also generally higher primary overage ratios and lower completion and test scores for their income level.[19] Although secondary completion and test scores tend to be complementary—that is, countries with high test scores tend to also have high secondary completion rates (which also will be shown in the efficiency chapter)—it is notable that countries such as Chile, Argentina, Bolivia and Brazil have relatively high enrollment and completion rates, but relatively low quality levels.[20]

Figure 1.17. Dynamic Categorization of Countries by Progress since the Mid-1990s in Enrollment and Measures of Quality



Source: Authors' elaboration.
(*) High growth is taken to be increases higher than 2 percent yearly in the completion rate and/or PISA test scores increasing between 2000 and 2003 in at least math or reading. Country ranking is arbitrary.
(**) Low growth is taken to be increases lower than 2 percent yearly in the completion rate and/or math and reading PISA score decreasing by at least 1% between 2000 and 2003. National data used for Chile. Country ranking is arbitrary.
(***) Indonesia is in the middle because it experienced an evolution of completion rates lower than 2 percent yearly.

Other countries, however, show that the trade-off between quality and access is not absolute. Countries such as Korea and Hong Kong (China) have high enrollment, high test scores, and high completion rates and are also performing reasonably well in regard to educational equity (table 1.5).[21] We provided some insights above on why Korea managed to be where it is today; a more complete story is provided in spotlight 4.

Other evidence that the quality/access trade-off can be addressed comes from the dynamic analysis of country performance since the mid-1990s (figure 1.17[22]). Vietnam, Cambodia, Mexico, Brazil, and Indonesia have performed well on most accounts, showing progress on enrollment and completion, test scores, or both. The report provides insights on the strategic approach and policies applied by Brazil, Mexico, and Vietnam in spotlights 1, 2, and 3 and Cambodia in box 4.5. After having prioritized enrollment,

Brazil and Mexico are applying a combination of supply-/demand-side policies that are having an impact on both quality and equity indicators (and, by improving access to the poor, overall access also continues to increase). These two countries are still facing a trade-off related to the previous policy imbalance, but are on the right track to address it. Vietnam has increased secondary enrollment substantially since the early 1990s, while increasing quality, thanks to effective school self-financing policies (recently adjusted to tackle adverse equity consequences). Although Vietnam is still a low performer overall, by continuing to focus on education quality while providing wider access to the poor, the country can follow in the footsteps of Korea. Cambodia has applied a combination of promotion targets and quality-enhancing policies that is managing to have a positive effect on both enrollment and quality indicators.

Finally, the dynamic analysis also confirms that test scores and completion, and equity and average performance, move mostly in the same direction. Clear inequity reductions are visible between genders in Cambodia; income levels in Vietnam, Brazil, and Mexico; and urban-rural areas in Mexico. The next section illustrates inequity trends. Inequity reductions have fostered further improvements in enrollment and quality indicators in these countries.

Indicators of Educational Equity in Secondary Education

Educational inequality is one of the most severe problems plaguing education systems worldwide. Educational inequity is devastating for those youth and families that fall victim to it. But inequity also hurts countries as a whole. Greater educational inequity contributes to greater internal inefficiency, which is a source of much wasted investment, and educational inequity brings the overall quality of learning down, hurting countries' ability to respond to economic demands and to grow to their full potential. Countries face unique challenges in regard to educational equity. Educational inequities center on certain axes, frequently these include urbanicity, wealth, race or ethnicity, disability, gender, and region. This section examines within-country equity levels, particularly as they relate to different subpopulations and their likelihood of remaining in school.

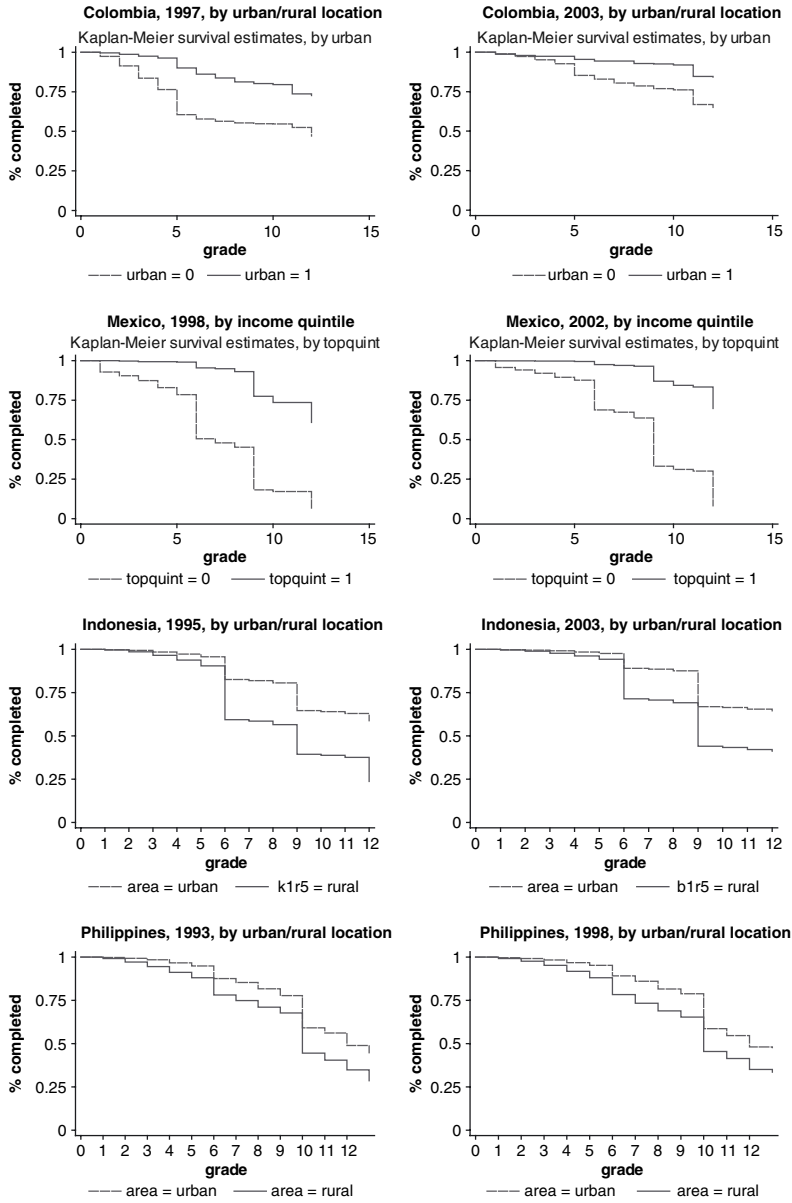
Educational equity, like educational quality, is a hazy subject. Although most people agree that educational equity has something to do with fairness, there is little or no agreement on what equity means precisely,

what should be distributed fairly, or how it should be measured. This next section looks at educational equity, but only at one small sliver. We look at how likely different groups of children in a country are to continue their schooling from the 1st through the 12th grade. We do not look directly at the distribution of test score results (which we do partly in chapter 2), but assume that there is a correlation between completion and quality. Still, equity is a much larger issue. Should different groups of children have fair access to resources, or should they have fair and equal results? Should disadvantaged children have precisely the same resources and services as less disadvantaged children, or should they have more? How much does something have to be unfairly distributed to count as inequitable?

In this section we look at the equity of educational completion and survival outcomes. Perfect equity is when all children, regardless of where they were born, how much money they have, or what their gender is, have an equal likelihood of completing school. Annex 1.6 presents completion rate graphs for 11 East Asian and Latin American countries. These plots demonstrate equity challenges by urbanicity, wealth, and gender by plotting the likelihood of remaining in the system through grade 12. Larger gaps between the two lines in each graph indicate more inequity; two completely overlapping lines represent perfect equity between the two groups. The graphs examine children ages 13 to 19 only. Figure 1.18 illustrates completion rate graphs for countries with varying results in closing disparity gaps. Colombia, in the first set of graphs, illustrates a country that has been successful in improving completion rates for urban and rural students and greatly decreasing the gap in completion. The second set, graphing Mexico, shows substantial improvement in completion rates for the poorest students, thus improving the completion gap between the richest and poorest. The third set, which graphs Indonesia, shows improved completion rates for urban and rural students, a decrease in the completion gap up to grade 9, but a substantial gap remaining afterward. The Philippines, shown in the final set of graphs, has been much less successful in decreasing the gap between the richest and poorest students.

Table 1.6 categorizes the countries depicted in the completion rate graphs as having high, medium, or low levels of inequity in one or more of the comparisons (urbanicity, wealth, or gender).[23] Countries with 20 percentage point differences at the time of primary to secondary transition (first year of secondary) are considered highly inequitable. Countries with a 10 to 20 percentage point difference are grouped as having

Figure 1.18. Completion Rate Graphs



Source: Household Surveys.

Table 1.6. East Asian and Latin American Countries Vary in Degree of Inequity

	High inequity	*Medium inequity*	*Low inequity*
Latin America and the Caribbean	Mexico (UM) Bolivia (LM) Guatemala (LM)	Brazil (LM) Colombia (LM)	Argentina (UM)
East Asia and the Pacific	Indonesia (LM) Cambodia (L)	Vietnam (L)	Thailand (LM) Philippines (LM)

Source: Household Surveys.
Note: UM = upper-middle income; LM = lower-middle income; L = lower income.

medium inequity, and countries with a less than 10 percentage point difference are considered to have low inequity. Note that our categorization of countries would remain the same if we were looking at the time of secondary completion rather than entrance to secondary. The one possible exception is Argentina, in which inequity by income quintile worsens considerably during the secondary cycle. The rest of the analyzed countries, although inequity may worsen during the secondary cycle, remain in the same inequity *category* (as defined above) throughout the secondary cycle.

Table 1.6 shows that there is no evident pattern in the relationship between degree of inequity and either region- or country-income level. Countries with high inequity include countries categorized as lower, lower-middle, and upper-middle income, and come from the two regions, although perhaps slightly more from Latin America. Countries falling into the medium and low inequity categories also come from both regions and multiple income groupings. This suggests that the challenge of equity is not automatically resolved with economic development, but rather that countries can have wide equity gaps irrespective of income level.

Mexico and Argentina, two Latin American upper-middle-income countries, exemplify variance in equity. In 2003 Argentine students from the poorest income quintile were 10 percentage points less likely to enter lower secondary school than those from the wealthiest income quintile. By the first year of upper secondary school, poor Argentines were 20 percentage points less likely to be in school. These differences are important but pale in comparison to Mexico, in which in 2002 poor students were more than 30 percentage points less likely to be enrolled in the first year of secondary school and more than

50 percentage points less likely to be enrolled in the first year of upper secondary.

Cambodia and Vietnam offer another example. In Vietnam, in 2002, the poorest quintile of students was roughly 15 percentage points less likely to be enrolled in the first year of secondary school than their counterparts in the wealthiest quintile. Meanwhile in 2004, in Cambodia, students representing the poorest quintile were 40 percentage points less likely to be enrolled.

Countries also vary in the population groups most disfavored. Our analysis looked at urbanicity, gender, and wealth only. Of these three, gender is clearly the area in which inequity is least present. Table 1.7 identifies the countries in which one gender systematically tends to remain in school longer than the other. Interestingly, none of the Latin American countries in our analyses show this trend. Three East Asian countries do, but in two of them girls are actually favored over boys. Cambodia is the only country analyzed in which girls are significantly less likely to continue going to school than boys. Of course, this analysis deals only with survival rates; there could be other gender inequities favoring boys or girls in other indicators such as achievement levels or likelihood of attending a university.

All of the grievous inequities, and most of the less severe inequities, center on divisions between the wealthy and the poor and the urban and rural, in all instances with the wealthy and urban staying in school longer than the poor and rural. But again significant variation exists between countries as to which of these two inequities is dominant, and this variation does not appear to correspond closely with region or GDP (although the wealthy-poor gap is somewhat more important in the available Latin American countries). Table 1.8 divides countries according to whether the main area of inequity concerns the economic status of the students, the location in which the student lives, or both. All the countries analyzed, regardless of the level of inequity, are included in this table (unless

Table 1.7. Countries Characterized by Gender Inequity

	Boys favored	*Girls favored*
Latin America and the Caribbean	None	None
East Asia and the Pacific	Cambodia (L)	Thailand (LM) Philippines (LM)

Source: Household Surveys.

Table 1.8. Countries Characterized by Main Type of Inequity

	Income	*Both equally*	*Rural*
Latin America and the Caribbean	Mexico (UM)	Colombia (LM) Guatemala (LM) Brazil (LM)	Bolivia (LM)
East Asia and the Pacific	Cambodia (L)	Vietnam (L)	Thailand (LM) Indonesia (LM)

Source: Household Surveys.

analysis was available only on one of the two areas, such as in the Philippines).

The table shows that, for most countries, both urbanicity and wealth are important factors explaining inequities of survival and completion. In nearly all countries the two factors are interrelated: people living in rural areas tend to be poor. But most of the inequity in some countries appears to fall into one of the two areas. In Mexico and Cambodia there is significantly more inequity between the wealthy and the poor than between the urban and the rural. In Indonesia, Bolivia, and Thailand, however, there is significantly more inequity between the urban and the rural. In Indonesia most urban and rural students complete primary school. But beginning in grade 7, the first grade of lower secondary, urban students are roughly 20 percentage points more likely to be enrolled in school. Overall, income plays a more important role in the included Latin American countries; it constitutes the main area of inequity, alone or combined with the location, in four countries in Latin America, versus two in East Asia.

In several of the countries we have data for more than one point in time, allowing us to examine to what extent progress has been made in reducing inequities in recent years. Table 1.9 categorizes countries according

Table 1.9. Inequity Trends across Time

	Reduced inequity	*Constant or mixed inequity*	*Worsened inequity*
Latin America and the Caribbean	Mexico (UM)	Colombia (LM)	None
East Asia and the Pacific	Vietnam (L) Indonesia (LM) Cambodia (L)	Thailand (LM) Philippines (LM)	None

Source: Household Surveys.

to whether inequity was reduced, remained constant, or was mixed (i.e., reduced along some lines but worsened along others). Notably, there were no cases among those we analyzed in which inequity increased in multiple areas. Generally, East Asian countries have made more strides in decreasing inequities in recent years than the available Latin American countries, in particular in the wealthy-poor gap. Mexico, Vietnam, Indonesia, and Cambodia have all made important strides in decreasing inequity in recent years. Three out of four of these countries, however, still fall into the severe inequity category discussed earlier. Both urban-rural and wealthy-poor gaps fell between 1998 and 2002 in Mexico, the wealthy-poor gap falling roughly 15 percentage points. In Indonesia, the urban-rural gap closed 5 points, and the wealthy-poor gap closed 15 points between 1995 and 2003.

Other countries had more mixed experiences. In Thailand, for example, the wealthy-poor gap literally disappeared, but in 2002 a new equity challenge—that of keeping boys in school—emerged. In Colombia, the urban-rural survival gap closed somewhat between 1997 and 2003, but the wealthy-poor gap actually worsened during this same time period.

Several conclusions can be made about equity in Latin America and East Asia. First and most important, equity like quality is an urgent challenge. None of the countries studied exhibited equity across all three areas of urbanicity, wealth, and gender. Many of the countries had extreme secondary enrollment gaps, of up to 50 percentage points. Second, equity is an issue clearly present in the two regions, and it does not plague poorer countries more than relatively more wealthy ones. Upper-middle-income countries such as Mexico suffer equally from inequities as do extremely poor countries such as Cambodia. Importantly, however, within income groupings some countries have done a better job at keeping all children in school equitably. Thailand, Argentina, and the Philippines have relatively low inequity although it does not appear that equity has improved in recent years in Thailand or the Philippines (no longitudinal data are available for Argentina). Countries struggle with different forms of inequity. This section analyzed only three forms, gender, urbanicity and wealth. Of these, urbanicity and wealth describe much more of the regions' inequities than does gender, although gender does appear problematic in three East Asian countries. Some evidence illustrates that income inequities are of greater concern in Latin America than they are in East Asia. Finally, many of the countries with the most glaring

inequalities have made significant progress in recent years, although they still have a long road ahead of them. Frequently, the countries making the greatest progress reducing inequities are those with larger inequities. It may be relatively more difficult for countries with less inequity to overcome their persistent equity challenges.

Demand and Supply Constraints and Opportunities for Secondary Education

Latin American and East Asian countries face the interrelated objectives of expanding enrollment and completion rates equitably and improving the quality of secondary education. To fulfill these objectives, both regions face supply and demand opportunities and constraints at the country, household, and school levels that will be reviewed in the next three chapters. Brief illustrations of some of these constraints and opportunities follow.

At the country level several factors are conspiring to help countries improve their secondary enrollment rates. Increased primary enrollment and completion are necessary as the first step to ensuring that students enter secondary school. Primary gross enrollment rates averaged 112 percent in Latin America and 110 percent in East Asia for the 2002–03 school year, with more than 253 million children enrolled.[24] Despite continuing deficiencies in primary completion rates in some East Asian and Latin American countries (caused in part by high overage enrollment and low learning quality), most countries have made significant progress toward the Millennium Development Goal of universal completion. As more students complete primary school, more become eligible for secondary. Continuing migration to urban areas will also facilitate easier access to secondary schools. At the same time, the secondary age population in Latin America and East Asia is expected to decline from 257 million to 226 million between 2003 and 2015.[25] These three factors—growing primary completion, urban migration, and decreasing secondary-age population—create opportunities for most countries into improving their secondary enrollment rates. Unfortunately, as we will see in chapter 3, they are not necessarily putting the required resources into improving their secondary education sectors.

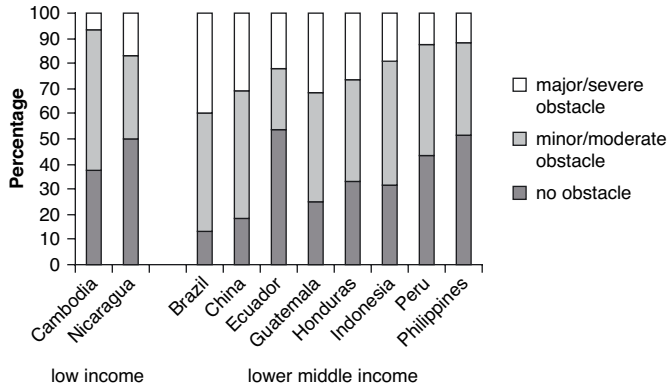
The increasing demand in East Asian and Latin American labor markets for skills provided through secondary education is another

clear opportunity at the country level. The rise of knowledge-based economies, countries whose technologies are supported by educated labor forces, creates a demand for high-skilled workers, while decreasing the demand for low-skilled workers. Countries' supply of well-educated labor is increasing in both Latin America and East Asia, but supply remains below demand.

Analysis of investment climate surveys in East Asian and Latin American countries confirms that employer demand for skilled labor outstrips supply. Sixty-nine percent of employers in East Asia and 70 percent of employers in Latin America consider the lack of employee skills to be an obstacle in business. Twenty-nine percent of Latin American employers and 24 percent of East Asian employers deem this constraint to be major or very severe, with little variation between regions. Furthermore, when examining the level of perceived business constraint by country income grouping, no distinctive patterns emerge, suggesting that countries of all income levels face a growing need for skilled workers (figure 1.19).

Although the number of students eligible for secondary education is increasing, not all of them may be interested in pursuing or able to pursue their studies at the secondary level; household demand can be a constraint. At the household level, demand for secondary education can

Figure 1.19. Level at Which Available Workers' Skills Are Considered a Business Constraint by Employers



Sources: 2002 and 2003 Investment Climate Surveys.
Note: Data for all countries 2003, except 2002 data for China and Peru.

be constrained by multiple factors, including demographics, user fees, family income, distance to school, health, quality of education, opportunity costs, and perceived risks and returns from education.

User fees, forgone family income (opportunity costs), distance, and student health determine whether the student can afford to attend school. Forgone family income tends to be the greatest constraint because the student attends school in lieu of earning money. The quality of education and perceived returns of education assist parents and students in deciding whether the perceived benefits of secondary education are worth the perceived costs. Opportunity costs to schooling and rates of return, with their impact on the demand for secondary schooling, are thoroughly analyzed in the next chapter. Recent research suggests that for every additional year of schooling a male earns 11 percent more, on average, during his lifetime in East Asia and 9.5 percent more in Latin America. These are substantial returns, which indicate high labor market demand for education, but may not be high enough to compensate for the perceived costs of schooling, particularly for the poor. Chapter 2 explores interventions that can address cost barriers to education.

A lack of school facilities and qualified teachers also hinders enrollment rates. For example, many remote villages in Lao PDR offer only two grades of primary school and often must contract teachers themselves, without assistance from the Ministry of Education. Children must travel approximately 2 kilometers to a neighboring village for grades 3 to 5, and up to 10 kilometers for lower secondary school. In such situations, demand-side interventions alone will not improve enrollment. Supply-side interventions targeting the construction of schools with toilet and water facilities and the training of teachers, alongside demand-side interventions, are necessary to improve secondary enrollment rates. Beyond school and teacher supply shortages, more complex constraints are the quality and efficiency of the school production process itself, meant as the way school resources are used to reach target outputs. Quality and efficiency constraints will be examined in chapters 2 and 4.

Analysis of school abandonment patterns reveals that some countries face severe between-cycle dropout, whereas others face continuous grade-by-grade dropout (table 1.10). In slightly under half of the countries examined children tend to leave school between cycles, meaning that large proportions of students complete primary but do not enter

Table 1.10. Countries Characterized by Whether Children Exit the School System within or between Cycles

	Between cycle	*Within cycle*	*Between and within Cycle*
Latin America	Mexico (UM)	Argentina (UM)	Colombia (LM)
		Bolivia (LM)	
		Brazil (LM)	*Guatemala (LM)*
East *Asia*	*Indonesia (LM)*	*Cambodia (L)*	
	Thailand (LM)	*Vietnam (L)*	*Philippines (LM)*

Source: Household Surveys.

lower secondary and/or complete lower secondary but do not enter upper secondary. For these countries there is relatively little school abandonment in any one education cycle. Other countries, including both of the low-income countries in the sample (Cambodia and Vietnam), face steady dropout rates at all grades, with little distinction between school cycles. This is not just a low-income phenomenon; the upper-middle-income country of Argentina and lower-middle-income countries of Brazil and Bolivia also face dropout across the system. Finally, some countries, including Colombia and the Philippines, have steady dropout rates across all grades but significantly worse transition between cycles. These two countries suffer from both forms of school abandonment.

Implications to these dropout patterns exist. Countries such as Mexico, Thailand, and Indonesia, in which the majority of school abandonment is occurring between cycles, need to examine the reasons behind this pattern. Possible reasons may be that the countries face basic supply constraints in which students simply do not have access to the next education cycle (such as in rural areas) and are forced to drop out. Comparing completion rates across urban and rural areas in annex 1.6 confirms this hypothesis because transitions between cycles tend to be sharper in rural areas. Sharper transitions between cycles in rural areas occur in most countries, and in particular in low income and lower-middle income, indicating possible substantial gaps in school infrastructure between urban and rural areas in these countries. Between-cycle abandonment, however, may also be due to the perception that the benefits of the subsequent education cycle are low. Low real or perceived returns to education, high private costs, or high opportunity costs may cause students not to enter higher education cycles. In some countries private costs may increase dramatically from one cycle to the next, such as from primary to secondary in Guatemala, creating a major disincentive for transition

to the secondary cycle (World Bank 2005c). Finally, widespread desertion at all grades of secondary education in most countries, in both urban and rural areas, suggests demand-side constraints, which go beyond the existing basic supply-side ones. This high within-cycle abandonment should also be investigated further and could be the result of low levels of schooling quality, high private and opportunity costs, or low perceived benefits of secondary schooling. Policy interventions that could address these constraints in both urban and rural areas (such as conditional cash transfers and nontraditional secondary education modalities) would need to be identified.

Conclusion

In expanding secondary education, Latin America and East Asia face the dual challenge of ensuring equity and quality. In this chapter we broadly examined the state of secondary education in East Asia and Latin America to take stock of where the regions are today and the feasibility of meeting the challenges of expansion. Despite a positive evolution, secondary enrollment rates in many Latin American and East Asian countries remain well below average given GDP per capita. This chapter brought to light several patterns that exist between the two regions as well as between income-level groupings of countries. It also, however, found that there is great variation and diversity even among countries of the same region and income level.

Both regions suffer from internal efficiency problems, with high primary overage enrollment ratios and low secondary completion rates. These problems are more acute for lower-income countries and in Latin America. Education quality is of great concern in both regions, with test scores demonstrating that a majority of students are failing to acquire basic knowledge and skills. PISA results demonstrate that problems in quality relate largely to the income level of the country, are stronger in Latin America given its income level, and are a factor of low completion. Beyond disparities between countries based on income levels, marked equity gaps centering on the urban-rural divide and income inequality are prevalent in both regions. Income and urbanicity inequalities are present in upper-middle-income countries as well as low-income countries. Data on racial inequalities in access to and completion of schooling were not easily available but are likely to also be important. We also examined some opportunities and constraints related to the supply and demand of secondary education, showing that the demand for skilled labor is still

constrained by lack of supply of skilled labor in both Latin America and East Asia, requiring interventions at the country, household, and school level to fill the gap. Country examples from Latin America and East Asia have shown that it is possible to improve the supply and quality of secondary graduates through a careful choice of policies. The remaining chapters of the report focus on policy options, while providing further exploration of constraints and opportunities at all levels.

Notes

1. Economic categories based on 2004 gross national income (GNI) per capita; low-income countries maintain GNI per capita less that $825, lower-middle GNI per capita is between $826 and $3,255, upper-middle GNI per capita is between $3,256 and $10,065, and high-income countries possess a GNI per capita greater than $10,066. Regions are defined on the basis of the World Bank administrative categorization of regions.
2. The background paper produced for the section on private schools is Marshall (2005b), and the background work for the vocational education section comes from a background paper by Hawley (2005b), with additional elaborations by Alec Gershberg.
3. Chapter 4 provides some evidence of the impact of private schools on learning and efficiency.
4. Note that Chile and Argentina, two countries with high private secondary enrollment, participated in PISA 2000 but not PISA 2003. We include them (as well as Peru) in the 2003 average, assuming little change between these two years.
5. There are some problems with this information, beginning with the fact that in most cases a single individual in the school (namely, the director) is estimating the makeup of school funding. There are also missing values that cannot always be distinguished from zero.
6. Argentina, for example, shows a dramatic 128 percent increase in vocational secondary although this is likely to be due almost entirely to the *Polimodal* reform which, though categorized as a vocational stream, is actually a diversified model.
7. Inputs to this section were done by Jeffrey Marshall, Alec Gershberg, and Ilana Umansky.
8. Which, we will see in chapter 4, may be a good thing from the perspective of learning but not necessarily an efficient choice.
9. The main input to this section was from Joe Shapiro.
10. Data on gross enrollment rates are not strictly comparable between figure 1.5 and figure 1.6 because of different data sources.

11. Countries include Cambodia, Indonesia, Korea, the Philippines, Thailand, and Vietnam in East Asia and the Pacific and Argentina, Bolivia, Brazil, Colombia, Guatemala, and Mexico in Latin America and the Caribbean.
12. As illustrated in pyramids on enrollment per age and quintiles undertaken for 12 countries and included only selectively in this chapter.
13. Which is a somewhat surprising result considering lackluster test scores at 15 (see quality section). This points to possibly lower promotion standards in Argentina (see also chapter 4).
14. Woessmann and Hanushek 2005; OECD 2005.
15. Compulsory school laws have been found to increase education attainment (Lochner and Moretti 2004) and adult earnings (Patrinos and Sakellariou 2005).
16. Knight and Sabot 1990; Mete 2004.
17. World Bank 2005g.
18. The California higher education system is a good example, see http://www.cpec.ca.gov/.
19. Cuba may be an exception to this picture, judging from the high test scores obtained in the standardized exam organized by the UNESCO-led Latin American Laboratory (in which the country's results were much above all other Latin American countries). Comparing Cuba with the other countries, however, is difficult. Cuba did not participate in international assessments (beyond the Latin American ones) and has very few other data comparable with the other countries in this report, such as a comprehensive household survey, which could be used to calculate completion and equity indicators.
20. Information on national test scores in Bolivia confirms this pattern. As will be shown in chapter 4, Argentina and Chile modified their promotion standards somewhat to obtain higher grade-for-age and completion levels. Chile also accompanied these changes with quality-enhancing reforms, but test scores have remained low.
21. Admittedly, these are upper-income East Asian countries, which generally are better positioned than most other countries to achieve higher outcomes and have had their own specific political and institutional characteristics. Korea, however, started from much lower levels not long ago.
22. In the figure, countries are ranked progressively on the enrollment scale, but only approximately on the quality scale (in the low- and high-growth patterns).
23. The highest grade completed for each child is censored, that is, the approach adjusts for the fact that children in a given grade cannot have completed a grade higher than the grade they are currently attending.
24. See Yilmaz 2005.
25. See chapter 3.

Spotlight 1—Brazil: Addressing Access and Quality

Brazil, an expansive country with 170 million inhabitants, has 27 states and almost five thousand municipalities responsible for the provision of education. This federalist structure has characterized education provision in Brazil from the earliest days of its independence. The central government started taking part in education provision only in the 1930s—the Ministry of Education and Culture was established in 1931—as a part of President Getulio Vargas's efforts to consolidate and centralize the country. During this period education was seen as an important tool for national identity formation. Even then, states and municipalities retained management and administration of primary and secondary schools and teacher education. In 1971 mandatory basic education was increased from four years to eight years, suggesting a focus on access to basic education. But aside from this important education access policy, the 1930s configuration of education remained more or less in place until the 1980s when, for the second time in Brazilian history, education became a centerpiece of national politics.

Through the 1980s and 1990s, the central government and states implemented a number of reforms focused on access and quality through a combination of supply-side policies, including granting financial autonomy to schools, democratizing the selection of school principals, establishing free basic education as a basic right, establishing national testing for students, granting autonomy to municipal education systems, and implementing a 10-year plan for education (Grindle 2004). At this time education in Brazil evolved into its current structure: two cycles of basic education (the elementary cycle includes grades 1 through 4, and the lower secondary includes 5 through 8) provided by both state and municipal governments and upper secondary education (grades 9 through 11) run by state governments.

Between 1980 and 1996 Brazil achieved improvements in access: the gross enrollment rate in basic education (which includes lower secondary) increased from roughly 97 percent to above 112 percent, and at the upper secondary level, gross enrollments reached 60 percent, up from 34 percent. Nonetheless, education in Brazil continued to have serious problems of equity, efficiency, and quality: in 1996, for every one hundred 18-year-olds, only 66 completed fourth grade, 43 completed eighth grade, and barely 25 finished secondary education (Herrán and Rodríguez 2000). High repetition rates meant that students completed the 8-year basic cycle in more than 10 years, and took another 4 years to complete the 3 years of upper secondary schooling. Consequently, although gross enrollment

(*Continued*)

rates were high, net enrollment rates were very low, especially at the upper secondary cycle (30 percent) (Larach 2001).

In 1996 Brazil passed the Lei de Directrices e Bases de Educacao Nacional (the National Education Law), which redefined the roles of state and municipal governments in education provision; charged the central government with standard setting, ensuring equity, monitoring, evaluation, and partial responsibility for education funding; and put in place new and innovative demand- and supply-side programs and policies to address the multiple ills of the education system. The reforms brought, among other things, minimum quality standards for the curriculum and teacher training, equalization grants for basic education provision, and demand-side incentives to improve access and completion for the poor.

Since 1996 Brazil has noticeably improved its secondary education system, especially the lower secondary cycle. Enrollments kept on increasing, particularly in response to changes in education funding methods and newly introduced demand-side incentives. In 1998 the Fund for the Maintenance and Development of Basic Education and Teacher Appreciation (FUNDEF) tied the allocation of municipal and state education funds to enrollment. Consequently, poor municipal governments gained access to greater resources, and enrollments increased by 6 percent at the lower secondary level (Gordon and Vegas 2005). With FUNDEF's success, the Brazilian government is now contemplating a similar program, FUNDEB, for upper secondary education. Bolsa Escola, a means-tested cash transfer program, was implemented in 2001, providing cash payments to poor families whose children enroll and stay in school. One study finds that Bolsa Escola may have encouraged attendance among children ages 10 to 15 by up to one-third (Jones 2004). Another conditional transfer program, Eradication of Child Labor (PETI), targets the reduction of child labor in Brazil's poorest areas. Families receive cash payments if the children attend school and after-school programs.

Since 1996 the central government also took steps to address another constraint on the expansion of secondary education—the availability of qualified teachers. The 1996 law requires that all teachers have completed at least secondary education. To address this requirement, among other things, Brazil implemented a federally funded distance teacher-training program, PROFORMAÇÃO, to train teachers for specialized courses in the relatively poor northern and northeastern states. Between 1996 and 2002 the percentage of unqualified teachers in grades 1 to 4 dropped dramatically, particularly in the poorer regions of Brazil. For example, in the northern states, unqualified teachers declined from more than 60 percent to roughly 10 percent (Gordon and Vegas 2005).

Brazil also achieved widespread reductions in grade repetition, the biggest source of inefficiencies in the Brazilian education system. From 1996 to 2000, grade promotion rates rose by almost 9 percentage points in municipal systems and 5 percentage points in state systems. Among the programs targeting grade repetition are summer schools, monetary graduation incentives, accelerated instruction programs, learning cycle approaches, and flexible promotion based on academic credit mechanisms. Increased fiscal autonomy at the school level (funded through payroll taxes) and the dissemination of school report cards (in the state of Paraná) are among other programs designed to improve efficiency (Vasconcelos-Saliba 2004).

Some have argued that the quick expansion in enrollments may have reduced quality during the past decade in Brazil (citing the decline in Brazil's national basic education test scores); at the same time low quality is one of the biggest impediments in improving access and efficiency, such as Brazil's serious grade repetition problems. Since 1996 the country has taken many steps in the right direction to improve quality: by linking the availability of resources to retained students, FUNDEF has helped significantly improve municipal provision of education services, for example, through reductions in class sizes. The Brazilian government reopened the National Institute for Educational Research (INEP), which now implements national educational assessments of student performance through the Basic Education National Evaluation System (SAEB) and an exit examination (ENEM) that tests graduates on the upper secondary curriculum. The school census has increased the availability of information on schools' underlying conditions. Finally, the aforementioned efforts to improve teacher qualifications and the establishment of national minimum curricular standards are important steps toward greater education quality.

Despite improvements, inequity continues to be one of the biggest ills of the Brazilian secondary education system. Conditional transfers such as Bolsa Escola and PERI target inequality in access specifically, and FUNDEF has targeted inequalities in access, quality, and achievement by reducing discrepancies in per pupil expenditures. Furthermore, auxiliary programs that fund student health, nutrition, and transportation have helped poor and rural children to stay in school. Nonetheless, Brazil has much room to improve its targeting of secondary education expenditure toward low-income groups. Barely 5 percent of expenditure benefits the first income quintile, compared with more than 20 percent in countries such as Uruguay (World Bank 2003c). There is strong evidence that the cumulative effect of repetition at the lower years disproportionately affects poor, minority, and rural children: children from a poor background are more likely to

(*Continued*)

repeat their grades, less likely to enroll in school, and more likely to drop out and work (Côrtes Neri et al. 2005).

Although Brazil still appeared to have a fairly cost-ineffective education system in 2000, which is plagued by insufficient academic achievement and low grade attainment rates, significant improvements have been achieved in recent years. Not only has secondary gross enrollment increased steadily, but since 2000 Brazil shows signs of improved education quality (and cost-effectiveness). Brazil is the only country among Latin American and East Asian countries whose PISA scores climbed in all three areas—math, reading, and science—between 2000 and 2003. Still, Brazil faces many challenges in expanding and improving its secondary education, including persistently high repetition rates at all levels and persistent challenges at the upper secondary cycle. During the past two decades most of the country's attention on education has focused on the basic education cycle. Now that indicators have begun to improve significantly at this cycle, attention can shift to the upper secondary cycle. Because many students at the upper secondary cycle are overage and have to work, demand-side incentives are a promising initiative for the equitable expansion of the upper secondary cycle.

Sources: Umansky (2005) and Yilmaz (2005) on the basis of cited references.

CHAPTER 2

Demand for Secondary Education in Latin America and East Asia

Introduction

This chapter analyzes the factors that affect the demand for secondary education and how those factors have different effects on various regional, country, and socioeconomic contexts, and it suggests policies that would be successful in alleviating demand-side constraints.

A key challenge in expanding secondary education is the demand and willingness of young individuals and their families to pay for secondary education. The growing number of students finishing primary school in Latin America and the Caribbean and East Asia and the Pacific countries has resulted in an increased latent demand for secondary education. However, chapter 1 shows substantial gaps in enrollment and completion of secondary education, which point to both supply- and demand-side constraints to expansion. These constraints are related insofar as the range and quality of secondary education opportunities affect the demand and willingness to pay for secondary education. However, to be effective, more and better opportunities need to be accompanied by efforts to alleviate

the constraints that young learners and their families face that prevent them from making the most of these opportunities. Some of these constraints relate to young people as decision makers and include the lack of decision-making skills and a good environment for decision making. The focus of this chapter is, however, on constraints pertaining to market failures related to the lack of information about secondary education opportunities and the labor market and to the limited access to resources. The pattern and intensity of these constraints are analyzed for countries of Latin America and the Caribbean and East Asia and the Pacific at different stages of development.

The outline of the chapter is as follows. The first section examines how the structure and functioning of labor markets and schooling characteristics shape the economic benefits of secondary education and how young people form expectations about and respond to these benefits. The second section examines the role that information about secondary schooling options plays in education decisions and accountability for performance and discusses appropriate information-based policies. The third section examines the role of liquidity constraints relative to long-term factors affecting academic readiness in explaining demand for secondary education, and it discusses combinations of demand-side financing mechanisms to address liquidity constraints at different levels of secondary schooling and for different levels of fiscal and implementation capacity. Section four examines how choices competing with schooling (and choices among schooling options) play a role in shaping education decisions and discusses the incentives to address competing choices (Conditional Cash Transfers [CCTs], vouchers, nontraditional schooling modalities).

The main findings and policy implications in this chapter relate to enhancing opportunities and enabling better education choices. In most countries in Latin America and the Caribbean high-income individuals command significantly higher wages than low-income individuals with the same level of education, and this pattern can be explained in part by the fact that the poor in Latin America and the Caribbean countries are likely to attend schools that are of lower quality than the schools attended by wealthier individuals. Improving the quality of the schools attended by the poor is therefore an imperative. In addition, uncertainty about future returns can lead to underinvestment in education, particularly for the poor; often young individuals lack information about secondary schools, which makes them less able to make good choices. Policies and programs that provide information on labor market and education opportunities

have a positive impact on school enrollment and performance. Finally, credit constraints are pervasive, suggesting the need for a combination of policies, including conditional cash transfers and vouchers. Overall, young individuals are likely to suffer from multiple constraints, and thus integrated policies—including information, financial resources, mentoring—are needed.

Making Labor Markets Work for Young People

Young people make education decisions based in part on their expectations about their future labor market returns from education. It is therefore important to have high returns to secondary education to foster demand. However, returns are not necessarily high for everybody. In addition, young individuals face a great deal of uncertainty about future returns. Uncertainty matters because it leads to inefficiencies and, coupled with risk aversion, to underinvestment in education. Labor market opportunities and payoffs associated with secondary education affect choices but only to the extent that individuals have good information about them. This section first examines the patterns and trends in the mean and distribution of returns from secondary education and how those relate to labor market distortions and wealth inequality in the quality of schooling and then policy implications are drawn. The final part of this section analyzes uncertainty about future returns, the impact of uncertainty on choices, and the policy implications in relation to information and financing policies.

Patterns in average labor market returns

Labor market returns to secondary education are examined using the recent household survey data from 16 countries of Latin America and the Caribbean and East Asia and the Pacific. The analysis of returns is focused on wages (thus excluding day laborers, self-employed, and employers) of 25- to 65-year-olds. We use these data to estimate average returns from education using the standard earnings function (Mincer 1974).[1] Although there are well-known potential problems with the standard approach to estimating returns,[2] in practice addressing these biases makes little difference to the results (Card 1999).[3] In any case, the estimates presented here should be taken as illustrative of the economic benefits of education.[4] Estimates by school level do not take into account the option value of general secondary education (higher education), which tends to underestimate

its return, nor the costs associated with different school levels and modalities, all of which limit the ability to compare returns across school levels and modalities.

The estimated average returns to an additional year of schooling are presented in table 2.1 for males and females.[5] At 12 percent, the estimated return for males is slightly higher in the East Asian countries under study, compared with Latin American countries (11 percent). Female returns (averaging 13 percent for East Asia and Latin America) are significantly higher than male returns. **Overall returns are high in all countries, especially in Thailand, Cambodia, and Brazil, and larger than in high-income countries** (Psacharopoulos and Patrinos 2004).

Table 2.1 also shows that, to varying degrees, **these high returns are explained partly by low stocks of education**. Average years of schooling among 25- to 65-year-old male wage earners in East Asia range between 8.6 and 11.3 years (Cambodia and China) and between 7.2 and 13.2

Table 2.1. Average Returns (%) and Years of Schooling of Adult Wage Earners, by Sex

	Males		*Females*	
	Returns	*Schooling*	*Returns*	*Schooling*
East Asia				
Cambodia	15.8	8.6	10.3	7.2
Mongolia	8.5	9.2	13.8	10.2
Vietnam	8.6	10.9	7.2	10.3
Indonesia	11.4	10.2	15.9	10.1
Thailand	15.2	9.0	16.1	9.4
Philippines	11.6	10.1	17.0	13.2
China	12.1	11.3	13.3	11.2
Singapore	11.9	10.1	11.9	9.9
Latin America				
Argentina	11.0	10.0	10.1	10.6
Brazil	14.8	7.6	15.1	9.8
Chile	12.0	9.3	13.3	11.2
Colombia	8.5	10.2	7.8	10.3
Guatemala	10.3	7.7	12.8	9.0
Mexico	11.4	8.6	14.4	9.1
Venezuela, R. B. de	9.9	8.5	12.9	10.1
Bolivia	10.3	9.8	13.3	11.5

Sources: Cambodia (Socioeconomic Household Survey 2004), Vietnam (Living Standards Survey 2002), Indonesia (Susenas 2003), Thailand (Socioeconomic Survey 2002), Philippines (Annual Poverty Indicator Survey 1999), China (Economic, Population, Nutrition, and Health Survey 2000), Singapore (Labor Force Survey 1998), Argentina (INDEC 2003), Brazil (PNDA 2001), Chile (ECSN 2003), Colombia (ECV 2003), Guatemala (MECOVI 2000), Mexico (ENIGH 2002), Venezuela, R. B. de (EHM 2002), Bolivia (MECOVI 2002). All surveys are nationally representative except China's Health and Nutrition Survey, which represents only 9 of 22 provinces in China.

years for female wage earners (Cambodia and the Philippines). In Latin America the regional average for males and females is 9.0 and 10.2 years, with Brazil and Guatemala lagging behind the other countries. In all countries the education level of wage earners is higher than that of other workers (table 2.2), particularly in low-income countries, in which the share of the wage employment sector also tends to be smaller.

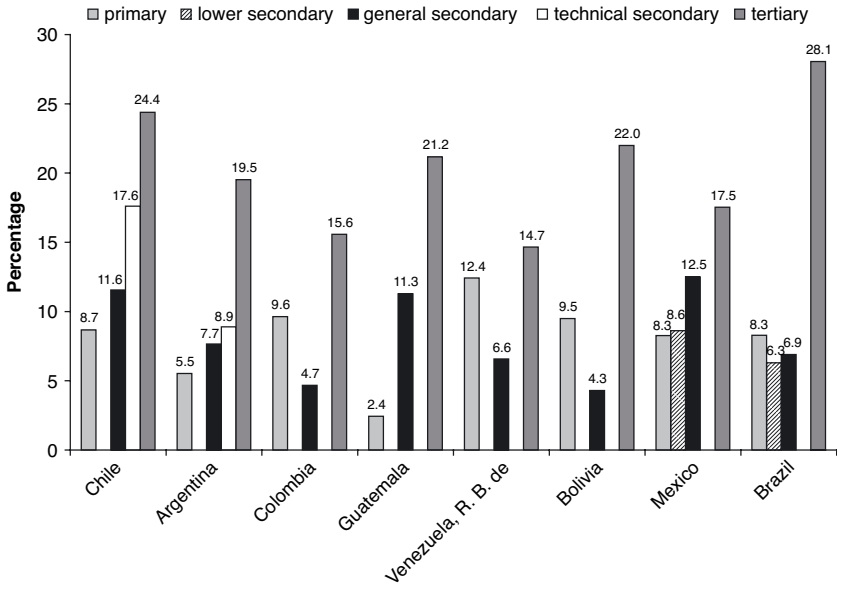
Figures 2.1 and 2.2 present the results by education level for males and, whenever available, by secondary school modality (general and vocational education). **Tertiary returns are the highest, generally followed by secondary returns**. Among countries of East Asia and the Pacific, estimated returns are highest for tertiary education in all countries—with large premiums in Singapore, Thailand, and the Philippines—except China and Cambodia, in which the highest premium corresponds to primary education. Secondary education carries the second largest premium except in China and Cambodia.[6] Among Latin America and the Caribbean countries, tertiary also carries by far the largest premium in all countries. The evidence on returns from secondary education is mixed, with half of the

Table 2.2. Stock of Education among the Adult Working Population

		Highest school level completed (%)					
	Average yr.	*NOED*	*PRIM*	*LSEC*	*USEC*	*VTE*	*TERT*
East Asia							
Cambodia	4.1	67.3	19.1	8.1	3.6	0.9	1.0
Mongolia	9.4	2.8	10.8		58.4[1]		28.1
Vietnam	8.8	2.2	35.8	36.3	11.7	8.2	5.8
Indonesia	7.2	27.5	32.8	14.9	14.5	5.0	5.3
Thailand	7.1	50.5	16.4	9.4	7.5	5.8	10.4
Philippines	9.6	22.5	30.1		21.7[1]		25.7
China	10.1	8.3	11.4	32.4	21.4	12.6	14.2
Singapore	10.0	22.2	14.1		39.9[1]		23.7
Latin America							
Argentina	9.8	10.1	41.8		17.7[1]	5.7	24.0
Brazil	6.4	53.1	16.4	5.4	17.8		7.3
Chile	9.4	26.6	29.6		17.6[1]	15.8	10.4
Colombia	8.9	4.4	21.7		30.8[1]	5.3	37.8
Guatemala	4.8	40.5	39.2		15.8[1]		4.5
Mexico	8.2	24.1	22.8	27.6	15.0		10.5
Venezuela, R. B. de	8.2	7.8	55.1		19.7	6.0	11.4
Bolivia	6.9	13.0	51.2		20.4	6.6	8.8

Source: Household Surveys.
Note: NOED = less than full primary school education.
1. refers to all secondary.

Figure 2.1. Annualized Average Returns of Male Wage Earners by School Level, Latin America and the Caribbean

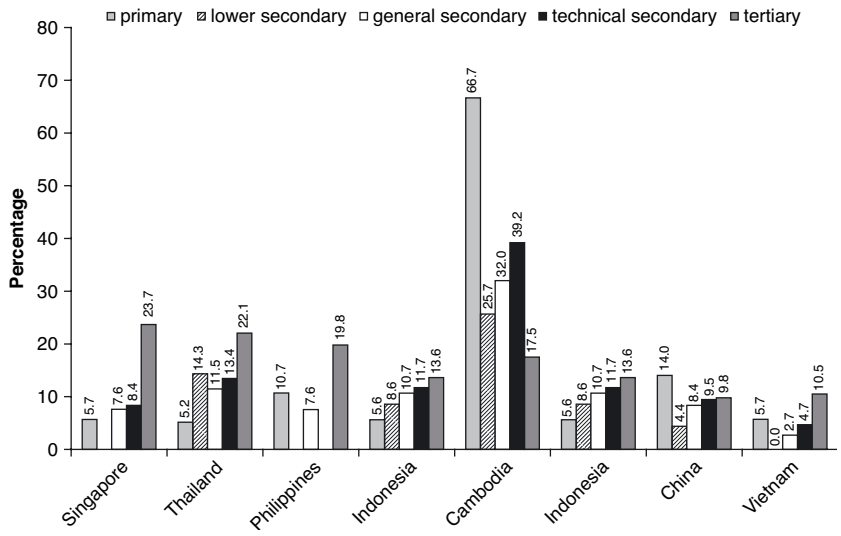


Source: Household Surveys.
Note: See table 2.1 for sources. Returns from lower secondary, general secondary, and technical secondary are relative to primary education, whereas those from tertiary are relative to general secondary (or secondary whenever data on technical secondary are not available).

countries (Argentina, Chile, Guatemala, and Mexico) showing premiums that are larger than those associated with primary education. Overall, wage differentials by level of schooling are larger in Latin America and the Caribbean countries than in East Asia and the Pacific countries; this is driven particularly by the consistently large premiums from higher education in Latin America and the Caribbean countries.

In all countries in East Asia and the Pacific and Latin America and the Caribbean for which a direct comparison can be made, the private return to vocational/technical qualifications exceeds the return to general secondary education. In the cases of Chile, Thailand, and Vietnam the difference is substantial. Furthermore, for four of the Latin American and Caribbean countries a comparison can be made between returns to higher vocational/technical qualifications and university qualifications.[7] An interesting finding is that, although returns from university qualifications in República Bolivariana de Venezuela and Colombia (males) exceed returns from higher vocational/technical qualifications, the opposite is

Figure 2.2. Annualized Average Returns of Male Wage Earners by School Level, East Asia and the Pacific



Source: Household Surveys.
Note: See table 2.1 for sources. Returns from primary education are relative to less than primary school completed. Returns from lower secondary, general secondary, and technical secondary are relative to primary education, whereas those from tertiary are relative to general secondary (or secondary whenever data on technical secondary are not available). Returns to primary and lower secondary school are not significantly different from zero.

true in the case of Bolivia and Colombia (females). This result does not mean that the payoff from VTE is larger than that of general education, because estimates do not account for the option value of the latter and the costs associated with each modality. **Given the option value of general secondary education and the fact that VTE is more expensive than general secondary, the true net returns to VTE are likely to be lower.**[8]

Wages are the only source of labor market returns to schooling, particularly in low-income countries, in which the share of the wage sector is small relative to the rest of the labor market. Sakellariou (2005) shows that there are significant returns to secondary education in regard to participating in the job market, being employed, and having a job in the wage sector. These employment-related returns are consistently higher among those with vocational and technical education than those with general secondary education.

Trends in returns to and demand for secondary education

The previous analysis shows that high returns are explained partly by low stocks of education. The analysis of changes in the relative supply of

workers with different education levels and relative returns to these levels sheds light on the trends in the relative demand for secondary education.

Analysis of the trends in relative wages and relative supply in Latin America and the Caribbean and East Asia and the Pacific countries reveals that **the relative demand for postprimary education workers has increased across the board**.[9] In all countries of Latin America and the Caribbean and East Asia and the Pacific the supply of workers with secondary education rose relative to that of primary education workers, whereas relative wages decreased. Thus from the simple comparison of relative wages and relative supply, it is not possible to infer directly the changes in the relative demand of workers with secondary education. However, demand effects are identified using the methodology developed in Katz and Murphy (1992). Except for crisis periods in Argentina and Brazil, the relative demand for secondary workers increased in all Latin American and Caribbean countries. In East Asia and the Pacific, relative demand increased in Indonesia and Malaysia but decreased in Thailand. The wages of secondary workers relative to tertiary workers increased in Latin America and the Caribbean and East Asia and the Pacific (except Thailand), whereas the relative supply decreased in Latin America and the Caribbean (except Brazil) and in East Asia and the Pacific countries (except Thailand).

For Latin America and the Caribbean countries, **skill-biased technological change and domestic market liberalization policies** (domestic financial market reform, capital account liberalization, and tax reform) **are the main drivers of the increase in the demand for postprimary education, particularly tertiary**.[10] De Ferranti et al. (2003), however, find that changes in minimum wages and unionization, which tend to compress the distribution of earnings, are opposite to the trends in relative wages of tertiary workers and could thus also help to explain these trends. Heckman and Li (2003) show that, after more than 20 years of market-oriented reforms in China, there has been a substantial increase in returns from education. Nga Nguyet Nguyen (2002) shows that the important market reforms introduced during the 1990s in Vietnam were accompanied by significant increases in the returns to upper secondary and tertiary education.

Heterogeneity in returns and labor market distortions

Not all individuals necessarily face the same return to secondary education. From a policy perspective, it is important to find out who benefits the most from secondary education and who benefits the least, and why. For example, do poor individuals face lower returns? If they do, is it related

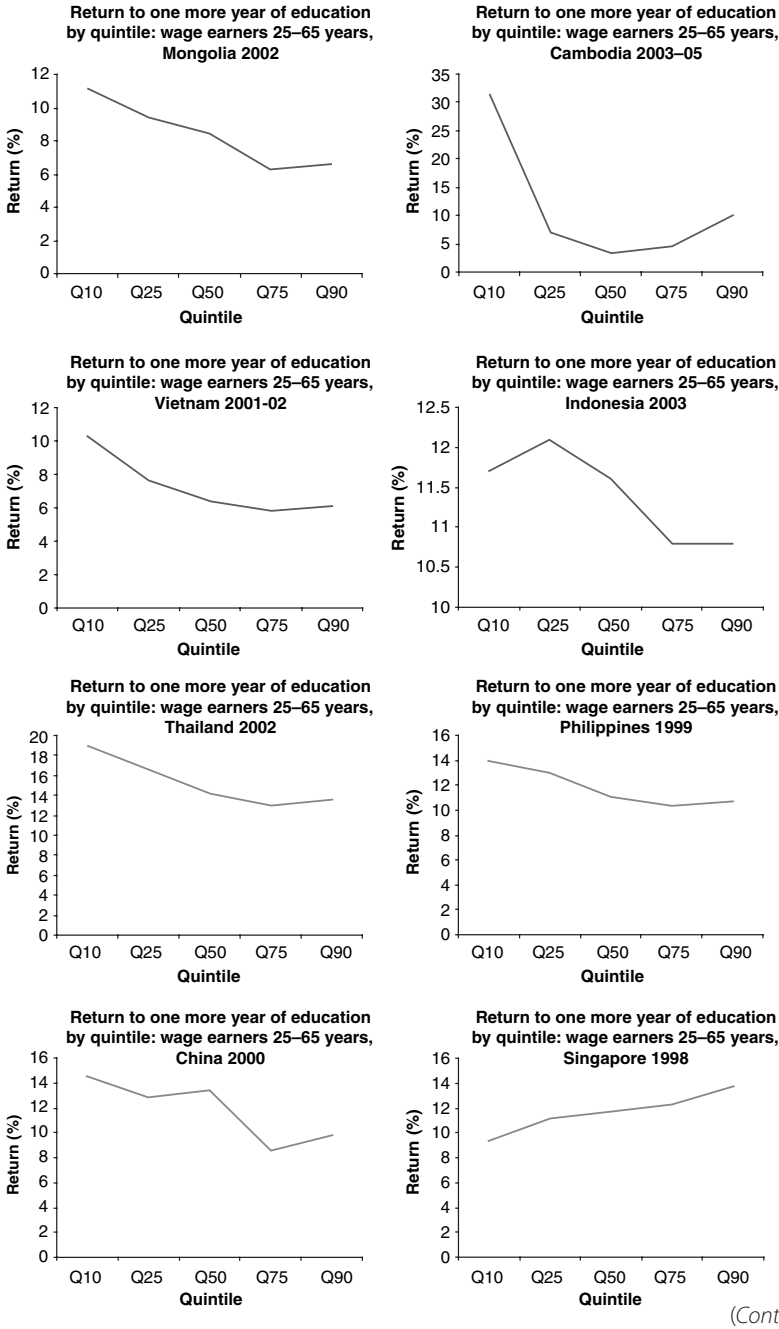
to poor individuals attending lower-quality schools? Does the distribution of returns reflect the degree of labor market distortions? For that purpose, we use the same data as before to examine the heterogeneity of returns along the earnings distribution by applying quintile regression techniques (Buchinsky 1994) to the standard earnings model.[11] Although this methodology allows for ex post heterogeneity in returns, it does not take into account the possibility that individuals may select ex ante, at least partly, upon this heterogeneity.[12]

In most of the countries in which evidence exists, increasing returns with earnings have been observed: individuals with characteristics other than schooling that command higher wages, such as ability and motivation, tend to benefit more from education. Increasing returns have been documented for 15 of 16 European countries studied and the United States—all developed countries—as well as for whites in South Africa.[13] This evidence is also consistent with several studies in the United States using models in which education self-selection is explicitly modeled.[14] This evidence is consistent with the concept of complementarity of skills (skills beget skills), whereby the productivity of skills acquired through, say, school is increased by other cognitive and noncognitive abilities.[15]

However, for the complementarity of skills to actually be reflected in pay, labor markets need to be sufficiently competitive. Thus high-earning individuals are expected to be more likely to gain from education than low-earning individuals in more competitive labor markets. That being said, evidence of increasing returns does not imply that labor markets are free of distortions. There are other factors, such as wealth inequality in the quality of schooling (considered later in this section), that may outweigh the effect of labor market distortions.

The evidence we present below is consistent with that hypothesis (figure 2.3). **In all low-income and lower-middle-income countries in East Asia and the Pacific returns to schooling** among males **decrease with earnings** quintiles **and increase in** the only high-income East Asia and the Pacific country considered (**Singapore**). **In all Latin American and Caribbean countries, except Colombia, returns increase with earnings, including lower-middle-income countries.**[16,17] To examine the link between the observed distribution of returns and the degree of competitiveness of the labor market, we compare the distribution of returns in the (mostly) competitive private sector with that in the (mostly) noncompetitive public sector. As noted earlier, trends in the standard sources of wage rigidity (minimum wages and unionization) are consistent with the trends in relative wages of tertiary workers in Latin America and the Caribbean.

Figure 2.3. Returns to One More Year of Education by Quintile in Selected Latin American and Caribbean and East Asian and Pacific Countries



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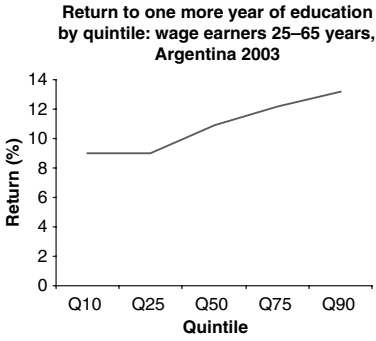
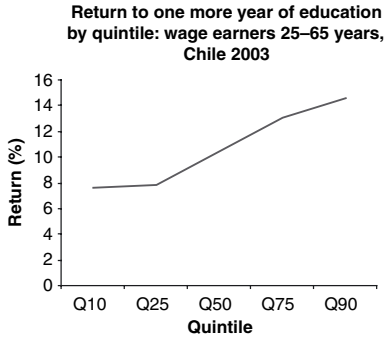
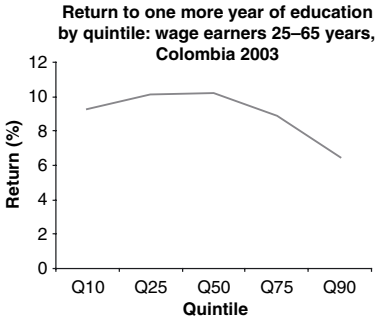
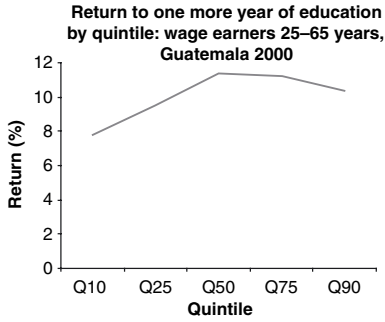
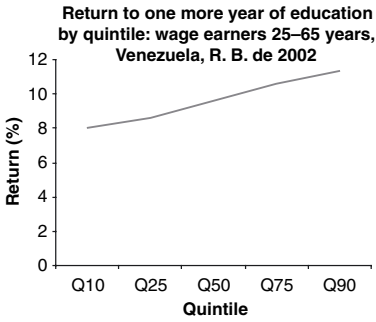
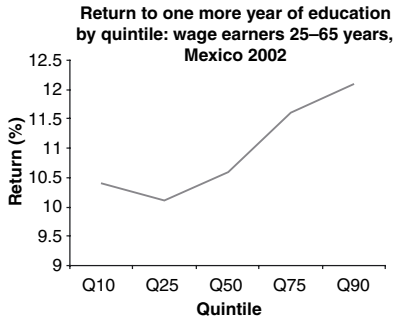


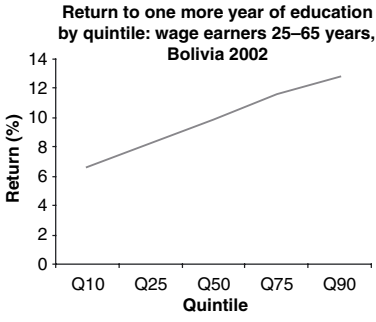












Source: Household Surveys.

Here we analyze the role of another potential source of wage rigidity, namely, public employment and pay policies.

In most European countries, most government workers appear to be overpaid relative to private sector workers (Karras 2005).[18] Evidence from developed countries shows that the public sector wage premium is higher in the lower end of the wage distribution and, in some cases, it becomes negative at the high end of the distribution. Although the evidence in developing countries is scant, results point in the same direction. Skyt-Neilsen and Rosholm (2001) found a positive average public pay premium for Zambia. However, at the upper end of the conditional wage distribution the pay gap became negative for highly educated public sector workers. A recent poverty report for Uruguay (World Bank 2003a) also finds a significant non-market-based public wage premium in Uruguay that decreases with the level of education to the point that it becomes a penalty for highly educated workers.

Table 2.3 compares the pattern of returns by quintiles in the public and private sector for 13 Latin American and Caribbean and East Asian and Pacific countries for which there is information on sector of employment.[19] With higher unobserved skills, returns in the small private sector in Vietnam increase, in the Thai private sector they increase slightly, and in the private sector of the Philippines and Colombia they decrease slightly. Cambodia and China show a different pattern in which returns in the private sector decrease sharply, and those in the larger public sector are flat across quintiles. Excluding Cambodia, the average 9th–1st quintile difference in returns in the countries in which male returns are decreasing with earnings (Vietnam, Thailand, Philippines, China, and Colombia) is −5.7 percentage points in the public sector, compared with about −0.8 percent in the private sector. In all countries in which male returns increase with earnings, returns increase in both the private and public sectors (with the exception of Mexico, in which returns in the public sector are flat), and this pattern is more pronounced in the private sector (7 country average of 6.5 versus 3.3 percentage points in the private and public sectors).

These findings suggest that **in countries in which labor markets are driven mainly by market forces,** so that the complementarity of skills is reflected in pay, **the pattern of increasing returns with earnings tends to be observed,** whereas in **countries in which market forces tend to be severely dampened by labor market rigidities and the influence of the state, returns are expected to decrease** with earnings, especially in the public sector (Vietnam, Thailand, the Philippines, and China), or both the public and private sector (China).

Table 2.3. Pattern of Returns by Public-Private Employment, Males

Country	*Overall pattern of returns*	*Ordinary Least Square return (%)* Public	private	*90th–10th quintile difference (%)* Public	private
Cambodia	Decreasing	7.72	27.73	−0.56	−31.97
Vietnam	Decreasing	7.92	7.19	−6.58	4.79
Thailand	Decreasing	14.57	14.37	−7.44	1.42
Philippines	Decreasing	10.84	10.79	−6.52	−1.41
China	Decreasing	10.39	1.00	−6.27	−7.79*
Colombia	Decreasing	5.17	7.94	−6.79	−1.04
Mean of:	*Decreasing*	*9.43*	*11.50*	*−5.69* **	*−0.80* **
Argentina	Increasing	10.23	11.08	6.26	4.84
Brazil	Increasing	16.79	13.07	5.65	8.88
Chile	Increasing	13.69	11.17	3.43	7.58
Guatemala	Increasing	12.33	11.50	2.78	7.68
Venezuela, R. B. de	Increasing	11.20	8.81	2.76	4.84
Bolivia	Increasing	13.30	8.70	2.76	8.23
Mexico	Increasing	13.28	9.21	0.33	4.62
Mean of:	*Increasing*	*13.02*	*10.57*	*3.35*	*6.67*

Source: Household Surveys.
* Based on 122 available observations.
** Excluding Cambodia.

These results illustrate the relationship between public sector policies and wage compression. However, it is beyond the scope of this report to provide structural estimates of a non-market-based wage gap (i.e., the wage gap net of productivity-related characteristics and job attributes).[20] In any case, table 2.3 indicates that public sector employees earn about the same or less than their private counterparts in most East Asian and Pacific countries,[21] whereas in all Latin American and Caribbean countries except Argentina (in which there are no significant differences) there is a public sector wage premium.

Overall, **labor market distortions introduced by public pay and employment policies have a cost to the economy in regard to efficiency, and they do not necessarily lead to a more equitable earnings distribution.** The latter depends on the relative strength of wage compression and the public wage premium itself.

Increasing returns and school quality

The previous analysis shows that labor market rigidities compress the wage distribution and thus tend to equalize the returns from schooling along the earnings distribution. These rigidities, and in particular the distortions caused by public sector policies, may be behind the observed pattern of

returns in low- and lower-middle-income East Asian and Pacific countries. However, even in the presence of strong distortions, increasing returns may still be observed because of the counterbalancing effect of other factors, such as school quality and, in particular, the sorting of individuals from different socioeconomic backgrounds into schools of different quality.

The quality of education, as measured by learning achievement, can have a labor market return independent from that of the quantity of education, but it can also affect the return or productivity of each year of schooling. To the extent that learning achievement is affected by schooling, low quality of schooling would tend to translate into low returns from schooling. Glewwe (2002) reviews the scant literature in developing countries on the link between earnings and learning achievement, controlling for years of schooling and ability. He finds that in all cases basic cognitive skills in math and reading have a direct effect on earnings and that, in most cases, this effect is larger than that of years of schooling. Furthermore, the estimated return from schooling is reduced once learning achievement is accounted for.[22] However, none of these papers models explicitly the contribution of schooling to learning achievement and, thus, the potential effect of schooling on earnings through learning. Behrman et al. (2005) find for Guatemala that schooling has a substantial impact on adult reading comprehension cognitive skills (but not adult nonverbal cognitive skills).[23] This microevidence is also consistent with macroevidence by Hanushek and Kimko (2000) and Barro (2001), who show that education quality, as measured by TIMSS test scores in mathematics and science, has a consistently strong influence on economic growth. Hanushek and Kimko also show that these quality differences are related to schooling.

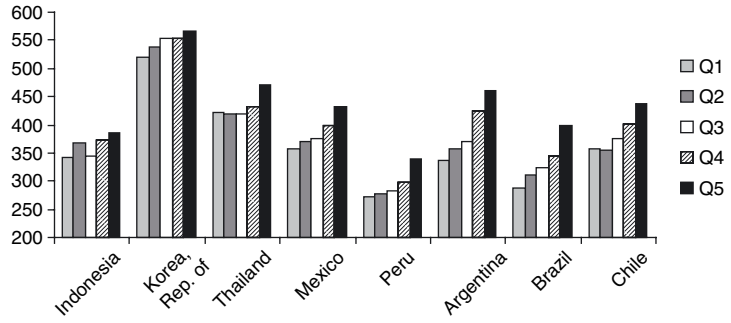
Thus the available micro- and macroevidence show that there are significant economic returns to learning achievement and that schooling is a key contributor to it. Countries with good-quality schooling are expected to have high returns from the quantity of education. Within countries, individuals or groups with low-quality schooling are expected to command lower returns from the years spent in school. Thus the sorting of individuals from different socioeconomic backgrounds into schools of different quality, in which poor individuals attend schools of lower quality than those attended by rich individuals, would tend to generate increasing returns with earnings. Below we investigate this issue in the context of Latin American and Caribbean and East Asian and Pacific countries. Ideally, we would investigate this hypothesis directly by using schooling, learning achievement, and labor information for each individual.

However, none of the household surveys used for the analysis of heterogeneity of returns has information on the schools attended by individuals or their learning achievement.

Instead we use data from internationally comparable student achievement tests to study whether the school quality hypothesis is consistent with the observed pattern of returns. We use data from PISA and TIMSS, but focus on the former because it attempts to assess young people's readiness for work.[24] As seen in chapter 1, PISA provides a comparable measure of reading, mathematics, and science achievement for nationally representative samples of 15-year-old students. The results reported below are based on PISA 2000 because it includes more of the Latin American and Caribbean and East Asian and Pacific countries.[25] Figure 2.4 shows the performance in mathematics of individuals from different wealth quintiles.[26] The wealth variable is based on an index of several household asset-ownership and housing conditions variables.[27] **There are statistically significant differences in test scores across wealth quintiles in all countries**. Individuals from wealthier households perform better than individuals from poorer households. **The inequality in test scores by wealth is larger in Latin America and the Caribbean countries than in East Asia and the Pacific countries**.

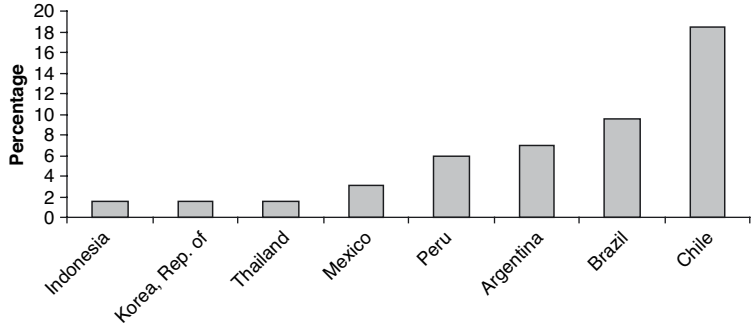
Figure 2.5 shows the percentage of variation in math test scores explained by differences in wealth. **Although wealth accounts for a modest share of the total variation in math test scores overall, this share is significantly higher in Latin America and the Caribbean countries than in East Asia and the Pacific countries,** with wealth inequality in test scores being the smallest in Indonesia and the largest in Chile. Using parental

Figure 2.4. Average Math Performance by Wealth



Source: PISA 2000.
Note: Q1 refers to the poorest quintile; Q5 refers to the richest quintile.

Figure 2.5. Ranking of Countries according to Variance in Math Scores Explained by Wealth

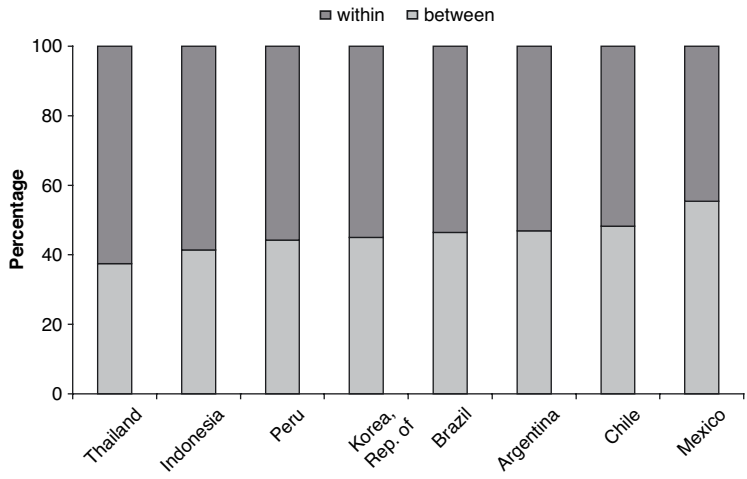


Source: PISA 2000.

occupation as an alternative proxy for household socioeconomic background yields the same basic conclusion.

The second piece of the analysis is to show the variation in test scores across schools. Figure 2.6 shows that **the school that students attend makes a difference to their performance in all countries, but its importance is greater in Latin America and the Caribbean countries than in East Asia and the Pacific countries,** with Mexico having the greatest

Figure 2.6. Between- and Within-School Variation in Math Scores



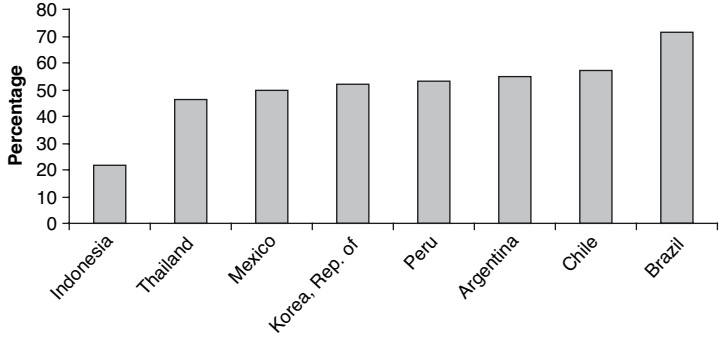
Source: PISA 2000.

inequality in test scores across schools. The same conclusion also holds in absolute terms; that is, East Asia and the Pacific countries have significantly lower between-school variation (smaller total variation in test scores for that matter) than Latin America and the Caribbean countries. In fact, East Asia and the Pacific countries are well below the average between-school variation for OECD countries, whereas Latin America and the Caribbean countries, particularly Chile, Peru, and Argentina, are well above the OECD average.[28] Thus overall there is significantly more inequality in test scores across schools in Latin America and the Caribbean countries than in East Asia and the Pacific countries.

The next question is how much of the between-school variation is explained by socioeconomic background, as proxied by household wealth. Figure 2.7 shows that overall **most of the difference in math test scores across schools is explained by differences in socioeconomic background of the individuals attending these schools**. Furthermore, **in Latin America and the Caribbean countries there is significantly more sorting of students from different socioeconomic background across schools than in East Asia and the Pacific countries** (confirming the findings of chapter 1). Brazil and Chile have the most inequality, whereas Indonesia has the least inequality. The percentage of within-school variation explained by household wealth is very small in all countries, but here again Latin America and the Caribbean countries show more inequality than East Asia and the Pacific with the exception of Mexico.[29]

The increasing pattern of returns observed in Argentina, Chile, Mexico and, particularly, Brazil, can be explained in part by the fact that the poor in these countries are likely to attend schools that are of lower

Figure 2.7. Percentage of Between-School Variation in Math Scores Explained by Wealth

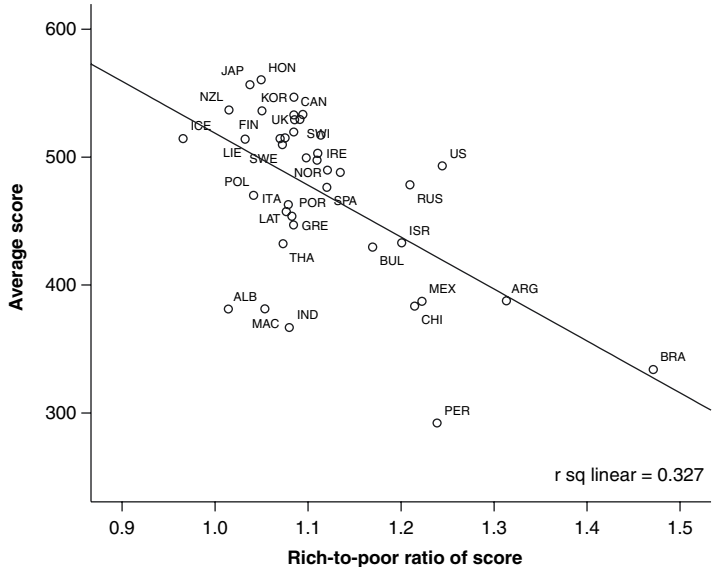


Source: PISA 2000.

quality than the schools attended by wealthier individuals. However, more work needs to be done to corroborate the preliminary and indirect evidence presented here. **This finding provides an additional explanation for the differences in educational attainment across individuals from different socioeconomic backgrounds.** In particular, these differences are not only due to differences in access to schooling but also to **inequity in access to quality schooling,** because low-quality schooling provides little incentive to continue in school. **The policy implication of this finding is that it will be necessary to improve the quality of the schools the poor attend, in particular in Latin America, through additional investment, by compensating for household disadvantage and/or allowing school choice.**

The fact that high-ability individuals or individuals with more quality schooling are paid more for the same level of education is justified from an efficiency standpoint. However, beyond equity considerations, and in the spirit of the *World Development Report 2006* (World Bank 2005a), the sorting of individuals across schools according to socioeconomic status can also be costly in regard to efficiency. To address that point, the relationship between average test scores and inequality is examined; inequality is measured by the ratio of the average score of individuals in the richest wealth

Figure 2.8. Performance and Inequality in PISA Scores (math)



Source: PISA 2000.

quintile to that of those in the poorest quintile. Figure 2.8 shows that there is a significant negative relationship between average performance and inequality, that is, countries with more inequality in test scores tend to have lower average test scores. Given the significant relationship between average test scores and productivity, the negative relationship between average test scores and inequality implies an efficiency loss.

Uncertainty about future returns to education

Young individuals make education decisions on the basis of their expected future gains in the labor market. The existence of ex post labor market returns to education that vary across individuals does not mean that young people form ex ante expectations about them when making education choices. Models that allow for individuals to select ex ante upon expected net gains (Heckman et al. 1999) have only recently started to be applied to the analysis of returns from college education.[30] In all cases there is significant heterogeneity in returns whereby returns are higher for higher-ability individuals, indicating complementarity between education and ability. Also, individuals select the level of schooling with the highest expected net gain to them in regard to earnings. Aakvik et al. (2003) find the sorting effect to be stronger for college attendance than for upper secondary attendance. Results for Indonesia (Carneiro and Ridao-Cano 2005) show strong selection into upper secondary school on the basis of expected net gains comparative advantage.

From an efficiency standpoint, the more sorting there is according to net gains, the better. Expected economic returns are, however, just one of the factors affecting schooling decisions.[31] Fleisher et al. (2004) find that the importance of comparative advantage in explaining college attendance diminished in China between 1988 and 2002, which they attribute to the combined effect of the privatization of higher education and the elimination of admissions tests.

However, young individuals face a great deal of uncertainty about future returns to education, particularly the poor, which has an impact on education decisions. Uncertainty prevents individuals from selecting education according to comparative advantage, thus generating inefficiencies. Also uncertainty coupled with risk aversion leads to underinvestment in education.[32] Cunha et al. (2005) distinguish between ex post heterogeneity in returns from college that individuals select ex ante from that

unanticipated at the time the college attendance decision is made. Applying a similar methodology to Indonesian data, Carneiro and Ridao-Cano (2005) show that there is considerable uncertainty about future returns from upper secondary education and higher (26 percent).[33] Furthermore, they show that individuals from poor families face more uncertainty (41 percent) than those from richer households (24 percent). Overall 11 percent of people would change their education choices under full certainty—13 percent of the poor and 10 percent of the nonpoor. The poor tend to underinvest in education more than do the rich as a result of uncertainty.

The evidence of uncertainty and its impact have important policy implications in regard to information, demand-side financing, and mentoring. Policies that provide individuals with information about labor market opportunities and payoffs associated with different levels of education can have potentially significant efficiency gains. Information would also increase the demand for education among those individuals who underinvested in education because of uncertainty.[34] The fact that the poor are not more responsive to having certainty about future returns, despite facing a great deal of uncertainty, indicates that costs are playing an important role in determining access to postcompulsory education in Indonesia.[35] This includes pecuniary costs (both direct and indirect) as well as nonpecuniary costs or noncognitive skills such as low aspirations. Thus the policies needed for (mainly) poor people that would go to upper secondary under full certainty, or would not go to upper secondary even when it is profitable for them, would include some combination of grants and income-contingent loans (ICLs), mentoring to raise noncognitive skills, and information.[36]

Information on Schools for Better Choices and Accountability

In addition to expectations about future returns to education, secondary education decisions are based on private information about the supply and quality of secondary education opportunities available to young individuals and an understanding of how these translate into education outcomes. Information will be important not only for its direct impact on the demand for schooling but also because it can make schools and teachers more accountable and young individuals more able to influence school quality. Improved school quality will in turn translate into higher demand for schooling.

Information on learning options can have a real impact on choices, particularly for the poor. There are very few information programs around

the world. The U.K. program Aimhigher addresses the underrepresentation of students from disadvantaged backgrounds in higher education by targeting 13- to 19-year-olds from disadvantaged backgrounds and raising their awareness and understanding of higher education opportunities well in advance.[37] The latter is done through information on higher education posted on a Web portal,[38] mentoring, and visits to higher-education institutions. Mentoring aims at raising aspirations and is key to making information effective. An initial evaluation of the program shows a positive effect on promotion rates and test performance and mixed results on intentions to seek higher education.[39] This program, as well as others (see box 2.1), reflect the fact that young people, particularly the disadvantaged, face multiple constraints, and thus policies must address their needs in an integrated manner. More evidence-based research is needed on information-based systems and youth participatory schemes.

Box 2.1

Integrated Approaches to Addressing Multiple Constraints Faced by Youth

Because adequate decision-making skills, information, and financial resources are likely to be complementary, when they are lacking policies that integrate information, mentoring, and financial incentives are required. There are some examples in developed countries of evaluated programs that combine, to varying degrees, all of the above plus academic support and are targeted to disadvantaged youth in secondary school to help them go to college and succeed. One example is the already mentioned Aimhigher Program in the United Kingdom, which combines information with academic support, mentoring, and financial support.

Similarly, Philadelphia Futures Sponsor-A-Scholar (SAS) Program provides students from Philadelphia public high schools with long-term mentoring (through high school and for one year after that), academic support, help with college application and financial-aid procedures, and financial support for college. Individually matched mentors monitor student progress and provide encouragement and support. The program is found to have significant positive effects on high school test scores and college attendance. The Upper Bound Program, a federal program in the United States that does not provide financial assistance, focuses more on academic support in preparing for college entrance exams and instruction in subjects that are necessary for success in college, counseling and mentoring,

(*Continued*)

information on postsecondary education opportunities, and assistance in completing college entrance and financial aid applications. A randomized evaluation of the program shows limited overall effects on high school and college performance, but significant effects for those coming to the program with lower educational expectations and for academically high-risk individuals. Results also show that the benefits of the program are larger the longer the exposure.

School-based career guidance services—which comprise information about education and job market opportunities, guidance, and counseling—are designed to help students make better education and career choices by providing them with the necessary information and skills. A review of the limited evidence on these programs in developed countries found positive effects on career decision making, maturity, and self-efficacy. Although these services are in their infancy, some middle-income and transitional economies are introducing them. A recent study examines the experiences of Chile, the Philippines, Poland, Romania, Russia, South Africa, and Turkey.

In all seven of these countries the most common type of career guidance is provided by guidance counselors who have a broad mandate but focus on guidance for students' learning and behavioral problems. In most cases the official allocation of counselors to students is very low (e.g., 1:500 in the Philippines, 1:800 in Romania). In most cases, guidance counselors receive limited support from psychopedagogical centers. In most cases guidance counselors do not deal with education and career choices. Separate career counselors were introduced in Poland in 2003, although it is not obligatory for schools. Alongside guidance counselors, most countries also have a system of classroom guidance teachers. Under this system most teachers also have the responsibility for the general educational development and social well-being of students. In Turkey attention is given to guidance skills in initial teacher training and subsequent teacher support, and specific time during the week is allocated to class guidance. Other countries, such as Russia, have included career education in the curriculum. In South Africa, career education has been integrated into a course called "life orientation," which also covers personal development, study skills, citizenship, and physical education. There is little career information available to counselors (or schools) in most of the countries.

Sources: Watts and Fretwell 2004; Carneiro and Heckman 2002.

Information is also a key building block of accountability for performance. A key constraint for improving the quality of secondary education is the way the production of schooling is organized and, in particular, the

lack of accountability for performance. The *2004 World Development Report* (World Bank 2004a) shows that additional public spending on education, even if it is on the right school inputs, will not improve learning unless education providers are motivated to implement and capable of implementing the required actions. Systemic reform involves setting up objectives relating to performance rather than inputs and giving education providers sufficient autonomy to manage for results while making them accountable for the results. Schools and teachers also need adequate financing to manage for results. Accountability is based on adequate information. **Adequate information about schools and teachers allows individuals to monitor their performance and influence school quality.** Accountability for performance requires the autonomy to act. Autonomy allows public schools to compete with each other and with private schools, and it is thus necessary for school choice to work. However, choice without reliable information is not a happy recipe.

It is argued that information on school performance provides a useful and easily understood management tool to stimulate the involvement of students and other relevant stakeholders in school matters, to stimulate school choice and competition between schools for students, and to motivate education reform at all levels. There are convincing arguments for centralizing the function of creating and disseminating information.[40] However, simply providing information may have limited impact if decision makers do not know how to use this information effectively.[41] Another potential problem is the difficulty of measuring the added value of schools in student learning and the risk that the use of partial measures may lead to perverse effects such as teaching to the test and increased sorting by ability and socioeconomic status.[42]

However, **the use of and evidence about information-based systems in developing countries are very limited**.[43] Thus our knowledge is limited concerning how to collect and disseminate information to best attain the objectives of stimulating demand for good quality education and motivating education reform. In a developing country context, in which young individuals and their parents often have little information about the performance of schools around them and in which they have traditionally had little participation in school decisions, well-executed information programs can provide a potentially powerful instrument to increase demand for good-quality secondary education.

A few countries have census-based student assessment systems in which testing results are publicly reported for each school (e.g., Chile).[44] In East Asia and the Pacific, report cards are about to be introduced in

primary schools as part of the bank-funded Education Sector Support Project in Cambodia. An interesting example in which information on system performance is collected at the national level and then disseminated is the Education Reform Project for Latin America (PREAL). The main goal of PREAL is to monitor and publicize education performance through concise, reliable, and current information.

An interesting accountability example comes from Mexico, a country in which there is limited information flow at the national level so far. However, the 1992 decentralization gave states the power to control the education system. One state is especially interesting. Ten years ago the state of Colima, located on the western coast, had among the worst results. With political will and important innovations—such as selecting 50 percent of teachers through competitive exams; school autonomy; further decentralization to the municipal level; and a state-level, universal assessment system that disseminates results—Colima reached the top of the national assessments in PISA 2003.[45]

Many developing countries are now conducting their own national studies of student achievement. National assessment systems are already in place in Thailand, the Philippines, Indonesia, and Singapore and are being developed in most other East Asian and Pacific countries, including Mongolia, Cambodia, and Lao PDR. Contrary to Latin America and the Caribbean's experience with Laboratorio, there are no regional assessment initiatives except the Pacific Islands Literacy Levels Test. Although these systems may serve as useful management tools, public access to them is limited at best. Only Mexico and Uruguay have produced national reports based on the results of the PISA study. Jordan provides a good example of the way information from TIMSS can be used to improve the performance of the system.

Finally, the other key and interrelated building block of accountability is the participation of youth and other relevant stakeholders in school governance structures. Chapter 1 reviewed some evidence on participation in East Asian and Pacific and Latin American and Caribbean countries, finding an increasing role for school boards, composed largely of school community members. The role of the boards is, however, still limited in some decision-making areas, and students themselves are rarely well represented. **Generally, in fact, the participation of students is very limited and in forms that do not stimulate substantial organizational change**.[46] Involving young people in decision making about schools may provide them with such practice, which could affect their interest and ability as young people and later in life to ensure the accountability of public institutions. It is important, however, to provide them with clear

and effective institutional mechanisms to lobby for a better education. Several studies suggest that providing youth with a voice in schools improves outcomes.[47] The Student Representative Council (SRC) plays an important role in making the South African education system one of the most innovative in the developing world. Many important South African political leaders were involved in the council as students and, thus, may have gained valuable political experience.[48]

Incentives to Alleviate Credit Constraints

Another type of constraint young people face is insufficient resources to finance education investments. In making education decisions, young people and their families face a budget constraint reflecting prices of school-related inputs and young people's schooling time in relation to forgone income and resources. Resources matter only to the extent that individuals and their families face imperfect credit markets that prevent them from borrowing against future income. This section explores the association between income and school progress, examines the extent to which this association reflects credit constraints versus long-term factors that affect school readiness, and draws policy implications. This section also provides a framework for thinking about demand-side financing mechanisms to address liquidity constraints in secondary education and reviews the experiences in the countries of Latin America and the Caribbean and East Asia and the Pacific.

The role of credit constraints

Figure 1.18 in chapter 1 shows completion rates from grade 1 by income quintile for countries of East Asia and the Pacific and Latin America and the Caribbean. In all cases, the most important attrition point in the system is the transition to lower secondary school, followed by the transition to upper secondary school. Differences in school progress by income quintile are significant in all countries except Thailand. In all countries except Indonesia these differences first appear in primary school. However in all cases, the differences by income quintile are accentuated in the transition to lower secondary school and the transition to upper secondary school. **These results indicate that there is a strong relationship between school progress and household income, particularly in the transitions to lower and upper secondary school.**

The question is whether this relationship is evidence for credit constraints to finance education investments in secondary school. The answer is, not necessarily or at least not entirely. There are a variety of competing factors

that are correlated with income and can explain the observed differences in school progress, including inequality in access to physical facilities. To the extent that the poor tend to live disproportionally in rural areas and the rich in urban areas, the rural-urban divide offers a good way of looking at this competing explanation. That would pick up differences in school availability as well as differences in school quality. When comparing the figures on school progress by residence from chapter 1 and those by income quintile (figure 1.18), we see that the urban-rural gap in secondary school availability explains, at least in part, the observed association between access to secondary school and household income. The income gap tends to be stronger in Latin American countries, especially Colombia, Mexico, and Guatemala.

Beyond inequality in access to physical facilities, the poor and the rich differ in school readiness. The poor are apt to attend schools of poorer quality than those attended by the rich. The quality of school affects the motivation for continuing in school but also the readiness for subsequent higher levels of education. Readiness is more generally determined by long-term factors that are associated with income at a given point in time. Families with high income in the adolescent years are more likely to have high income throughout the young person's formative years, which is in turn associated with higher quality of schooling and a better environment for skills formation. Most of the association between income and college attendance in the United States is due to long-term factors that affect readiness for college by increasing cognitive and noncognitive skills, rather than short-run liquidity constraints at the time the college decision is made.[49] Only about 8 percent of the total U.S. population is credit constrained in the short run.[50] The policy implication is to shift the focus away from tuition subsidies and concentrate more on preparing individuals for college through learning investments beginning at an early age.

Although the evidence is limited, the role of credit constraints in schooling is likely to be more important in developing countries because credit markets are less developed and direct financial support for schooling is often much more limited.[51] Many studies look at the relationship between income and schooling.[52] There are, however, a few studies looking explicitly at the role of credit constraints on the demand for education.[53] Jacobi and Skoufias (2002) find some evidence that liquidity constraints play a role in determining college attendance in Mexico, although the magnitude of the effect is small. Sawada and Lokshin (2001) find evidence of credit constraints for rural Pakistan, and these are more significant in explaining secondary school completion and postsecondary school attendance than secondary school entry. In all these cases, credit constraints are identified without direct information on them. Flug et al. (1998) use cross-country and panel regressions

to show that economic volatility and the lack of financial markets had a negative effect on average secondary enrollment in the 1970–72 period.

Another way of looking at the potential role of credit constraints is to examine the extent to which secondary education costs represent a burden for households, particularly poor households. Education costs include direct costs (tuition, school supplies, transportation, etc.) as well as the cost of young people's schooling time in relation to forgone income. The next section shows that opportunity costs are potentially high among the poor. Table 2.4 shows, for a small sample of countries,[54] that **overall direct costs of education, and secondary schooling in particular, do not represent a significant burden for average households, but can represent an important burden for poor households**, as in Bolivia and Mexico. Evidence of high burden for the poor also exists for some Central American countries (World Bank 2005c).

Although not much is known about the role of credit constraints vis-à-vis long-term factors in schooling, many young people are likely to face credit constraints in gaining access to secondary and higher education. This justifies the need for policies to alleviate that constraint. The first

Table 2.4. Share of Education Costs from Total per Capita Household Expenditures (%)

	Average	*Urban*	*Rural*	*Richest*	*Poorest*
Bolivia (2002)	6.91%	6.57%	8.99%	5.85%	14.10%
Primary	6.74%	6.22%	8.51%	5.24%	13.48%
Secondary	8.11%	7.40%	13.37%	6.14%	22.66%
Tertiary	7.09%	7.04%	8.93%	6.53%	23.28%
Mexico (2002)	6.48%	5.97%	6.64%	2.82%	8.71%
Primary	8.66%	9.17%	7.48%	4.10%	12.10%
Secondary	5.79%	4.72%	6.11%	2.53%	7.61%
Tertiary	2.06%	0.68%	2.21%	2.91%	0.32%
Cambodia (2004)	10.23%	16.42%	6.96%	13.79%	4.13%
Primary	4.04%	6.67%	3.28%	4.44%	3.48%
Secondary	13.25%	14.91%	11.68%	13.59%	9.50%
Tertiary	51.41%	47.12%	66.54%	50.25%	108.50%
Indonesia (2003)	2.58%	2.94%	2.23%	3.48%	1.08%
Primary	—	—	—	—	—
Secondary	—	—	—	—	—
Tertiary	—	—	—	—	—
Thailand (2002)	1.89%	2.56%	1.57%	2.98%	1.33%
Primary	—	—	—	—	—
Secondary	—	—	—	—	—
Tertiary	—	—	—	—	—

Sources: Mexico (ENIGH 2002), Bolivia (MECOVI 2002), Cambodia (Socioeconomic Household Survey 2004), Indonesia (Susenas 2003), Thailand (Socioeconomic Survey 2002).
—. Not available.

task is to identify the target group. The second task is to design the package of demand-side financing mechanisms for lower and upper secondary education and tertiary education using the following principles: externalities, uncertainty, induced behavior, equity, unit costs and fiscal capacity, and implementation capacity. In designing this package, it is important to think of the education system as a whole to avoid imbalances and bottlenecks. For example, the success of programs such as Oportunidades in Mexico and Bolsa Familia in Brazil poses serious challenges to the postcompulsory system. It is thus necessary to put the appropriate policies in place in anticipation of the increasing number of credit-constrained individuals completing basic education and willing to study further. Likewise, there is a need to address quality issues while expanding access through grants. In Mexico, many of the new students entering lower secondary are not well prepared and are entering poorly performing schools, especially rural television schools (telesecundarias) (World Bank 2005b).

Policies to alleviate credit constraints

Credit constraints on the demand for education can be addressed through targeted grants (e.g., scholarships, CCTs, vouchers) at the lower secondary level, given the externalities associated with basic education, and a combination of well-targeted grants, loans, and savings schemes at the upper secondary and tertiary levels, given the higher ratio of private to social benefits, as well as the combination of higher unit costs and fiscal constraints (see table 2.5). Even when lower secondary education is free of school fees, there are other important direct and indirect private costs that students and their families must incur, making the case for targeted grants to the poor. Scholarships and CCTs are grants given to students or their families toward schooling-related costs,[55] and vouchers are direct payments to students to enroll in the school of their choice.[56]

Well-designed loan schemes, coupled with targeted grants to the poor, can be used to generate the resources needed to expand postcompulsory education, while ensuring equitable access. Whenever affordable, grants are likely to be more appropriate for upper secondary education than for higher education.[57] Because grants at the postcompulsory education level do not serve a poverty alleviation goal as much, they should be more finely targeted to improve cost-effectiveness by selecting among the poor those who are more likely to benefit from the grant.[58] The higher cost of tertiary education makes student loans particularly useful at that

Table 2.5. Possible Demand-Side Policy Instruments to Alleviate Constraints

Main problem/goal	*Solution*	*Evidence*	*Needs*
Credit/liquidity constraint	CCTs targeted at lower secondary; loans/savings schemes/incentives (with fees for wealthy) at upper secondary	Strong	*Supply of schools*
Poor quality	Vouchers, choice, Public Private Partnerships (PPPs); along with fee paying private sector	Limited, generally positive	*Private school supply*
Continue enrollment /further schooling	Enrollment incentives; savings schemes	Limited	*Individual accounts; or tack on to existing programs (such as Oportunidades)*
Combinations:			
Liquidity/limited public funds	CCTs and loans (or savings schemes)	Very limited	*Capacity; schools; financial instruments*
Liquidity/limited funds/poor quality	*Early savings schemes (subsidized for poor, a la UK baby bonds); concession schools (Bogota); top up vouchers*	*Very limited; Bogota evaluation positive;* limited	*Capacity; schools; financial instruments; etc.*

Source: Authors' elaboration.

level. However, loans are also applicable, and do in fact exist, at the upper secondary level (e.g., Mexican state of Sonora).

A number of features make income-contingent loans (ICLs) superior to conventional loans, both in theory and in practice. ICLs assist macroeconomic stability by generating the needed resources in the face of limited fiscal capacity. By deferring payments until individuals start working and reach a certain level of income, ICLs have lower default rates, promote more equitable access and loan repayment, and promote efficiency by addressing uncertainty about future earnings and facilitating consumption smoothing. Generally, administration is simpler and cheaper under such schemes because loan recovery is handled through existing collection mechanisms. However, the challenges of implementing ICLs cannot be underestimated, which is why successful income-contingent schemes in advanced economies (e.g., Australia, New Zealand, the Netherlands, Sweden, and the United Kingdom) are not echoed in developing countries. ICLs are promising financing mechanisms for middle-income countries with developed financial markets and good systems of reporting and identifying income.[59]

Chile introduced an ICL scheme in 1994 to replace the previous fixed-payment loan system. The system has not been considered successful because of the small amount of funds and low levels of cost recovery (about 60 percent), which Palacios (2004) attributes to the fact that universities are responsible for collecting repayments. Thailand plans to introduce an income-contingent loan system in 2006, an important experiment whose success will depend greatly on the effectiveness of income tax collection. Designing a repayment mechanism that can be implemented cost-effectively in poorer countries should be at the top of policy makers' agenda.[60]

The relatively easy implementation and attractive features—induced savings, consumption smoothing, and low public burden—make individual learning accounts (ILAs) a promising financing option for middle-income countries. ILAs try to encourage savings for education and at the same time provide vouchers to individuals interested in pursuing further education. The amount to which an individual is entitled to in an ILA depends on the amount saved and on the particular kind of training. ILAs are becoming popular in Europe and throughout the OECD. There are also two relevant experiences from Latin America and the Caribbean. In Brazil, a graduation incentive for primary and secondary education, PoupanÁa Escola, was introduced as part of the first version of Bolsa Escola in the Federal District.[61] Oportunidades in Mexico introduced Jovenes con Oportunidades, which rewards scholarship recipients for staying in school, and upon graduation the beneficiaries may use their credits to finance further study. Oportunidades beneficiaries accumulate credits from the third year of lower secondary until the last year of upper secondary. The points that are accumulated are converted into a savings account and deposited into individual accounts in the National Savings Bank. Beneficiaries can obtain the funds only if they complete upper secondary before becoming 22 years of age.[62]

Incentives to Address Competing Options

The last constraint is directly linked with credit constraints, but it is analyzed here separately because it refers specifically to the availability of competing options. Compared with children in primary school, young people in secondary school confront a greater range of potential schooling choices (general versus vocational, public versus private) as well as opportunities outside education (work). The choices among these

different alternatives are constrained by relative prices and resources. In regard to choices competing with schooling, work can potentially prevent individuals from going into secondary school or prevent them from completing it (or limiting the knowledge acquired through education). This section first describes the interplay between school and work, then reviews some recent literature relating work to schooling, and concludes with a review of the evidence from programs that alter the relative price of schooling (e.g., CCT). It also reviews the evidence on school vouchers, which reduce the relative price of the first-best school option (in regard to quality) to the second-best option.

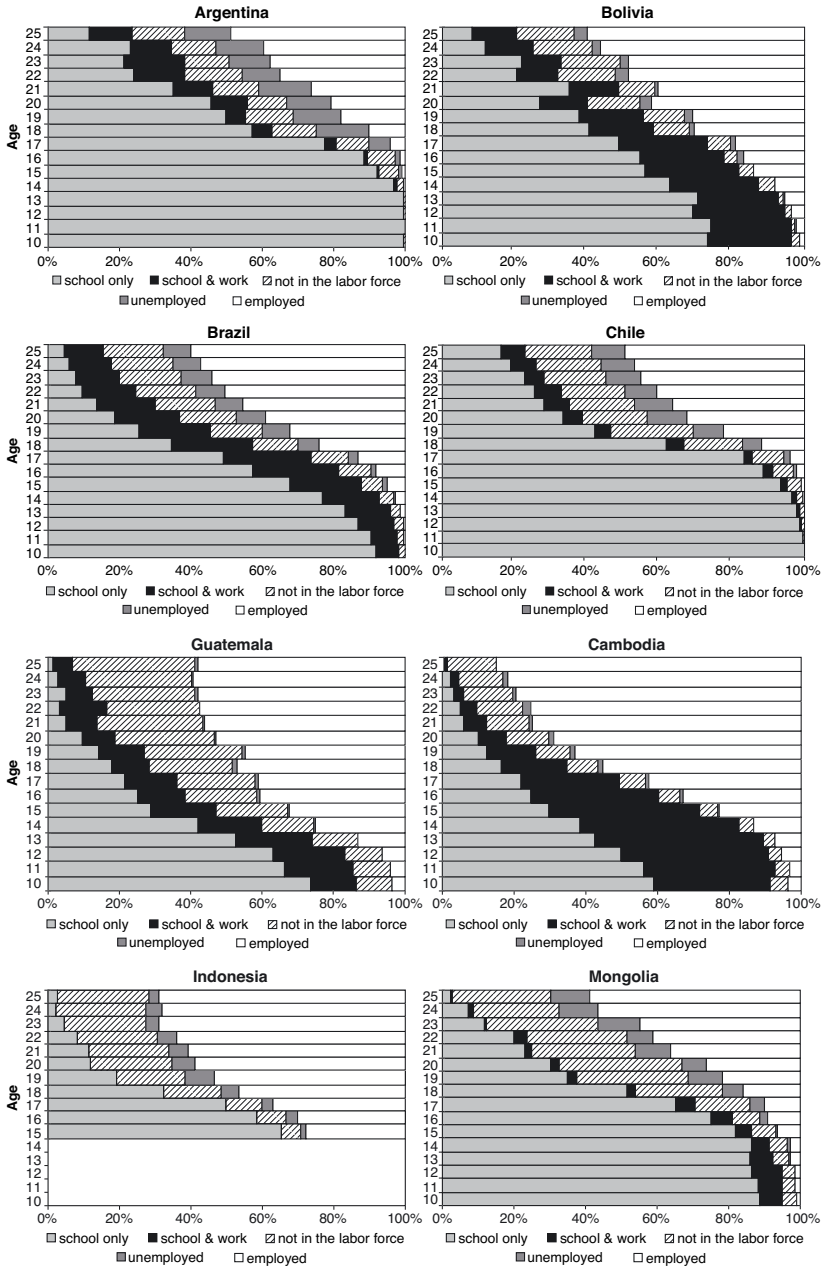
Incentives to alter the choice between school and work

The focus of this section is on work that impedes entering or completing secondary education. Work can compete with schooling directly by precluding school attendance and indirectly, when work is combined with schooling, by reducing the time available for school-related activities and by reducing school performance as a result of physical or mental exhaustion. As noted earlier, the total cost of schooling includes direct costs as well as the cost of young people's schooling time in relation to forgone income or product from work. The latter are known with certainty whereas future returns to schooling and the effects of work on schooling and earning are subject to a great deal of uncertainty, so young people tend to discount the latter relative to the former.

The analysis of the interplay between school and work is conducted using household survey data from countries of Latin America and the Caribbean and East Asia and the Pacific. Individuals are divided into 5 mutually exclusive categories: school only, school and work, work only, unemployed, and out of the labor force. The activity pattern is examined for ages 10 to 25 for the total population, as well as by gender and income quintile. Work is defined as "having been engaged in productive activities for at least 1 hour during the reference week."[63] Figure 2.10 shows the pattern of school and work activities by age for the total population. The discussions below focus on 10- to 17-year-olds because typically that age range covers lower and upper secondary education.[64]

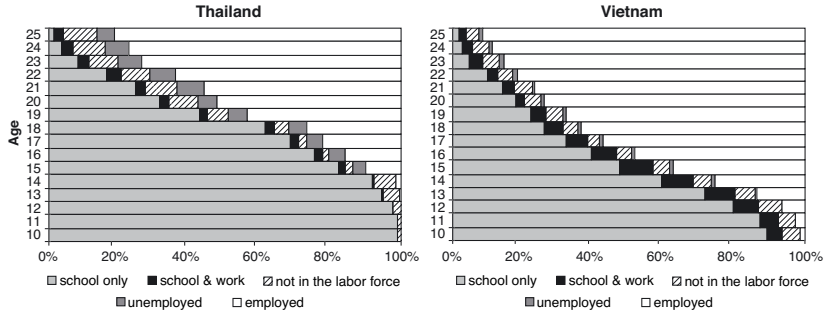
In low- and lower-middle-income countries work participation among secondary-school-age people is sizable, although the largest group of children is composed of those who attend school exclusively. **The age pattern of work participation,** whether combined with school or not, **is negatively related with the age pattern of school participation.** In particular, although the percentage of working children is 2 percent in Argentina

Figure 2.9. Relationship between School and Work



(*Continued*)

Figure 2.9. *(Continued)*



Source: Household Surveys.

and Chile, this proportion reaches more than 30 percent in Bolivia, Guatemala, Vietnam, and Indonesia, and an astonishing 54 percent in Cambodia.[65] Among 10- to 17-year-olds in low-income and lower-middle-income countries such as Cambodia, Guatemala, and Bolivia work is pervasive (36 percent of 10-year-olds in Cambodia are engaged in productive activities). The situation has been improving over time, however. Young people stay in school longer and join the labor force later.

Most working children are able to combine work responsibilities with schooling. **The combination of school and work responsibilities is common among low-income and lower-middle-income countries of both regions,** although it is more common in Latin America and the Caribbean countries. Thus school and work are not necessarily mutually exclusive in those countries. In Latin America and the Caribbean, Bolivia has 24 percent of its 10- to 17-year-olds combining school and work and only 7 percent working exclusively, and in Guatemala the split is more or less equal (17 percent combining school and work and 20 percent working only). In Cambodia, 39 percent of 10- to 17-year-olds work while attending school, and 15 percent are engaged in productive activities only; in Vietnam most working children are out of school.

The extent to which working children are able to combine work with school depends on household demand factors (e.g., poverty), job opportunities for children, as well as the institutional differences in education systems (e.g., length of the school day, timing of classes during the day, etc.) In all cases, **working students become a less important group with age relative to those who work exclusively**. The figures also show that being out of school does not equate to labor force participation; there is a sizable group of individuals who report being out of the labor force.[66]

Results by income quintile show that **work among 10- to 17-year-olds is partly explained by poverty**. Except for Argentina and Cambodia, all other countries show significant differences in activity patterns by income quintile. In particular, in all countries the proportion attending school only is significantly smaller among individuals from the poorest income quintile than it is among those from the richest quintile. In Bolivia and Mongolia, this difference is made up for by more poor individuals combining school and work, working exclusively, and being out of the labor force; in Brazil combining school and work and working exclusively make up the difference; in Vietnam working exclusively makes up the difference; and in Guatemala and Chile more are out of the labor force. By gender, girls are significantly less engaged in productive work than are boys in all countries except in Cambodia and Mongolia. However, evidence elsewhere shows girls are more likely to be engaged in domestic work.

The available evidence shows that working while in school has a negative impact on schooling. Despite the rapid acceleration of research on child labor and schooling in recent times, there is little evidence that relates child labor to schooling outcomes in developing countries.[67] Analysis of the impact of work on schooling outcomes presents a number of methodological challenges.[68] None of the papers in the literature for developing countries is able to address all of these challenges satisfactorily. In any case, most studies find a negative relationship between work and education outcomes.[69] For Vietnam, Beegle et al. (2004) find that for children ages 8 to 13 working while in school had a negative effect on school enrollment and education attainment five years later. For rural Bangladesh, Canals-Cerda and Ridao-Cano (2004) find that working while attending primary school has sizable negative effects on the transition to secondary school, and that starting to work while attending secondary school has even larger negative effects on secondary school completion. Gunnarsson et al. (2005) find sizable negative effects on both mathematics and language test scores among primary school students in 11 Latin American and Caribbean countries.[70]

Conditional cash transfer (CCT) programs offer a promising way to increase the demand for schooling both directly and by reducing the incidence of work. CCTs are incentive schemes that provide cash to poor, young individuals conditional on school attendance.[71] CCTs can

increase the demand for schooling directly by providing additional resources to poor individuals, as well as indirectly by compensating individuals for the forgone product from their work. CCTs started in the late 1990s, particularly in Latin America and the Caribbean countries, and are quickly becoming popular in Latin America and the Caribbean and East Asia and the Pacific.[72] **The initial wave of evaluations of these programs in Latin America and the Caribbean reveals significant effects on school enrollment.** The best documented in this family of programs is Oportunidades, which has been shown to increase secondary school attendance rates by 8.4 percent, transition to secondary school by nearly 20 percent, and grade attainment by 10 percent, with significantly larger effects for girls than for boys.[73] The impact on enrollment is due mainly to the conditionality on attendance.[74] CCTs can also serve as safety nets against shocks.[75] However, efficiency gains can be achieved through targeting and calibration of the grant.[76] Oportunidades is not inexpensive, but the net benefit is substantial.[77] Spotlight 2 on Mexico, at the end of this chapter, reviews this and other equity-enhancing policies applied in the country.

The scholarship program in Indonesia was found to have some success in protecting school enrollments, which did not change very much during the crisis (Ridao-Cano and Filmer 2004). The program had only a consistently significant (short run) impact on dropouts, school attendance, and enrollments at the junior secondary level, and no effect at the senior secondary level. In Cambodia, Filmer and Schady (2005) show that the scholarship program for girls in lower secondary school had large positive effects—approximately 60 percent of scholarships were given to girls entering lower secondary who would not have been enrolled in school in the absence of the program.

Part of the positive impact of CCTs on school enrollment comes from reductions in work, but CCTs alone do not appear to be enough for reducing work significantly.[78] The fact that CCTs do not reduce work significantly is important to the extent that policy makers are concerned about child labor per se, but also because child labor affects academic performance. In Oportunidades the decline in (productive) work participation for boys was roughly in balance with the rise in school enrollment, except among 16- to 17-year-olds for whom there was no effect on work participation.[79] However, conditional on enrollment the program did not have any significant effect on schooling time.[80] A substantial number of children continue to combine work and school under the program. For

girls, the effect on work participation was much lower than the effect on enrollment, and it came mainly out of domestic work time. Oportunidades helped protect enrollment, but did not refrain parents from increasing child work in response to shocks.[81] The evidence from the Program to Eradicate Child Labor (PETI) in rural Brazil suggests that after-school programs may be a good complement to the conditionality on school attendance.[82] Sparrow (2004) found that the scholarship program in Indonesia had a significant effect on work participation that was even larger than the effect on enrollment.

A promising formula to keep working children in school is to introduce some flexibility in the schedule and location of instruction. Alternative models for secondary schooling, such as the Tutorial Learning System (SAT) in Colombia, are designed specifically to make schooling more compatible with work responsibilities. Students define the schedule, and instruction can occur in different places. Dropout rates are no different from formal schools, and average test scores in the national exam are higher than those of students in traditional schools in the same municipalities.[83] Further evidence on flexible secondary modalities can be found in chapter 4.

Changing the relative price of schooling options: School vouchers

School vouchers are designed to address both liquidity constraints and school quality issues by altering the relative price of different schooling options. School vouchers are publicly provided funds that students can use to enroll in the school or their choice.[84] Beyond the potential effect of vouchers on their beneficiaries, vouchers can increase competition among schools and thus increase the overall quality of the system. However, at least in the short run, vouchers can have a detrimental effect on the (lower-quality) schools that (high-performing) voucher recipients leave as a result of the voucher. Vouchers have been implemented in a few developing countries, including Chile and Colombia. The evaluation of Colombia's PACES program, which offered vouchers to poor individuals to attend private schools, provides robust evidence of the positive impact of vouchers on beneficiaries (see box 2.2). The evidence on the overall effects of vouchers is, however, still inconclusive. Hsieh and Urquiola (2003) find no evidence that the universal voucher scheme in Chile improved average educational outcomes.[85] More research is needed to provide a firmer assessment of the overall impact of school choice.

Box 2.2

Vouchers in Colombia—Programa de Ampliación de la Educación Secundaria (PACES)

Between 1991 and 1997 Colombia operated a targeted voucher program to increase secondary enrollments, particularly among the poor who could not find a spot in the public schools. Programa de Ampliación de la Educación Secundaria (PACES) intended to take advantage of the existing private schools' strong infrastructure and their ability to expand capacity quickly. The program sought to increase access at the secondary level, expand choices available to poor families, and improve equity (Calderón 1996). The voucher amounts were fixed at the average tuition fee observed across a number of regions, and the funds were paid out directly to schools. The Ministry of Education coordinated the program, and the Colombian Institute of Educational Credit (ICETEX) administered it. To lend credibility to the program and ease bureaucratic burdens, the banking sector (Banco Central Hipotecario), not ICETEX, handled payments, transferring funds to participating schools three times a year.

Under the rules of PACES, the central government covered 80 percent of the voucher costs, and the municipal governments covered the rest. Students seeking vouchers had to demonstrate eligibility and need to receive vouchers; if more students applied than the available voucher quota, a lottery allocated spots. Vouchers were renewed annually, and student eligibility was conditional on success. Participation in the program was voluntary but open only to municipalities that had more than 10,000 inhabitants and three or more private schools. Typically, municipalities that participated in the program were those with a strong private school tradition and a high demand for secondary education relative to the availability of public schooling (King et al. 1997). Only private schools were eligible to participate: students were not allowed to transfer from a public school to another one. The participating private schools had moderately set tuition levels—typically, the vouchers covered 85 percent to 90 percent of the cost of service delivery for these schools.

PACES lasted eight years, and by 1996 benefited more than 100,000 students annually (about 1 percent to 2 percent of total enrollments in secondary schools). The program was a success in increasing enrollments at relatively low costs. By 1995 PACES accounted for more than 10 percent of the increase in enrollment since 1991, and by 1997 the enrollment gains across municipalities varied between 3 percent and 30 percent of their 1991 levels. The vouchers cost $145

(*Continued*)

per pupil in 1995, at less than half of the per pupil cost in public schools (which was at $345). In addition, students who participated in the voucher program achieved higher levels of attainment—participants were 13 percent to 15 percent more likely to have completed eighth grade (Patrinos 2000). Angrist et al. (2002, 2004) show significant effects on school progress, work, and learning that persisted over the long run.

Despite its strong achievements, the program drew some criticism. First, the program led to the creation of some new (and mostly fly-by-night) secondary schools that provided low-quality schooling. Second, typically the payments to schools were late. Third, over time, increases in voucher amounts failed to keep up with the real increases in costs. Consequently, schools with relatively higher costs (which are also better schools) dropped out of the system. In addition, the involvement of ICETEX—an institution associated with controversial distribution of parliamentary grants—created unease among the private schools. Although PACES effectively targeted students from the second-lowest economic strata, it has been criticized for failing to increase enrollment among the poorest schoolchildren. This criticism has less to do with the implementation of PACES, but more with its original design, which limited the voucher program to larger, urban municipalities with existing private schools. The PACES Program was most successful in areas with an existing, strong private education tradition. In such areas, unit costs tended to be low, access capacity was readily available, and education quality was higher than or comparable to the public secondary schools.

Source: Yilmaz 2005.

Conclusion

The main findings and policy implications in this chapter relate to enhancing opportunities and enabling better education choices. Labor market returns to and demand for secondary education are high, but labor market distortions caused by the public sector tend to compress the wage distribution. Eliminating these distortions is a priority intervention, particularly in East Asia and the Pacific countries. In contrast to countries of East Asia and the Pacific, in most Latin American and Caribbean countries high-income individuals command significantly higher wages than low-income individuals with the same level of education. This pattern can be explained in part by the fact that the poor in Latin America and the Caribbean countries are likely to attend schools that are of lower quality than the schools attended by wealthier

individuals. Thus policies to increase access to quality secondary education for the poor are a priority, particularly in Latin America and the Caribbean countries.

Young people face a great deal of uncertainty about future returns to education investments, particularly the poor, with negative consequences on these investments. Policies such as school-based career counseling provide individuals with information about labor market opportunities and payoffs associated with different levels of education and can thus lead to better choices. Often, young individuals also lack information about secondary schools, which makes schools less accountable and young individuals less able to make good choices. Programs that provide information on education opportunities have a positive impact on school progress and performance. School report cards are a promising tool for making information on schools publicly available and thus improving accountability and choice, but other information-based systems are also available.

The lack of access to resources to finance education investments is not the only, nor necessarily the main, reason that poor individuals fail to go to secondary education, but it is an important factor. Credit constraints are best addressed by a combination of targeted grants at the lower secondary level and a combination of well-targeted grants, loans, and savings schemes at the upper secondary level. In lower- and lower-middle-income countries, work participation among secondary-school-age people is sizable, as is the combination of school and work (particularly in Latin America and the Caribbean), and has negative consequences on schooling. CCT programs are effective schemes to raise the demand for schooling. However, although part of the effect on school participation comes from reductions in work, CCTs alone do not appear to be enough for reducing work significantly. Flexible modalities, if well designed, can be effective strategies for combining work and schooling. School vouchers have a positive impact on beneficiaries, but the evidence on their overall effect is still inconclusive. Young individuals are likely to suffer from multiple constraints, and thus integrated policies—including information, financial resources, and mentoring—are needed.

Notes

1. The logarithm of hourly wages is modeled as a linear function of years of education and experience and the square of experience.
2. See, for example, Griliches (1977) and Card (2001).

3. The main criticism is the bias in the estimated returns arising from the inability of the standard model to control for factors such as schooling quality and unobserved ability and motivation, which affect both earning and education, as well as the "selection" into different levels of schooling on the basis of unobservable gains to schooling in the labor market.
4. It is beyond the scope of this chapter to address these potential biases for such a large number of countries.
5. See background paper by Sakellariou (2005) for additional results and details.
6. Returns to primary and lower secondary school are not significantly different from zero, that is, the earnings of workers who have completed primary and lower secondary school are not significantly different from those with less than primary education.
7. See Sakellariou (2005).
8. See, for example, Psacharopoulos and Patrinos (1993).
9. De Ferranti et al. (2003) and Behrman et al. (2003) for the analysis of Latin America and the Caribbean countries (Argentina, Bolivia, Brazil, Chile, Colombia, and Mexico); Abu-Ghaida and Connolly (2003) for East Asia and the Pacific countries (Indonesia, Malaysia, and Thailand).
10. De Ferranti et al. (2003) and Behrman et al. (2003). Similar analysis is not available for East Asia and the Pacific countries.
11. See Sakellariou (2005) for details.
12. Such an exercise is beyond the scope of our work here. The validity of the results thus relies on the assumption that the inequality in the distribution of earnings across different levels remains constant.
13. For Austria, Denmark, Finland, France, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom, see Martins and Pereira (2004); for South Africa, see Mwabu (1996); for the United States, see Buchinsky (1994).
14. See, for example, Carneiro, Hansen, and Heckman (2001).
15. See Heckman et al. (2005) to present this concept in the context of a life cycle model of skills formation and provide evidence for it.
16. See Sakellariou (2005) for results for females and by school level.
17. A different specification for Mexico produces a decreasing pattern (Patrinos and Metzger 2004), which is consistent with later arguments about Mexico's performance.
18. In particular, the ratio of government to private wages exceeds the highest estimated value of the corresponding ratio of marginal products.
19. See Sakellariou (2005) for results for females and by school level.
20. This would require an explicit control for selection into sector of employment.
21. China is the exception, but the results for private sector workers are based on a very small sample.
22. The control for ability takes care of the fact that higher-ability individuals stay in school longer and have higher learning achievement regardless of schooling.

23. They also show that the estimated impact would be biased upward substantially without control for the behavioral determinants of schooling (e.g., genetic endowments).
24. The results reported here are from a background paper prepared by Abdul-Hamid (2005).
25. Even with PISA 2000, only one East Asia and the Pacific country (Indonesia) appears also in the analysis of the heterogeneity of returns.
26. The basic results are the same using science and reading tests.
27. These include the availability in the student's home of a dishwasher, a room for the student, and educational software and a link to the Internet; also included is the number of cellular phones, television sets, computers, motorcars, and bathrooms at home. These types of variables have been used in many other studies as a good proxy for household welfare in the absence of consumption information.
28. See OECD (2005) for additional results.
29. One possible reason for this result may be the existence of compensatory education in Mexico, which favors low-performing kids in low-performing schools in which the poor are located at basic and lower secondary level and works according to impact evaluations (Shapiro and Moreno 2004).
30. For the United States see Carneiro, Hansen and Heckman (2001) and Carneiro and Heckman (2002); for Norway see Aakvik et al. (2003), which also look at returns from upper-secondary education; for China see Heckman and Li (2003) and Fleisher et al. (2004).
31. Carneiro and Lee (2005) find that for the United States the variables that people select college attendance on explain only a small proportion of the variance in wages.
32. It also helps to explain why individuals react more strongly to costs (which are known with near certainty) than to returns (which are uncertain).
33. This result is based on the assumption that the risk associated with future earnings is not insurable, which is a reasonable assumption in the context of Indonesia.
34. Information failures exist on other socioeconomic outcomes of education, and thus policies that provide more information about the value of education more generally, can increase the demand for it. There is anecdotal evidence that campaigns for education at the grassroots level tend to increase demand for schooling (e.g., Bangladesh during the introduction of compulsory education in 1992).
35. These costs can offset the effect of certainty on risk-averse individuals, which would tend to increase educational investments. There is robust experimental evidence showing that individuals from poor family backgrounds are more risk averse than those from better-off families. Thus the poor would tend to underinvest in education as a result of greater uncertainty, higher risk aversion, lower aspirations, and greater liquidity constraints.

36. That is because repayment of ICLs is contingent on the ex post realization of earnings. ICLs will be covered later in the chapter.
37. The program package varies by region but usually includes academic support, mentoring, and financial support.
38. Main portal: www.aimhigher.ac.uk, with a parallel site for those ages 14 to 16 called "Don't Stop" (http://www.aimhigher.ac.uk/dontstop/home/).
39. The evaluation is based on one year of exposure to it among individuals 16 years of age (Emmerson et al. 2005). A more comprehensive evaluation of the program is under way.
40. Centralized information systems exploit economies of scale and address the information asymmetries in the school system, thereby introducing accountability and transparency and preventing opportunistic behavior in decentralized decision making.
41. In this context, a model such as New Zealand's has great appeal because there is an independent body that collects and disseminates information on schools to the public and provides specific recommendations for actions (http://www.ero.govt.nz).
42. Glewwe and Kremer 2003.
43. The only rigorous evidence comes from Reinikka and Svensson (2004), who find that an information campaign disclosing monthly capitation grant transfers to districts had a positive impact on the percentage of funds from the central government reaching primary schools in Uganda.
44. One of the more interesting examples of more comprehensive reporting is found in Parana State in southern Brazil; however, that was recently discontinued
45. World Bank 2005b; interview with Colima officials October 2005.
46. See Grant Lewis and Naidoo (2004) for South Africa's school governing bodies.
47. See, for instance, Davies et al. (2006).
48. The SRC provided an important mechanism for African students to defend their limited rights during apartheid.
49. Carneiro and Heckman 2002. These findings are corroborated by other work in the United States: Cameron and Heckman (1998), Cameron and Taber (2001), and Keane and Wolpin (2002).
50. There are two potential sources of downward bias in this estimate that are worth mentioning. First, individuals may be credit constrained even when their families are not, but are unwilling to finance their education. Second, this result is conditional on a given policy environment; that is, part of the reason for the small role of short-run credit constraint may be the success of policies to address it.
51. As mentioned earlier, a study is under way for Indonesia and Mexico.
52. See, for example, Lillard and Willis (1994), who find an insignificant association between income and the transition to secondary and tertiary, and

Behrman and Knowles (1999), who find strong income effects for children ages 6 to 17 in Vietnam. Behrman and Knowles (1999) summarize the findings of 42 studies in 21 countries. Estimates of the relationship between household income and schooling are significant but small in magnitude for about three-fifths of the schooling indicators.

53. None of them, however, examines the role of short-run liquidity constraints versus long-term factors.
54. Unfortunately, few household surveys include detailed information on private costs.
55. However, unlike scholarships, CCTs are not, strictly speaking, restricted to being spent on education. The line between the two is often very thin.
56. Scholarships, CCTs, and vouchers will be examined in more detail later in the chapter.
57. Access to and completion of upper secondary education are still low in many developing countries. Also, the ratio of social to private benefits is likely to be higher in upper secondary, and grants in upper secondary are likely to be more progressive.
58. The impact evaluation of the means-tested scholarship program in Indonesia (Sparrow 2004) shows no effect on upper secondary school enrollment.
59. Barr 2001; Johnstone and Aemero 2001.
60. Related to the concept of income, contingent loans are human capital contracts (Palacios 2004). A human capital contract is a contract in which students commit part of their future earnings for a fixed period of time in exchange for capital for financing education. The main difference with ICLs is the private initiative to invest in human capital and the development of a market for human capital, which would assist in setting prices for human capital. Few programs are in existence; they are found only in the United States and Germany, including a program operating out of Miami that serves students in Chile (www.lumnifinance.com).
61. The program was discontinued, and it was not emulated when Bolsa Escola was adopted as a national program. Lavinas et al. 2001.
62. Closely related are Education Savings Accounts, which encourage individuals or their families to save to invest in education in the future. The state usually gives a subsidy (tax benefit or grant) to those who save for investing in education. In the U.K.'s Child Trust Fund, the state gives a gift of £250 to start the account and makes a further contribution when the child is seven.
63. None of the household surveys used has information on domestic work. However, it is increasingly recognized that conventional definitions that neglect domestic work underestimate the amount of work done by girls and thus the role of work as a potential impediment to their schooling.
64. Further analyses, including the breakdown by gender and income quintile, can be found in the background paper by Hawley, Sommers, and Montrichard (2005).

65. In the case of Indonesia, work participation is available only for individuals 15 years of age or older and defined by survey design as mutually exclusive to schooling, thus precluding any analysis of the extent to which work is combined with schooling.
66. However, it is also possible that many of those reported to be out of the labor force are working in the informal sector.
67. A review of the recent literature includes Basu and Tzannatos (2003).
68. First, to be able to evaluate the impact of work on schooling one needs data on the schooling and work histories of individuals to be able to get the timing of school and work events right. Second, it is not possible to understand the consequences of work on schooling unless the full joint dynamics of school and work decisions are examined. Third, decisions about the schooling and work are interrelated and thus dependent on many common factors that confound the true impact of work on school.
69. Most of the studies focus on the relationship between current work participation and current school attendance (see, for example, Patrinos and Psacharopoulos 1997). Direct estimates of the impact of work on schooling are available for study hours (Akabayashi and Psacharopoulos 1999), years of school completed (Psacharopoulos 1997), and learning (Heady 2003).
70. For developed countries, studies are focused on high school and college students and find little evidence that part-time work combined with schooling hurts school achievement. When adverse effects are found, they are apparent only at relatively high work hours (e.g., Eckstein and Wolpin 1989).
71. CCTs can also include other conditionalities on health and nutrition behavior.
72. See Rawlings and Rubio (2005) for a review of these programs in Latin America and the Caribbean.
73. Skoufias and Parker 2001; Schultz 2004; Skoufias et al. 2001.
74. Todd and Wolpin 2003.
75. De Janvry et al. 2005.
76. Saodulet and Janvry (2004) show that efficiency gains in the program could be achieved by (1) selecting among the poor those children that are induced to go to school with the scholarship and (2) calibrating the size of the transfer so that it is just sufficient to induce children to go to school.
77. Coady 2000.
78. Most CCTs are conceptualized around the idea that the extra school time resulting from the grant comes out of work time, at least for those who were working before the grant was introduced.
79. Skoufias and Parker 2000. A similar program in Nicaragua (RPS) also was found to decrease the incidence of work among 12- to 13-year-olds (Maluccio, forthcoming). Ravallion and Wodon (2000) found that the Food for Education Program in Bangladesh did reduce child labor, but the effect accounted for only 25 percent of the increase in the enrollment of boys.

80. This suggests that the impacts of Oportunidades are primarily to increase the number of children in school and to reduce the number of children who are working, but not necessarily, for instance, to reduce the hours worked of children who attend school.
81. De Janvry et al. 2005.
82. Yap et al. 2001.
83. Lopez Ramirez 2003.
84. The basic rationale underlying school vouchers is that individuals face a supply of varying quality, and some individuals would like to attend a school of higher quality than the one they are currently attending but do not have the financial resources to do so. School vouchers reduce the price of the high-quality school option relative to the lower-quality school option.
85. They interpret these results as evidence that the program merely increased sorting rather than adding value to education. However, the results are subject to serious identification problems.
86. Although these have been less effective, judging by declining PISA test scores in reading between 2000 and 2003 (math scores stayed roughly constant).

Spotlight 2—Mexico: Effective Combination of Supply- and Demand-Side Policies

Mexico faces very serious educational challenges, particularly in regard to low overall education quality, as measured by international exams, and high educational inequality, particularly along income lines. Yet looking at the progression of indicators of educational access, quality, and equity, Mexico is one of the more successful countries in Latin America and East Asia. Enrollment rates in lower and upper secondary have increased markedly in the past decade; gross enrollment climbed from 53 percent to 79 percent between 1990 and 2002. At the same time both lower and upper secondary completion rates have also increased an average of 2.5 percent per year between 1998 and 2002, suggesting an improvement in education quality. Finally, the gaps between the secondary completion rates of urban and rural students and of wealthy and poor students have declined significantly since the late 1990s. The lower secondary completion gap between the top and bottom income quintiles, for example, decreased nearly 20 percentage points between 1998 and 2002. These simultaneous improvements in access, quality, and equity are an encouraging contradiction to the frequently held notion of an access/quality trade-off.

What policy actions on the part of the Mexican government might explain Mexico's multifaceted progress? In the early 1990s Mexico began a set of aggressive and diverse education reforms that targeted educational modernization and improvement. Major education reform hit center stage in Mexico in 1992 (Andrade de Herrara 1996; Murillo 1999; Tatto 1999). Since the late 1970s there has been discussion of and movement toward educational decentralization to transfer primary responsibility for the running of the basic education system from the central government to the 31 Mexican states. In 1978 federal education delegations were established in the states to deconcentrate the federal Secretariat of Education. The goals of decentralization were to improve education quality and efficiency as well as transfer more fiscal responsibility to states and provinces (Gershberg 1999; Murillo 1999). After a series of small steps toward decentralization in the 1980s, the Agreement for the Modernization of Basic Education was signed by the central government, the 31 states, and the national teachers' union in May 1992. This reform transferred the administration of basic education to the states and required all states to have state secretariats of education. Even after this reform, however, the central government continued to control curricular and

(*Continued*)

pedagogical decisions as well as provide the bulk of education financing (nearly 80 percent) (Gershberg 1999; Kubal 2003).

Although the 1917 national constitution established primary education to be free, secular, universal, and run by municipal governments, this federal system was never established. From the creation of the national Secretariat of Public Education (SEP) in 1921, the role of the central government in education delivery grew steadily. By 1992 the central SEP was responsible for 65 percent of students and supported 80 percent of education expenditure. The central government also determined the national curriculum for both primary and secondary, designed and distributed free textbooks to all students, and allowed the national teachers' union, the SNTE, to assign teachers to schools. Thus, Mexico had a heavily centralized education system.

The thrust of the 1992 reform was, in President de la Madrid's words, to return to the "spirit of the Mexican Constitution" by federalizing basic education (primary and lower secondary) and teacher education (Tatto 1999). Actually, the reform was not approved during de la Madrid's administration, and decentralization was not implemented until four years later under President Salinas. Though centered on decentralization, the reform, which included changes to the Mexican constitution and a new General Education Law, also had major implications on access to and quality of education.

The most dramatic progress in secondary education made in Mexico in the past decade is in enrollment figures. The 1992 reform, for the first time in Mexican history, made lower secondary education mandatory. Three changes to the constitution supported secondary expansion. First, the constitution was amended to include lower secondary in its declaration that the government was obliged to offer free, secular, and universal access to basic education. Second, both primary and lower secondary education were made obligatory and, third, parents were deemed legally responsible for sending their children to both primary and lower secondary school (Andrade de Herrara 1996). The conditional cash transfer program, Oportunidades, discussed below, supported greater educational access for poor and rural families, in particular, as did Telesecundarias, a television-based education program in rural areas created in 1967, but now the fastest-growing type of lower secondary school in Mexico, serving 20 percent of lower secondary students.

The 1992 reform and subsequent reforms have also focused on quality improvements.[86] The 1992 reform focused on quality in two areas—curricular renovation and improving the status of teachers. The 1992 reform announced a

(*Continued*)

complete overhaul in the national primary school curriculum. This new curriculum was implemented during the 2002–03 academic year. In addition, new textbooks were created, including texts in indigenous languages; the school year was extended; and schools were provided with classroom libraries. The reform also included an across-the-board increase in teachers' salaries as well as the creation of the Carrera Magisterial, a teacher incentive reform that provided a career ladder for teachers.

Reforms since 2000 have continued to focus on curricular reform and teacher valorization. The 2001–06 National Education Program includes a major revision of the secondary education curriculum, focusing on fewer subject areas and the acquisition of competencies rather than specific factual knowledge.

Although equity was not the center of the 1992 reforms, the reforms contained what would become a model for a conditional cash transfer program. Oportunidades, originally called Progresa, provides monthly monetary transfers to poor rural households contingent on school attendance. The Quality Schools Program (PEC, by its Spanish acronym) also focuses on improving the quality of education for poor and marginalized communities by providing school grants (World Bank 2005c). The National Council to Promote Education (CONAFE) Program, begun in the 1970s, was scaled up to provide more compensatory programs in disadvantaged regions after the 1992 reform. More broadly, part of the new General Education Law specified that the central government is responsible for compensating for any inequalities in education across the Mexican states under the new federal system. At least nominally, the new National Education Program for 2001–06 has intensified the focus on educational equity, and the programs described above have been retained and in some cases scaled up.

Some of Mexico's success in addressing education access without sacrificing quality and addressing quality without sacrificing equity may stem from the combined focus on the quality of primary schooling and access to lower secondary in the early 1990s, followed by an increased focus on equity. That was done while also maintaining a relative consistency in reforms since 1992; the 2001–06 National Education Program scaled up equity programs and extended quality improvements to the whole education sector, and the Mexican government strengthened its financial commitment to education (SEP 2001).

Source: Umansky on the basis of the cited references.

CHAPTER 3

Secondary Education Finance in Latin America and East Asia: Challenges and Opportunities in the Next Decade

Introduction

Now we turn to the financing options available to countries of East Asia and the Pacific and Latin America and the Caribbean to support their secondary education sectors. In this chapter, first, we estimate the amount of resources each country in the two regions is likely to need during the next decade to accommodate the growing demand for secondary education. Then, we discuss how governments could raise additional resources, surveying both traditional and nontraditional funding sources.

The financing of secondary education has emerged as an important policy issue across the two regions with the rapid growth in secondary school enrollments. Many factors contribute to this growth: First, with near-universal primary education in the two regions, more students are becoming eligible for secondary education (Lewin 2001b). Second, rural to urban migration has made secondary education a viable option for a

larger number of eligible students (Adams 2002). Last, globalization is quickly changing the type of labor in demand[1]—even agricultural workers are now expected to understand and use basic mathematics, biology, and physics; communicate in writing; and research and read about concepts that are new to them (Heyneman 1997), skills refined mainly through secondary education. Consequently, secondary school enrollments are on the rise: between the school years 1998–99 and 2002–03, enrollments at the secondary level grew by 20 percent whereas the school-age population grew by less than 5 percent.[2]

Historically, many countries in East Asia and the Pacific and Latin America and the Caribbean have failed to focus on secondary education (Shixue 2003), which is a significant omission: Secondary education is an important tool for growth, economic development, and social stability; a compelling body of research links secondary education to the development of human capital, economic growth, increased stability, and democratization. Investment in secondary education improves global competitiveness (Wood and Ridao-Caño 1999; Nelson and Pack 1998) and has been linked closely with the rapid growth among both East Asia and the Pacific countries (Lewin 1998) and Latin America and the Caribbean countries (Brown and Hunter 2004; Ramirez and Nazmi 2003; Blondal et al. 2003). In sum, strengthening secondary education is critical to achieving growth and reducing poverty. And because both quality and quantity improvements at the secondary level are relatively costly, exploring resources mobilization schemes for secondary education is important, and timely.

The rest of this chapter is organized as follows: section 2 presents an overview of the current secondary education finances in the two regions. Section 3 projects the educational expenditures countries in the two regions will have to finance by 2015. Section 4 explores, by using several examples, various resource mobilization methods and the extent such methods could help close the fiscal gap in secondary education provision. Section 5 concludes the chapter.

The State of the Secondary Education Sector: Demographic and Economic Trends, Enrollments, and Current Finances

This section presents a snapshot of the current state of secondary education in East Asia and the Pacific and Latin America and the Caribbean. The analysis focuses on the 54 countries from the two regions and presents economic and demographic movements, as well as financing and

expenditure trends across different income levels.[3] Detailed analysis and data tables can be found in Yilmaz (2005).[4]

Demographic trends, economic factors, and enrollment rates

The next decade presents many countries in the two regions with a demographic opportunity in relation to education finance: The population growth is slowing down across the two regions, and both the share of secondary-school-age population (ages 12 to 17) and age dependency ratios are decreasing.[5] With more adults supporting fewer secondary school students, more resources are likely to become available for the sector, keeping the growth of the financial burden under control. And a declining school-age cohort will improve the enrollment rates—at least on paper. With the current demographic and enrollment trends, between 2003 and 2015, total enrollments in the two regions could grow from 183 million to 269 million, boosting the (weighted) gross enrollment rate from 69 percent to 117 percent.[6]

During the past decade the average annual real economic growth for the two regions was 2.8 percent.[7] The real growth rate did not vary greatly across developing countries of different income levels (or across the two regions): low- and upper-middle-income countries grew close to 3 percent, and lower-middle-income countries grew at 2.5 percent. Although economies kept growing, governments' revenue-raising efforts have remained behind world averages. Data from the 2004 World Development Report and UNESCO show that, on average, countries in the two regions raised tax revenues equivalent to 14.5 percent of their GDPs and spent 5 percent of their GDPs on education.

Among the 54 countries studied in this chapter, gross enrollment rates at the secondary level (GER2) averaged 77 percent and net enrollment rates at the secondary level (NER2) averaged 62 percent.[8] At 51 percent, GER2 was lowest across low-income countries, but enrollments grew three times faster than the rest of the group at 9 percent (see figure 1.5). Lower-middle-income countries reached 74 percent GER2, but the enrollment rates grew at a much lower rate of 2 percent. Finally, among the upper-middle and high-income countries, the GER2 averaged 92 percent (growing at slightly higher than 1 percent) and the NER2 averaged 76 percent. In East Asia and the Pacific, net enrollments grew faster than gross enrollments at 4.4 percent—that is, an increasing number of students have attended secondary school at the appropriate age. In Latin

America and the Caribbean, however, adult demand for secondary education remained high.

Data for the school years 1998–99 through 2002–03 show that enrollments grew fastest in countries in which GER2s are the lowest. With that trend, low-enrollment countries are poised to experience the highest relative growth in their enrollment rates, but only if they can quickly expand their schooling capacities and address demand-side constraints. Yet, the rapid enrollment growth is taking place in countries with the weakest economies. For example, among countries with less than 40 percent GER2, enrollments grew by 7 percent, but per capita income shrank by about 0.5 percent (table 3.1). These countries will face the severest financing challenges in expanding and improving their secondary education sectors because they will have to allocate a growing percentage of their already shrinking incomes to secondary education. Without additional funds, to maintain the current enrollment trends, the low-enrollment, low-income countries must either quickly expand and increase the efficiency of their secondary education systems or decrease their already low per pupil expenditures.

Sources of finance

According to UNESCO data, during the 2002–03 school year, countries in the two regions spent $66 billion (or $163 billion in PPP converted dollars) of their domestic resources on secondary education.[9] **On average, each country spent 1.82 percent of its GDP on its secondary education sector, falling behind what countries with strong secondary education sectors typically spend.[10]**

Table 3.1. Latin American and Caribbean and East Asian and Pacific Developing Countries Grouped by GER2: Enrollment Trends and Economic Trends

GER2 at 2002–03 school year	*GDP per capita, 2003 dollars*	*GDP per capita growth (%)[a]*	*Average GER2 (%)*	*Change in GER2 (%)[b]*	*Potential GER2 by 2015 (%)*
Less than 40%	$671	–0.4	28	7	83
Between 40% and 70%	$1,781	0.9	59	5	102
Between 70% and 85%	$2,946	2.2	76	2	108
Above 95%	$3,857	1.1	101	2	129

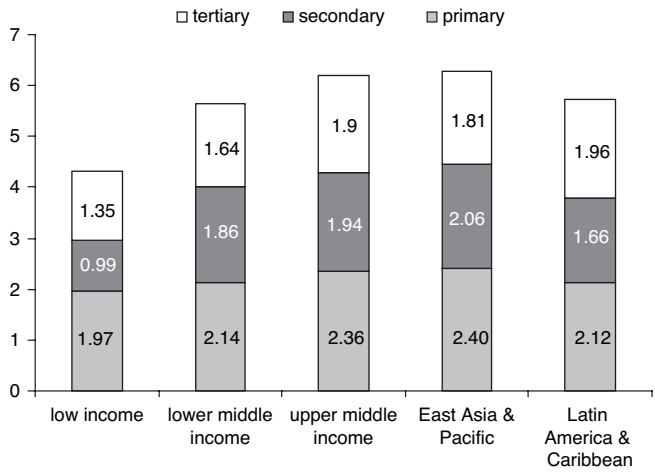
Source: UNESCO Institute of Statistics and authors' calculations.

a. To remove the year-to-year variation from the data, the average annual GDP per capita growth is calculated during the years 1995–2003.

b. Annual growth in gross enrollment rates is calculated during the 1998–99 to 2002–03 school years.

In 2003, low-income countries allocated less than 1 percent of their GDPs, and about one-quarter of their total education expenditures to secondary education (figure 3.1). Although total commitment levels are low, recently, governments of low-income countries have been increasing secondary education expenditures: Between 1998 and 2003, the share of secondary education funds (as a percentage of GDP) grew at 6 percent among the low-income countries (as opposed to 2 percent among all countries of East Asia and the Pacific and Latin America and the Caribbean.) On average, each lower-middle-income country allocated to secondary education less than 40 percent of its total education resources and 1.86 percent of its GDP (approximately $1.4 billion in current dollars, or $5.2 billion PPP converted dollars). In this group, on average, the share of public education funds in GDP shrank by 1.42 percent, but the variation in the group is large: in China, this share grew by 20 percent annually, in Malaysia by 16 percent, and in Lao PDR and Nicaragua by 10 percent. However, for its secondary education sector, the Dominican Republic is spending approximately half of what it was spending (as a share of its national income) in 1998. Finally, upper-middle- and high-income countries allocated 32 percent of their total public education funds—1.94 percent of their GDPs (approximately $2 billion in current dollars or $3.2 billion in PPP converted dollars) to secondary education (annex 3.1).

Figure 3.1. Total Education Expenditure, by Levels, as Percent of GDP, 2002–03



Source: UNESCO Institute for Statistics.

Macroeconomic data on the share of the private sector in secondary education are available only for 15 countries in our sample (table 3.2). In this group, private resources constituted 38 percent of all domestic resources allocated to the secondary education sector. Private resources as a percentage of GDP are largest in Jamaica (1.7 percent, or 84 percent of all secondary education expenditure). The shares of the private sector were very low in Barbados and Thailand: in these two countries, private resources constituted 4 percent and 5 percent of all expenditure, respectively, a level too low to be efficient.

Finally, evidence suggests that although not accounted for in education finance statistics, household contributions to secondary education, including tuition, school fees, books, supplies, transportation, and meals at school, are an important source of secondary education finance. Even when public education is free, schools sometimes rely on significant formal or informal contributions from households. Taken together, the direct and indirect costs covered by households at the

Table 3.2. Total Education Expenditure at Secondary Level as Percent of GDP in Selected Countries, by Sources of Funding, 2003

	Income level	*Public resources (% of GDP)*	*Private resources (% of GDP)*	*Share of private resources in all domestic resources (%)*[a]
Argentina	Upper middle	1.58	0.38	24
Barbados	Upper middle	2.66	0.10	4
Belize	Upper middle	1.38	0.20	14
Chile	Upper middle	1.49	0.70	47
Colombia	Lower middle	1.53	1.00	65
Grenada	Upper middle	1.83	0.20	11
Hong Kong (China)	High	1.50	1.50	50
Indonesia	Lower middle	0.48	0.28	57
Jamaica	Lower middle	2.02	1.70	84
Korea, Rep. of	High	1.83	0.60	47
Mexico	Upper middle	1.52	0.40	26
Nicaragua	Low	0.38	0.10	27
Paraguay	Lower middle	1.24	0.60	48
Philippines	Lower middle	0.69	0.58	83
Thailand	Lower middle	1.13	0.06	5
Average		**1.42**	**0.56**	**38**

Source: UNESCO Institute for Statistics 2005.

a. Domestic resources are the sum of all public and private resources.

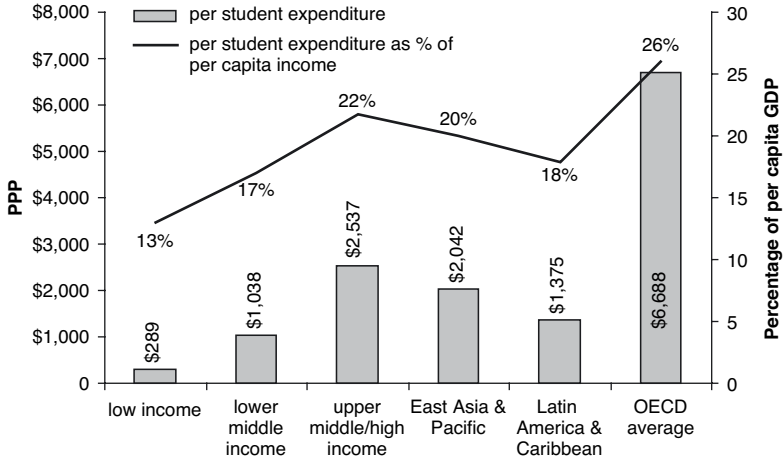
secondary level could become substantial: In Honduras, households' share of expenses double as children transition from primary to lower secondary education and double again for the upper secondary cycle (World Bank 2000). According to household surveys, in Cambodia, secondary education expenditure expenses consumed 13 percent of total household spending (2004 data). In Mexico, this figure was 6 percent, and in Bolivia, 8 percent, but could go up to 13 percent among rural households, and to 22 percent among the poorest (both 2002 data). In 2002, Vietnamese households shouldered 41 and 48 percent of total education expenses in lower and upper secondary schools, respectively (the Socialist Republic of Vietnam and World Bank 2005).[11] In Nicaragua, secondary schools receive up to 35 percent of their budgets from user fees and tuition charges (Gershberg and Meade 2005). A 1995 study finds that in the Philippines, households finance 42 percent of all education expenditure at the secondary level (Schwartz 1995).[12] A recent study on Central America finds that household financing, including fees, books, uniforms, and transport, represents between 50 percent and 80 percent of total secondary education spending in El Salvador, Nicaragua, and Guatemala (World Bank 2005c; Gershberg and Meade 2005; Schwartz 1995).

Excessive reliance on household contributions could depress enrollments, even when there is excess capacity. Especially among rural households, user charges and fees are shown to have a substantial impact on parents' decisions about their children's schooling (Ilon and Moock 1991), evidenced by increases in enrollments—albeit, short run—following the prohibition of school fees (Kattan and Burnett 2004). Nonetheless, household contributions are important sources of secondary education financing and, with good policy design, they could provide cross subsidies for the poor and help improve efficiency and accountability by increasing the schools' responsibility to parents. Furthermore, especially in centralized systems, household contributions could increase the reliability and resiliency of local service delivery (Fafchamps and Minten 2004) and help ensure that the schooling delivered matches the demand.

Per pupil expenditures at the secondary level and the relative importance of secondary education

In the two regions, in 2003, countries on average spent 19 percent of their GDP per capita ($1,614 in PPP converted dollars) on each secondary school student (figure 3.2).[13] This figure possibly overestimates the actual per pupil expenditures because 9 of the 12 omitted countries (due

Figure 3.2. Secondary per Pupil Expenditures ($PPP), as percent of per Capita Income, 2002–03 School Year



Sources: OECD 2004; World Bank 2005h; and Yilmaz 2005.

to lack of data) are low and lower-middle income with very low gross enrollment rates.[14]

Low-income countries spent 289 PPP converted dollars for each enrolled student, and their total secondary education expenditure amounted to only 13 percent of the per capita income. A typical lower-middle-income country spent $1,038 (PPP converted) per pupil, or 17 percent of its per capita income. Among upper-middle- and high-income countries, domestic education expenditure per pupil averaged $2,537 (PPP converted), or almost a quarter of the GDP per capita. In regard to resource allocation, although middle- and high-income countries are having significantly more success than the poorer countries in the two regions, their secondary-education sectors are still fairly underfunded compared with the OECD, in which each secondary school student on average received a quarter of personal income, or $6,688 (annex 3.2).

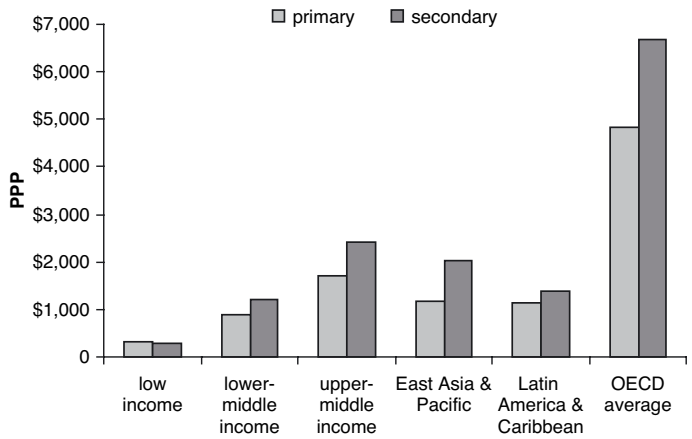
On average, putting a student through secondary education is 41 percent more expensive than putting a student through primary education. Secondary schooling costs are higher because specialized teachers teach a larger set of skills, covering a more varied curriculum, in classrooms that are more capital intensive. The magnitude of this cost difference between primary and secondary schooling captures, among other things, qualitative

differences in the resources employed as well as the demand and supply conditions for these resources. The growth in the demand for secondary education is likely to keep secondary education provision costlier, even over long horizons, because stronger markets in secondary education will result in better factors of production, which then will require higher compensation rates.

The comparison of the current per pupil expenditures across countries in the two regions is telling: across low-income countries (in which data are available) during the 2002–03 school year, per pupil expenditures on primary and secondary students were very low and quite similar at $318 and $289, respectively. (These figures are PPP converted 2003 dollars). The relative cost difference is highest among the East Asian and Pacific countries: on average, these countries spent about $1,100 on each primary-level student and $2,000 on each secondary (in PPP converted terms)—a 74 percent premium. In comparison, among OECD countries, each primary school student cost about $4,818 and each secondary-school student cost 39 percent more, at $6,688 (figure 3.3).

In countries for which data are available, secondary school teachers with 15 years of experience receive on average twice the GDP per capita, or 11 times the per pupil expenditure (table 3.3.). A teacher of comparable experience from an OECD country receives only 1.4 times

Figure 3.3. Per Pupil Expenditures in PPP Converted Dollars in East Asia and the Pacific and Latin America and the Caribbean: Primary vs. Secondary Levels



Sources: UNESCO Institute of Statistics and *OECD Education at a Glance 2004.*

Table 3.3. Public Primary and Secondary School Teacher Salaries, Selected Countries (2001)

	Salary premium from primary to secondary		*Salaries for teachers with 15 years of experience (no training)*		
	Entry-level teacher with no experience (%)	*with 15 years of experience (%)*	*Salary $PPP*	*Ratio to GDP/Capita*	*Ratio to per pupil expenditure*
Argentina	44	44	$12,076	1.45	9.44
Brazil	45	55	$9,883	2.02	13.11
Chile	0	4	$11,033	1.38	5.10
Indonesia	2	25	$975	0.59	3.52
Jamaica	0	0	$10,955	3.43	4.12
Malaysia	46	59	$13,647	2.69	9.85
Mexico	28	109	$15,269	2.25	10.72
Paraguay	56	56	$4,577	2.93	18.20
Peru	–1	6	$9,857	0.99	11.19
Philippines	0	0	$5,861	2.84	16.36
Thailand	0	0	$5,397	2.39	16.71
OECD	8	21	–	1.41	5.50

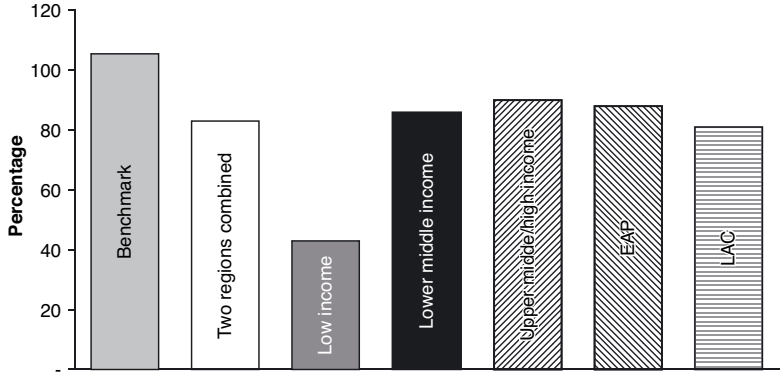
Sources: OECD and UNESCO Institute for Statistics.

the GDP per capita or 5.5 times the expenditure per student, yet this is triple the salary of his peers in these East Asian and Pacific and Latin American and Caribbean countries. We will see in chapter 4 that high salary shares are a source of inefficiency for both regions (more so in Latin America and the Caribbean than in East Asia and the Pacific).

Now that we have an idea of the way primary and secondary education sectors differ in per-pupil expenditures, we can calculate the required allocation of resources between the two sectors for financing a given enrollment goal—for example, universal enrollment and completion rates at the primary level and 75 percent enrollment at the secondary level. Assuming that primary- and secondary-school-age populations grow at similar rates, if each secondary student costs 40 percent more than each primary school student does (as currently observed in these two regions), then the share of secondary and primary education in total education expenditure must be roughly the same (this is our benchmark in figure 3.4).

The current ratio of public funds for secondary and primary schools in the two regions is much lower. Currently, governments in the two regions allocate, on average, to the secondary sector 83 percent of the budget they typically allocate for the primary schools (figure 3.4).[15] Especially among the low-income countries, the secondary education sector receives funds that are less than half the budget allocated for the primary sector.

Figure 3.4. Ratio of Total Education Expenditures at the Secondary Education Level to the Total Education Expenditures at the Primary Level, 2002–03



Sources: UNESCO Institute of Statistics and Yilmaz (2005).

However, low enrollments at the secondary level are only one element of the story: per pupil public expenditures are also low, especially among the low-income countries, pointing to the severity of the fiscal challenge for this particular group.

The allocation of education budgets mostly toward primary education is not surprising. Typically, countries focus on provision of primary education over secondary education. With the ongoing emphasis on the Millennium Development Goals, the international community continues to encourage universal primary education as a priority.[16] The point of figure 3.4 is that once there is substantial progress toward achieving universal primary education, countries must look for ways to reallocate public resources such that secondary education budgets start growing with respect to primary education budgets. To accommodate the expansion of secondary education, governments must shift their focus so that they channel, at a minimum, a larger proportion of additional funds to the secondary sector. This means changes in thinking and in established funding practices.

What Is the Fiscal Gap? What Will It Be in 10 Years?

This section presents estimates on the magnitude of the financial challenge countries in the two regions are likely to face during the next decade. The analysis considers a range of static and forward-looking estimates of the fiscal gap—some based on the current conditions in each

country and some based on "ideal service" conditions (such as expenditure variables observed among the OECD countries).

We find that, under "ideal service" conditions, to reach a GER2 of 85 percent during the next decade, countries must gradually increase their commitments to secondary education by 1.2 percent of their GDPs. In other words, the 22 countries in our sample, with GER2 rates under 85 percent (and with available data) must spend $55 billion in present value terms during the next decade. Current commitment levels cover only 62 percent of these funds. That is, the countries in the sample must find an additional $21 billion (or $86 billion in PPP converted terms) during the next decade to support the growth of secondary education.

A few caveats about these estimates are in order. First, because time series data on enrollment and expenditure are missing for most countries in the two regions, the calculations rely on observed averages (for example, of enrollment growth rates or per pupil expenditures) and stylized relations.[17] Consequently, these estimates assess how service delivery costs change with target indicators, but do not identify the specific cost implications of the policies and mechanisms that would in fact make improvements possible. To reach the target 85 percent enrollment rates (which in several cases requires very substantial enrollment growth rates during the next 10 years), all countries will need to finance comprehensive supply- and demand-side interventions. Second, construction of ideal "cases" with "ideal" levels for enrollment and expenditure is difficult because countries vary greatly in enrollment rates and per pupil expenditures. Third, the estimates use enrollment rates as a measure of access, but the ultimate target should really be increased secondary completion, which would require either many more resources or much higher efficiency in the use of these resources (as seen in chapters 1 and 4). Fourth, the assumption that current cost structures would continue to hold in the face of growing demand is problematic. Access and quality changes do not take place in a vacuum; these improvements would be possible only if market conditions evolve over time. Therefore, even with the necessary cash in hand, countries would have to battle with limited resources that take time to cultivate, such as a qualified teacher force, adequate school buildings, and other necessary infrastructure such as libraries.[18]

Previous calculations of the fiscal gap related to education delivery reflect many of these difficulties. Estimates vary greatly because of their different assumptions about targets and future conditions (World Bank 2005d) and tend to fall beyond what countries could afford with their

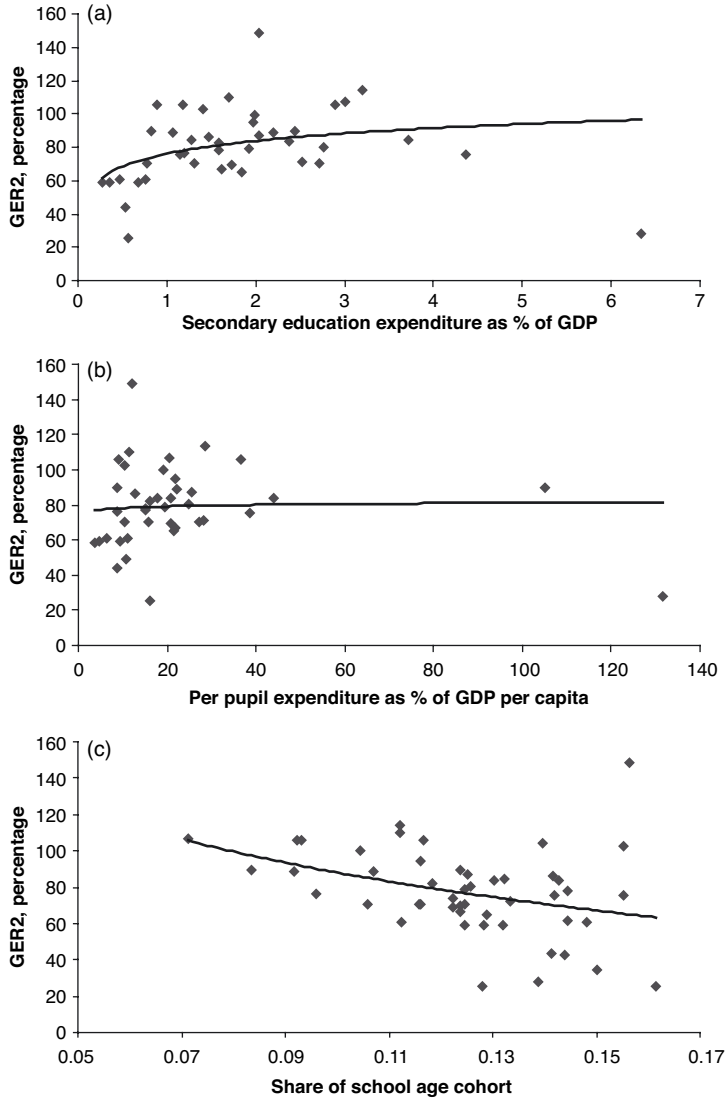
existing resources. For example, one study finds that under current cost structures, a gradual move toward universal secondary education through 2015 would cost developing countries between $27 billion and $34 billion annually, or about 3.14 percent of their GDPs—this is in addition to what they are already spending (Binder 2005). Financing such a gap requires that these countries more than triple the resources channeled to their secondary education sectors.[19]

To make estimating the financial gap more tractable, the analysis allows for some broad generalizations. First, access and quality improvements are treated as separate items, achieved independently. Second, it is assumed that improvements in access could be captured by changes in the gross enrollment rates and that per pupil expenditures fully reflect any quality improvements and possible demand-side interventions. The static estimates are projections of one-time changes in spending under current (2003) cost conditions. The forward-looking estimates provide not only information on how much additional funds governments need, but also the rate at which economies should grow to make the required education expenditure affordable.

The estimates follow the method developed by Colclough and Lewin (1993) and make use of the relation between enrollment, expenditure, and student base. Specifically, the gross enrollment rate is expressed as a function of domestic secondary education expenditure as a percentage of GDP, domestic expenditure per secondary school student as a percentage of GDP per capita, and the proportion of secondary-school-age children to the total population (annex 3.3). The three panels of figure 3.5 depict the observed relations between GER2 and secondary education expenditure, GER2 and per pupil costs, and GER2 and secondary-school-age cohort.[20] The observed values help identify in very general terms the constraints on the current secondary education service (Lewin 2001a).

Taken together, low gross enrollment rates, a small education budget, and low per pupil expenditures suggest that secondary education provision receives little or no attention. This is the case among the low- and lower-middle-income countries in Latin America and the Caribbean. Low gross enrollment rates coupled with relatively high per pupil expenditures exemplify the way relatively high costs of education delivery hinder mass access to secondary schooling. Typically, low- and lower-middle-income countries in East Asia and the Pacific exhibit this property; to increase enrollment rates, these countries must find ways to reduce or reallocate costs, or to do both. Even upper-middle-income countries in

Figure 3.5. Relation between GER2 and (a) Secondary Education Expenditure, (b) per Pupil Expenditure, and (c) Secondary-School-Age Cohort, 2002–03 School Year



Sources: UNESCO Institute of Statistics and Yilmaz (2005).

East Asia and the Pacific must place more emphasis on access by reducing or reallocating costs of delivery—despite their large education budgets, the gross enrollment rates in these countries are somehow lagging. Chapter 4 also confirms that observation by showing that East Asian countries are less efficient than Latin American countries are in enrolling students and are generally more input inefficient. Upper-middle-income countries in Latin America and the Caribbean face the opposite problem: these countries have high gross enrollment rates, yet small education budgets and relatively low unit costs. They must raise additional funds or reallocate them to improve the quality of secondary education (table 3.4). This latter point is also illustrated by the lower output efficiency rates reported in chapter 4.

Static estimates: The financial gap in 2003

The current fiscal gap for each country for 2003 is calculated as the difference between the percentage of GDP required to achieve a target gross enrollment rate and the actual total secondary education expenditure, keeping the per pupil expenditure and proportion of school-age children constant (annex 3.3).[21] Table 3.5 presents the summary results aggregated by income level and by region for a gross enrollment target of 85 percent. Estimates (reported for 24 countries that fell below this target) show that in 2003 countries in the two regions, on average, should have spent 1.94 percent of their GDPs on secondary education, but the actual expenditure fell 0.37 percent short of this need, resulting in a fiscal gap of $5.5 billion ($19.4 billion in PPP converted dollars). This fiscal gap is 15 percent of actual spending on secondary education during the same year.

The expenditure need and the fiscal gap estimates vary with the three variables that drive the model: the current GER2 levels, current secondary education expenditure, and per pupil expenditures.[22] Per pupil expenditure in East Asia and the Pacific is considerably larger than in Latin America and the Caribbean, resulting in higher estimates for the expenditure need for the East Asia and the Pacific countries. Low-income countries appear to face a small fiscal gap compared with the rest of the group (in particular vis-á-vis lower-middle-income countries), but this calculation reflects the very low unit costs, a sign of poor education quality.

To understand better how the education expenditure needs change as enrollment levels increase, the data must be examined on a country-by-country basis. Figure 3.6 presents this information for a handful of countries for three different GER2 targets. The slope of the expenditure

Table 3.4. Observed Parameters of the Model*

	GER2		*Secondary education expenditure as % of GDP*		*Per pupil expenditure as % of GDP per capita*		*Proportion of school -age population*	
	East Asia and the Pacific	*Latin America and the Caribbean*	*East Asia and the Pacific*	*Latin America and the Caribbean*	*East Asia and the Pacific*	*Latin America and the Caribbean*	*East Asia and the Pacific*	*Latin America and the Caribbean*
Low income	50%	61%	1.16	0.48	15.2	6.2	14%	15%
Lower-middle income	81%	72%	1.71	1.54	17.0	16.6	13%	13%
Upper-middle/high income	87%	93%	2.29	1.83	33.84	19.5	10%	12%

Sources: UNESCO Institute for Statistics and Yilmaz 2005.

*Data presented in this table exclude Vanuatu.

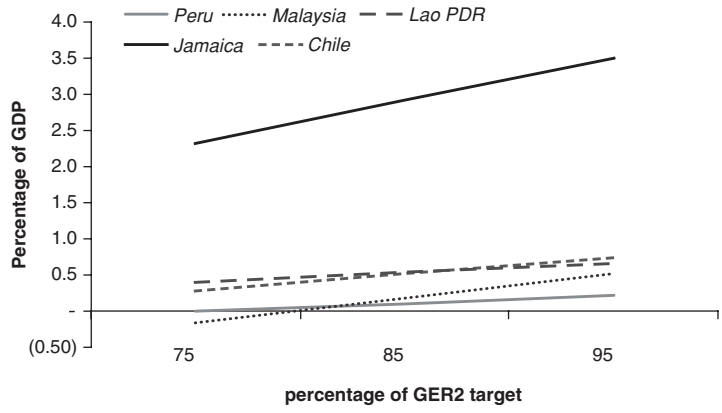
Table 3.5. 2003 Estimated Fiscal Gap, with Current Cost Structures (target GER2 = 85%)*

	Resources needed as % of GDP	*Fiscal gap as % of GDP*	*Fiscal gap without capital improvements (billion $PPP)*	*Fiscal gap with capital improvements (billion $PPP)*
Low income	1.54	0.55	$0.21	$0.33
Lower-middle income	1.94	0.34	$8.3	$17.0
Upper-middle/high income	2.15	0.34	$0.2	$2.1
East Asia and the Pacific	2.11	0.43	$8.1	$16.1
Latin America and the Caribbean	1.87	0.34	$0.5	$3.3
Two regions combined	**1.94**	**0.37**	**$8.7**	**$19.4**

Source: Yilmaz 2005.
*The fiscal gap calculations exclude 10 countries in the sample that already achieved 85% GER2.

needs line for each country tells us how expensive it is to put a student through secondary education in a given year: the steeper the slope, the higher the per pupil expenditures. The vertical distance of the expenditure line from the x-axis tells us how far the country is from the given GER2 target. For example, Lao PDR and Peru each spend 8 percent of their GDP per capita per secondary school student, so their expenditure need lines are parallel. But, Lao PDR's GER2 is only 42 percent, whereas Peru has already achieved 76 percent gross enrollment at the secondary level. Therefore, Lao PDR's expenditure need, as a percentage of its GDP, is much higher than Peru's.[23]

Figure 3.6. Expenditure Needs across Different GER Targets



Source: Yilmaz 2005.

Cost of quality (and demand-side interventions)

So far, the discussion on fiscal gap focuses on access only, ignoring any quality improvements; any increase in unit costs due to demand-side interventions, such as scholarships; and any variations in the availability and costs of factors of production, such as teachers and their salaries. Because the true production function is not known, it is very hard to quantify the resources needed to achieve quality and sustainability. In addition, even with adequate resources, quality might not improve because poor incentives might make the number of teachers and students shrink or salary structures might not discriminate against mediocrity, leading to a permanently stagnant teaching force. Therefore, simply putting more money into the education system might not lead to better quality or adequate production factors.

One method of estimating how the "maturing" of the secondary education institutions would affect secondary education expenditure is to use a benchmark expenditure or "effort" measure, such as the per pupil expenditure observed in countries that already have stable education institutions with reliable factors of production (Wolff and Gurría 2005). For example, OECD countries spend 26 percent of their per capita GDP to put each student through one year of secondary schooling. Countries of East Asia and the Pacific and Latin America and the Caribbean, however, spend on average 20 percent of their per capita income, but the variation among countries is very large: in 2003, 8 countries spent less than one-tenth of their annual per capita income on each secondary school and 7 spent at or above OECD levels (and not at all times achieved OECD-like results). How would adjusting per pupil expenditures to OECD levels change the financial burden on those countries?

Table 3.6 presents the results of the recalibrated model for the 85 percent GER2 target, but substituting 26 percent for per pupil expenditures (see annex 3.4 for other targets). Under those assumptions 31 of the 36 countries now face fiscal gaps. Expenditure needs go up significantly, by 1.5 percent of their GDPs for low-income countries and by 0.8 percent of their GDPs for lower-middle-income countries. With similar unit costs, resource needs presented in column 1 of table 3.6 now start to look more homogeneous across the two regions (with Latin American countries facing even slightly higher needs than East Asian countries in most cases) and different income levels.

Under this scenario, to achieve 85 percent gross enrollment rates in 2003, countries in the two regions should have spent 2.74 percent of

Table 3.6. 2003 Estimated Fiscal Gap, with OECD Unit Costs (target GER2 = 85%)*

	Resources needed as % of GDP	*Fiscal gap as % of GDP*	*Variation in per pupil expenditure (% of GDP Per capita)*	*Fiscal gap (billion $PPP)*
Low income	3.10	2.11	12.99	$1.10
Lower-middle income	2.77	1.46	12.03	$136.30
Upper-middle/high income	2.60	0.83	7.16	$10.90
East Asia and the Pacific	2.73	1.29	9.34	$119.50
Latin America and the Caribbean	2.74	1.27	10.47	$28.90
Two regions combined	**2.74**	**1.28**	**10.01**	**$148.30**

Source: Yilmaz 2005.
*The fiscal gap calculations exclude 10 countries in the sample that already achieved 85 percent GER2.

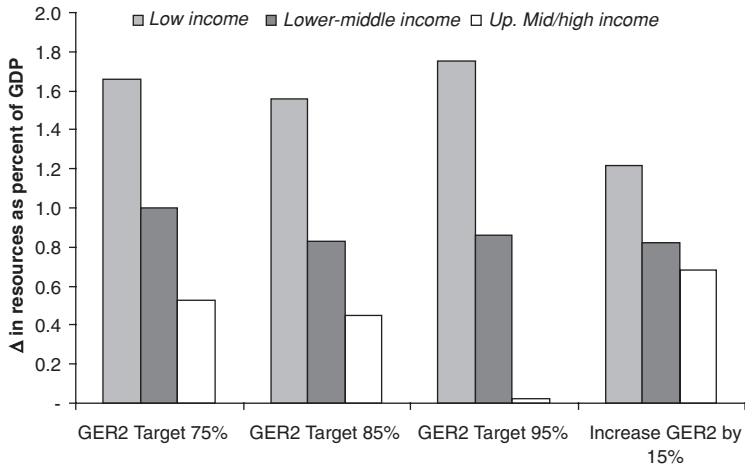
their GDPs on secondary education—an ambitious amount—and should have financed additional spending that, on average, adds up to 1.28 percent of their national incomes. In other words, the 31 countries in this group should have nearly doubled their education expenditures and, to do this, find an additional $40.4 billion (in current dollars; in PPP converted dollars this amount is $148 billion).

Improving quality is significantly more expensive for low-income countries—about twice as costly as it is for middle-income countries (figure 3.7). For the 85 percent GER2 target, low-income countries must invest an additional 1.6 percent of their GDPs in secondary education. Quality improvements at the margin are cheaper for middle-income countries: lower-middle-income countries must invest 0.8 percent of their GDPs in addition to what they are already spending, and upper-middle-income countries must invest 0.4 percent of their GDPs. Again, care must be taken in interpreting these results because the expenditure level reached by OECD countries is not by any means a necessary or sufficient condition for quality. However, some increase in per pupil expenditure will very likely be necessary in low-income East Asian countries and most Latin American and Caribbean countries (combined with the efficiency improvements illustrated in chapter 4).

Forward-looking estimates (2003–15)

Even with funds in hand, changes to the secondary education system will not take place overnight—implementing reforms and cultivating the necessary production factors (such as better teachers, more school

Figure 3.7. Marginal Cost of Quality, as a Percentage of GDP



Source: Yilmaz 2005.

buildings, etc.) will take time. We now consider changes needed over longer horizons. The assumption that drives the expenditure need estimates during the next decade is that countries will gradually achieve OECD-level unit costs, spending 26 percent of their per capita income on every secondary school student by 2015 while keeping up with changes in the secondary-school-age cohort (table 3.7).

Obviously, improving the secondary education sector is more than a numbers game—implicit in the scenarios presented in this section is that countries will implement necessary reforms and secondary education institutions will truly improve, with capacity to handle demand and with quality as high as possible for a given unit cost. In other words, estimates put forward in this section are best-case scenarios.

Table 3.8 presents the forward-looking estimates of expenditure needs and fiscal gap for GER2 of 85 percent. **To reach this enrollment target by 2015, countries in the two regions must expand their secondary education expenditure by 0.1 percent of their GDPs each year.** By the year 2015, assuming that per pupil expenditures gradually reach 26 percent of per capita income, countries, on average, must allocate 2.5 percent of their GDPs to the secondary education sectors. The forward-looking estimates for resources needed are lower (on average by 0.3 percent of GDP) because they take into consideration both the projected economic growth and the projected decline in the secondary-school-age cohort.

Table 3.7. Average Change in School-Age Cohort and Total Population, 2003–15*

	Secondary school cohort growth (%)		*Population growth (%)*		*Change in proportion of school age population (%)*	
	East Asia and the Pacific	*Latin America and the Caribbean*	*East Asia and the Pacific*	*Latin America and the Caribbean*	*East Asia and the Pacific*	*Latin America and the Caribbean*
Low income	4.82	9.5	25.1	27.9	−2.2	−2.2
Lower-middle income	−3.3	5.2	17.0	17.8	−2.4	−1.3
Upper-middle/high income	−5.5	−7.0	9.9	9.76	−1.3	−1.9
TOTAL	−1.4	−0.4	17.4	14.3	−2.1	−1.7

Source: U.S. Census International database.

*The numbers presented are unweighted averages obtained across countries.

Table 3.8. Estimated Expenditure Need at GER2 = 85% and c_{2015} = 26%

	Number of countries	*2003 resources (% GDP)*	*2015 needed (% GDP)*	*Annual funds (% GDP)*	*Need (annual) billions of $PPP*	*Gap (annual) billions $PPP*
Low income	3	0.52	2.84	0.19	$0.9	$0.6
Lower-middle income	11	1.09	2.41	0.11	$203.5	$84.9
Upper-middle/high income	8	1.65	2.30	0.06	$11.39	$0.9
East Asia and the Pacific	5	0.78	2.50	0.14	$168.10	$78.1
Latin America and the Caribbean	17	1.34	2.41	0.09	$47.6	$8.3
Two regions combined	**22**	**1.21**	**2.43**	**0.10**	**$215.8**	**$86.4**

Source: Yilmaz 2005.

These estimates also highlight that low-income countries are facing a much tougher financial challenge during the next decade compared to middle-income countries. To expand their gross enrollments to 85 percent by 2015, low-income countries must allocate 2.8 percent of their GDPs to secondary education, whereas middle- and high-income countries need allocate only 2.3 percent to 2.4 percent of their GDPs. The change is also more gradual for lower-middle- and upper-middle-income countries—these countries must increase their annual education expenditure by 0.1 percent and 0.06 percent of their GDPs, respectively. However, low-income countries face a steep expenditure curve—not only must they allocate an additional 0.2 percent per year of their GDPs during the next decade to reach their enrollment goal, but they also must finance the largest gap in doing so. Consequently, low-income countries have the least time to waste in mobilizing resources. Every year that passes without an improvement in the existing system creates a larger fiscal hole to fill.

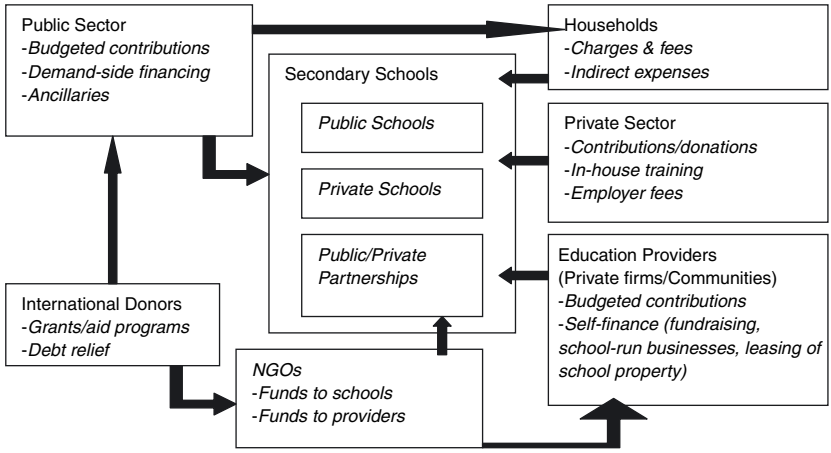
Mobilizing New Resources for Secondary Education: What Are the Options?

Depending on their current enrollment levels, total expenditures, and unit costs at the secondary level, increasing enrollment and quality to the most generally acceptable levels will cost countries in East Asia and the Pacific and Latin America and the Caribbean roughly 1 percent to 2 percent of their national incomes (or 0.05 percent to 0.2 percent of their GDPs every year between now and 2015). Finding stable and reliable

funds to close that gap requires thinking carefully about the means for funding, the budgeting process, the expenditure items, and the design of the fiscal system. The financing mechanism itself is relevant to education attainment and quality (Fernández and Rogerson 2003); even countries that spend a reasonable portion of their national income on secondary education could increase the effect of their education dollars by rearranging or reforming the financing mechanisms they use.[24] In what follows, we survey a menu of funding options available to the countries in the two regions. Figure 3.8 provides a road map for the current analysis (and box 3.1 offers economic rationales behind each of these funding sources).

The main items on the funding menu have remained unchanged during the past 50 years: to finance secondary education, countries could expand public funds, encourage contributions from the private sector, or ask the international community to help (figure 3.8). What has changed is that financing programs now frequently mix different funding sources in innovative ways. The pressure to expand access quickly and the better accounting of private contributions to the secondary education sector have led governments to formalize the role of the private sector by relying more frequently on decentralization and public-private partnerships (Bray 2004; ECLAC-UNESCO 2004). As we go over the resource options in this section, the examples reviewed reveal that new financing mechanisms increasingly blur the boundaries between public and private funding.

Figure 3.8. Secondary Education: Flow of Funds



Source: Authors' elaboration.

Box 3.1

Who Should Finance Secondary Education?

	Rationale for Funding	Comments/Caveats
Public sector rationales	*Positive externalities*	• Paychecks do not fully reflect the direct and indirect benefits (growth, innovation, a healthier society, fewer social problems, fewer individuals tapping into public safety nets, a stronger democracy (Lucas 1990; Rauch 1991; Ritzen 2003). Therefore, individuals consume "too little" secondary education. • The public subsidy should coincide with the size of the externality, but little consensus exists on exactly how social and private returns differ. Policy makers must rely on inherently imperfect information in reaching decisions on public financing (Poterba 1994). • Other public policy options for addressing externalities are purely regulatory. For example, to ensure that citizens invest in education at socially optimal levels, governments could simply make education lumpy and mandatory.
	Borrowing constraints on poor households	• Data on borrowing constraints are scarce, but household surveys find high willingness to pay for secondary education, even among the very poor (Lopez-Acevedo and Salinas 2000; Gertler and Glewwe 1990). • However, net enrollment rates could go down as low as 4 percent among the poorest (Bray 1996). • Thus, easing of credit constraints could significantly increase access to secondary education. • Chapter 2 outlines policy options for easing borrowing constraints.

	Coordination/free rider problems	• Funding education requires collective action, but once families pay for the capital investments and the school is in operation, additional students could be admitted at marginal cost, and households that hold out for the longest can gain access cheaply. This potential to free ride could prevent funding of schools in the first place. • Coordination problems lend legitimacy to extensive public financing of education—local tax collection, for example, could substitute for a contract to fund secondary education collectively by ensuring that each household pays its fair share of education expenses. • But government is hardly the unique solution: communities and other organizations manage to effectively coordinate financing of secondary education.
	Redistribution toward the poor or minorities	• High private returns to secondary education suggest that education provision might be a very effective policy tool that could help governments address inequalities by increasing access to secondary schools. • On the basis of evidence presented in chapter 2 this is especially true for East Asia and the Pacific countries in which private returns from education are higher at the lower-income levels. • Even when returns increase with income levels, as seen in most Latin American and Caribbean countries, there could still be a role for government funding if the return differentials stem from the variations in the quality of education.
Private sector rationales	*Quickly increase service capacity*	• Once allowed into the system, the private sector produces successful pro-poor schools (Tooley 2001), and even those schools that fully recover costs through tuition and fees become more egalitarian over time.

(*Continued*)

	Rationale for Funding	Comments/Caveats
		• Mixed schemes of public financing-private delivery could also help in enrolling a larger population of poor in private schools.
	Infusion of money/capital	• Frequently, businesses fund vocational schools with contracts for work, and sometimes the poor emerge as the biggest beneficiaries of such arrangements (Tooley and Dixon 2003; Chowdhury and Rose 2004). • Individual businesses could also give to schools for receiving tax benefits or as a part of their marketing efforts.
	Stability in service provision	• Empirical evidence suggests that household financing of secondary education is a relatively stable source of financing (Fernandez and Rogerson 1997; Weiss 2005), and the existence of household contributions may increase the reliability of the services, especially during times of political unrest or turmoil (Fafchamps and Minten 2004).
International Rationales	*Social stability and strong institutions*	• Studies find a strong positive relation between secondary education, social ability, and democratization. • Funding secondary education could help increase international security.

The public sector: Increase public secondary education expenditures

Typically, low enrollment levels and low levels of public commitment to the secondary education sector go hand in hand.[25] When education is underfunded, management, salaries, and quality tend to suffer. Typically, budget changes are incremental, based on historical allocations that do not consider current or future needs (Bouapao et al. 2000; Ba Can et al. 2001; Pheng et al. 2001). Such financing practices lead to poor expenditure habits and a poor record of accomplishment in access and quality improvements.

Public secondary education expenditures could receive a boost from a variety of reform programs. Governments could increase their overall revenue efforts, institute revenue sources earmarked for (secondary) education, shift resources from other types of social services—even defense—to the (secondary) education sector, or incorporate pro-education characteristics into other social expenditure programs. Countries could also shift resources within the education sector, from other levels to secondary education or from blanket programs to programs targeted specifically to improve access and enrollment.

a. Increase overall revenue effort and improve budgeting practices

Public support for the education sector is "limited by a government's ability to levy taxes on economic activity as well as its willingness to channel a part of these funds to the education sector" (Lewin and Caillods 2001, 291). Not surprisingly, studies find that tax revenues (in addition to the student population) have the biggest impact on overall education expenditure.[26]

Generally, the tax effort among the countries of East Asia and the Pacific and Latin America and the Caribbean lags behind world averages, even when controlling for different income levels. Low tax effort could be due to economic, political, or historical factors. Sometimes, the formal sector is small and the governments are committed to debt financing. Other times, revenues lag because no history of revenue-generating institutions exists, especially in countries that recently moved to market-based models, such as China, Lao PDR, and Mongolia (Bray 1998).

Although prescribing tax reforms is beyond the scope of this study, two options in direct relation to secondary education financing are worth mentioning: decentralization of revenue generation powers (for raising revenue effort) and formula-based financing (for effective budgeting):

b. Decentralize revenue generation

Taxing locally could greatly enhance revenue capacity. Resources raised locally are less susceptible to political swings that typically affect transfers from the central government; therefore, they allow for better fiscal planning and accountability and encourage spending decisions that cater to local needs and preferences.

Decentralization reforms are under way in many countries in Latin America and the Caribbean and East Asia and the Pacific and, in many cases, the reforms have produced positive results on education investment. Assigning financial decision making to the localities could benefit large, heterogeneous countries, in particular, especially when the localities have enough capacity to cater to local needs. For example, a study on Bolivian decentralization finds that investment patterns in human capital and social services changed significantly after decentralization, mostly because in the aftermath of decentralization, the smallest, poorest municipalities invested devolved funds in their highest-priority projects, which involved education, urban development, and water and sanitation (Faguet 2004).[27] India, which started its decentralization process in late 1990s, achieved considerable improvements in education provision. Indian states' education expenditures grew at faster rates, increasing from 3.1 percent (between 1991 and 1996) to 6.1 percent (between 1997 and 2003) (World Bank 2004d). Gross enrollment rates in the lower secondary cycle increased from 54 percent to 61 percent, and the gains were significant among girls, with an increase from 45 percent to 56 percent. Large northern states (which accounted for most of the out-of-school children) with the most disadvantaged groups achieved significant improvements (Wu et al. 2005). China made great strides in mobilizing and diversifying its resources for education through decentralization (see box 3.2). Finally, higher levels of municipal financial autonomy in the delivery of education in Chile are shown to be associated with lower inequity between schools of the same municipality (di Gropello 2004).

Property taxes—a common method of raising local revenue for education in many developed countries—have little following in the developing world. Quick implementation of property-based financing is next to impossible (especially because of political objections), but property-based financing is worth exploring in the medium term. Property taxes have interesting efficiency and equity implications. First, under a property-based

Box 3.2

Resource Mobilization in China: Decentralization and Diversification of Revenue Sources

With a major policy shift in 1985, China fundamentally transformed its education financing structure from a centralized system with a narrow revenue base to a decentralized system with a diversified revenue base (Tsang 1996). Decentralization charged local governments with education provision, administration, and financing; resource diversification strategies involved both the broadening of the public revenue base through collection of surcharges and levies and mobilization of private resources at the school level through local and parental contributions, income-generating activities, and school fees. Further legislation passed in 1985 and 1986 made the nine-year basic education cycle compulsory and required governments at all levels to increase total expenditures for the basic cycles—and do so at rates higher than the overall revenue growth—to boost per pupil spending. More reforms followed in 1993, encouraging private citizens and groups to participate in school development. Consequently, many people-run schools (called min-ban schools) emerged, especially in growing urban areas.

The impact of decentralization and resource mobilization on education financing was already apparent by the mid-1990s. At the secondary level, between 1986 and 1992, real per pupil expenditures increased by 5.1 percent every year. Both budgeted and off-budget funds were on the rise—the growth in the latter was particularly rapid: between 1986 and 1997, budgeted allocations for basic education increased (in real terms) by 5.7 percent per year and off-budget funds by 27.5 percent, drastically changing the composition of the funding sources in total budgets:

Sources of funds, over time (% of the budget)	*1986*	*1991*	*1997*
Government budgeted funds	76.52	62.85	53.63
Off-budget funds			
Levies and surcharges	4.94	10.27	10.58
Enterprise-run institutions	5.2	5.83	4.72
Institution-generated resources	4.16	5.09	3.91
Social contributions	4.59	8.59	6.74
Tuition and fees	3.06	4.42	12.88
Others	1.53	2.95	7.54
Subtotal	*23.48*	*37.15*	*46.37*

Source: Tsang 2000.

(*Continued*)

Yet, the funding increases did not materialize for everyone. With little to tap in their fiscal bases, poor and rural areas experienced financial difficulties (Tsang and Ding 2005). Tax reforms implemented to reduce tax burdens on farmers and the "Unitary Fee" policy of 2001, which regulated the ways schools collect fees (to reduce the direct costs of schooling on households), further impaired the financial capacity of governments at county and township levels to provide basic education. As early as 1989 availability of funding became increasingly inequitable. For example, average per pupil expenditure at the secondary level was 350 yuan for each student, but spending at the top was more than four times the spending at the bottom (and off-budget spending was nine times higher). During the next decade little took place to help close those expenditure differences. On the contrary, increased reliance on local wealth for financing education contributed further to the large disparities in per student spending across areas: in 1997, per student expenditure among the poor was only 86 percent of the national average.

The central government began in the late 1990s to address concerns over inequities, particularly those between rural and urban areas. Financial subsidies to local governments earmarked for the development of basic education in poor areas increased gradually. Though ad hoc in usage and small in scale, these categorical grants for basic education represented the first attempt by the government to use intergovernmental grants to finance education (Tsang 2002).

Programs targeting poor regions and needy students have focused largely on access. Between 1995 and 2005 the amount the central government gave (in grants and matching funds) to poor counties for school reconstruction and other programs to improve enrollment exceeded 38 billion yuan. Since 2004 central government has been offering targeted subsidies for needy students, covering school fees for textbooks, boarding, and other miscellaneous items. Currently, 10 billion yuan has been earmarked for construction of boarding schools in areas with adverse geographic conditions, mainly targeting 372 western counties without universal nine-year compulsory education (as of 2003) and some minority districts in central China. The Eleventh Plan Period of 2006–10 involves major increases in intergovernmental grants to support basic education. Totaling 218 billion yuan from central and provincial levels, the new funding will provide exemption of school fees, textbooks to children from poor backgrounds, and living subsidies for boarding students; support essential nonpersonnel spending and school maintenance and reconstruction; and contribute to the payment of teacher salaries in poor counties. This represents a clear commitment of the government for the support of rural basic education and marks the beginning of a substantial use of

(*Continued*)

intergovernmental grants as a regular part of the overall system for financing rural education.

The financing of education in China has been a continuous process of changes and shifts during the past two decades. The financial reform has succeeded in fundamentally altering a financing structure to a decentralized system. In the context of a growing national economy, the financial reform, which has been an integral part of the education sector, has achieved remarkable achievements in broadening access and reducing illiteracy. But this brief historical overview also indicates that Chinese education is still confronted by unresolved issues, such as ascertaining an appropriate financing structure to mobilize additional resources for education and closing the gap in access and quality among the poor and the rich regions of the country.

Sources: Tsang 1996, 2000, 2002; Tsang and Ding 2005; Ministry of Education 1999, 2003.

financing system, the cost of home ownership reflects the differences in school quality across different jurisdictions—that is, those with higher willingness to pay for education fund quality improvements (Hoxby 1996; Gatti 2002).[28] Second, because school quality and the cost variable are capitalized in the property values, loss in quality could result in budgetary penalties for the local schools (Hoxby 1995). In that way, by reducing the information asymmetries (but not collective action problems) in the system, property-based financing could improve school performance regardless of who provides the service.

Two concerns raised about local funding of education (including property-based financing) are externalities and equity. First, critics worry that as they invest in education, localities will not be able to take into consideration the human capital spillovers, which are hard to measure. In fact, spillovers might be small compared with the private returns to schooling (Hoxby 1996), and benefits from local accountability might outweigh the forgone returns to national coordination (Cortes 2005). Second, critics point out that local financing, especially through property taxes, could result in inequalities in education service availability and quality across jurisdictions. Inequality issues are crucial and must be addressed through equalization policies. At the same time it is important to compare the outcomes of fiscal decentralization with the existing conditions that prevail in a country, not with some "ideal state." In some cases, the central government

cannot deliver some of the theorized benefits attributed to the ideal centralized state, simply because these theorized benefits are not there.[29] Consequently, benefits to the poor could be greatly enhanced under fiscal decentralization augmented with intergovernmental transfers and targeted subsidies, compared with a centralized government with low tax effort.

c. Consider formula funding

Formula funding involves allocation of resources (in kind or in cash) from the funding entity—typically, the central or local government—to the operational units (schools or school districts) based on a universally applied rule (Caldwell et al. 1999).[30] The simplest kind of formula allocates funds by a single variable, such as school-age children or the number of students enrolled. Depending on the goal of the policy, formulas might become very complicated, taking into consideration various proxies for costs, such as grade levels, curriculum differences, and number of teachers, among others. Formulas could also consider specific needs for a group of students or schools. For example, funds for school lunches, uniforms, and books might be distributed based on the number of needy families, funds for supplemental education might be distributed in proportion to the number of failing students, and funds for purchases or salaries might be based on school location.

Compared with its alternatives (historic budgeting or intergovernmental and equalization grants not based on costs), formula funding has numerous advantages: First, by focusing on costs and needs, formula funding could help generate a better understanding of trade-offs and encourage reallocating funds for more effective spending. Second, because it is based on specific measures of costs, formula funding is relatively, but not entirely, immune to political lobbying or manipulations[31] and could help generate reliable and predictable resources that allow for long-term planning, promote financial accountability, and reduce corruption. Third, well-designed formulas automatically allow funding levels to change with needs, without any political or administrative intervention. Fourth, formula funding could help pursue narrowly defined policies. Finally, under a formula-funding regimen, rather than wasting time on budget negotiations, school administrators could focus on education planning.[32] Taken together, less bureaucracy and more transparency are likely to increase resources available for spending, even when the initial commitment levels remain unchanged.[33]

Formula funding is becoming increasingly common in education budgeting across Latin America and the Caribbean and East Asia and the

Pacific as countries move toward more decentralized forms of education funding and provision. Sri Lanka started experimenting with a "norm-based unit cost resource allocation mechanism" in 2000 (Arunatilake and de Silva 2004). Batu, Indonesia, started with a simple formula based on enrollments in 2004 and in academic year 2005 switched to a more complicated model that includes the school level, number of students, number of classrooms, number of teachers, and even number of high-achieving students. In 2004, under its Modernization and Decentralization Program (PROMODE), Ecuador used a simple formula to allocate 5 percent of its education budget—the so-called "Budget Item 53," which covers operating and teaching costs (Utstein Anti-Corruption Resource Centre 2003).[34] Brazil implemented its formula funding program (FUNDEF) in 1998 (box 3.3).

Formula funding could be particularly appropriate at the secondary level because schools are more diversified and management capacities are stronger. At the same time, because it relies on proxies for measuring costs, formula funding requires the ability to collect reliable

Box 3.3

Formula Funding in Brazil: The FUNDEF Program

In 1998 the federal government of Brazil implemented the Fundo de Manutençã e Desenvolvimento do Ensino Fundamental e de Valorização do Magistério (Fund for the Maintenance and Development of Basic Education and Teacher Appreciation), known as FUNDEF, primarily to equalize basic education financing across different jurisdictions and regions. FUNDEF uses federal, state, and municipal funds collected through income taxes, sales taxes, and intergovernmental transfers to guarantee a minimum per pupil expenditure in primary and lower secondary schools (the basic education in Brazil). Before FUNDEF, subnational governments were required to allocate a fixed share of their revenues determined historically, ignoring the current expenditure needs. FUNDEF funds, however, are distributed to the state and municipal governments based on enrollment figures. This formula not only allocates funds according to need, but it also provides incentives for the local governments to enroll more students.

In three years, FUNDEF created substantial improvements in removing supply-side constraints, including a 6 percent increase in the initial enrollments, and

(*Continued*)

11 million students benefited from increased education expenditures in their local systems. The program was particularly successful in municipalities that already played an active role in education (de Mello and Hoppe 2005). FUNDEF helped expand access to lower secondary education because each retained student represents additional income for the locality (Larach 2001). Consequently, local service provision improved, and the share of basic education enrollments in schools under municipal governments' control increased from 34 percent in 1996 to 54 percent of enrollment in 2001 (World Bank 2002). Gordon and Vegas (2005) find that FUNDEF-induced spending raised enrollments at the lower secondary level (grades 5–8) specifically in the program's target states (in which per pupil expenditures were low), and FUNDEF funds did not replace municipal funds: funds were used to reduce class size and increase quality. The same study shows that low achievement and low per pupil expenditure correlate. Therefore, by reducing discrepancies in per pupil expenditures, FUNDEF is also closing the gap between high- and low-achieving students. FUNDEF will expire in 2007.

Sources: World Bank 2002; Larach 2001; Gordon and Vegas 2005.

demographic, economic, and school data.[35] It is common practice to incorporate incentives such as enrollment targets in the formulas, but in the short run, formula funding is a zero-sum game, and localities with more capacity could capture the lion's share of the funds, leaving little for poor regions under stress. Another challenge often arises in which there are disparities in resources such as experienced teachers across jurisdictions; in such cases it is challenging to avoid having the formulas simply re-create historical budgeting as the starting point.[36]

d. Increase revenues earmarked for secondary education

Revenue tools instituted specifically for increasing secondary education expenditures could be general, such as sin taxes, or selective, targeting those who receive the first round of benefits from a more educated workforce. Below, we review two commonly used earmarked revenue resources for secondary education.[37]

e. Use lotteries and sin taxes

Frequently, developed countries use lotteries and sin taxes to raise funds for education without increasing the overall tax burden on the

general population. Although seemingly a good idea, evidence from the United States shows that earmarked lottery revenues do not result in a permanent increase in education resources (Mejia 2005). Lottery funds tend to displace education spending in the long run: the initial boost from the lottery revenues is followed by a permanent depression in the growth of education expenditures.[38] That is because given the comfort of the lottery revenues; legislators reallocate general funds previously allocated to education toward other uses (Miller and Pierce 1997). To prevent the displacement of general education funds, policy makers could create specific programs to be funded only through lottery or sin tax revenues (Miller 2004). Another important consideration is the tax incidence: lotteries and sin taxes are also generally regressive—in fact, they are commonly dubbed as "poor taxes"—although they may also bring other social benefits.

f. Use targeted taxes

Targeted taxes generate funds specifically from those who are the main beneficiaries of an educated workforce. The most widespread forms of such targeted taxes in East Asia and the Pacific and Latin America and the Caribbean are payroll levies on employees and corporate taxes. Payroll levies across the two regions vary from 0.5 percent to 2 percent (Guerrero 2002) and typically fund vocational and technical programs, especially in the Latin American and Caribbean region: Serviço Nacional de Aprendizagem Industrial (SENAI) in Brazil, SENA in Colombia, and Instituto Nacional de Aprendizaje (INA) in Costa Rica rely heavily on payroll levies. In the Republic of Korea, companies with more than three hundred employees must contribute to vocational schools either by conducting in-house trainings or by paying payroll taxes. In Beijing, all salaried employees contribute 2 percent of their paychecks to capital investments in schools. In addition, 2 percent to 5 percent of the profits from state enterprises go to education funds.

Even earmarked revenues from targeted taxes are susceptible to political manipulation. In 1990 Costa Rica's government increased payroll levies from 1 percent to 2 percent, but ultimately spent the money elsewhere (Ducci 1991). Furthermore, payroll taxes can fall disproportionately on government employees. In China, and to some extent, in the Republic of Korea, payroll levies and taxes on profit are hard to enforce on privately owned businesses.

g. Institute pro-secondary education programs funded by other government sectors

Shifting resources away from other government sectors toward education is a daunting task subject to many political objections. Nonetheless, governments must consider generating additional public resources for secondary education by encouraging the implementation of social programs with pro-education components. With little manipulation, welfare programs, counseling and youth programs against drugs and violence, lifelong learning programs, and infrastructure development (such as telecommunications and roads) could create a larger impact on secondary school access and enrollments (see box 3.4 for the case of Oportunidades in Mexico).

Box 3.4

Cross-Sectoral Funding for Secondary Education in Mexico—The Oportunidades Program

One successful cross-sectoral funding scheme is Mexico's Oportunidades Program, which offers transfers to poor households conditional on school attendance. Oportunidades started in 1997 (then, it was called Progresa—Programa de Educación, Salud y Alimentación), providing scholarships and food aid to poor, rural households that seek basic health and education services.

Oportunidades is funded mainly by the resources freed by the reduction in the blanket food subsidies popularly known as the "tortilla subsidies." The scholarships are awarded to poor local children attending basic education, and the awards increase with grade level, slightly favoring girls in the lower secondary level. In these ways, the scholarships are adjusted to cover the opportunity cost of attending school for children and youngsters in poor households.

In 2000 the coverage of the Oportunidades Program was expanded from primary education in rural areas to secondary education and urban areas. Between 2000 and 2002, enrollments at the secondary level in Mexico grew by 6 percent annually—the annual growth rates before 2000 hovered at only about 2 percent.

The cross-sectoral approach of Oportunidades (together with demand-side subsidies) goes a long way in explaining its success. According to the World Bank, the Oportunidades Program "exploits synergies between education, health, nutrition, and monetary transfers in the production of human capital, offering beneficiaries a long-term chance to escape chronic (intergenerational) poverty on a

(*Continued*)

permanent basis as well as current income support" (World Bank 2004b). A recent evaluation of Oportunidades finds that the program was particularly effective at the secondary level, and a shift of resources from primary school students to secondary school students is likely to significantly improve secondary school enrollments, without a major impact on primary school enrollments (Attanasio et al. 2005).

Source: World Bank 2004b.

In addition, cross-sector funds could help provide ancillary services (services provided within educational institutions, but peripheral to the main objective of learning). Ancillary services such as meal and health programs, school uniforms, and other in-kind transfers could increase the demand for secondary education, especially among the very poor. Table 3.9 provides examples of ancillary services from selected countries of East Asia and the Pacific and Latin America and the Caribbean.

On the downside, generally, ancillary services act as blanket subsidies because excluding high-income students from receiving these services is hard. For example, typically transportation subsidies such as reduced fare passes for schoolchildren cover all students. Once in place, political populism could extend ancillary service benefits to groups without any obvious needs for such subsidies. Malaysia's textbook program is one such example: although it initially covered the poor, over time, 82 percent of all students ultimately qualified for the subsidy (Motivans 2003). Although there is nothing wrong with such blanket programs per se, these types of funding schemes might be more effective in countries in which enrollment rates are very low across different income levels and incentives offered for education would benefit the entire population. In countries in which enrollment levels are already high among high- and upper-middle-income (or urban) families, funds might be spent better on programs that specifically target those who are poor (or rural). So, ancillary services can work well in countries in which the size of the government is relatively large but the amount of education spending is low.

h. Shift resources from other levels to secondary education

Another potential resource for secondary education is transfers from other levels of education, especially from tertiary education, in which cost recovery through charges and fees could replace public subsidies (Tan and Mingat 1992).[39] However, reducing tertiary funding could be

politically difficult because university students are a formidable group: they come from politically connected families, are generally well organized, and are willing to protest policies that reverse historically free services. Nicaragua and Guatemala are two examples in which the spending at the tertiary level far exceeds secondary school spending. In Nicaragua, the public expenditure on tertiary education was $42 million in 2002, whereas the expenditure on the secondary sector was $13.9 million; in Guatemala, the 2001 expenditure on secondary education was only 55 percent of the spending on tertiary education (World Bank 2005c).[40]

Table 3.9. Ancillary Services at Secondary Level, 2005: Selected Countries of East Asia and the Pacific and Latin America and the Caribbean

Service type	*Examples*
School meals	– Chile: Free meals to low-income households in public and government-dependent private schools – Jamaica: Partial funds for meals in public schools – Paraguay: Support for supplementary nutrition in public schools
Transportation	– Chile: Reduced prices to students but no subsidies to transportation companies – Jamaica: Free school bus service to uniformed students – Paraguay: Schoolchildren ride public transportation at half the price
Boarding/housing	– Chile: Some boarding/housing funded by state – Jamaica: State subsidies for a few schools – Malaysia: Boarding schools for students from rural areas, low-income families, or indigenous background
Health services	– Chile: State provides specific medical programs at lower secondary level for some institutions – Malaysia: Ministry of Health provides services to students through School Health Program
Textbooks	– Chile: State funds textbooks for public and government-dependent schools – Jamaica: State pays for the books, students pay rental fee – Indonesia: Limited number of textbooks to schools – Malaysia: Funds for a national textbook loan program – Paraguay: State provides textbooks to public schools and funds a small quantity of library books for independent private schools
Guidance/counseling	– Jamaica and Paraguay: Counseling services in public schools

Source: Adapted from OECD's *2002 Report on World Education Indicators,* table 2.6 (Motivans 2003).

Figure 3.1 indicates that there is more ground for shifting resources out of tertiary in Latin America and the Caribbean than in East Asia and the Pacific.

i. Shift resources from blanket programs to targeted incentives for access and enrollment (demand-side financing)

Governments can also improve secondary school financing by providing incentives for increased access and enrollment rates. Funds could be directed toward schools that successfully recruit students or to students (specifically poor students) who choose to stay in school. Demand-side financing can take the form of stipends, cash payments or scholarships paid to families, or targeted vouchers paid directly to schools based on enrollments. Table 3.10 lists some examples from the two regions.

Generally, demand-side financing is seen as an efficiency-enhancing policy (Sapelli 2003) with significant impact on removing demand-side constraints (see chapter 2). Nonetheless, it must be listed among sources of additional resources at the secondary education level for two reasons. First, when implemented as part of a larger welfare program (such as the Oportunidades Program in Mexico), demand-side financing could generate additional cross-sectoral resources.[41] Second, because its funds are more likely to depend on current needs, demand-side financing provides a more stable source of funding for secondary schools.

Table 3.10. Demand-Side Financing Schemes from Latin America and the Caribbean and East Asia and the Pacific

Country	*Mechanism*
Belize	Government partnerships with churches to share costs of schooling
Bolivia	Private management of public schools by church-based organization
Brazil	Matching grants, capitation grants, and scholarships for poor students
Chile	Voucher system for poor students; capitation grants for all students
China	Matching-grant programs; targeted bursary for poor and minority children
Colombia	Targeted voucher system
Dominican Republic	Assistance to private schools serving low-income students
El Salvador	School choice for poor children
Guatemala	Targeted stipends for girls in 13 communities
Indonesia	Targeted scholarships for junior secondary school students
Jamaica	Student loans
Mexico	Targeted bursary for poor and indigenous populations
Thailand	Bicycles for poor students to get to school in rural areas

Source: Patrinos 2000.

Demand-side financing could help governments easily pursue even a very narrowly defined goal by earmarking cash transfers (Patrinos 2002b). Cash transfers could be used to achieve regional equality (for example, in Vietnam [Socialist Republic of Vietnam and World Bank 2005]) or gender equality (for example, Guatemala)[42] or to improve rural education and increase quality in the overall education system (for example, in Côte d'Ivoire)[43] or just among the poor-performing schools (for example, Chile's P-900 program).[44]

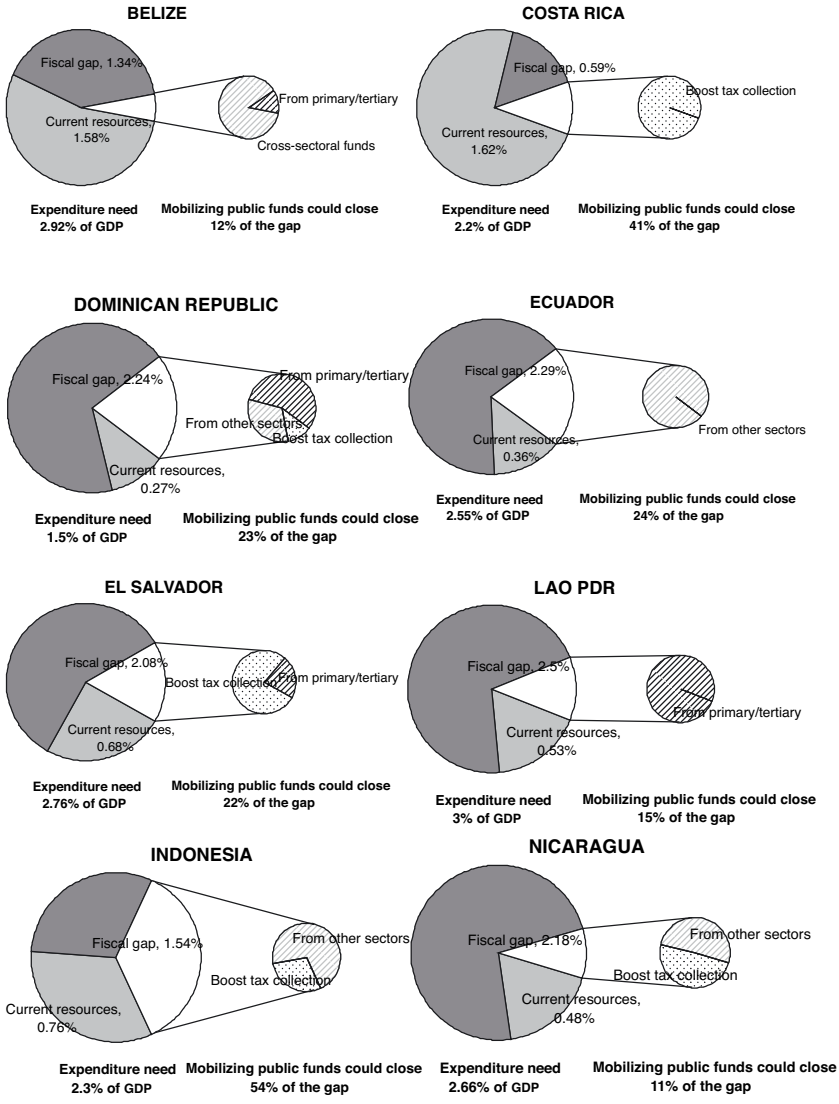
j. Review public funding options

Although public finance is likely to stay as the main mode of resource mobilization in East Asia and the Pacific and Latin America and the Caribbean, it is important to recognize the limitations and problems associated with the use of public funds in education. First, public funding of education cultivates a large bureaucratic machine and strong interest groups whose lobbying could result in ineffective education programs, wasteful spending, and inertia in the education sector.[45] Second, centralized budgeting removes students, parents, and employers from the decision-making process and typically produces an education service with little relevance to public preferences and current needs (ECLAC-UNESCO 2004; Bolina 1996). Third, political pressures lead to overpromising of public sources—frequently, governments open schools without adequate resources and with underpaid staff, leading to a poor education service with little market value (Puryear 1997). Fourth, public funding could be erratic and subject to fluctuations, especially during times of economic crises, shortening planning horizons for schools and students (Varghese 2001). Fifth, depending on the type of revenue-generating mechanism, public funding could lead to long-term distortions in the community, which are not very well understood at the time the policy is initially implemented.[46]

Nonetheless, increasing public funding could be the easiest way of increasing access to secondary education, and with careful policy design, it could also improve the quality and the efficiency of the education system, as reviewed above (World Bank 2005d). Increasing publicly available resources should be the focus of the secondary education sector strategy. particularly for those countries whose total commitments to secondary education, per pupil expenditures, and gross enrollment rates are low (Guatemala, the Dominican Republic, Ecuador, Nicaragua, Lao PDR, Papua New Guinea, El Salvador, and Indonesia come to mind, all of whom spend less than 1 percent of their GDP on secondary education).

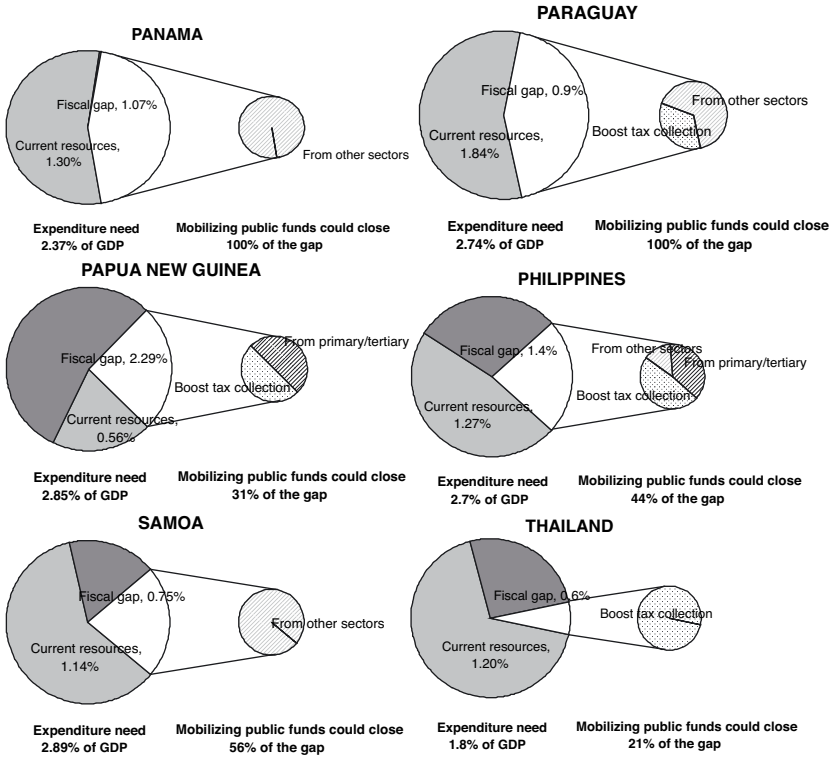
Figure 3.9 presents back-of-the-envelope calculations of the extent to which additional public resources could help close the fiscal gap some of the countries in the two regions are likely to face during the next 10 years. We start with the forward-looking estimates of the fiscal gap presented in

Figure 3.9. Closing the Gap with Public Resources



(*Continued*)

Figure 3.9. Closing the Gap with Public Resources (*Continued*)



Source: Authors' elaboration.

the fourth section and assume that during the next decade, countries increase their tax revenues to 17 percent of their GDPs (this is the current average in the two regions). We also assume that countries reallocate their total expenditures from other sectors to the education sector such that education expenditures equal 20 percent of all government expenditures. Finally, we assume, in a conservative way, that funds are reallocated from primary and tertiary education toward secondary education if they exceed 50 percent and 20 percent of total education expenditures, respectively.

Under these assumptions, for example, Panama could easily close the fiscal gap it is facing by diverting some of the existing government expenditures into education. Lao PDR could cover one-fifth of its expenditure need by diverting some funds from tertiary to secondary, and Costa Rica can make up for half of its needs by increasing its tax collection to the regional average. The criteria adopted for assessing the potential of the different measures are somewhat conservative; additional effort, for

instance, in raising tax revenues, would allow the countries to fill more of their gaps with public resources.

Encourage/allow for additional private funds for secondary education

Private resources are increasing in importance as sources of secondary education funding. Although experimentations with demand-side financing have made governments more comfortable with private service provision, an increased awareness of the extent of private contributions to secondary education is pressuring policy makers into institutionalizing formal channels of funding from households and private firms. In the following we review options that would encourage the flow of additional private funds into secondary education.

a. Deregulate entry and institutionalize competition

One way to increase capacity quickly at the secondary level is to ease the entry into education provision. Allowing private schools to operate could help boost enrollments even when public services are constrained. Governments could then use the additional capacity to provide services to the poor through voucher schemes or simply let private schools operate, catering to whomever these schools choose to accept. For example, the PACES Program in Colombia (reviewed in chapter 2), which relies on the private schools' ability to expand quickly, was a success in areas with an existing strong presence of private schools. In a similar effort, the Philippines government contracts with private schools to enroll students if the public schools cannot meet the demand for upper secondary education (LaRocque 2005b). The Department of Education in the Philippines limits funds to government-recognized schools that have met certain quality standards (Asian Development Bank 2001).[47] Finally, in Korea, private schools were key in providing the additional capacity for boosting secondary enrollments (see spotlight 4 on Korea).

Critics of private education provision stipulate that allowing private schools would not only deteriorate quality of education, but also could lead to increased inequalities and excessive credentialism (Holsinger and Cowell 2000). But **when schools are put on an equal footing to compete, they not only can deliver high-quality services, but they also can compete for good students, improving opportunities both for the poor and the rich** (Hoxby 1995; Tooley 2001). In the Netherlands, in which private and public schools are on an equal footing in their competition for public (and private) funds, the secondary schools are among the top achievers in the world—the eighth graders consistently score among the top 10

in the International Rankings for Math and Science (Patrinos 2002a). In contrast, the Chilean model, which promoted competition between public and private schools via per capita public subsidies, was less successful in promoting egalitarian, high-quality services, in part for not allowing the public schools the same level of decision-making autonomy that the private schools enjoyed.[48]

The Dutch system is also a significant example of the way the boundaries between public and private schools are starting to look less definite: Eligibility for public subsidies for private schools is tied in with strict regulations on service delivery. Consequently, although subsidies have allowed the private education sector to grow, they also made "(t)he private sector 'quasi-governmental' and interwoven into the comprehensive bureaucracy of the government and intermediary associations of governing boards, teachers unions, and the like" (Janssens and Leeuw 2001).

Some government regulation on quality is to be expected when private entities receive public funds, but not all countries could afford restrictive regulations that might be inappropriate given the needs of the population. In India, many private schools provide services for the poor who live in the slums, charging monthly tuition rates of from $0.60 to $3.50 per month. To receive recognition from the government, these schools must post approximately $1,200 in a bank account, must have playgrounds that are at least one thousand square yards large, and must have government-trained teachers in the school (Tooley 2003; Tooley and Dixon 2003). Generally, the schools fail to secure any of these requirements, and the regulations ultimately hurt the poor. The advantage of involving private schools is therefore probably stronger when they are already good-quality schools catering to wealthy and/or good students. The analysis of chapter 4 indicates that public-private partnerships may be particularly useful in Latin America because of the high efficiency of private schools.

b. Privatize school ownership and school management

Privatization might stem from ideological shifts in the management of the public sector or simply from necessity, especially when governments are experiencing severe financial crises. The complete transfer of the ownership of existing schools to the private sector might be involved, or it might involve merely an increase in the private financing or control of government schools (Bray 1998). Evidence from cross-country studies suggests that privately financed schools tend to be more efficient; they

operate at larger scales, with lower per pupil expenditures (Tan and Mingat 1992) (chapter 4 confirms that finding).

Vocational schools are prime candidates for privatization options because of their terminal nature and close ties to employers (Wilson 1996). In Chile, education sector reforms resulted in the creation of more than 70 upper secondary technical schools (Liceos de Educación Técnico Profesional) that were managed by industrial federations such as manufacturing or agricultural sector employees (Sociedad de Fomento Fabril and Sociedad Nacional de Agricultura). Completely removed from direct government funding, these schools have built alliances for additional funding with the industries to which they cater: employers participate in planning and curriculum design, students and teachers participate in on-site training, and the industry contributes materials or equipment to the schools.

Privatization of ownership or management could also stem from the need to improve the efficiency in the education sector. For that purpose, in 2000 Colombia implemented the Colegios en Concesión (concession schools) Program, which transferred the management of some public secondary schools to private institutions. The concession schools receive subsidies from the government (which are well below the per pupil expenditures in the public schools); in return, they must accept all students. The management contracts, which run for 15 years, give the provider full autonomy over school management; are performance based; and are evaluated on results based on contracted performance standards, including hours of instruction, quality of nutritional provision, and the establishment of a single shift. Initial results from the concession schools program are very positive, and the demand for these schools remains high (LaRocque 2005a).

Although privatizing school ownership and management could lead to increased resources, lower unit costs, professionalism, and higher quality in service, private providers are not immune to inefficiencies that afflict the public sector. Especially if the private participation in education delivery becomes sufficiently large, private schools might turn into powerful interest groups, too costly for the government to ignore. For example, in Nigeria, 1,400 private schools that enroll approximately 1 million students are facing forced closures because they do not conform to requirements for registration or operation. These schools have formed the Association of Formidable Educational Development (AFED) to influence government policy and legislation, and so far AFED has managed to prevent these

schools from shutting down through its political influence, media campaigns, and mobilization of support from the local community. More important, these private schools are now too big to fail: the government is reluctant to close these schools down because it is not politically possible to displace 1 million students that currently attend them (Larbi 2004).

c. Decentralize at the school level: Encourage local funding sources and management decisions

Shifting a part of the responsibility for raising and managing funds directly to schools could increase the overall resources available to the secondary education sector and at the same time improve school performance and efficiency and help to relieve strained public finances (Behrman et al. 2002).[49] This type of decentralization, in which autonomous community schools take control over some or all of the funding decisions, is common in both Latin America and the Caribbean and East Asia and the Pacific. Typically, community schools arise to meet excess demand for education and, as they create capacity, they mobilize local funds into the school system. Most community schools are run by local or religious organizations, which have an advantage in eliciting funds from parents and local businesses.[50] For example, in Timor-Leste, church secondary schools tend to offer a better education than do public schools because of the additional contributions they receive from the religious community and parents (World Bank 2004c).[51] Community schools could also help cater to the varied demand among the locals. For example, the Chinese community in Malaysia has formed community schools that extend the standard national curriculum by teaching Chinese language, history, and culture (Tan 1997). In 1995 independent Chinese schools enrolled more than one-quarter of the pupils in private secondary schools, representing more than 3 percent of all secondary school enrollments in Malaysia (Tan 1988). The parateachers (teachers recruited by local communities) have helped set up small-scale schools in localities that are too small or too rural (for example, tribal populations) to qualify for public funding. Evidence from a small number of studies suggests that these alternative schools perform better than do public schools as measured by absenteeism, student attendance, and parental participation. See box 3.5 for evidence on the Fe y Alegria community schools.

Box 3.5

Community Schools—The Case of Fe y Alegria in Latin America and the Caribbean

Fe y Alegria (FyA), a sectarian, nongovernmental organization controlled by the Jesuit Order of the Catholic Church, operates formal preschool, primary, secondary, and technical education programs in the poorest communities in Latin America (LaRocque 2005a). FyA's primary mission is to provide a good quality education to those who are poor, to ensure that students complete at least the basic cycle of schooling, and to establish schools that operate on behalf of community development. The FyA Program began in Repúblíca Bolivariana de Venezuela in 1955 and now operates in Argentina, Bolivia, Brazil, Colombia, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Panama, Peru, and Spain. Most FyA schools are located in rural areas, and some are in or near urban slums. In each country, a national office coordinates the schools in its network. Although the headquarters in República Bolivariana de Venezuela provide the overall coordination, national federations enjoy a high degree of autonomy.

In 2003 more than 1.2 million students attended FyA schools, up from just 220,000 in 1980. In the same year, the organization employed 31,000 people, of which 97 percent were lay and 3 percent were members of a religious order. Under its current model, the local FyA organization mainly mobilizes funds and supervises schools. FyA mobilizes resources from ministries of education, international agencies, and local communities. Ministries pay salaries; foundations, international agencies, and voluntary fees from the local community pay for the land, construction, and maintenance of schools; the community invites FyA to open a school and builds the school, trains and supervises teachers, manages the school, and assists the school in its operation as a community development center.

A study of FyA schools in nine Latin American countries shows that when the community contributions are factored in, the unit costs in FyA schools were higher than in public schools. However, at these higher costs, the FyA schools also achieved better results: FyA schools reduced repetition and dropout rates—progression and retention were, respectively, 44 percent and 11 percent higher in FyA schools compared to public schools.

Sources: McMeekin 2003; LaRocque 2005a.

Community financing of schools could rely on a variety of funding formulas: typically, communities finance capital expenses, and governments fund recurring expenditures. Typically, most governments, especially in East Asia and the Pacific, provide teachers to community schools and even prohibit communities from employing their own teachers, so that they can retain more control over curriculum and quality standards (Behrman et al. 2002). Communities then provide supplemental income to teachers.[52] Community schools also rely on parental and community cash contributions for capital projects, but in rural areas, they might encourage inputs in kind—typically, construction materials for buildings and food for students and teachers.

Although community schools increase funding and accountability, if not guided and controlled, they may exacerbate regional and socioeconomic inequalities. Sometimes, local elites might monopolize management decisions, obstructing genuine community involvement (Chowdhury and Rose 2004). Therefore, community-financing programs must institute a mechanism to ensure that levies or corruption do not prevent the poor from accessing the school.

d. Encourage cost recovery schemes

Cost recovery schemes could significantly increase funds available at the secondary level, especially if they involve methods of extracting the marginal willingness to pay from the students. In addition, when instituted with transparency, cost recovery schemes could generate more accountability and better management of funds. Cost recovery mechanisms involve forced and voluntary contributions, including tuition fees, labor and material contributions, fees for texts and materials, feeding programs, facility fees, and boarding fees.

Recent studies show that households contribute a significant (and increasing) portion of secondary education expenditures through cost recovery mechanisms. In India, for example, the National Open School, the largest secondary school with enrollments across the country, finances itself through tuition fees and other charges such as examination fees (Sujatha 2002). The school's main audience comes from disadvantaged populations, women, people in rural areas, and poor people, and the school offers 20 percent to 30 percent discounts in fees to these groups. The revenues generated through fees and charges grow much faster than the government's commitments to the National Open School. In 1998, less than 1 percent of the school's resources came from the government (as opposed to 34 percent in 1990).

Fees and charges in the rest of Asia have also been increasing and diversifying (Bray 2002). In Hong Kong (China), for example, school fees increased from 12 percent of recurrent costs in 1991 to 18 percent in 1997. In China, many secondary schools are now admitting self-sponsored students at higher fees. In Singapore, differential fees were charged by academic discipline. Finally, in Nicaragua household contributions also vary by income (Gershberg and Meade 2005), suggesting that schools are somehow successful in extracting contributions that vary with households' willingness to pay.

If done correctly, cost recovery could enhance equity by transferring funds from rich students (with high willingness to pay) to poor students (with low willingness to pay). But little work exists on "how to implement a fee regime properly or modify an existing one so as to maximize the positive and minimize the negative" (World Bank 2005d). The World Bank suggests that household contributions are likely to support increased enrollment, efficiency, and equity if the contributions support marginal improvements in quality, if the poor could avoid paying them, if the contribution decisions are made by the community and if quality (not access) is the main problem. Even under such conditions, cost recovery schemes could also result in perverse outcomes. First, if schools successfully collect household contributions, these increased revenues could displace public funds as in the case of the National Open School. To continue receiving funds from the government, administrators might prefer to keep household contributions low or push them under the table. Second, high, uniform fees and charges could jeopardize equity. In Kenya, for example, cost recovery programs displace students from poor and vulnerable households if they continuously fail to meet cost requirements (Njeru and Orodho 2003).

e. Encourage self-financing schemes

A recent trend in secondary school financing is self-generated resources from off-budget items. As funds become scarcer, many schools are moving into self-financing schemes, including running businesses, asking teaching staff to take on consultancy positions, leasing school properties, and raising funds. For example, in Mongolia, some schools manage their own flocks of sheep; in Nepal, schools commonly rent out buildings and use land for other noneducation purposes. In Vietnam, rural institutions have been able to generate revenues by raising poultry, producing vegetables, managing restaurants, and tailoring clothes (Bray 2002).

Critics point out that off-budget revenue-raising actives could increase inequality by placing additional burdens on parents who must already pay for direct and indirect expenses. Others complain that off-budget revenue activities will distract managers from focusing on education delivery and turn them into businesspeople. If well implemented, self-financing schemes can be very effective, as illustrated by the cases concerning China (box 3.6) and Vietnam (spotlight 3), which relied extensively on school self-financing to increase secondary enrollment and quality. However, countries need to be aware of the possible negative implications for equity in the medium run (as exemplified by both countries).

Box 3.6

Self-Financing Arrangements in China

In China, in the face of growing demand for secondary education, especially in urban areas, schools must often rely on off-budget revenues because their funding from city and local governments cannot catch up with the growth in their recurrent expenditures, especially increased salaries. For example, schools in Beijing's Haidan District use the budgeted funds from the city almost entirely to pay salaries, and they rely on school-run businesses, renting out space (labs, classrooms for night school), fees for an optional foreign language program, and increased tuition collections from foreign students and nonlocal students who come from outside the catchment area. The revenues from off-budget activities could amount to half the budgeted funds. In another district, schools charged higher fees to students with low scores on their entrance examination and sought cash and material donations from local benefactors. Elsewhere in China, schools run cafeterias and use buildings for discos and other forms of revenue-earning entertainment.

A review of schools engaged in off-budget revenue raising shows that schools with favorable locations, a good reputation, excess land or buildings to rent, and entrepreneurial management did extremely well. The off-budget revenues significantly increased per pupil expenditures—they largely hike up teacher salaries. Finally, the ability to collect fees and cash in on the school's reputation increased interschool competition and improved quality.

Source: Lewin et al. 2001.

f. Consider private tutoring and supplemental services

Tutoring could be an especially useful and efficient way of providing education in preparation for examinations or supplementing alternative delivery methods. As discussed in section 3, private tutoring constitutes an important portion of households' consumption of education. Around the world, Egypt, India, Japan, the Republic of Korea, Singapore, Malta, Turkey, Cambodia, Hong Kong (China), Romania, the Czech Republic, Russia, and Slovenia are among the countries in which a significant portion of elementary and secondary school students receive private, supplemental education (Bray and Kwok 2003). Typically, households that pay for tutoring services are middle to high income, and educated parents are more likely to purchase tutoring services for their children. Most times, private tutoring supplements students who are preparing for high-stakes tests such as entrance examinations. Research shows that private or peer tutoring could be as effective as teacher tutoring (Walberg and Paik 2000) and could provide a low-cost method of providing education services in areas with limited funds or limited teacher capacity.

g. Consider education savings accounts

In countries in which borrowing constraints prevent children from attending public and private secondary schools, governments could encourage long-term savings by offering subsidized education savings accounts. Education savings accounts are likely to be important in countries in which household contributions are high or the capacity for private education provision is strong. In upper-middle- and high-income countries, especially in those in which the tax system is strong, offering tax-free accounts might provide enough incentive for the households to save. The subsidies could be adjusted for different income levels, and for poor households (or in low- and lower-middle-income countries in which tax breaks are not that meaningful) the government could offer matching grants (Vonderlack and Schreiner 2002).

h. Review private funding options

Although private funding options open a new world of opportunities, particularly in combination with public financing, a few words of caution concerning some of the options surveyed in this section are in order. First, formal public-private partnerships could potentially have a large impact on access, but not on quality or equity. Second, as mentioned before, the trade-off between access and quality will change as secondary

education matures and becomes widely available. Although excessive regulation of the private sector could initially choke growth, over time countries must look for ways to improve the quality of both public and private secondary schools. Achieving high-quality standards need not rely only on regulation of schools from the center: competition among schools, supplemented by local or regional accreditation programs, could achieve that result.

Third, public-private partnerships, specifically local control over curriculum and teacher selection, could cause political unrest in the country, especially when regional preferences are perceived as divisive. However, in the absence of self-reliance in local communities, local elites could usurp power, school administrations could resist outside participation, and a myriad of political problems might arise (Winkler 1989; Adams 2002). Therefore, decentralization decisions must balance local needs and capabilities and national priorities.

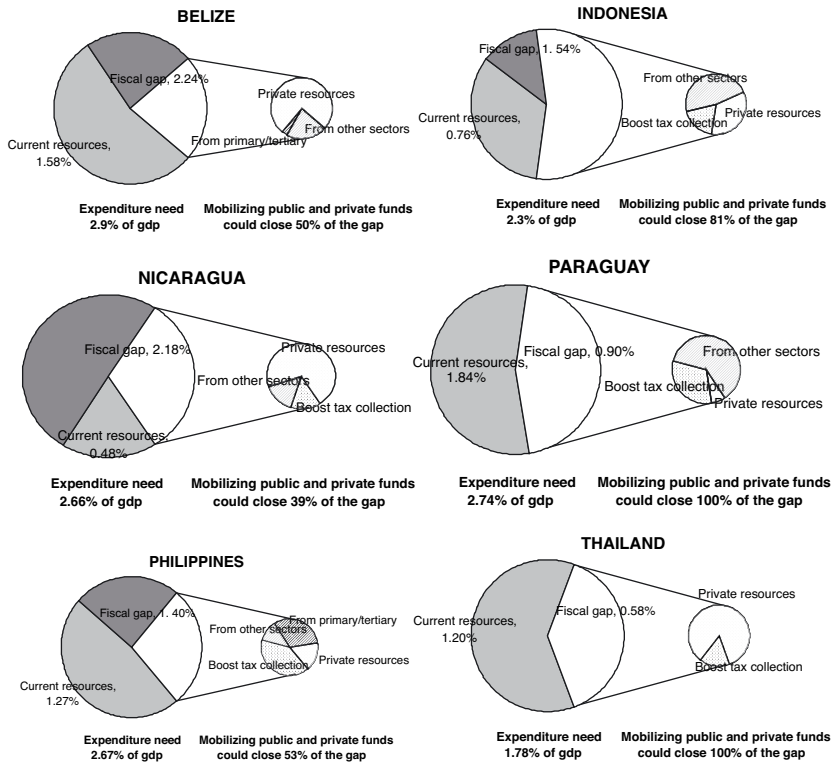
Figure 3.10 presents another set of makeshift estimates; this time, the potential resources the private sector could generate toward secondary education, vis-á-vis the fiscal gap these countries are likely to face during the next decade. The calculations use the OECD levels as a benchmark—in which private sector contributions to secondary education (excluding household expenditures) are 0.7 percent of GDP. For example, if Thailand were to reach this benchmark during the next 10 years, it could cover its entire expenditure need.

Seek an increase in international donor contribution at the secondary level

International funds are not likely to provide long-term solutions to a country's resource needs, but these funds could help jump-start access and enrollment improvements, particularly if the funds help cover capital expenditure needs, such as building schools. International donors could contribute through grants for secondary education, assistance in various programs, and other innovative incentives such as debt relief for education.

Examination of the distribution of aid from Development Assistance Committee (DAC) countries shows that assistance for the secondary-education sector lags far behind primary and postsecondary sectors: in 2001 and 2002, only 10 percent of the total assistance from DAC countries targeted secondary education (as opposed to 29 percent of assistance supporting primary education and 61 percent assisting postsecondary education) (see table 3.11). There is room for allocating a larger

Figure 3.10. Potential Resources from the Private Sector



Source: Authors' elaboration.

proportion of international donor funds to secondary education, given the high share of postsecondary aid.

The international community could provide additional support to secondary education by providing assistance in school management, curriculum development, teacher training, and production and development of teaching materials, especially in the sciences. Initial support from development agencies or international donors in innovative programs with which the recipient country has little or no experience could go a long way toward establishing programs that are ultimately funded by domestic resources. For example, the USAID's support for girls' education in Guatemala in the early 1990s led to the implementation of similar programs by Guatemala's Ministry of Education without international assistance. In its first year, the ministry fell short

Table 3.11. Composition of Bilateral Education Assistance, Two-Year Averages for 2001–02 (percentage)

	Percentage distribution of aid by level of education		
	Primary	*Secondary*	*Postsecondary*
Australia	53	18	29
Austria	1	10	89
Belgium	11	15	74
Canada	43	7	50
Denmark	68	2	29
Finland	65	17	18
France	20	8	71
Germany	10	10	80
Greece	0	1	99
Italy	2	31	67
Japan	13	15	73
Netherlands	82	0	18
New Zealand	8	13	79
Norway	43	7	50
Portugal	17	31	52
Spain	21	31	48
Sweden	39	7	54
Switzerland	42	27	31
United Kingdom	85	11	4
United States	72	0	28
Total DAC countries	29	10	61

Source: UNESCO 2005, table 5.4.

of its goal of reaching 6,000 girls: only 600 girls received help because of implementation problems. But the program expanded quickly in the following years, providing 27,000 indigenous girls with scholarships (Montoya 2004). Finally, the international community could support the development of the secondary education sector by supporting innovative programs such as debt relief for education (Ritzen 2003).

Summing It Up: What Are the Shared Characteristics among Countries That Have Successfully Expanded Their Secondary Education?

A review of the secondary education sectors in 54 countries from Latin America and the Caribbean and East Asia and the Pacific reveals great variations. Although the two regions have achieved relatively high overall gross enrollment rates (at 77 percent), low access is still a problem

for some countries—especially in those countries whose enrollment rates are coupled with low levels of commitment and low per pupil expenditures. However, 14 countries in the two regions have managed to achieve high enrollment levels (on average, 86 percent) and high commitment to secondary education (2.3 percent of GDP) while maintaining reasonable per pupil expenditures (22 percent of per capita income). These countries are among those that are unlikely or less likely to face funding shortages for their secondary education sectors (table 3.12).

Table 3.12. Possibility of Acute Funding Shortages for Secondary Education

		Weak enrollment growth (GER improving by less than 3 percentage points annually)	*Strong enrollment growth (GER improving by more than 3 percentage points annually)*
Relatively High Funding (>1.3% of GDP)	*FUNDS GROWING*	**Acute funding shortages: Unlikely** Barbados, Colombia, Jamaica, Malaysia, Republic of Korea, St. Vincent and the Grenadines, Trinidad and Tobago, Vanuatu Total commitment: 2.01 percent of GDP Growth in total commitment: 10 percentage points Enrollment growth: –0.6 percentage points Region: 3 East Asia and the Pacific and 5 Latin America and the Caribbean Income: 3 lower-middle income and 5 upper-middle and high income	**Acute funding shortages: Low risk** Argentina, Bolivia, Chile, Costa Rica, Mexico Total commitment: 1.5 percent of GDP Growth in total commitment: 3.6 percentage points Enrollment growth: 3.72 percentage points Region: 4 Latin America and the Caribbean Income: 1 lower-middle income and 3 upper-middle income
	FUNDS SHRINKING	**Acute funding shortages: Low risk** Fiji, Panama Total commitment: 2 percent of GDP Growth in total commitment: −3.6 percentage points Enrollment growth: −0.8 percentage points Region: 1 East Asia and the Pacific and 1 Latin America and the Caribbean Income: 1 lower-middle income and 1 upper-middle	**Acute funding shortages: Some Risk** Belize, Brazil, Tonga Total commitment: 1.5. percent of GDP Growth in total commitment: −3.7 percentage points Enrollment growth: 3.53 percentage points Region: 1 East Asia and the Pacific and 2 Latin America and the Caribbean Income: 2 lower-middle income and 1 upper-middle

(*Continued*)

(*Continued*)

Low funding (<=1.3% of GDP)	*FUNDS GROWING*	**Acute funding shortages: Low risk** Palau, Samoa, St. Kitts and Nevis, Thailand Total commitment: 1.13% of GDP Growth in total commitment: 4.1% Enrollment growth: –2.3% Region: 3 East Asia and the Pacific and 1 Latin America and the Caribbean Income: 2 lower-middle income and 2 upper-middle income	**Acute funding shortages: Some Risk** China, El Salvador, Lao PDR, Papua New Guinea Total commitment: 0.6% of GDP Growth in total commitment: 8.7% Enrollment growth: 5.4% Region: 3 East Asia and the Pacific and 1 Latin America and the Caribbean Income: 2 low income and 2 lower-middle income
	FUNDS SHRINKING	**Acute funding shortages: Some risk** Dominican Republic, Ecuador Total commitment: 0.31 percent of GDP Growth in total commitment: –28.5 percent Enrollment growth: 1.13 percent Region: 2 Latin America and the Caribbean Income: 2 lower-middle income	**Acute funding shortages: Likely** Indonesia, Paraguay, Peru, Philippines, Uruguay Total commitment: 0.83 percent of GDP Growth in total commitment: –4.6 percent Enrollment growth: 2.93 percent Region: 2 East Asia and the Pacific and 3 Latin America and the Caribbean Income: 4 lower-middle income and 1 upper-middle income

Source: Authors' elaboration.

Although country profiles and funding strategies vary greatly in the regions, some stylized facts emerge from this chapter:

1. When both access and quality improvements are considered, countries that are likely to face the most severe funding shortages during the next 10 years are the countries with the most-limited resources allocated to secondary education. Typically, these countries spend less than 1 percent of their GDPs on secondary education.
2. Simulation analyses, assuming unit costs benchmarked at the OECD level (that is 26 percent), show that reaching a target enrollment rate of 85 percent by 2015 would require the two combined regions to double their secondary education share in regard to GDP.
3. Low per pupil expenditure is not necessarily desirable. Lowering per pupil expenditures could help expand access to secondary education in countries with sufficient commitment to secondary education expenditure (for example, above 1.5 percent of GDP). However, among countries with low funding commitments, low per pupil expenditures signal low quality and lack of emphasis on secondary education.

4. Although countries of East Asia and the Pacific are more likely to deal with inefficiencies in regard to increased access and enrollment, more of the Latin American and Caribbean countries face issues in quality, with implications for the completion of the secondary cycle.
5. Countries that are achieving significant annual enrollment expansions in their secondary education sectors and that at the same time are devoting an increasing share of their national incomes to secondary education (table 3.12) include Argentina, Bolivia, Chile, Costa Rica, Mexico, China, El Salvador, Lao PDR, Papua New Guinea, and Vietnam.[53] During the long run, Korea has also achieved this double objective. These countries have implemented reforms that typically involve one or more of the following elements:
   a. Mixed public and private resources successfully and innovatively through private school provision, self-financing schemes, and so forth (China, Argentina, Chile, Korea, Vietnam)
   b. Used multiple types of resource mobilizing programs, such as cross-sectoral funds for education and targeted taxes (China, Chile, Mexico, Costa Rica, Korea)
   c. Moved toward more decentralized school systems (Argentina, Chile, China, Mexico, Bolivia)
   d. Managed political opposition to education reforms effectively (China, Chile)
   e. Preferred target funding schemes that favor poor and rural students (almost all on the list)
6. The possibility of future funding shortages in secondary education looms for one group of countries because the growth in funding commitments is not keeping up with the growth in enrollment (for example, China). These countries have a larger menu of options available to them because high and growing demand could mobilize private resources into the secondary education sector.
7. For another group, funding problems could become acute because the commitment to secondary education (as a percentage of national income) is decreasing (for example, the Dominican Republic, Ecuador, Indonesia, Paraguay, Peru, Philippines, Uruguay). These countries must find ways to mobilize resources and perhaps try to lower cost by achieving higher rates of efficiencies. If enrollment rates are also decreasing, as in the Dominican Republic, these countries must refocus on secondary education as a priority area.
8. If funding levels are sufficient, countries could push for large sector reforms to achieve efficiency and to increase quality, for example, by

involving schools in management or by looking for ways in which households would directly fund a larger proportion of school costs. But if funding shortages are likely to become acute, the emphasis should be on marginal improvements (such as allowing greater autonomy at the local level) that would eventually lead the way to longer-term reforms.

Notes

1. Neumayer and de Soysa (2005) and Bray (2003a) show that secondary education participation tends to increase with globalization. Wood and Ridao-Caño (1999) discuss how openness to international trade correlates positively with increased enrollment in secondary education. See Carnoy (1999) for a discussion of the way globalization will interact with the public administration of education.
2. Enrollment numbers reflect the conditions in 38 countries for which data for school years 1988–89 and 2002–03 are available.
3. The sample includes, in addition to the 51 bank client countries, 3 high-income countries in East Asia and the Pacific (Hong Kong [China], Singapore, and the Republic of Korea) to facilitate a more balanced comparison between Latin America and the Caribbean and East Asia and the Pacific.
4. The sample countries vary greatly (even within the same income group) in size, economic vigor, and especially in secondary education attainment—measured both as enrollment rates and as per pupil expenditures. Although the averages presented through the analysis are informative, we encourage the reader to peruse the country-level data found in Yilmaz (2005).
5. Through 2015, in all but three countries, total population will increase faster than the secondary-school-age cohort will, and half the countries in the two regions will see this cohort decline. Although the rates for individual countries vary greatly (see table 3.7), the largest *collective* decline is projected for low- and lower-middle-income countries—by 10 percent and 13 percent, respectively, compared with expected population growth of 18 percent and 11 percent. Upper-middle-income countries will see a 3 percent reduction in this cohort, compared with an expected population growth of 14 percent (Yilmaz 2005).
6. Enrollment rate projections use annual gross enrollment growth rates averaged over five consecutive school years (1998–99 and 2002–03). When countries lack data on enrollment growth (Antigua, Cambodia, Haiti, Honduras, Kiribati, Marshall Islands, Micronesia, Singapore, Solomon Islands, Timor-Leste) the calculations substitute data from the same income group.

7. The economic growth is the average rate observed between 1995 and 2003 (Yilmaz 2005).
8. These calculations are unweighted averages.
9. This figure includes both public and private resources, but excludes household contributions.
10. Generally, developed countries spend 2 percent to 3 percent of their GDPs on secondary education. For example, the OECD countries allocate 2.1 percent of their GDPs to the secondary education sector.
11. Household contributions declined significantly when the government made education one of its top priorities in the mid-1990s. In 1993, for example, households contributed approximately 60 percent to 65 percent of the funds used in delivering public education, at both lower and upper secondary levels (Bray 1996).
12. Cited in Bray (1996).
13. The analysis in this section excludes Vanuatu, which, according to UNESCO, spent 132 percent of its per capita income on each secondary student.
14. These countries include the following: among the low-income group: Cambodia (GDP per capita = $321 and GER2 = 25%), Timor-Leste (GDP per capita = $341 and GER2 = 34%), Vietnam (GDP per capita = $478 and GER2 = 72%), and Haiti (GDP per capita = $376, and GER2 = 19%); among the lower-middle-income group: Guatemala (GDP per capita = $2,158, GER2 = 43%), Honduras (GDP per capita = $1,091, GER2 = 50%), Solomon Islands (GDP per capita = $467 and GER2 = 61%), and Kiribati (GDP per capita = $555, and GER2 = 104%). The upper-middle-income countries excluded are Suriname, República Bolivariana de Venezuela, and Antigua and Barbuda.
15. Alternatively, in general, primary schools absorb 40 percent of total education expenditures, whereas secondary schools receive only 30 percent.
16. Oxfam, for example, suggests that countries should allocate up to 70 percent of their entire education budgets to primary education, especially if a substantial number of children are out of school and dropout rates are high (Watkins 2000).
17. The available panel data are rich, but cross-country comparisons are not the focus of this study; therefore panel data are helpful to the extent that they help make inferences about averages.
18. With rapid expansion of secondary education, expenses such as teacher salaries and costs of producing textbooks are likely to increase. However, if transition from low to high enrollment rates is gradual, with appropriate institutional arrangements, the cost of providing secondary education might go down even when the quality increases. Therefore, estimates on the financial

gap must make additional assumptions about the conditions in the resource markets.

19. Mingat (2004) calculates for a smaller set of African countries that universal secondary education would cost, on average, 2.4 percent of each country's GDP (and in some cases, could go as high as 5 percent of the GDP). Although 2 percent to 2.4 percent of the GDP is at par with what countries with developed economies spend on secondary education, as the author notes, this magnitude of spending ($3 billion in 2001 dollars) is "about 6 times greater than the estimated available national resources" and therefore largely unattainable through government financing. In fact, the universal secondary education goal itself is largely unrealistic, *and not necessarily desirable*. Finally, Lewin (2001a) shows that most countries in Africa currently lack resources to attain even a 60 percent gross enrollment rate at the secondary level. Estimating the financial gap using a unit-cost approach produces reasonable outcomes for countries that already have higher enrollment rates and spend about 1 percent of their GDPs on secondary education. Wolff and GurrÌa (2005) show that under plausible conditions, both the quality and access to secondary education could be attained among the Latin American and Caribbean countries by expanding the resources allocated to secondary education from 1.6 percent to 2.5 percent of their GDPs, an ambitious, but perhaps reasonable, goal.
20. An OLS estimation of gross enrollment rates at the secondary level yields the following equation: $GER2 = 0.67 + 25x - 1.6c$ with all estimates of the parameters significant at the 95 percent confidence level.
21. Data are available for 36 of the 54 countries in the two regions, but we exclude Vanuatu from this discussion because at 135 percent of GDP per capita its unit costs are very high. Country-level data for these and the other estimates are available in Yilmaz (2005).
22. Ratio of secondary-school-age cohort varies very little across countries.
23. In this group Jamaica faces the most significant challenge: its per pupil expenditure at the secondary level is very high—more than twice that of an average country in the two regions at almost 44 percent of its per capita income—and its gross enrollment rate is very low, only 33 percent. Jamaica already allocates more than 2 percent of its GDP to secondary education and has high participation from the private sector. Channeling more resources to secondary education in Jamaica is unlikely, and possibly not very productive. Jamaica's problems are institutional—this country must look for ways to reduce per pupil expenditure and increase efficiency to increase access.
24. Obviously, without efficient use of funds, resource mobilization would be ineffective. Chapter 4 discusses the efficiency issues in education in East Asia and the Pacific and Latin America and the Caribbean.

25. See Burgess (1997) on a discussion of the importance of public sources for education provision.
26. See, for example, Verbina and Chowdhury (2002).
27. The central government also provided strong support to education in the aftermath of decentralization. For a detailed study of the Bolivian education reform, see Contreras and Talavera Simoni (2003).
28. Gatti also points out that property-based local funding could redistribute wealth from older, more established households (which may not have children in school) to younger households with school-age children. See also Brueckner (1982, 1983).
29. For example, critics of decentralization often note that if central governments would give up teacher assignments, availability of quality teachers would significantly diminish in poor areas. That is a theoretically sound argument, but its impact is possibly overemphasized. A study from Peru shows that typically teachers favor working in their hometowns, thus the infra-marginal teachers are rarely affected by central staffing decisions (Baanante 2005).
30. For a general introduction to formula funding, see Ross and Levacic (1999). For case studies on formula funding and the relation between formula funding and decentralization issues, see Downer and Levavic (2004).
31. The processes by which the formulas are developed are often very politicized; policy makers must work hard to ensure that analysis trumps politics in the initial construction of financing formulas.
32. For an extensive discussion of the advantages and disadvantages of formula funding, see the World Bank (2005d).
33. Formula funding is generally considered an efficiency-enhancing policy: by shifting operational decisions closer to the operational unit (whether schools or districts), formula funding could result in more cost-effective decision making, better procurement models, and increased flexibility in spending school resources (World Bank 2005d).
34. To prevent the allocation of funds disproportionately to urban areas, the PROMODE formula incorporated the number of school-age children, poverty levels, and enrollment rates in each municipality (Donoso Naranjo 2003). The use of the formula was abandoned in the 2005 budgeting.
35. In addition, the funding formula should not incorporate variables that are part of the problem. For example, unit costs that are too high or too low could limit the formula's effectiveness. To avoid that problem, it is common practice to incorporate incentives such as enrollment targets in the formulas (as in the FUNDEF program).
36. That is, unless the new formulas hit areas with experienced teachers particularly hard. Phasing in such changes during a transition period while giving schools increased leeway in hiring decisions can mitigate those challenges.

37. Many other forms of earmarked funds, short-term tax hikes or revenue measures, are simply poor policies: These taxes tend to be arbitrary (for example, attached to construction licenses and other government services such as the issuing of passports), and because these are small items levied on a dispersed population, taxpayers rarely ever contest these programs. Therefore, these programs are easy political targets for appropriation.
38. For example, before it instituted its lottery in 1975, Ohio, on average, had $11 per capita annual increases in education spending. In its first year the state's lottery for education pushed that annual increase up to $26 per capita. After the initial surge, however, the annual per capita rate of increase sank to less than $7.
39. Hutchinson and Lewin (2001) point out that Costa Rica is a prime candidate for testing such a transfer program: not only are secondary education completion rates low compared with primary and tertiary levels, but the funding at the tertiary level benefits mostly rich students, with 40 percent of the benefits going to the top two income deciles. Timor-Leste is another country in which a large share of education resources is spent on universities and scholarships.
40. Even when political forces permit the implementation of wide-scale cost recovery programs at the tertiary level, allocating these funds to secondary education might be difficult. Primary education as well as other government sectors bids on these resources.
41. A study that uses Mexico's household income and expenditure data shows that although increased public expenditure contributes significantly to enrollment, the impact of public spending for an average child is minor—that is, to maximize the supply-side interventions, these should effectively target rural and poor communities, not the average child (Lopez-Acevedo 2005).
42. For a review and evaluation of the Eduque a la Niña program, see Liang and Marble (1996). Juárez and Associates Inc. (2002) provide a longer-term review of programs targeting girls in Guatemala.
43. Côte d'Ivoire's subsidies target private schools with various school qualifications, such as duration of operations, teacher certifications, and classroom size (Sakellariou and Patrinos 2004).
44. The P-900 school program (Programa de las 900 Escuelas) from Chile involves no cash transfers, but offers training and books in return for commitment to attendance. In 1997 this program was expanded to secondary schools. The program has increased student achievement, improved retention, and boosted completion rates (Chay et al. 2003; Tokman 2002).
45. For example, in Colombia, opposition from teachers' unions severely limited the impact of decentralization reforms (Fiske 1996).

46. The prime target of this claim is property-based financing of education. For example, one study finds that property-based revenue generation for schools has led to a more segregated society in the United States (Nechyba 2002).
47. PACES had its shortcomings: it did not impose limits on voucher funds a school could receive; it also did not have quality restrictions and therefore attracted some very low quality schools. In the Philippines, the Department of Education funds only government-recognized schools that meet certain quality standards (Asian Development Bank 2001). However, this program is receiving criticism because it is open to abuse by those who could afford the private school tuition.
48. In this case, the solution is to allow schools to compete on the same footing more than trying to limit competition.
49. Winkler and Gershberg (2000) point out that characteristics that lead to success in education have to do with school autonomy, not with regional or municipal autonomy.
50. The school's organization might be fixed by the decentralization model: for example in Nicaragua and El Salvador, schools are required to elect a council among the parents (parents and teachers in Nicaragua). This council signs a contract with the Ministry of Education, which allows the council to take control of teacher management, school operations, and costs (and academic decisions in Nicaragua) (di Gropello 1999, 2004).
51. Church schools are funded from the ministry's budget on the same basis as are public schools. However, the private schools are granted much greater autonomy than those in the public sector in regard to setting working conditions for teachers, academic standards, parental contributions, and conditions for exemption and in regard to matters such as discipline. Private schools are also subject to less frequent supervision from the state. During the 2002–03 academic year, church schools, together with other private schools, accounted for 25 percent of enrollments at the lower secondary level and 32 percent of enrollments at the upper-secondary level.
52. A notable exception is China, in which, in 1994, collectives and village communities employed 32.4 percent of primary teachers and 7.4 percent of lower secondary teachers (Bray 2003b).
53. Although this increase, consisting largely of private funds, is not exactly quantifiable.
54. Semipublic schools use public infrastructure such as classrooms and facilities, but self-finance for most of their recurrent expenditure, such as salaries for new-hire teachers and increasing salaries for experienced teachers. Semipublic schools accounted for 47 percent of total upper secondary enrollment in 2004 (United Nations 2005).

Spotlight 3—Vietnam: School Self-Financing Strategies to Improve Access and Quality

Although Vietnam is still a poor performer in relation to secondary enrollment and completion, its performance has been drastically improving since the early/mid-1990s. A close examination of Vietnam's education policies over time highlights priorities and agenda-setting trends in the government's reform effort.

In 1986 the government of Vietnam launched doi moi, a broad economic reform that effected the transition from central planning to a market-based economic system. The education system was adversely affected during the initial phases of the transition, which was accompanied by a rapid deterioration of school infrastructure and teacher motivation, shortages of textbooks, and increased use of double and sometimes triple shifts in primary and secondary schools (World Bank 1993). Enrollment at both levels dropped sharply in the late 1980s and did not recover until 1992.

Since then Vietnam has displayed laudable progress in the education sector. Universal primary education was assessed as "feasible" in the annual Millennium Development Goals progress review in 2005. Perhaps even more remarkable is the boost in gross secondary education enrollment, which increased from 32 percent in 1992 to 72 percent in 2004 (Asian Development Bank 2005a). Indeed, Vietnam is far along the path toward universal nine-year schooling.

At the same time, although still insufficient overall, quality has been improving in the country since the early 1990s. A recent report by the Asian Development Bank (2005b) suggests that Vietnam's education system is still in pursuit of an out-of-date purpose, one that is not apt for transition to a market or knowledge-based economy, but, despite this serious quality issue, Vietnam's secondary sector is not burdened with many of the problems familiar to developing countries. Teachers are well-educated and trained, textbooks are in adequate supply, infrastructure is basic but offers reasonable libraries and teaching aids, class size is within the normal range, and administration for the most part is effective and sound.

Which policies can explain this favorable recent performance? The doi moi reform ushered in a new system of cost sharing or "socialization" of education and the emergence of semipublic,[54] people-funded private schools. In 1989 an official fee system was introduced at the upper primary and lower secondary levels. Although user fees at the primary level were abolished four years later, parents are still required to pay a monthly fee for lower secondary school. The new system of user charges was meant to mobilize additional resources for education, foster parental involvement in decision making about school curriculum and finance, increase the accountability of schools and commune authorities in the delivery of

educational services, and diversify the provision of educational services (United Nations 2005). These policies were successful in increasing access to secondary education, as well as mobilizing additional resources (estimates based on the 1992–93 and 1997–98 VLSS suggest that total private spending on education increased dramatically from about 1.7 percent of GDP in 1003 to 3.4 percent of GDP in 1998 [Nga Nguyet Nguyen 2004]), which was used for quality-enhancing purposes and for improving the governance of the education sector.

However, the resulting financial burden on the poor and near poor has been heavy, especially at the secondary level, explaining the persistently high inequity levels along the lines of income, gender, ethnicity, and region, particularly at the secondary level (Asian Development Bank 2005a, 2005b; Nguyen 2004). The private cost of schooling, including fees and contributions, school uniforms, textbooks, and transportation, account for 39 percent and 58 percent of total spending on primary and lower secondary education, respectively (Government of Viet Nam-Donor Working Group 2001). This trend is expected to continue to rise because funding from "socialization," including overseas development assistance, is expected to increase to 40 percent by 2010, up from 29 percent in 2000 (Vietnam Education Forum 2003). In addition, although resources for secondary education have increased overall, public spending has not been keeping pace with the rapid change in the number of enrollments since the mid-1990s, resulting in insufficient public spending per student, in particular in upper secondary education.

In recent years, the Vietnamese government has recognized the financial burden of basic education on poor households in the Comprehensive Poverty Reduction and Growth Strategy (Government of Vietnam 2003) and sector-specific strategies including the Education for All Plan (Ministry of Education and Training 2003) and the Education Development Strategy (Ministry of Education and Training 2001). In addition to such national policies, all of which identify the elimination of fees in primary and secondary schools for poor children as a core objective, the World Bank has been working with the government to eliminate fees for tuition, textbooks, compulsory uniforms, Parent Teacher Associations and other community support, and unauthorized or unofficial charges for basic education services (Kattan and Burnett 2004). As a result equity has started to improve since 2000.

Given Vietnam's impressive growth in enrollment during the past 15 years, it is an opportune time for its education system to continue moving beyond providing minimal standards of education quality and equity. The priority now is to restructure the composition of budgetary allocations in the sector toward more public resources for secondary education, to improve equity (and therefore, also

(*Continued*)

access), while continuing to raise the quality and internal efficiency of service delivery. It would also be more efficient and even equitable to encourage further private schools and public-private partnerships as applied in other East Asian countries (private schools receiving public subsidies for recurrent costs) than to continue promoting semipublic schools, which require heavy investment of public funds in infrastructure and higher self-financing levels.

Sources: Inoue and di Gropello on the basis of the cited references.

CHAPTER 4

Measuring and Improving the Efficiency of Secondary Education in Latin America and East Asia

Introduction

Previous chapters have shown that Latin American and East Asian countries face both coverage and quality challenges in secondary education. An obvious way to increase coverage and quality in education is to increase the volume of resources school systems receive. This option was reviewed in chapter 3. However, the link between resources and education outcomes is often tenuous. In particular, 40 years of research into the determinants of education success has pointed to low and often insignificant effects of school resources on educational achievement. There are many reasons for that: usually education resources are measured omitting important factors such as family background,[1] education outcomes in quality are usually measured in levels and not through added value, and a fundamental issue in education is not only the volume of resources but also how they are used. In other words, the efficiency of schools is at least as important as the volume of resources devoted to them.

The overall research question for this chapter is, therefore, how can a country achieve better outcomes given a fixed budget? In other words, we analyze what the main bottlenecks and opportunities are for improving cost-effectiveness in secondary education. By being more efficient, countries could substantially expand and improve secondary education or have the potential to do so with less resource mobilization effort.

The chapter is composed of two main sections. In the first we attempt to measure the cost-effectiveness level of different Latin American and East Asian countries by using data envelopment analysis on the PISA 2000 school database. This innovative approach allows us to provide reliable measures of cost-effectiveness, and we will see that there is a substantial margin for efficiency improvements in both regions.

In the second section we try to explain efficiency results and analyze interventions, which can be efficiency-enhancing, by using a combination of analytical insights from the PISA analysis, literature reviews, and case studies. We analyze interventions, such as changes in input composition; pedagogical and curricular reforms; management reforms, with particular focus on school-based management and public-private partnerships; and internal efficiency improvements, as measured by decreased repetition. We will identify particularly promising interventions, such as increases in the proportion of nonsalary recurrent costs, promotion of public-private partnerships, decentralization of decision making in some areas of teacher management and budget composition and allocation, and improved curricular structure.

Efficiency/Production Frontier Analysis

In this first section we use a nonparametric technique, known as data envelopment analysis (DEA) to estimate a production frontier by aggregating data on inputs and outputs. DEA analysis measures the productivity of individual units as the distance of the individual from the measured frontier. The basic unit of analysis is the school.

What do we mean by efficiency?

Schools fall in the category of production units whose efficiency is excruciatingly difficult to measure. They are very different from firms that specialize in one output and whose inputs are easily valued using market prices.

First, schools produce multiple outputs. Besides instruction in content along multiple dimensions such as mathematics, communication, and

science, much of what schools should impart to children consists of socialization skills and values. Schools also select students through promotion and retention: a given school could produce excellent graduates if it allowed only the very best to graduate, and many are known to resort to that scheme. This means that in addition to multiple dimensions of achievement (some measurable by test results), education attainment (grade level) is also an important output of schools.

In addition to the existence of multiple outputs, an added difficulty is that some of these outputs are very difficult to quantify. Although measuring attainment is quite easy, measuring socialization skills and content mastery is still in its infancy and there is no accepted yardstick for it. Measuring knowledge of content, although an advanced science, is subject to some difficulties, such as what content will be measured. Most learning evaluations are curriculum-based and highly academic, which means that the link between knowledge and its use in the lives of individuals becomes relatively tenuous. Some learning evaluations, however, adopt a "life skills" approach that attempts to measure knowledge in the context of how useful it is in real-life situations.

Finally, schools also use multiple inputs that are difficult to value. Two of the most important factors affecting learning are family background, whose price can never be estimated, and teachers, whose price is very far from a market price because teachers in most countries have career structures more affected by political negotiation and budget availability than by marginal returns.

Ultimately, to measure how efficiently countries or schools convert the inputs into the set of outcomes, the efficiency, or cost-effectiveness, of education resources must be analyzed, which requires us to compare the outcomes of the production process, typically of a country or school, with the inputs invested in this process. A production frontier is derived from the most efficient observations, and all the other observations are located within this frontier: the farther they are, the more inefficient they are. Box 4.1 provides a methodological description of how efficiency can be calculated in its two main dimensions (input efficiency and output efficiency). What really interests us in the context of this report is output efficiency, which measures the gap between the potential output that could be produced from a given level of resources and the actual output: most countries or schools could be producing more out of what they invest. Input efficiency measures how much fewer resources countries or schools could invest to reach a certain output. This concept is of less

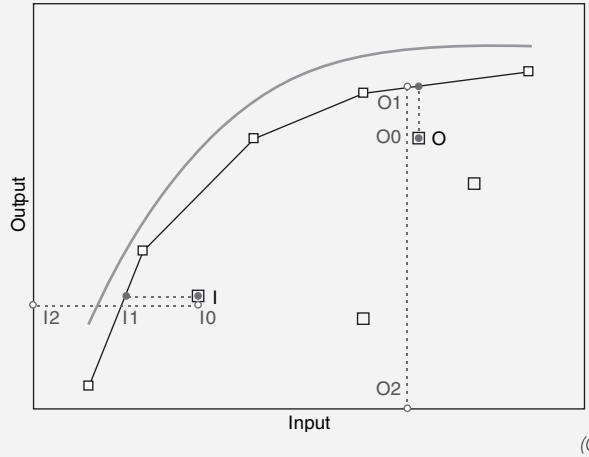
Box 4.1

Efficiency Concepts and Measurement

Two types of efficiency can be defined: output efficiency and input efficiency. The graph illustrates the different concepts of output and input efficiency. The light gray line enveloping the rest of the graph represents a hypothetical unobservable production possibilities frontier. That is, it shows the maximum that a given school could achieve with a given volume of input. The squares within the gray line represent hypothetical observed data points; those joined by line segments represent the observed efficiency frontier, and those within represent schools that achieve less than they could from their inputs than their peers do.

Input efficiency means that a school is using as little input volume as possible to obtain a given output volume. In the figure below input efficiency is defined as $I = (I0–I2)/(I1–I2)$. In perfectly efficient schools, input efficiency will equal unity,[2] and the higher the index the more input is being used to obtain a given level of output. Output efficiency measures how much output a school is obtaining from a given input volume and is defined as $O = (O0–O2)/(O1–O2)$. Once again, for schools on the frontier, output efficiency will be 1, but for inefficient schools it will be less than 1.

The figure makes it clear that although efficient schools are efficient in both definitions,[3] inefficient schools may be much more so in one than in the other. Points **O** and **I** are both inefficient, but whereas point **I** is close to the frontier in the input sense but quite far in the output sense, point **O** is close in the output sense but far in the input sense. It is important to note that differences between input and output efficiency are possible because we assume that the production



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function is nonlinear, that is, it does not exhibit constant returns to scale everywhere. In addition, by assuming a convex function, which exhibits a certain pattern of variable returns to scale (increasing, constant, and decreasing), we also imply that input efficiency will be harder to achieve as inputs increase and, vice-versa, output efficiency will be easier to achieve. Both the shape of the production function and the location within the frontier will therefore be key in determining the efficiency level. Convexity is generally assumed for production functions, and there are grounds to believe that an education production function would also be convex, that is, it is assumed that beyond a certain level of human and physical resources, the input-output relation would decrease or, in other words, returns to scale would be decreasing, producing both higher input inefficiency and higher output efficiency. Data envelopment analysis (DEA), the nonparametric technique used in this section, estimates production frontiers assuming convexity.

applicability to us because generally system rigidities make it more difficult to save on resources, such as teachers or salaries, whereas it is more relevant to think about using the existing teachers more efficiently. In addition, we are more interested in seeing how we can improve performance in this study rather than saving on resources to achieve a similarly unsatisfactory performance. This being said, positive impact on input efficiency may also be relevant to examine if saving resources allows us, a second time, to reinvest them in better outputs.

Main results

A number of studies have attempted to undertake cross-country analysis of cost-effectiveness by using DEA techniques. One example is Herrera and Pang's 2004 paper,[4] which attempts to undertake this analysis in education and health for 140 non-OECD countries, including large samples of East Asian and Latin American countries. Data from 1996 to 2002 are used, and one input (the orthogonalized to GDP public education expenditure) and eight different output education coverage and attainment indicators are used.[5] A second example is a paper from Wilson (2004),[6] which undertakes DEA and FDH analysis on the same data set as Herrera and Pang, using similar inputs and outputs but a somewhat different methodology.[7]

These existing analyses have some key limitations. In particular, they are run only on country data, limiting the number of observations available to

generate the production frontier and making it impossible to do within-country analyses; they consider only measures of education coverage and completion as outputs; they are not directly applicable to secondary education by considering overall expenditure and outcomes;[8] and they include only public expenditure. In addition, by not controlling more explicitly for the socioeconomic context, they produce results that are too dependent on income levels, complicating comparisons among countries and of different income levels.

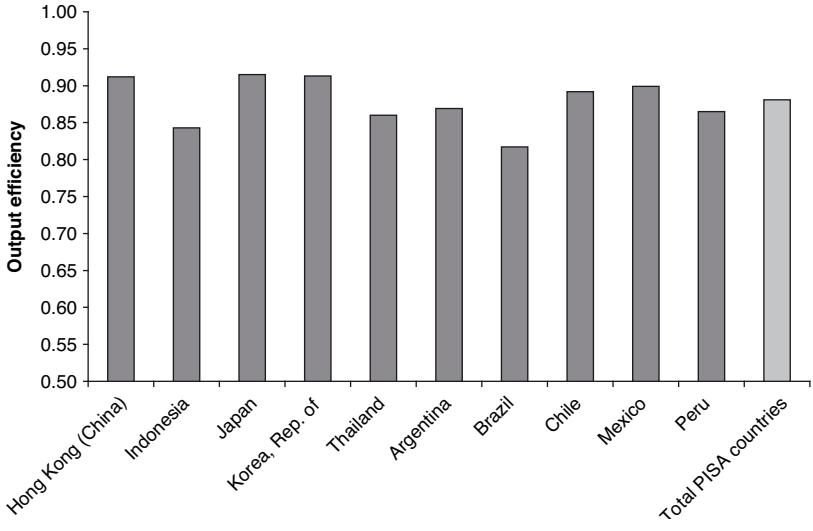
To address these difficulties we chose to apply the efficiency frontier approach, using the Program for International Student Assessment (PISA) as our source of data. PISA, already used in several other chapters, provides us with observations at the school level, is as good a learning assessment as can be found, and provides detailed socioeconomic information on students and schools. In addition to using the best measurement technology available, its philosophical approach is life skills measurement, which is coherent with attempting to measure not just the volume of knowledge but also its usefulness. Finally, PISA tests children by age, not by grade—all 15-year-olds in school are tested independent of what grade they find themselves in. That is fundamental to our purposes because it means that education attainment can be measured, not just achievement.

We estimate efficiency using the following as outputs: (1) number of students, (2) principal components measure of PISA scores in all subjects, and (3) grade attainment. Inputs used are (1) a principal components index of socioeconomic status, (2) number of secondary teachers, and (3) quality of secondary teachers as measured by the proportion of certified teachers in the school. This type of analysis is the only one that allows us to study the production process in secondary schools in the absence of information on unit costs at the secondary school level.[9] The teacher variables are the key determinants of education expenditure and the key factor in the production of education, and we chose to control for the socioeconomic context to make comparisons among countries and schools of different income levels more meaningful. We are aware of the fact that other country and school circumstances, including specific institutional and geographic characteristics, can limit somewhat the validity of the comparison, but adding too many inputs or creating separate frontiers for different types of countries or schools would complicate (because of too many inputs) or weaken (because of too few observations) the efficiency estimation. Finally, we use m-order estimates, which are robust to outliers and do not suffer from the curse of dimensionality, to assess efficiency in a multiple-input multiple-output framework.[10]

We concentrate below on output efficiency results.[11] **The analysis of PISA 2000 results shows substantial margins for improving secondary schools' efficiency in the two regions, particularly in Latin American countries.** In particular, controlling for socioeconomic status, schools could, on average, reach an academic achievement and grade attainment level about 15 percent higher for the quantity and quality of teachers employed.[12] Brazil and Indonesia, for example, could reach about 22 percent and 19 percent higher outcomes, respectively, for the teachers employed (figure 4.1). These results are broadly consistent with those of Herrera and Pang, who also find that East Asia and the Pacific countries have an edge over Latin America and the Caribbean countries when output efficiency is calculated in relation to secondary completion.[13]

There is some complementarity between attainment and achievement at age 15, but resources are being used less efficiently for test scores, and East Asian and the Pacific countries increase their advantage slightly. Output efficiency scores decrease in all countries when only test scores are considered, suggesting that it is more difficult to aim at higher academic

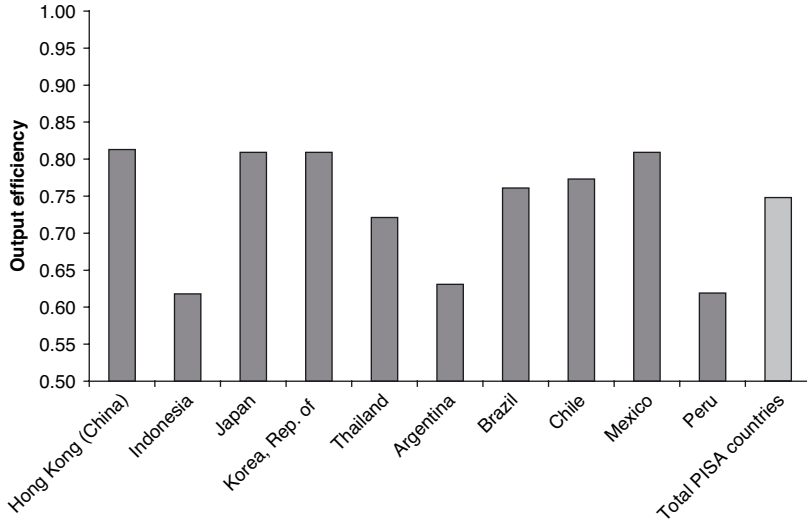
Figure 4.1. Output Efficiency (in grade attainment and academic performance) in Selected Countries of East Asia and the Pacific and Latin America and the Caribbean*—PISA 2000



Source: Author's elaboration on the basis of Wilson (2005).
* Higher scores indicate higher output efficiency.

performance, that attainment is receiving more priority than achievement, or both (figure 4.2). Controlling for socioeconomic status, schools could, on average, reach an academic achievement level about 35 percent higher for the quantity and quality of teachers employed. The decrease in output efficiency tends to be stronger in Latin America and the Caribbean countries. Results also become more heterogeneous across and within regions, although the efficiency ranking remains the same (with the exception of Brazil which, because of a particularly strong decrease in Indonesia, Argentina, and Peru, is no longer ranked last). This analysis suggests that, to some extent, countries can reach higher education attainment rates without an equivalent increase in education quality. In particular, Argentina, Indonesia, and Peru seem to be clear cases of countries in which attainment has improved at the cost of quality. However, there is a limit to these policies because the relative country ranking tends to stay the same with or without education attainment (and the ranking is confirmed when using only education attainment). Brazil is somewhat of an outlier in this analysis, as it seems to have focused relatively more on quality, with little positive impact on attainment (still hampered by high repetition rates—as will be illustrated in the section on internal efficiency—and entrance at

Figure 4.2. Output Efficiency (in academic performance) in Selected Countries of East Asia and the Pacific and Latin America and the Caribbean—PISA 2000



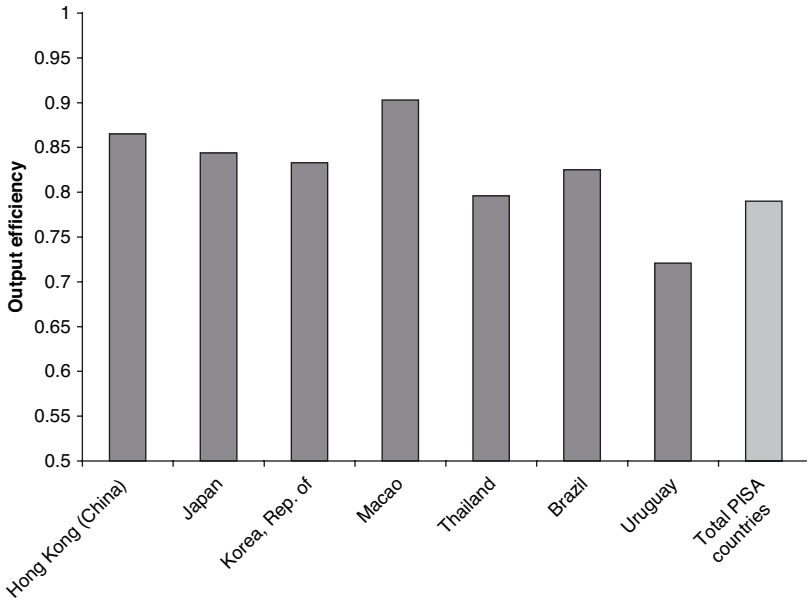
Source: Author's elaboration on the basis of Wilson (2005).

7 instead of 6). The fact that some countries managed to achieve both higher grade attainment at 15 and higher quality indicates that there isn't necessarily a trade-off between these two dimensions and that, in many cases, quality may in fact be necessary to achieve higher attainment rates.

Secondary completion and achievement tend to be positively correlated. The comparison with the study of Herrera and Pang confirms that East Asia and the Pacific countries tend to be slightly more output efficient than Latin America and the Caribbean countries when outputs such as secondary completion and test scores are concerned, which therefore tend to be positively correlated. In particular, Korea appears to be consistently efficient. Indonesia, Thailand, and Brazil, however, are fairly inefficient in all analyses.

Output efficiency scores have improved over time. A comparison between the 2003 PISA analysis[14] and the 2000 PISA using test scores as the main output (figure 4.3) reveals that all countries repeated in 2000 and 2003 (four countries of East Asia and the Pacific and one country of

Figure 4.3. Output Efficiency (in relation to academic performance) in Selected Countries of East Asia and the Pacific and Latin America and the Caribbean—PISA 2003



Source: Author's elaboration on the basis of Wilson (2005).

Latin America and the Caribbean) have slightly improved their output efficiency scores over time (although these scores remain lower than outputs including education attainment), at a similar pace. Brazil and Thailand are the countries that experienced the higher increase. Macao, not tested in 2000, appears particularly output efficient.

Countries with low output efficiency scores tend to have a higher score dispersion across schools, with some high performers and many poor performers. Finally, we look at the school-level efficiency scores in each of the countries by estimating confidence intervals for each school and ranking the schools in each country according to the upper bound of their intervals (annex 4.1). We find that generally scores are more heterogeneous across schools in Latin America and the Caribbean countries. Performance is very consistent across schools in Korea and Hong Kong (China), particularly inconsistent in Brazil and Indonesia. Overall, these results suggest that there is a correlation between average levels and dispersion, with countries having lower averages being characterized by some schools that do well or very well, many schools that perform poorly, and a few that perform very poorly.

Efficiency Constraints and Efficiency-Enhancing Interventions

Because there is scope for efficiency improvements for most schools in the two regions, it is important to understand what some of the main causes of the efficiency gaps could be and to identify promising policies to address them. This section focuses on efficient processes at the school level using the PISA efficiency analysis (which, with caution, can also be used to derive some policy implications), literature reviews, and case studies. We review the impact and analyze the potential of the following interventions: (1) expenditure allocation, (2) curricular and pedagogical practices, (3) management practices, and (4) repetition and internal efficiency improvements.

Impact of expenditure allocation[15]

Budget composition across economic categories, such as salaries/nonsalaries, and recurrent/capital costs, can have a substantial impact on the efficiency of public education expenditure. That is because the existing empirical literature on education attainment and production functions suggests that variables, such as distance to school, availability of basic services, school fees, and cash and noncash transfers, have a substantial

impact on enrollment and/or grade attainment,[16] and that variables such as teacher experience and education, teacher subject matter knowledge, instructional time, textbooks, and other learning materials, have a substantial impact on test scores.[17] In contrast, the literature suggests that teacher salaries, pupil-teacher ratios, and class size do not have a substantial impact. This implies that the same expenditure level could have a fairly different impact on efficiency depending on how it is allocated. Public spending is inefficient when there is an inefficient mix of staff versus nonstaff inputs, recurrent versus capital inputs, and so forth. In fact, Herrera and Pang (2004) find that countries in which the wage bill is a larger share of the total budget tend to have lower efficiency scores. To confirm this analysis for the countries of Latin America and the Caribbean and East Asia and the Pacific is not easy because of substantial data limitations, which oblige us to work largely with global budgets rather than with secondary education budgets (very few countries report budgets that are disaggregated by both functional levels and economic categories).[18] In addition, the PISA analysis does not allow us to explore the impact of budget composition shares, although it allows us to examine how efficiency varies with two of the main determinants of the salary share: the number of teachers per pupil and the proportion of certified teachers. We therefore base most of this analysis on a simple comparison between expenditure shares and the country efficiency ranking as it appears in Herrera and Pang.

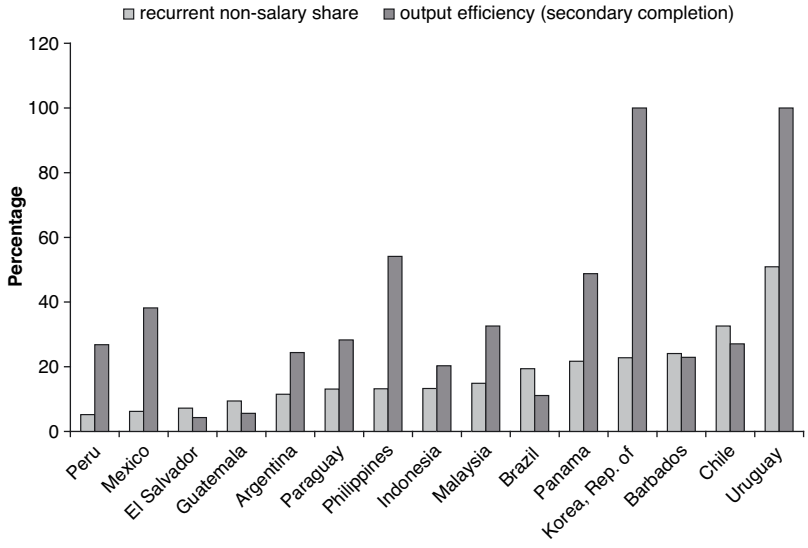
Countries with higher capital shares tend to be more efficient concerning enrollment. Information taken from the UNESCO Global Education Digest 2004 and 2005 (see annex 4.2) shows that the average capital share is about 10 percent in Latin America and the Caribbean and about 17 percent in East Asia and the Pacific.[19] A correlation between the budget capital share and the efficiency scores calculated by Herrera and Pang indicates that the countries with the higher capital share tend to have higher output efficiency scores in relation to enrollment,[20] in other words, that by investing relatively more in infrastructure and equipment, they manage to obtain higher enrollment for a similar expenditure level. This impact is stronger in Latin America and the Caribbean, suggesting more construction of infrastructure for coverage purposes.

Higher salary shares tend to be associated with lower output efficiency levels, and higher nonsalary shares are associated with higher output efficiency levels. In general, salaries tend to account for the largest share of recurrent expenditure and thus of the entire education budget. On average,

Latin America and the Caribbean countries spend about 76 percent of their recurrent budget on salaries, which is generally in line with OECD countries. On average, the six East Asia and the Pacific countries for which we have information spend about 66 percent of their recurrent budget on salaries, quite a bit lower than the Latin American and Caribbean average. A simple correlation analysis indicates that larger salary shares tend to be associated with lower efficiency scores. The impact is stronger in relation to output efficiency and secondary enrollment and completion, as illustrated by correlation coefficients of above −0.5. Clearly, countries that spend relatively more on salaries tend to perform less well, largely related to the fact that they have little left for other more cost-effective expenditures. There is ample evidence that nonsalary recurrent expenditures can be a cost-effective use of funds. However, salaries tend to squeeze out large shares of expenditures in the limited education budget allocations, leaving limited resources for teaching and learning materials, teacher training, assessment, and scholarships. In Latin America and the Caribbean, the average nonsalary recurrent spending is 16 percent, which is below the OECD average of 19.7 percent (2000). Upper-middle-income countries tend to spend more on nonsalary items than do lower-income countries. In East Asia and the Pacific, this evidence is available for four countries only, producing a similar share of 16 percent. A simple correlation analysis indicates that a higher proportion of nonsalary recurrent expenditure tends to be associated with higher output efficiency. This is visible from correlation coefficients equal to or higher than 0.5 for secondary enrollment and completion and in figure 4.4 below.[21] As for the salary share, we find a somewhat differentiated impact of nonsalary expenses across East Asia and the Pacific and Latin America and the Caribbean, with a stronger impact on efficiency in East Asia and the Pacific (with a correlation coefficient for completion of .9 in East Asia and the Pacific and .7 in Latin America and the Caribbean). This is likely to indicate that East Asia and the Pacific countries invest in more productive nonsalary items.

The impact on efficiency will also depend on how salaries are spent: a higher number of pupils per teacher is more conducive to higher efficiency. High salary shares can be the product of low pupil-teacher ratios and/or high average salaries and/or a high proportion of trained teachers, with different impacts on efficiency. An analysis of pupil-teacher ratios in secondary education across Latin America and the Caribbean and East Asia and the Pacific countries shows that pupil-teacher ratios are very similar across the two regions and slightly higher than the OECD average. These

Figure 4.4. Output Efficiency Scores and Non-salary Shares in Selected Countries of East Asia and the Pacific and Latin America and the Caribbean



Sources: Annex 4.2; Herrera and Pang (2004).

pupil-teacher ratios are quite low given the expenditure per capita in the two regions, particularly so in Latin America and the Caribbean. We find evidence of a negative association between pupil-teacher ratios and efficiency scores.

These results are also confirmed by the analysis done on PISA 2000, which finds that the most efficient schools are those that maximize the number of students per teacher (see table 4.1 below). Related to this there is substantial evidence that points to the higher efficiency of larger secondary schools.[22] The PISA results of table 4.1 also suggest that in labor market contexts in which it is difficult to dismiss or lay off teachers once they have been hired and schools have little control over hiring and firing decisions (which we have seen to be the case for selected Latin American and East Asian countries in the governance section of chapter 1), it may be easier to take the number of teachers as a given and achieve higher efficiency by trying to increase the number of students per teacher.[23]

Applying salary incentives can be an efficient policy. With similar reasoning, in labor market contexts in which salary levels are often determined through rigid and centralized pay structures and tied to a strict

Table 4.1. Mean Input, Output Level for the Most Output-Efficient Schools and Comparison with Other Schools (East Asian and Pacific and Latin American and Caribbean countries)—PISA 2000

	Output Efficiency <0.9623	*Output efficiency ≥ 0.9623*
Social status	3.80	3.20
Teachers	46.63	**49.75**
Certification	0.73	0.39
Test scores	867.9	915.63
Grade	9.27	9.73
Students	923.4	**1554.2**

Source: Author's elaboration on the basis of Wilson (2005).

seniority and education scale, it would probably be easier to introduce salary incentives, such as performance-based pay, than to negotiate salary cuts.[24] Some Latin American countries, such as Mexico, with the Carrera Magisterial Program, and Chile, with the National System of School Performance Assessment (SNED), have been quite innovative in the use of performance-pay schemes with some initial promising results on student performance for the team-based SNED performance-pay scheme.[25]

More surprising, the most efficient schools also tend to have a lower proportion of teachers certified by the appropriate authority. Teacher certification, which generally confirms the completion of teacher studies, is positively related to the PISA test scores in Woessmann and Fuchs (2004), confirming a positive impact of teacher education on quality, but not so in this efficiency context and for the included Latin American and East Asian countries. That could indicate either that teacher certification is not a good predictor of education quantity and quality in the included East Asia and the Pacific and Latin American and Caribbean countries (although probably a good predictor of costs) or that teacher education is of very spotty, insufficient quality in these countries. In both cases, this implies that there is no current advantage in having high teacher certification rates, whereas what makes the difference is probably the true subject knowledge of the teachers (not quantifiable in the database).

Finally, budget allocations tend to be an inadequate proxy for the quantity and quality of resources received by schools, especially in countries with weak accountability systems. In recent years, Public Expenditure Tracking Surveys (PETS) have been increasingly used to track the flow of public resources through the various layers of

government to understand better why public education expenditures repeatedly produce unsatisfactory outcomes.[26] The surveys undertaken for Latin America and East Asia[27] indicate that public funding for non-wage expenditures is usually insufficient and does not meet all the schools' basic needs, that there is a lack of coordination among the various institutions of the sector, and that there are delays and leakages in the transfer of budgets or inputs to the schools. At least in the short run, management reforms can help alleviate those problems by giving more autonomy to the schools themselves.

Pedagogical and curricular practices

A vast literature reviews efficient and effective pedagogical and curricular practices for secondary education, including technical and vocational education. Without entering into great detail in this very large sector of study, focused literature reviews, case studies, and the PISA efficiency analysis allow us to review some of the efficiency implications of TVET secondary education and curricular reforms, assessment practices, and flexible modalities for secondary education.

a. General and technical-vocational education, curriculum fragmentation, and curriculum alignment

A key issue in secondary education is the balance between general and technical secondary education. Chapter 1 provided a brief overview of the relative enrollment in general and technical-vocational education, highlighting some recent trends. Traditionally, in Latin America and the Caribbean as in East Asia and the Pacific, vocational schools have been separated out from general secondary schools. In most countries, the separation starts at about grade 9. Historically, vocational education and training enrollments have been declining as a proportion of the total secondary education enrollments.[28] This is a long-term trend that is occurring internationally as well locally in the East Asia and the Pacific and Latin American and Caribbean regions. The declining trend is stronger in Latin America and the Caribbean because there is higher growth at the postsecondary level and an increase in industry-based training, whereas East Asia and the Pacific countries have put more emphasis on modernizing existing secondary vocational systems. Traditionally, curricula have been fairly different, with TVET focusing on specific skills and general secondary on general skills, but there is an increasing focus on broader and more integrated curricula (both in these regions and internationally).[29]

The cost of producing technical and vocational education is higher, although it is decreasing with the new reform trend. There is a wide debate on the benefits and limitations of technical and vocational education and on future directions for its development, but that is beyond the scope of this report. We highlight here some of the cost and efficiency implications of technical and vocational education. Calculating the cost of secondary education is quite complex, and a firm estimation of the secondary vocational and technical education costs is even more complex. The wide range of programs in type and duration, the heterogeneous types of schools and providers, and the varying subjects in vocational and technical education cause more difficulties in estimating the secondary vocational and technical educational costs. Usually, existing studies are focused on comparing the unit-cost ratios in vocational and technical schools with those of academic schools. Typically, they are estimated on the basis of institutional cost per student, recurrent cost per student, and capital cost per student. 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 class size 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. These likely cost differences are generally confirmed by the existing empirical literature. In particular, a review of 24 studies on 20 countries in Africa, Asia, Latin America, and the United States shows that the unit costs of vocational and technical schools are from 1.14 times to 7.20 times higher than those of academic schools.[30] Some other studies suggest even larger gaps.[31]

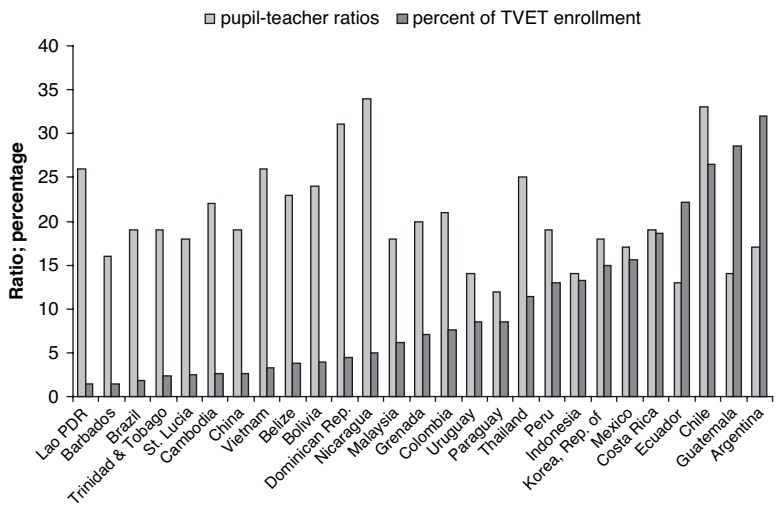
That being said, current trends in technical and vocational education have the potential of decreasing unit costs. In particular, the trend toward a more integrated general-technical curriculum could result in less separation between tracks and schools and, therefore, economies of scale in the use of teachers and equipment (as we have seen above, large secondary schools tend to be more efficient). Second, there is evidence that delivering the specific skills through alternative training modes, such as

training in specialized centers and enterprise-based training, is less expensive than doing it in traditional technical and vocational schools.[32] Studies on unit-cost ratios of alternative training modes for three countries in Asia show that unit costs of enterprise-based training are the least expensive among alternative training modes.[33]

Our efficiency analysis provides limited evidence that technical and vocational education tends to be more costly and less efficient in Latin America and the Caribbean and East Asia and the Pacific countries. We do not have a great deal of evidence on the relative costs and efficiency of technical and general secondary education. Only the 2003 PISA analysis is representative of the two tracks, and only for two countries (Uruguay and Korea). A more indirect way of measuring these cost and efficiency implications is simply to relate the different technical enrollment shares, reported in annex 1.3, to the secondary pupil-teacher ratios, budget shares, and efficiency scores constructed by Herrera and Pang, to see whether we note some sort of correlation.

Figure 4.5 shows that the higher the technical enrollment share, the lower tends to be the secondary pupil-teacher ratio, although a marked exception

Figure 4.5. Technical and Vocational Enrollment Share and Secondary Pupil-Teacher Ratios for Selected Latin American and Caribbean and East Asian and Pacific Countries



Source: Annex 1.3 and UIS.

in this context is Chile, which manages to maintain high pupil-teacher ratios despite a high TVET share (more on Chile below). This analysis generally confirms the existing empirical evidence that salary costs are likely to be higher in TVET education. In fact, this is also confirmed by the salary shares, which tend to be higher for countries with higher TVET shares.

However, there is only weak correlation between the enrollment shares and the efficiency scores in regard to enrollment and completion calculated by Herrera and Pang.[34] This weak correlation is in a way confirmed when mean efficiency scores are compared across technical-vocational and general education schools in Korea and Uruguay using the PISA 2003 data (table 4.2).[35] Although we focus on output-efficiency results, input-efficiency results are also telling in this case. In Uruguay general education schools perform better than technical and vocational schools in output-efficiency terms, but not in input-efficiency terms; and in Korea there is no significant difference between the efficiency scores of general education and vocational education. Notwithstanding the limitations of the analysis for the purposes of comparing technical and general schools,[36] which can bias the results in both directions, it is notable that technical and vocational schools can achieve a level of general skills similar to those of the general schools, without using more human resource inputs than the general schools do.

Korea and Chile are two examples of successful TVET reforms. The good efficiency results of the Korean vocational schools, at least concerning human resources, can be related to the country's successful TVET framework. In 1991 the government pushed forward new policies to increase the share of students attending vocational schools to half of total upper secondary enrollments. This was cited as a "leading example" of the way governments can promote an extensive school-based TVET in a well-known report from the ADB.[37] Subsequently, the country made substantial efforts to improve curricula (with an emphasis on general skills)[38]

Table 4.2. Comparison of Mean Efficiency Scores across General/Technical Schools—PISA 2003

		Output efficiency				*Input efficiency*			
Country	*Code*	*General*	*Vocational*	*Technical*	*p-value*	*General*	*Vocational*	*Technical*	*p-value*
Korea, Rep. of	410	0.926	0.920		54%	1.330	1.396		16%
Uruguay	858	0.877	0.791	0.834	0%***	1.561	1.415	1.627	20%

Source: PISA 2003.
***Significant at 1 percent.

and link vocational high schools with technical colleges so that rather than providing terminal degrees, vocational high school becomes a prerequisite for advanced studies.

Chile is another interesting case of efficient and innovative TVET reform. The reform proceeded gradually by education level (starting with primary in 1992 and extending to higher education in 1998). It is by 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 allow continuity and flexibility in the delivery of technical education. Creating this lifelong learning framework has required, among other aspects, (1) creating a system based on vocational competencies, (2) making the curricula "modular" in both secondary and higher education, (3) drawing up "training itineraries" that allow the certification of competences of differing origins through mechanisms of assessment and evaluation, (4) improving basic knowledge (mastering the language, mathematics, essential knowledge in technology), and (5) improving a quality assurance system for the entire technical training system. Vocational profiles are key to the whole system because they provide the needed flexibility to move across education levels and the school and the workplace. The Chilean TVET system is also an efficient one; it is now composed of only 13 vocational categories, compared with 400 technical training specialties before the 1980s.[39]

Overall, a more comprehensive efficiency analysis of general and technical schools would need to be undertaken to be able to extract some clearer results, and this should include comparing not only attainment and skills but also earnings and social outcomes and relating these outputs to unit costs. Chapter 2 provided an updated comparison of private rates of return showing a slight advantage for technical and vocational education; generally that advantage disappears when social rates of return are calculated.[40] More updated calculations of social rates of return are needed, however, taking into account the latest developments in technical and vocational education.

Curriculum fragmentation and early selection tend to be inefficient. The technical-general secondary education discussion and recent trends toward more curriculum integration suggest that too much curriculum fragmentation is inefficient in upper secondary education. In fact, a recent study on PISA 2000[41] finds that institutional differentiation, as measured by the age of selection (by level of performance or interest) into different tracks and the number of educational programs available for 15-year-olds

(variables which are also highly correlated), is detrimental not only to equity but also to educational achievement (test scores), suggesting lower efficiency levels (lower outcome for generally lower pupil-teacher ratios). This relation is, however, less strong for non-OECD countries and for Latin America and the Caribbean and East Asia and the Pacific countries. Another analysis of international test score data also shows that early tracking significantly increases inequality in learning achievement and (weakly) reduces mean learning performance, which suggests that there does not appear to be any equity-efficiency trade-off.[42]

One challenge facing reforms in secondary education is that all the different parts of the system need to be aligned with the objectives of curriculum reform.[43] Too often, different parts of the system do not fully support the instructional improvements that a reform aims to accomplish. Reforms must be synchronized to obtain the full leverage of all parts of the system. High synergy will be conducive to a more efficient system, capable of producing higher outputs for similar input levels, whereas misalignment will hamper the achievement of higher outputs and produce unnecessary costs. The Malaysian case (box 4.2) illustrates the need for alignment between curriculum, selection mechanisms, student and teacher assessments, and report cards.

b. Assessment practices

Standardized testing can enhance efficiency. Generally, national assessment systems have two primary roles: (1) the *diagnostic and action role*, which provides inputs to specific audiences (education authorities, school directors, teachers, parents) for diagnostic and policy reform/correction purposes and (2) the *accountability role*, which creates accountability mechanisms for education authorities, schools, and teachers.[44] To a lesser extent, some national systems also have a formal student *accreditation* role. The different roles of national assessment systems have an impact on how information is disseminated. For diagnostic and action purposes, teachers should be provided with detailed and accurate information on their teaching practices and their students' learning outcomes. For accountability purposes, information should be available to a wide audience and should be used to promote behavioral changes in specific groups of actors.

Economic theory suggests that in a national assessment system external exit exams, which report performance relative to an external standard,

Box 4.2

Curricular Reform and Alignment in Malaysia

In the past half century Malaysia has increased its primary school enrollment to near universal coverage. As a result, increasing emphasis has been placed on expanding and improving secondary education to create a workforce that has the ability to use and produce new materials and technologies, assisting in the future growth and global competitiveness of the Malaysian economy. Two major secondary-education policies have been initiated in Malaysia to address components of a larger reform effort to accelerate human resource development in science and technology. The first initiative, the 60:40 ratio of science to art students in upper secondary (from a current level of about 36:64), made science compulsory for all students from the fourth year of primary school until upper secondary school. The second initiative, the instruction of science and mathematics in English, changed the medium of instruction in those two subjects from Bahasa Melayu to English at both the primary and secondary level. We report below the results of a qualitative study that analyzes alignment issues in this new curricular setting by using existing empirical statistical information and the information generated by two sets of questionnaires distributed to large groups of teachers and students in two secondary schools.

In Malaysia, public examinations are taken seriously by both the school community and society. With the implementation of a new reform, the nature of what is examined in these tests and their purpose should be aligned with the objectives of the reform. The assessment given at the end of primary school, the UPSR achievement test, which the reform intended to be diagnostic in nature to guide teachers toward understanding possible weaknesses in scientific subjects and English and suggesting remedial classes, has been treated as a performance-based assessment that streams students into particular disciplines in secondary school. Students are placed in classes with peers who received similar assessment scores. That demonstrates a misalignment in the intention of the UPSR exam to be more diagnostic when in effect it is serving as a performance indicator that determines which courses a student will take and with whom. As students advance from lower secondary schooling to Form Four (the first year of upper secondary school), the Ministry of Education provides specific guidelines for how students' PMR (lower secondary school evaluation) scores will determine which stream they will enter, in an attempt to be more selective at that time. Both schools examined in the study

(*Continued*)

were flexible in allowing students to select their stream based on preference. In addition, students who received poor PMR scores were still allowed to join mathematics and science courses in an effort to allow the school to achieve the target of the 60:40 reform.

The result of this double misalignment in the selection of streams and reform objectives is that, instead of obtaining a large pool of candidates for the sciences track in lower secondary and achieving the 60:40 division with quality candidates in upper secondary, there is a smaller pool of candidates in lower secondary and either the 60:40 division is achieved by lowering the standards of access to the upper secondary science track, and therefore lowering the quality, or the 60:40 division is not achieved.

For education reforms to be properly implemented, teachers must receive updated curriculum and instructional materials and have the incentive to train in a timely manner to ensure that the appropriate changes are occurring at the classroom level. In Malaysia there was some lack of coordination between the divisions of the Ministry of Education in distributing the revised curriculum at the school level, accompanied by a significant difference in opinion between the policy makers and the teachers about the relevance and effectiveness of the revised curriculum. This difference may have caused resistance on the part of the teachers to implement the reform effectively. Many of the teachers interviewed for the study have not attended any of the training sessions designed using the revised curriculum. Only about one-third of the science and mathematics teachers are adequately prepared to integrate subject matter and values as the national curriculum specifies, although teachers are well prepared to teach the subjects in English or Bahasa. Incentives need to be created for teachers to receive training on the curriculum in science and mathematics, and with training they may come to see the value of the pedagogical changes. Updated criteria for teacher evaluation and higher standards in the PMR exam should provide incentives to train.

Finally, communication about student learning between teachers and parents is an important aspect of an education system. If curriculum and learning goals change, it is important that the form of reporting reflects these changes. As part of the reform, Malaysian schools have taken the initiative through Report Card Day and the issuance of semester report cards to communicate with parents about their children's progress in school. However, parents appear to be more concerned with their child's summative examination results than with their behavior or classroom work. The reforms have placed more emphasis in lower and upper secondary school on formative assessment that

(*Continued*)

occurs continuously throughout the semester; therefore, schools must work to make parents more aware of the importance of these scores.

Source: Adapted from Siow Heng Loke, Chang Lee Hoon, Lee Siew Eng, Chien Lee Shing (2005): "A Case Study on Alignment of Malaysian Education Policies," background paper prepared for this report.

may be particularly effective in improving student performance because they make education goals and standards clearer. Recent evidence on PISA 2000 for 31 countries[45] indicates that the presence of national secondary exit exams has a positive effect on PISA test scores, as does the frequent use of standardized testing at the school level, although only when combined with national exit exams.[46] The study also finds that there are strong positive interactions between school autonomy (in particular in the pedagogic area) and external exit exams.

If countries use standardized assessment effectively, they should be able to improve the efficiency of their education systems, improving test scores and possibly educational attainment, without the need for more resources; they may even be able to achieve similar results with fewer resources. We explored that issue with the PISA 2000 data.

We find no evidence that assessment is associated with higher efficiency (except in a few countries). It is difficult to define exactly what is meant by the use of evaluation as a pedagogic and management tool. There are six questions on the use of evaluation in PISA 2000 (providing only 64 possible combinations) and five on the form of evaluation. We grouped these into two categories: (1) schools using external evaluation for purposes of grouping students into grades, making decisions on retention and promotion, and informing parents, and (2) schools using external evaluation of the school for purposes of making comparisons with other schools, tracking progress over time, and making judgments about the effectiveness of teachers. Finally, if a school either does not use external evaluation or uses it for neither of the two purposes above, it is classified as not using evaluation. The results of the analysis are shown in table 4.3.

There appears to be few significant results and practically no evidence that external evaluation used for diagnostic or accountability purposes at the school level is associated with higher efficiency (with the notable exception of Brazil). That may not be surprising considering that most of the included countries do not have fully fledged external secondary exit

Table 4.3. Comparison of Output Efficiency by Use of Evaluation

	Use of evaluation			
	None	*Pupil*	*School*	*p value*
Argentina	0.891	0.879	0.896	34%
Brazil	0.798	0.818	0.840	**2%**
Chile	0.916	0.879	0.846	**0%**
Mexico	0.899	0.885	0.901	69%
Peru	0.868	0.823	0.863	49%
Hong Kong (China)	0.912	0.927	0.904	**3%**
Indonesia	0.860	0.863	0.842	32%
Korea, Rep. of	0.915	0.910	0.916	50%
Thailand	0.855	0.884	0.856	**2%**

Source: Soares 2005.
Note: Significant results in bold.

exams and, therefore, may lack the national accountability framework needed to make regular school standardized testing truly effective. Another reason may be related to the lack of sufficient dissemination of the schools' results (a common problem in many countries, in particular in Latin America).[47] The use of evaluation for grouping students within schools and making promotion decisions is also generally not associated with higher efficiency, except in Thailand, Hong Kong (China), and Brazil. We will see that Brazil badly needs objective evaluations and is working on introducing them (the introduction of the secondary exit exam [ENEM] is a step in the right direction).

c. Alternative models in secondary education[48]

Alternative models for secondary education, such as a distance or tutorial education program, seek to address a number of common weaknesses in conventional secondary schools. These weaknesses, which disproportionately affect disadvantaged population groups, include poor learning in traditional schools; a secondary curriculum that is not relevant to the lives of many students and communities; insufficient access to schooling, particularly in rural areas and for the poor because of private costs; inadequate structure of traditional schooling for many people, such as those who work or migrate seasonally; and traditional model for secondary schools with prohibitively high per pupil costs in areas that are sparsely populated and in which there is low or irregular school attendance, such as rural areas.[49]

Objectives of alternative models include expanding access and, to a lesser extent, providing quality improvements. Often, alternative models are designed for individuals and groups who could not succeed or take part in conventional schools. Many programs are designed for rural populations in which youth have little or no access to nearby schools; for economically disadvantaged youth and adults who work during traditional school hours; and for individuals who, for a wide variety of reasons, left school or have difficulty having their learning needs met in conventional schools.

The most common primary objective of alternative education models is to expand access, particularly to previously marginalized populations, at a low relative or absolute per student cost. Part of this objective is to ensure that these programs are of adequate quality, that is, comparable with conventional education offerings. There are cases, however, of alternative models whose primary objective is to improve education quality.[50] These two objectives—the first being to expand access to comparable quality schooling at a lower cost and the second to improve the quality of educational offerings—can be understood as attempts at input efficiency in the first case and output efficiency in the second. In fact, programs that respond to the first objective may even be overall more efficient than conventional programs if they increase completion at lower costs.

What are alternative secondary models? At the most general level, alternative secondary models are programs that offer secondary education in nontraditional ways (table 4.4 lists several of the largest alternative secondary programs in Latin America and East Asia). These programs range from those that differ only slightly from traditional programs to those that are dramatically different from traditional secondary schools. Figueredo and Anzalone (2003) identify four features that tend to differentiate alternative secondary models from conventional models: (1) *policies* that favor students who otherwise are unlikely or unable to attend; (2) *organizational arrangements* that permit working students to study (innovative and adaptive in regard to time and location); (3) *instructional systems* that operate at lower cost than conventional schools (generally lower-cost teaching, by using volunteers, tutors, etc. or lower capital costs, either by using existing infrastructure or less infrastructure than traditional models); and (4) *curriculum and learning materials* designed especially for the needs of the country, community, or target participants (alternative teaching materials include radio, television, and computer-based programs as well as specialized texts; most

Table 4.4. Some of the Major Existing Alternative Secondary Models in Latin America and the Caribbean and East Asia

Country	*Type*	*Name*	*Level*	*Size*	*Quality*
		LATIN AMERICA AND THE CARIBBEAN			
Honduras	Audiocassettes facilitators, print	Educatodos	Primary and lower secondary	3,000 7th graders (2002)	Low completion
Mexico	TV	Telesecundaria	Lower secondary	800,000 (1998)	Mixed, decreasing
Brazil	TV	Telecurso 2000	Primary, secondary	200,000 (~1998)	Good
Colombia	Facilitators	Tutorial learning system	Secondary	25,000 (2004)	Good
		EAST ASIA			
Thailand	Print, TV, radio	Department of Nonformal Education	Various, including secondary	2.5 million (1998/9)	
Korea, Rep. of	Texts (for self-study), radio, teacher encounters	Air and correspondence high schools	Secondary	13,700 (1999)	Good
Philippines	Printed materials, instructional managers, radio, video	Nonformal Education Project	Primary, secondary	71,500 (2001)	Low pass rates
Indonesia	Print, TV, radio	Open schools	Secondary	376,600 (1999)	Good

Source: Umansky 2005.

programs base their curricula on national or regional curricula but many adapt to suit specific needs).

Notwithstanding these common features, programs vary along several lines, including target population, management (public or private), program structure/organization (distance education programs, open learning programs, and group study), role of teachers/facilitators (ranging from accredited teachers to community volunteers), program content (models can follow or deviate from traditional secondary school curriculum), accreditation (generally through the same exit exams as traditional schooling, but not always), and use of technology (more or less high-tech—see box 4.3).

Box 4.3

The Role of Information and Communication Technology (ICT) in Alternative Models

Although high-tech equipment is now available and can be useful in some settings, research suggests that printed material and other low-tech resources such as radio instruction are effective in teaching subject knowledge and much less expensive.

Traditional ICT methods: Eighty percent of distance education programs, in fact, are print-based although programs are increasingly using technological blends, such as EDUCATODOS and the Open Junior Secondary Schools of Honduras and Indonesia, respectively, which blend printed, radio, and video instruction. Interactive radio instruction (IRI) is the oldest and most well-researched ICT method in education.[51] Like other ICT methods, radio instruction can ensure that students in disadvantaged areas, where teachers may have little subject knowledge or poor teaching practices, receive high-quality content and instruction (Grace and Kenny 2003). In one recent study, a dollar spent on IRI is found to be 70 percent more effective than textbooks and 10 times as effective as teacher training (Adkins 1999).

New ICT methods: But computers and Internet-based technologies have the potential to offer opportunities that no previous ICT method can. Like radio or TV instruction, computers and the Internet can offer the most advanced and modern content knowledge, and they also have the benefit of a high degree of interactivity between the student and the computer as well as between and among students and teachers through the Internet.

Many countries are also experimenting with ICT distance learning components in conventional schools. Chile now has linked computer labs in 90 percent of primary and secondary schools through its Enlaces program, and Cambodia is providing Internet access to remote, rural formal and nonformal education students through part of its Education for All Plan. Countries increasingly see the provision of computers and Internet technologies in schools as necessary to provide students with the skills they will need to thrive in the global knowledge economy.[52]

Nonetheless high-tech equipment and maintenance can be very costly, and their impact on student outcomes is, as yet, largely unverified. Even those few studies that have found positive effects of advanced ICT on learning out-

(*Continued*)

comes do not look at cost-effectiveness (Ruth and Shi 2001; Grace and Kenny 2003). Many communities do not know how to use and care for advanced technologies, and thus far research suggests that printed material and other low-tech resources such as radio instruction are effective at teaching subject knowledge and much less expensive than advanced ICT (World Bank 2004e).[53] In addition, in developing countries, human resources in education (teachers, etc.) are paid comparatively less than in developed countries whereas technology is comparatively more expensive (UNESCO 2001; Grace and Kenny 2003), which further calls into question the cost-efficiency of large investments in technology.

At most, there is some evidence that computers may be advisable on a smaller scale, particularly in alternative education programs (Grace and Kenny 2003). Taiwan's distance-based Open University, for example, reached 30 percent more students at one-third the cost of National Taiwan University. Most important, perhaps, is that the technology used be the appropriate technology for the given setting and program. Learner and context needs assessment and context research are critical (World Bank 2004e). Computer or Web-based technologies in areas that do not have stable electricity, phone lines, or means of technological upkeep, for example, are clearly not a good option.

Source: Adapted from Umansky (2005).

Alternative programs have lower costs of delivery than do traditional programs for similar target populations, but their results in regard to test scores and particularly completion are mixed. Alternative models of secondary education have lower costs than traditional secondary schools serving the same target populations because typically they have reduced recurrent costs from teacher salaries and reduced fixed costs from infrastructure.[54] Three major factors affect the cost-effectiveness of distance education programs: the number of enrolled participants,[55] the amount of student support, and the technology used. We have no evidence on the exact unit costs of the reviewed alternative programs but, overall, the Colombia, Indonesia, and Honduras low-tech or relatively low tech programs are shown to be less expensive than traditional programs for the same target populations. Mexico's Telesecundaria program, a large program offering TV-based lower secondary schooling in rural areas, is relatively costly as an alternative modality because each Telesecundaria does have its own

school building; it uses traditional teachers, although far fewer than in traditional secondary schools; and the ongoing cost of producing high-quality television programs is substantial. But De Moura Castro, Wolff, and Garcia (1999) estimate that traditional secondary schools in rural areas would have a per pupil cost three times that of Telesecundaria because of the number of teachers required for all the subject areas and the infrastructure and equipment necessary in a traditional school.

Unfortunately, few alternative secondary models have undergone rigorous analysis, and many have not been studied at all.[56] Some, however, have been examined and demonstrate mixed results. The following discussion looks at indicators of program quality as measured by test scores and then as measured by completion rates.

Participants of the Tutorial Learning System (SAT) in Colombia on average have higher test scores on a national exam than students in traditional schools in the same municipalities (Lopez Ramirez 2003). In Indonesia's Open Junior Secondary Schools 92 percent of participants who took the national exit exam passed, and there was no significant difference in the academic performance of Open School and traditional school students (Sadiman 1994). In the Philippines Nonformal Education Project, tests were developed for participants and were designed to be equivalent to national exams. Between 1999 and 2001 the pass rate on this exam was only 10 percent. Of those who passed, however, 99 percent went on to continue their schooling or found employment. In Mexico, the Telesecundaria program, which offers lower secondary education in rural areas, is able to completely erase the urban-rural achievement gap in mathematics and halve the same gap in language (De Moura Castro, Carnoy and Wolff 1999). However, recent evidence from PISA 2003 suggests that Telesecundaria programs may in fact be producing lower test scores than traditional lower secondary programs in reading and science, controlling for the socioeconomic level (by about 20–30 percentage points),[57] which may be taken as a signal that the quality of the program may be decreasing as its access increases.

Telesecundaria also graduates more of its participants than do traditional academic or technical high schools in Mexico. Nonetheless, far fewer Telesecundaria graduates continue on to upper secondary (21 percent) than do urban traditional students (85 percent) (Calderoni 1998). Part of this low continuation rate is due to the absence of schools or private costs of attending upper secondary schools, but this is unlikely to explain the extremity of the inequity between the two programs. In the EDUCATODOS Program in Honduras, by contrast, 65 percent to 70 percent of

program participants do not complete the three-year program, indicating that there is a severe attrition problem—nearly 45 percent of first-year participants did not make it to the second year (Marshall et al. 2005).

By generating similar or higher test scores than traditional schools at lower costs, the alternative programs in Colombia and Indonesia seem to be cost-effective programs, in contrast to the programs in the Philippines and Honduras, whose results are lower. The falling test scores in Mexico are signaling possible decreases in the efficiency of the program, as also confirmed by the 2000 PISA efficiency scores, which are not significantly different between traditional and Telesecundaria programs. This result suggests the presence of possible tensions between increased access, also necessary for the purposes of lowering unit costs, and consistent quality.

The right balance between costs and quality needs to be found. There are many strong and convincing arguments for the use of alternative education offerings at the secondary level. However, frequently alternative programs are designed to have lower per student costs than conventional programs; in addition, they tend to serve students with particularly acute learning needs and populations that may have little voice in society. This combination of factors makes these programs very vulnerable to becoming second-rate schooling options. They need to break that cycle. There is growing consensus on what is key to reaching the "right balance" in these models:[58] (1) sustained political commitment and will; (2) good knowledge of needs and context of the target population; (3) appropriate design in regard to choice of technology and content for the particular population and context (with preference for low-tech or relatively low tech resources); (4) blended use of technologies and methods; (5) well-trained facilitators or teachers; (6) sufficient face-to-face contact of participants with facilitators; (7) minimal complexity in design; and (8) popular sentiment that the program is of good quality and is comparable with conventional programs.

Management practices[59]

By analyzing how efficiency scores vary with some key management characteristics of the schools, the PISA efficiency analysis and focused literature reviews allow us to obtain some insights into which management practices may be efficiency enhancing. Below we analyze the impact of school management with simple analytical tools (one-way analysis of variance, comparison of means) and slightly more complex econometric techniques. We undertake cross-country analysis as well as within-country analysis to make our main points.

Management can improve efficiency. Public-private mixed delivery systems (such as public financing with private delivery) and decentralization are management reforms that can have an impact on the efficiency of education delivery through higher input productivity, input choice efficiency, or both. For instance, decentralizing administrative responsibilities to the school level could lead to a more intensive use of teaching inputs by increasing accountability of teachers to the school and/or to a higher proportion of textbooks per pupil (input choice closer to local needs). Even more simply, by gaining control over their teaching staff, schools may finally be able to make decisions, which could be efficiency enhancing.

a. Private schools and public-private partnerships

Below we review the case for public-private partnerships based on higher efficiency of private schools in regard to academic performance. Although private school efficiency in these terms makes public-private partnerships more attractive, we should also add here that, with good quality-assurance systems, it may be profitable to involve private schools also only on the basis of their efficiency to enroll additional students, as it is the case in some East Asian countries such as Korea (see spotlight 4).

Private schools can be more efficient. About 20 percent of the total secondary enrollment is in private schools in East Asia and the Pacific and Latin America and the Caribbean. That is not insubstantial and suggests that the private sector is an important actor in secondary education in many countries. Overall, private sector shares are higher in lower-income countries (about 40 percent in 2002–03 according to UNESCO data) or upper-income countries (about 21 percent in 2002–03), than in lower-middle and upper-middle-income countries, suggesting that demand for private schooling may increase when there is no public supply (in low-income countries) and/or when some communities (wealthier groups, ethnic or religious minorities, children with learning difficulties, etc.) want more choice (in upper-income countries). All of this means that private schools may have different functions as we move from society to society. Overall, private schools may be more efficient than public schools if they increase schools' and teachers' accountability to parents (accountability argument) and/or are better at fulfilling local preferences and needs (local preference argument) and/or are simply more effectively managed (ensuring a better school climate, better pedagogical practices, etc.). In other words, it is often argued that because of empowered principal agents and more efficient communication of signals, the private school

environment should be more conducive to learning,[60] with a similar (or even lower) level of resources. Generally, different socioeconomic environments and nonrandom selection across schools (according to motivation, ability, etc.) substantially complicate an efficiency comparison across public and private schools, but some studies have tried to deal with this matter. Assuming private schools can be more efficient, there is scope not only for encouraging their development but also for establishing public-private partnerships.

Public-private partnerships cover a range of education contracting models, which include management, operational, and service delivery contracts. In management and operational contracts, the government contracts with a private provider to manage an existing government service using government infrastructure; in service delivery contracts, the government contracts with a private provider to deliver a specified service or set of services (using a privately owned facility).

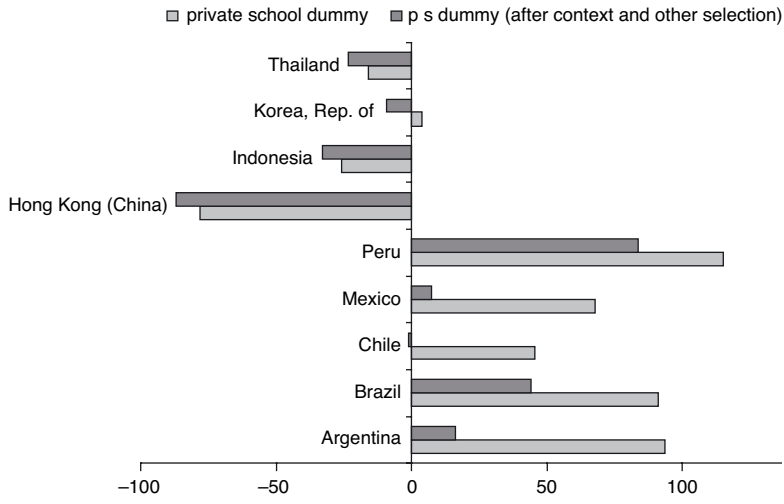
Contracting models can be efficiency enhancing in many ways. To mention some, they can lift the efficiency of education delivery and education spending by harnessing competitive forces and bringing the pressure of the marketplace to bear on inefficient producers (for instance, the public-subsidized private schools in Chile), allow governments to take advantage of specialized skills that might not be available in a government agency (concession schools in Bogota, Colombia), and allow governments to take advantage of idle capacity in the private sector and increase access to quality education for groups that have been poorly served under traditional forms of education delivery (the PACES Program in secondary education in Colombia). Examples of public-private partnerships have already been analyzed in chapters 2 and 3 related to targeted demand-side mechanisms (PACES) and increased private resources for secondary education by involving private sector schools in financing and provision (the Netherlands, Chile, the Philippines, community schools). As highlighted above, with good quality-assurance systems, involving private schools may still be a cost-effective way of increasing enrollment capacity if they can do it at a lower cost than the public sector does (Korea).

Rigorous studies measuring the impact of private schools on learning show somewhat mixed results, although in most cases a positive private school effect is discernible. An analysis undertaken for this report on the relative performance of public and private schools in the East Asian and

Latin American countries included in the PISA 2000 and 2003 (Marshall, 2005b) indicates a strong initial private sector school effect on learning in Latin America and the Caribbean countries; however, it is wiped out in many cases (with the exception of Uruguay in 2003, Argentina, Peru, and Brazil in 2000) after the student, school context, and selection effects have been controlled for (figure 4.6). It also shows no significant advantage of private schools in East Asia and the Pacific (except Korea in 2003, before controlling for the context, and Thailand in 2003, after controlling for context and selection), or even a significant disadvantage, suggesting the very different nature of private schooling in the East Asian countries under analysis. In fact, we have seen in chapter 1 that, generally, in the selected East Asian countries, private schools are more similar to public schools in their being more government funded and less elitist or even in their attracting low-income groups. The analysis provides no definitive answer to what causes the persistent private school advantage in Uruguay, Argentina, Brazil, and Peru, although autonomy in teacher management explains part of the advantage in Argentina and Brazil.

These results are generally less positive for private schools than the results found in Jimenez and Lockheed's (1995) rigorous study on Tanzania, Colombia, the Dominican Republic, the Philippines, and

Figure 4.6. Private School Advantage before and after Controlling for Context and Selection—PISA 2000



Source: Author's own elaboration on the basis of Marshall (2005b).

Thailand, which point to higher learning in private secondary schools, even controlling for student background and varying selection practices in all countries. However, the countries included are not the same, with the exception of Thailand, and the positive impact of private schools in Thailand is also found with the PISA 2003 database. In addition, when attempting to explain the positive advantage of private schools, the study by Jimenez and Lockheed also finds that this advantage can be explained partly by higher levels of decision-making autonomy. Finally, if the impact of private schools on learning may be somewhat mixed, the impact of these schools on efficiency is more clear-cut.

When focusing on efficiency the advantage of private schools increases: new evidence on PISA 2000 suggests that private schools are more efficient than public schools, although this effect is stronger in Latin America and the Caribbean countries. By using the PISA 2000 database, we calculated average output efficiency scores by type of management and country (see table 4.5). Interestingly, in most cases, private schools appear to be more efficient, even when controlling for the socioeconomic context as we do in the efficiency measures (see also figure 4.7). However, these results are stronger for Latin American countries than for East Asian countries. In particular, private schools generate higher outcomes than public schools in all Latin American countries at the same human resource and socioeconomic level, although this difference is much less marked in the included countries of East Asia and the Pacific, or even reversed in Hong Kong (China).

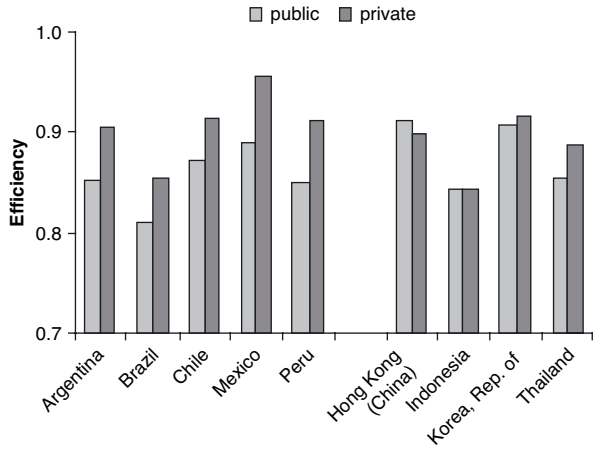
This analysis suggests that although the advantage of private schools may not be as strong when looking only at outputs, such as test scores

Table 4.5. Comparison of Mean Output Efficiency Scores across Public and Private Management

Country	*Public*	*Private*	*p-value*
Argentina	0.852	0.907	**0%**
Brazil	0.811	0.857	**1%**
Chile	0.873	0.915	**0%**
Mexico	0.890	0.958	**0%**
Peru	0.851	0.913	**0%**
Hong Kong (China)	0.913	0.899	22%
Indonesia	0.843	0.843	99%
Korea, Rep. of	0.910	0.918	**4%**
Thailand	0.857	0.888	**2%**

Source: Soares 2005.
Note: Significant results in bold.

Figure 4.7. Efficiency by Public and Private Management



Source: Soares 2005.

and attainment, it becomes stronger when considering human resource inputs as well into the equation, confirming that private schools may be better in the way they use teachers, by making them more accountable, creating a better school climate, or pushing for more effective pedagogical practices and/or they may have the flexibility to choose a more appropriate input mix (such as higher pupil-teacher and lower pupil-textbook ratios). Jimenez and Lockheed's study also finds that, in general, private schools are more efficient because they also have generally lower unit costs; they attribute part of this result to better input mixes (higher pupil-teacher ratios, lower ratios of qualified teachers to total teachers, and higher shares of nonsalary inputs).

Having said that, we should reiterate that private schools may also be better able to select students who are more motivated and capable; Marshall's paper shows that tendency to be particularly strong in Latin America, in which private schools are more likely to be elite types of schools. Similarly, private schools may have more educational resources or pay teachers higher salaries (although that is not generally the case), without that being captured in our efficiency measures.

The PISA analysis also shows that public schools tend to be more output efficient in East Asia and the Pacific than in Latin America and the Caribbean, possibly because of higher management autonomy of public schools in the included East Asian countries (as shown in chapter 1),

accompanied by stronger national regulatory and monitoring and evaluation frameworks (more stringent application of regulatory frameworks,[61] better dissemination of information to schools).

b. School-based management

Increased decision making in public schools can be efficiency enhancing. Without going all the way toward privatization, a whole strand of literature (the so-called school-based management [SBM] approach) developed toward decision-making autonomy at the school level. This approach, which originated in the Anglo-Saxon world leading to and following the experience of countries such as the United States, Australia, New Zealand, and England in this type of decentralization, is related to the organization theory and school-effectiveness literature approaches. Fundamentally, the SBM approach is a proposal to decentralize and debureaucratize school control and, for many, it is also a proposal for shared decision making in schools.

Increased autonomy at the school level can produce higher-quality education services at a similar input level or similar quality at lower input levels by taking advantage of the schools' superior knowledge of the conditions, needs, and preferences of families and students and their tighter accountability to the families. In all cases, participatory decision making will be essential to enhance the potential for higher cost-effectiveness through a clearer expression of preferences and needs and strengthened monitoring and oversight. The literature on participation in decision making suggests that it can improve the flow and use of information in the organization,[62] resulting in better decisions as well as more effective implementation of those decisions. In fact, most SBM schemes call for establishing school advisory councils for obtaining systematic input on school decisions from teachers, parents, and sometimes from other citizens and students as well. The fact that organizational members closest to and most familiar with the organization's problems are involved in the process of devising solutions will enhance the likelihood that the organization will be more innovative, responsive to its clients, and able to adapt to environmental changes on a timely basis.[63] Also, the literature suggests that participatory decision making can result in greater employee job satisfaction and morale, which in turn can produce a higher level of motivation and, ultimately, better individual performance.[64]

Existing evidence shows that school autonomy can lead to higher test scores and/or lower costs, although the mechanisms through which this

would occur are not always clear. Reviewing the extensive evidence on the impact of SBM is beyond the scope of this chapter. However, a quick review suggests the following:

1. There is some evidence at the primary level that SBM can be more efficient through higher teacher and school effort. In particular, rural autonomous schools in Central America (El Salvador, Honduras and, to a minor extent, Guatemala) appear to be generating higher or similar educational achievement than other rural schools with similar or lower inputs (in regard to socioeconomic status, educational resources, and teacher quality), largely related to a more intensive use of teachers and schools.[65]
2. There is more evidence on SBM and school autonomy in general at the primary than at the secondary level and, therefore, there is a need to explore to what extent, and under which circumstances, this management model can be appropriate to reach higher cost-effectiveness in secondary education. An education production function analysis undertaken by Marshall (2005a) on PISA 2000 and 2003 for this report shows that the functional areas in which autonomy is granted and the entity in the school to which this autonomy is granted are both important in determining the impact of autonomy (we have seen in chapter 1 that autonomy can vary quite a lot along these two dimensions),[66] as well as regional location. The analysis finds that, controlling for schools' socioeconomic characteristics, a principal's autonomy in hiring and firing predicts higher achievement in the included Latin American sample, autonomy given to schools' departments in generating and allocating budgets predicts higher achievement in the included East Asian sample, and autonomy for schooling process variables (textbook choice, content, etc.) also predicts higher achievement in the included East Asian countries, in particular when granted to school boards and departments. These results suggest that national teacher management systems, although not more centralized, may be particularly inefficient in Latin American countries (see also below), making teacher management decentralization particularly effective; East Asian schools may be more capable of making use of local information advantages. The study also finds evidence of positive interaction between school socioeconomic level and the impact of autonomy in schooling processes, confirming that capacity is important for exploiting local information advantages.

This and most other international studies centered on secondary schools[67] provide little further guidance on how the impact of these autonomy measures works, although there is some evidence that the impact of autonomy on teacher management would be working through a lower pupil-teacher ratio and, above all, longer class time (Marshall 2005a) and, to a minor extent, teacher morale and commitment (OECD 2005). The impact of pedagogical and curricular autonomy would be working through a better school climate, longer class time, lower pupil-teacher ratio (Marshall 2005a), and a higher proportion of certified teachers (OECD 2005); and the impact of financial autonomy would be working through more educational resources (OECD 2005). This evidence does not suggest that output efficiency would also necessarily be increased.

New PISA 2000 evidence indicates that more autonomous schools tend to be more output efficient, although a multivariate analysis is needed to confirm those results. Using the PISA 2000 database, we calculated average efficiency scores by type of autonomy. To simplify, we decided to construct three different indexes of autonomy (human resources,[68] financial,[69] and pedagogic[70]), without differentiating by the actor who makes the decision in the school. We also assumed that schools can be ranked into more than one autonomy category (for example, be human resource and pedagogical autonomous or financial and pedagogical autonomous, etc.).

The analysis of variance (ANOVA) results are shown below (table 4.6). There is a clear significant association between autonomy and output efficiency, which is stronger in Latin America (at least for human resources and pedagogical autonomy). This suggests that autonomy may in fact be conducive to a better use of resources in an output sense, maybe by having teachers working more, better budget composition, and a better choice of teachers and textbooks. Again, however, some of the results may be explained by selection, and these measures do not include all educational resources used by the schools. In addition, and importantly, autonomy and private schooling are likely to be highly correlated, requiring a multivariate framework.

c. How do autonomy, private schools, assessment, and selection interact?[71]

Given the suspected correlation between the indicator variables examined thus far and suspicions that some observed effects may be picking up the effects of other variables, a multivariate regression becomes desirable.

A regression[72] was run on the efficiency scores; variables included were public-private management, autonomy, and assessment as well as

Table 4.6. Comparison of Mean Output Efficiency Scores across Autonomy Categories

Country	*No pedagogical autonomy*	*Pedagogical autonomy*	*p-value*	*No financial autonomy*	*Financial*	*p-value*	*No human resource autonomy*	*Human resource autonomy*	*p-value*
Argentina	0.860	0.883	**6%**	0.863	0.890	**5%**	0.869	0.909	54%
Brazil	0.808	0.832	**5%**	0.813	0.822	46%	0.813	0.849	**5%**
Chile	0.874	0.899	12%	0.878	0.904	**6%**	0.883	0.920	**2%**
Hong Kong (China)	0.919	0.912	47%	0.891	0.913	**3%**	0.912	0.909	70%
Indonesia	0.854	0.840	15%	0.835	0.844	66%	0.846	0.841	61%
Korea, Rep. of	0.904	0.915	**3%**	0.915	0.913	79%	0.914	0.914	93%
Mexico	0.894	0.907	34%	0.882	0.908	**6%**	0.888	0.949	**0%**
Peru	0.849	0.879	**2%**	0.858	0.870	36%	0.857	0.910	**0%**
Thailand	0.867	0.858	39%	0.845	0.865	**2%**	0.857	0.878	**5%**

Source: Soares 2005.
Note: Significant results in bold.

two variables measuring sorting (by academic record and placement exams) and selection (by academic performance). The scores capture common practices of the schools to improve school outcomes; these practices are likely to heavily influence the composition of the student body and possibly be correlated with private management, autonomy, or both. We also added country control dummies. Although we focus our analysis on output efficiency, we report the set of results also for input efficiency owing to some interesting findings on the impact of autonomy.

The analysis confirms that private schools are associated with higher efficiency. The results in table 4.7 confirm what was seen in the one-way analysis of variance for the impact of private schools. Even controlling for selection, which has, as expected, a strong impact on output efficiency, private schools still have a strong impact on efficiency. Evaluation is confirmed as not having a significant impact.

The results on autonomy are more mixed, with a positive association between efficiency and financial autonomy and a negative association between efficiency and pedagogical autonomy. Results on autonomy show that financial autonomy is significantly associated with output efficiency, which suggests that schools with some autonomy in raising and allocating their budget may be made more accountable to communities for results and/or spend more in nonsalary items, such as textbooks and training, which tend to be positively associated with achievement and attainment, as seen above. However, pedagogical and curricular autonomy, although not significant in output-efficiency terms, tends to be negatively associated with input efficiency. This apparently surprising result may indicate simply that too much autonomy in choosing textbooks and courses may lead schools to hire additional teachers and certified teachers (and there is some evidence of this above), leading to higher levels of inputs per output. If schools opt for more diversified/fragmented course offerings, for instance, lower pupil-teacher ratios would result. That is not to say that pedagogical autonomy is in itself bad and, in fact, education production function analysis shows that it can be conducive to higher test scores, but it is saying that this type of autonomy is not conducive to saving on inputs or, in other words, it can be a fairly expensive policy. Finally, at least in the aggregate regression, we do not note a significant impact from human resource autonomy.

Table 4.7. Multivariate Results on Selected Latin American and Caribbean and East Asian and Pacific Countries—PISA 2000

	East Asia and the Pacific + Latin America and the Caribbean		*East Asia and the Pacific*		*Latin America and the Caribbean*		*Latin America and the Caribbean (new definition of HR autonomy)*[a]	
Variable	*Input efficiency*	*Output efficiency*	*Input efficiency*	*Output efficiency*	*Input efficiency*	*Output efficiency*	*Input efficiency*	*Output efficiency*
Sorting								
Low	Base	Base						
Medium	0.112	0.011	0.113	0.009	0.162	0.018	0.156	0.020
High	0.170	**0.014***	**0.172***	0.009	0.195	0.015	0.177	0.016
Selection								
None	Base	Base						
Low	0.107	**0.015****	0.098	**0.014***	0.215	0.008	0.213	0.008
Medium	–0.006	**0.023*****	0.037	**0.018****	–0.072	**0.023***	–0.052	**0.023****
High	0.059	**0.023*****	0.164	**0.017***	–0.356	**0.036***	–0.320	**0.033****
Management								
Public	Base	Base						
Private	**–0.403*****	**0.017*****	**–0.305*****	0.008	**–0.619*****	**0.034****	–0.306	**0.029****
Use of evaluation								
None	Base	Base						
Pupil	–0.073	–0.002	–0.064	0.005	–0.143	–0.006	–0.151	–0.007
School	–0.060	–0.009	–0.074	**–0.009***	–0.066	–0.009	–0.071	–0.011

(*continued*)

Table 4.7. Multivariate Results on Selected Latin American and Caribbean and East Asian and Pacific Countries—PISA 2000 (*Continued*)

	East Asia and the Pacific + Latin America and the Caribbean		*East Asia and the Pacific*		*Latin America and the Caribbean*		*Latin America and the Caribbean (new definition of HR autonomy)*[a]	
Variable	*Input efficiency*	*Output efficiency*	*Input efficiency*	*Output efficiency*	*Input efficiency*	*Output efficiency*	*Input efficiency*	*Output efficiency*
Autonomy								
None	Base	Base						
Pedagogic	**0.181****	–0.002	**0.167****	–0.009	0.224	0.004	0.236	0.004
Financial	–0.056	**0.010***	–0.040	**0.011****	0.011	0.004	0.039	0.005
Human resources	0.136	0.003	0.092	0.001	0.178	0.014		
Human resources (only teacher hiring and firing)							**–0.364****	0.016

Source: PISA 2000.

Note: A negative sign implies positive impact on input efficiency; a positive sign implies positive impact on output efficiency. Significant results are in bold.

a. Results for the whole sample and East Asia and the Pacific do not change when the definition of HR autonomy changes; therefore, they are not reported.

*10 percent.

**5 percent.

***1 percent.

When running the regressions separately for the included countries of Latin America and the Caribbean and East Asia and the Pacific, we see substantial differences across the two regions. The results for East Asian countries are similar to the results of the overall regression. The private school effect on output efficiency is much weaker (confirming the one-way analysis of variance), but the impact of autonomy is confirmed with a somewhat higher positive impact from financial autonomy. Part of this impact may also be explained by a wise/productive choice of nonsalary recurrent inputs, as illustrated in section 3.1. The results for Latin America confirm the very strong impact of private schooling in the region, but also show none of the expected positive impact of autonomy on output efficiency (although the coefficients on pedagogical and human resource autonomy are higher than in East Asia). This indicates simply that this positive autonomy impact was capturing the positive effect of private schooling in the region.

However, when separating out teacher hiring and firing from salary determination in the human resource autonomy indicator, in an attempt to focus on where the advantages of decentralization in human resources should really be (in teacher hiring and firing), we see some interesting results: although still not quite significantly related to output efficiency, autonomy in hiring and firing teachers becomes strongly positively associated with higher input efficiency, superseding the private schooling effect. This finding indicates that some Latin American secondary schools may in fact be skilled in keeping the number of teachers under control when given some control over that or, more important, may be able to save on the size of the teaching staff and the education level of the teachers by using them more intensively, that is, through lower absenteeism and longer effective instructional hours. Better teacher allocation and higher teacher accountability would therefore be the key reason for this improvement. This evidence also suggests that salary determination may, in contrast, not be used more effectively at the school than at the central level (that is with little effective use of salary incentives) or that it may even be used to attract certified, better paid teachers, without better results. These results for East Asia and Latin America are broadly confirmed when looking more specifically at the cases of Brazil and Indonesia (box 4.4), although financial autonomy does not appear to be related to more efficiency in Indonesia.

Local informational advantage is more important in East Asia and the Pacific countries; the accountability argument is more important in Latin

Box 4.4

An Analysis of Efficient and Nonefficient Schools in Brazil and Indonesia

Making use of the same PISA 2000 database, we also attempted to identify some of the factors that may explain the performance of the most efficient and least efficient schools in two countries, Brazil and Indonesia, in which there is a large variation in efficiency scores across schools. Once again, we are able to identify more factors enhancing output efficiency than input efficiency and, therefore, focus on the output-efficiency results (in which both countries also experience the highest school variation), which we report in the table below, for the 20 percent more efficient and 20 percent less efficient schools in both countries.

Variable name	*Mean low efficiency quintile*	*Mean high efficiency quintile*	*Difference is significant according to t-test*
Brazil – output efficiency			
sort	1.263	1.486	*
select	0.222	0.618	***
private	0.026	0.256	***
pupil evaluation	0.333	0.316	
school evaluation	0.179	0.474	***
pedagogical autonomy	0.324	0.500	*
financial autonomy	0.487	0.553	
HR autonomy	0.053	0.205	**
Indonesia – output efficiency			
sort	1.650	1.826	*
select	1.125	1.278	
private	0.453	0.542	
pupil evaluation	0.024	0.083	*
school evaluation	0.893	0.792	*
pedagogical autonomy	0.880	0.583	***
financial autonomy	0.965	1.000	
HR autonomy	0.647	0.583	

The model has somewhat more explanatory power in Brazil, in which we find that the most efficient schools tend to select more, to be private, to make more use of standardized testing, and to have higher levels of pedagogical and human resource autonomy. In Indonesia, we find that the most efficient schools make more use of sorting practices and pupil evaluation, but also that they make less use of school evaluation and pedagogical autonomy. We see again how autonomy can work both ways. Lack of school capacity may help to explain why pedagogical autonomy even decreases output efficiency levels in Indonesia.

America and the Caribbean countries. Summing up, the econometric analysis confirms that standardized evaluation, at least as carried out, that is generally not in combination with an exit exam, does not seem to have a significant impact on efficiency. Private management is also confirmed to be more efficient than public management, but more so in Latin America and the Caribbean than in East Asia and the Pacific. Finally, the analysis shows that financial autonomy can be a quite powerful instrument for enhancing efficiency in East Asia and the Pacific, and autonomy in human resources, seen as teacher hiring and firing, can be a quite powerful instrument to enhance efficiency in Latin America and the Caribbean. This impact of autonomy seems to confirm that local informational advantages (needed for making decisions on budget composition) may be stronger in the included East Asia and the Pacific countries, whereas the need for better teacher allocation and accountability may be stronger for the included Latin American and Caribbean countries. In other words, Latin American bureaucracies may be particularly inefficient at allocating teachers and making them accountable, also because of the political interference of strong teachers' unions, making school autonomy in hiring and firing teachers a very wise policy decision. But we cannot rule out that teacher management decentralization, when undertaken, is more effectively undertaken in the selected Latin American countries than in the East Asian countries, creating opportunities for learning of the different experiences with it across regions.

In light of these results, East Asia and the Pacific schools should definitely be given, at least in practice, significant levels of autonomy in managing their budgets (as shown in chapter 1). In contrast, the still limited autonomy in staffing decisions of Latin American schools (as also shown in chapter 1) is worrisome.

Improvements in internal efficiency[73]

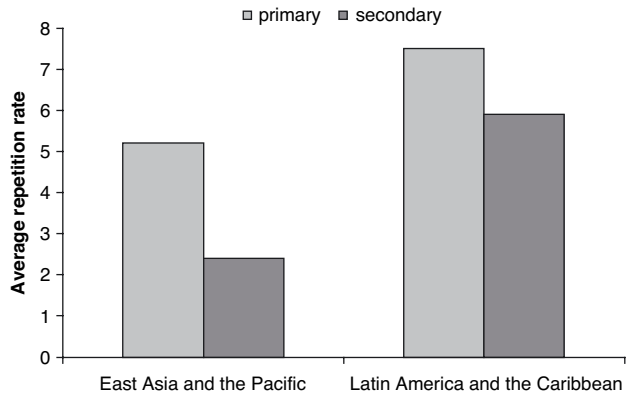
An important variable to examine when analyzing the efficiency of service delivery is the repetition rate. Reducing repetition could potentially have an impact on efficiency by leading to a reduction in overall costs (by decreasing the total number of students enrolled in the system and the associated total recurrent and capital costs) for similar or even higher educational outcomes. Higher outcomes can occur as the NER and grade for age increase, and secondary completion also increases because of decreased dropout rates related to overage. However, this impact on efficiency will depend on several factors such as the elasticity of inputs to the reduced number of students, the costs of the interventions to reduce repetition, and pedagogical leeway for reducing repetition. This section

summarizes repetition rates and costs for countries in Latin America and the Caribbean and East Asia and the Pacific and discusses the potential for improved cost-effectiveness.

The available evidence suggests that repetition and the cost of repetition are higher in Latin America and the Caribbean than in East Asia and the Pacific and in primary than in secondary education. Annex 4.3 provides repetition and cost estimates. Unfortunately, although repetition data are widely available for primary education, they are less often available for secondary education, constraining our analysis in regard to number of countries. The cost analysis is a very simplified one.[74] Summary points are as follows:

1. Repetition rates are higher in primary than in secondary education, indicating the need for addressing repetition first in primary. The unweighted mean of repetition for primary is about 6 percent, versus about 4 percent in secondary. In East Asia and the Pacific, secondary repetition rates are about half the rates in primary; in Latin America and the Caribbean repetition rates are about 80 percent of the rates in primary.
2. Primary and secondary repetition rates, at least for the available countries, are higher for countries of Latin America and the Caribbean than for East Asia and the Pacific (although less so in unweighted than weighted terms) (figure 4.8).

Figure 4.8. Average Repetition Rate in Latin American and Caribbean and East Asian and Pacific Countries (unweighted)—2000

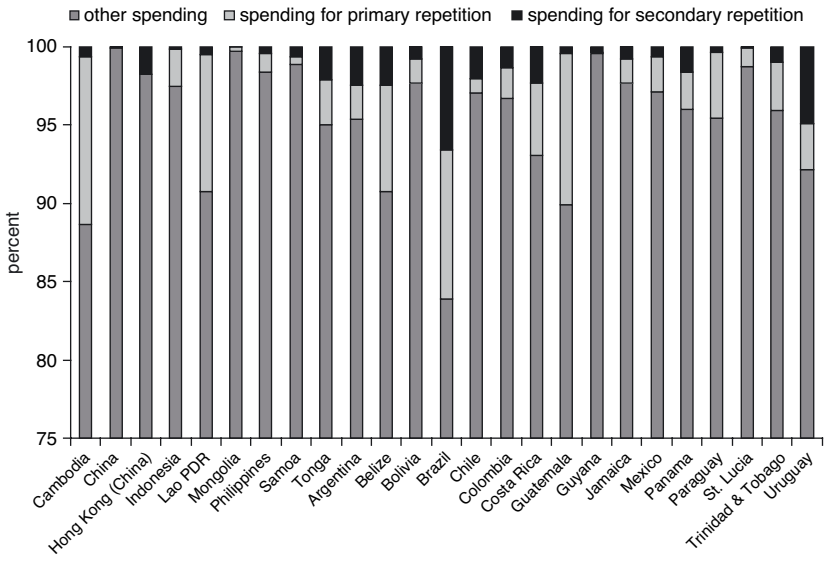


Source: Annex 4.3.

3. In percentage terms, repetition represents about 3.5 percent of recurrent public education expenditure in primary school and about 1 percent of recurrent public education expenditure in secondary school. In unweighted terms, figures are slightly higher for the available countries of East Asia and the Pacific than for countries of Latin America and the Caribbean in primary education (largely because of the few available East Asian and Pacific countries); they are larger in Latin America and the Caribbean countries for secondary (1.8 percent versus 0.7 percent). The cost increases proportionally more in Latin America and the Caribbean than in East Asia and the Pacific in weighted terms because of Brazil. Figure 4.9 illustrates the countries for which primary and secondary repetitions represent the greatest cost relative to recurrent public education expenditure.

However, repetition rates in primary and secondary are not always related to efficiency scores. Simple correlation analysis between the efficiency scores calculated by Herrera and Pang and primary and secondary

Figure 4.9. Portion of Recurrent Expenditure due to Repetition in Selected East Asian and Pacific and Latin American and Caribbean Countries



Source: Annex 4.3.

repetition shows weak results or even some positive correlation between output efficiency scores in regard to GER and the secondary repetition rate (correlation coefficient of .59). The only strong correlation suggesting a negative relation between repetition and efficiency is between the PISA 2000 output efficiency scores and primary and secondary repetition (correlation coefficients of, respectively, –.81 and –.61). Both positive and negative correlations are to be expected because by reducing repetition the GER would also tend to decrease, at least in the short run, and educational attainment, as measured by the grade reached at 15, obviously tends to increase. However, these results do not offer immediate evidence that countries with lower repetition rates save resources to reach specified outcomes. Similarly, the analysis confirms that lower repetition (or higher grade for age attainment) is not always associated with higher completion, higher test scores, or both. The potential for improved cost-effectiveness should, therefore, be taken with caution.

First, decreasing repetition rates do not guarantee cost savings. Most countries allocate funds to schools based on those schools' historical cost allocations, which are related largely to the number of teachers. If teachers are not reduced following the reduction in repeaters, costs will not be reduced either. Related to this, because of these rigidities, countries may prefer to replace repeaters with new students, increasing the enrollment rate, but keeping the same resource level. Changes to per capita financing, as some countries have done (see the section on formula funding in chapter 3), may help link decreased repetition and enrollment to costs, but in practice schools will be given the incentive to replace repeaters with new students (or, even, to keep high repetition rates) to avoid losing funds. Finally, it should not be forgotten that decreasing repetition may itself be a fairly expensive endeavor if accompanied by policies to improve quality. Overall, it is likely that decreasing repetition will not generate any "actual" savings, but will allow a country to increase its enrollment rates at a lower cost than would otherwise have been necessary (as illustrated by the cases of Cambodia and Chile). There is therefore more potential for increasing output efficiency than input efficiency. By the same token, high repetition does not necessarily imply higher overall expenditure if countries respond by cutting unit costs, as seems to be the case, for instance, in Brazil and Lao PDR, which spend little in education in relation to GDP and per student. In sum, education budgets are rigid in both senses.

Second, although a student who completes a grade twice may fall behind peers, become discouraged, and drop out; pushing students to a new grade when they are unready for it may position them for failure, resulting in dropout or a low test score. Two strong types of arguments for reduction in repetition are related to the role of schools' and teachers' policies in determining repetition and to the consequences of repetition itself. Evidence from Brazil, a country with one of the highest repetition rates in the world, suggests that, although student performance remains the main determinant of repetition, other factors, such as the availability of higher grades and the teachers' overwhelming role in the repetition decision with little supporting quality evidence, are very relevant in determining repetition.[75] At the same time, controlling for other factors, evidence from a variety of countries suggests that repetition may increase a student's likelihood of dropping out of school, decrease the academic achievement of a student's classmates, decrease a student's self-esteem, and even decrease the learning of the repeating student (Aguerrondo 2000; García-Huidobro 2000; and Schiefelbein and Schiefelbein 1999). In that context, countries would be well advised to implement policies that can drastically reduce repetition, including increasing school supply in rural areas, setting clear quality standards through effective standardized testing (and, at least in Brazil, the evidence shown in box 4.4 indicates that the use of evaluation makes a difference) and, if necessary, establishing automatic promotion policies, although these policies are controversial if they are not accompanied by quality improvements, which brings us to our second point.

Although there are strong grounds for reducing repetition, and Brazil is candidate number one for this, it is also important to recognize that performance is still a key determinant of repetition and, if this is the case, pushing someone through without the necessary academic achievement can in fact lead to unchanged efficiency or even lower efficiency, if the likelihood of completing secondary does not increase and test scores decrease. Countries such as Argentina and Indonesia, which decreased their secondary repetition rates, could be examples of countries in which improvement in repetition and attainment has been made by lowering standards of promotion (as reflected in low output efficiency scores in regard to test scores—see figure 4.2). In that context, the best option would have been to make quality improvements before proceeding with reducing repetition or at least proceeding with very careful repetition reductions. Policy makers need therefore make a detailed diagnostic of

the causes and consequences of repetition to ensure that the proper repetition strategy is adopted.

Box 4.5 illustrates the case of two countries, Chile and Cambodia, which have both decreased their repetition rates with comprehensive policy packages.

Box 4.5

Chile and Cambodia: Different Paths to Reducing Repetition

Cambodia and Chile have both reduced their repetition rates considerably in recent years. Cambodia's most significant decrease in repetition rates has been at the primary level, which dropped from 25 percent in 1998 to 10 percent in 2001. There was also a decrease in repetition rates at the secondary level, which fell from 14 percent to 2.5 percent in the same period. Chile has also seen a decrease at both the primary and secondary levels. In the period from 1994 to 2001 the primary repetition rate fell from 6.9 percent to 2.8 percent, and the secondary repetition rate fell from 12.3 percent to 5.9 percent. What led to these dramatic reductions? Cambodia and Chile are at very different stages of development and present strikingly different contexts. Cambodia is attempting to build a new education system after its destruction during the Khmer Rouge regime and subsequent neglect during the country's civil war. Chile has a relatively developed education system that has gone through a series of comprehensive reforms and implemented many innovative programs. Although Cambodia is still focused on primary education, Chile has dedicated considerable resources to its secondary and tertiary schooling.

Cambodia's policies: The main goal of the Ministry of Education, Youth and Sport (MoEYS) in recent years has been to address enrollment and access issues to meet Education for All (EFA) goals. In this context, and recognizing the high financial costs of repetition and with concerns of overcrowding in the early grades, which is exacerbated when students are held back, some evidence suggests that to meet the quantity dimension, promotion standards have been altered to meet unofficial promotion targets. Although there is no official repetition target, in a telling statement a field evaluator noted, "We were informed by many teachers that a target was set for them, i.e. they can't afford to have more than 15 percent of total students failed. Some school directors say the pass rate needs to be more than 80 percent... They said there is even a monitoring group coming down to

(*Continued*)

see whether such targets are met." The country also made some efforts to increase quality. There is evidence that it made strides through quality-enhancing policies such as school grants programs; a vast priority action plan including remedial classes, scholarships, and nutrition support; and a broad basic textbook program.

Impact: In this policy context, the country was successful in reducing repetition, and although this did not translate into actual cost savings, this reduction allowed the country to spend less on repeaters and more on new enrollees, increasing its enrollment rate at a more reasonable cost. The NER in primary and lower secondary increased (although the exact extent of the increase is not clear), following in particular higher entry into primary, the decrease in the female-male gap, and the quite substantial increase in the completion rate between 1997 and 2004. However, inequity between socioeconomic groups decreased only slightly. Although there is unfortunately no national test in Cambodia to measure student ability, quality may have improved according to measures of teacher quality.

Chile's policies: In a context in which high repetition was the product of both insufficient academic performance and a widespread "culture of repetition" (in which teachers have the concept that a given percentage of students should fail), Chile put in place a dual strategy to address repetition based on improving student learning, in particular for low-income groups, and on making some changes in promotion standards (including automatic promotion at the end of grades 1 and 3).[76] The country focused on the student learning dimension through a series of innovative programs using a multipronged approach at both the primary and secondary levels that includes reformulating the curriculum, providing in-service teacher training to modernize pedagogy, funding educational development projects designed and prepared by the schools, and providing educational resources (textbooks, school libraries, teaching materials, computers). The country also developed many targeted programs for groups most at risk for repetition, such as indigenous minorities, children with learning disorders, and those living in poorer regions.

Impact: In this policy context, the country was successful in reducing repetition (saving on the resources needed to reach higher enrollment rates), but less successful at increasing test scores (Chile's national test [SIMCE], which is given in 4th, 8th, and 10th grades, has shown practically no improvement in learning achievement). In addition, secondary graduation rates have increased only slightly. A plausible explanation for this trend can be related to the significant improvements in net enroll-

(*Continued*)

ment and reduced dropout and repetition between 1994 and 2002, which have translated into 26 percent more of the potential student-age group being incorporated into the system and being promoted at the secondary level. Of this 26 percent increase, many students are from groups that are the most at risk. Although the fact that overall test scores *did not drop* while the most at risk groups were being incorporated into the system may actually indicate that quality has improved somewhat (in fact, correlations of changes in SIMCE scores and changes in repetition rates by school suggest that quality is playing a role in reducing repetition); it also suggests that Chile faced somewhat of a trade-off between access and quality. Implementation of automatic promotion before the implementation of major quality-enhancing policies may be part of the explanation for this trade-off.

Source: Adapted from Ragatz (2005): "Addressing Repetition in Cambodia and Chile: A Tale of Two Approaches," background paper written for this report.

Conclusions

This chapter has identified some emerging messages on the efficiency of secondary education delivery in selected East Asian and Latin American countries. The main messages are as follows:

1. Schools in Latin American and East Asian countries have substantial margins for efficiency improvements. In particular, controlling for socioeconomic status, schools could, on average, reach an academic achievement and grade attainment level about 15 percent higher for the quantity and quality of teachers employed. In Brazil and Indonesia, for example, they could reach about 22 percent and 19 percent higher outcomes, respectively, for the teachers employed. The gap in output efficiency increases to about 35 percent when considering only test scores.
2. Educational attainment at 15 and test scores at 15 do not always move in the same direction, and some countries, such as Argentina and Indonesia, have been pushing students through at the expense of quality. However, a trade-off is not inevitable as illustrated by several other countries in which schools perform well along both dimensions. In fact, higher test scores may be conducive to higher attainment.
3. Although the selected Latin American and East Asian countries perform similarly, East Asian countries tend to be more output efficient (in particular in regard to test scores and secondary completion).

4. Countries with lower efficiency scores tend to have a higher score dispersion across schools.
5. The efficiency analysis conducted on the PISA test scores, literature reviews, and case studies allowed us to identify the following interventions as particularly promising to improve efficiency levels:
   a. Gradually increase proportion of nonsalary recurrent costs (in particular in lower-income countries).
   b. Increase student numbers per school and per teacher (in all countries).
   c. Apply teachers' performance-based incentives (more so for middle-income countries).
   d. Decrease curricular fragmentation, also by promoting a broader and more integrated curriculum between technical-vocational and general education and fewer technical tracks (in all countries).
   e. Ensure that all parts of the system are well aligned with the curriculum and the objectives of the education sector (in all countries).
   f. Promote public-private partnerships (in particular in Latin America, but also in East Asia for increasing enrollment capacity).
   g. Decentralize decision-making responsibilities in hiring and firing teachers (in Latin American countries, in which central bureaucracies are particularly inefficient) and budget composition and allocation to public school (more so in East Asian countries, exploiting local information advantage).
6. The same analysis suggests that other interventions need to be more thoroughly analyzed and assessed, particularly the following:
   a. The quality and certification process of teacher education in the two regions needs to be assessed.
   b. A more comprehensive efficiency analysis of general and technical schools needs to be undertaken.
   c. School assessment practices should be reassessed, with particular emphasis on the coordination between exit exams and continuous standardized testing and the purposes of evaluation.
   d. The benefits and costs of pedagogical autonomy should be carefully assessed. Pedagogical autonomy can also lead to inefficiency.
   e. The impact of alternative secondary modalities should be evaluated more comprehensively and thoroughly; it will be important to find the right balance between cost savings and quality results.
   f. It is necessary to undertake detailed diagnostics of causes and consequences of repetition to apply a reduction strategy that is conducive to a higher grade for age attainment, test scores, and secondary completion prospects.

Notes

1. Since the Coleman report, the overwhelming importance of socioeconomic background in education results has been a constant in the education production literature. Parents' education levels and occupation are the most important causal variables in almost any regression explaining education results.
2. Or lower in some methodologies.
3. In a perfectly deterministic world without measurement error, whenever input efficiency is equal to unity, output efficiency will be also. In the real world, in which the frontier must be estimated from imperfect data, often schools will have unity score in one dimension but be inefficient in the other.
4. Herrera and Pang 2004.
5. Gross primary school enrollment, net primary school enrollment, gross secondary school enrollment, net secondary school enrollment, youth literacy, average years of schooling, "first level complete," "second level complete."
6. Wilson 2004.
7. In particular, Wilson uses public education expenditure expressed in PPP, presents only multiple-input multiple-output analysis (inputs include education expenditure in PPP, teacher-pupil ratio and, in some of the analyses, literacy of adults), and uses m-order estimates (which are robust to outliers and do not suffer from the curse of dimensionality).
8. Or, even when secondary outcomes are considered, by relating them to overall expenditure.
9. Most countries do not have this type of information.
10. The methodology of estimation is provided with great detail in Wilson (2005), the background paper commissioned for this report.
11. On input efficiency, the PISA 2000 data reveal substantial margins for efficiency gains in both regions, more so in East Asian countries. Although the East Asia and the Pacific results are fairly homogeneous, the Latin American and Caribbean results are fairly heterogeneous, with Argentina on the one side, with very low efficiency levels, and Chile and Mexico on the other side, with the higher efficiency levels of the 11 countries. Although a comparison with the other DEA analyses is difficult because the methodology, inputs/outputs, and databases (with country coverage) are different, little difference in input efficiency between East Asia and the Pacific and Latin America and the Caribbean countries is consistent with the findings of Herrera and Pang, in which more efficient countries also generally tend to be spending less than the average (for example, Guatemala and the Dominican Republic).
12. Results appear more homogenous than in relation to the mere test scores presented in chapter 1 as a result of having incorporated grade attainment (which

is related to coverage, repetition and completion), and having controlled for the school socioeconomic status. In addition, countries that can have fairly low quality, as expressed in test scores, can actually rank better when comparing these outcomes with the inputs invested to achieve them.

13. In contrast, Herrera and Pang find an advantage for Latin American countries in output efficiency when calculated in regard to secondary enrollment rates. This advantage of Latin America and the Caribbean in secondary education coverage is not surprising in view of the findings of the previous chapter, in which we have seen that East Asia and the Pacific countries have still lower secondary gross enrollment rates, while spending a little more. They have margins for improving their coverage levels given their resource level.
14. Which includes only three Latin American and Caribbean countries and could be undertaken only on two of them.
15. This subsection benefited from the inputs of Steffi Stallmeister.
16. A review of educational attainment functions can be found in the background paper prepared by di Gropello and Marshall (2005).
17. This evidence comes largely from meta-analyses, international or focused on Latin America, such as Fuller and Clarke (1994); Hanushek (1995); Velez, Shiefelbein, and Valenzuela (1993); and UNESCO/LLECE (2000).
18. Fourteen Public Expenditure Reviews (PERs) performed since 2000 in Latin America and the Caribbean and East Asia and the Pacific were reviewed. None of the PERs reviewed include disaggregated data on budget allocations within the secondary education subsector. Most PERs include figures for overall recurrent, recurrent nonsalary, and capital expenditures. However, a few go beyond providing disaggregation in these categories. For instance, the PERs for the Dominican Republic, Honduras, Lao PDR, and Mongolia include more specific budget line items.
19. UNESCO data are available for only four countries (Indonesia, Korea, Malaysia, and the Philippines). In addition, this section included data from public expenditure reviews for Cambodia and Lao PDR. However, the indicator used in the UNESCO Digest and the two PERs differ slightly. UNESCO excludes expenditures for tertiary education. The PERs include tertiary education. However, in both countries the share of public expenditure allocated to tertiary education is relatively low. Data for Cambodia refer to 2001, for Lao PDR to 1999–2000.
20. The correlation coefficient is about .4.
21. It is also notable that there is a correlation close to .5 with the output efficiency score in regard to the PISA test scores (without attainment), suggesting that the use of textbooks can complement teacher work, generating higher achievement levels.

22. See Barnett et al. (2002) and Bradley and Taylor (2000).
23. Which would still require reforms in school size, instructional structures, typical class or lecture sizes, number of classes taught by a typical teacher per term, and duration of studies (OECD 2000).
24. There is evidence that the level of teacher pay relative to other professions is an important determinant of teacher quality and performance, but that the intensity of the link between teacher pay and teacher performance depends on peculiarities of the teacher labor market and remuneration structure and that, in many cases, the link will be weak. In particular, generally teachers are rewarded according to experience and qualifications, without taking actual performance or teacher effort into account: in such a system higher wages may attract more skilled and harder-working new entrants and foster further qualification, but not necessarily create incentives to boost student performance or increase effort by teachers who are already practicing. To illustrate that point, some studies show a clearer impact of teacher pay on education achievement when performance is directly taken into account in the salary scale, by introducing, for instance, team-based performance pay (see Glewwe and Kremer [2003] and Lavy [2003]).
25. For a well-documented analysis of teacher incentive schemes in Latin America, see World Bank (2005e).
26. Reinikka, Ritva, and Smith 2004.
27. Honduras, Papua New Guinea, Peru, Cambodia, Laos, and Mongolia.
28. Benavot 1983.
29. Hawley 2005b and World Bank 2005f.
30. Tsang 1997.
31. See, for instance, Middleton and Demsky (1989) on Korea and Dougherty (1990) on China.
32. Middleton, Ziderman, and Van Adams 2003 and Ziderman 2003.
33. Tsang 1997.
34. In part this may be related to the noninclusion of private expenditure in the education expenditure input, which could be overestimating the efficiency of countries with high technical shares, substantially financed with private funds.
35. The probability that the two subsamples are random draws from the same sample is calculated using one way analysis of variance and is shown in the final columns.
36. In particular, inputs such as equipment, which are used more in TVET schools, are not factored in; only general skills are being tested, and possible selection biases into technical and vocational education are not taken into account.
37. Asian Development Bank 1991.

38. Tilak 2003.
39. See Proceedings from the CIEP International Conference on TVET reform in the knowledge economy (CIEP 2004) and Consultores en Economia y Desarrollo (2004).
40. See Tilak (2003), which reports the results of a meta-analysis, which finds SRR about 1 to 2 points lower for TVET than general education in South Korea in 1981 (8 percent vs. 9.1 percent), and Indonesia in 1986 (11 percent vs. 9 percent), and about 6 points lower for Thailand in 1990 (6.7 percent vs. 11.4 percent). SRR are, however, higher for TVET than general education in 1978 in the Philippines (23.6 percent vs. 19 percent) and in Taiwan in 1970 (27.4 percent vs. 26 percent).
41. See OECD 2005.
42. Woessmann and Hanushek 2005.
43. This subsection benefited from the inputs of Charles Abelman.
44. This dual objective is also developed in Ravela (2002).
45. Woessmann and Fuchs 2004.
46. When there are no exit exams, the study finds a negative relationship between school standardized testing and achievement, stating that the reason would be the absence of clearly specified education goals and standards at the school system level, which could make continuous standardized testing even unbeneficial.
47. According to Ravela (2002), only Chile, Argentina, and Uruguay regularly disseminate results at the school level.
48. This section is based on a background paper by Umansky (2005).
49. Relatedly, providing traditional resources and recruiting, training, and retaining teachers in rural, isolated, or difficult areas are very challenging.
50. Interactive Radio Instruction (IRI) used in conventional classrooms in more than 18 countries worldwide is an example of an educational model designed primarily for quality enhancement (Bosch 1997).
51. In a 50-country survey, 55 percent of distance education programs used radio instruction, 37 percent audiocassette, 15 percent video, and less than 3 percent computer (Dodd [1999] as cited in Grace and Kenny [2003]).
52. The Republic of Korea in 2000, for example, committed itself to providing computer access in all primary and lower secondary public schools.
53. Generally, hardware is the least costly investment in high-tech programs. Network infrastructure, service, transportation, training, and software constitute the bulk of the costs (World Bank 2004e).
54. They have relatively high start-up costs but lower per pupil costs.
55. Programs with fewer participants have higher per pupil costs. Research suggests that technology is more cost effective if it serves large numbers of participants.

56. More impact evaluations and qualitative evaluations of these programs, such as the one recently completed on EDUCATODOS (Marshall et al. 2005), will certainly help improve our understanding and subsequently our design and implementation of these important programs.
57. See World Bank 2005b.
58. World Bank 2004e; Figueredo and Anzalone 2003.
59. The main input to this section is the background paper by Soares (2005). Specfic contributions were also provided by Christelle Vermeersh.
60. Marshall 2005b.
61. See, for instance, Atagi (2004) on Thailand.
62. See, for instance, Robertson and Briggs (1998).
63. See, for instance, Robertson and Briggs (1998); Kanter (1983); and Peters and Waterman (1982).
64. See, for instance, Robertson and Briggs (1998) and Hannaway (1993).
65. di Gropello 2005.
66. The PISA schools questionnaire has four questions on human resource autonomy, two on financial autonomy, and six on pedagogical autonomy. Each question allows for five nonexclusive possible actors to decide—the school board, the principal, the department head, and teachers—in addition to an option stating that a given measure is not an attribute of the school.
67. Woessmann and Fuchs 2004, OECD 2005, Nabeshima 2003.
68. Including teacher hiring and firing and salary determination.
69. Including budget formulation and allocation.
70. Including establishing disciplinary measures and student assessment; approving student admittance; and choosing textbooks, course content, and course offerings.
71. This subsection benefited from the key contributions of Christelle Vermeersh.
72. For arguments explained in Wilson and Simar (2005), a truncated regression with bootstrapping errors was needed to undertake multivariate analysis on efficiency scores.
73. This section is based on a background paper by Shapiro (2005).
74. The annual cost of repetition (in US$), C, is estimated as C = rnc, where r is the percent of students that repeated a grade in the indicated year, n is the number of students enrolled in the given level in the indicated year, and c is the per student public expenditure for students enrolled in that level; the financial burden of repetition is estimated as R=C/E, where E represents total annual public expenditure on education.

75. See Gomes-Neto and Hanushek (1994) on Northeast Brazil and Klein (1999). Using panel data for three years, Gomes and Hanushek find that a group of students performed above the mean on both Portuguese and mathematics achievement tests but repeated anyway for lack of advanced grades.
76. Programs such as P-900, MECE-Basica, and MECE-Rural also sent teachers a clear message against repetition and provided them with several pedagogical supports to tackle it.

Spotlight 4—Korea: High Priority for Education and Effective Public-Private Partnership

Korea's secondary schools are among the best performing in East Asia and the Pacific and Latin America and the Caribbean. Access is strong and equitable, with gross enrollment at the secondary level at 90 percent across both boys and girls. Frequently, Korean students score at the top in international evaluations such as PISA and TIMSS, and student achievement transcends socioeconomic backgrounds: in PISA math tests, even children from Korea's bottom income quintile score significantly above average. Schools are adequately funded—more than 2.4 percent of Korea's GDP is spent on secondary education, one-third of this generated privately.

Korea's achievements in secondary education rest largely on four interrelated characteristics. First, starting from the early 1950s, the Korean government viewed building a strong education sector as an important part of Korea's economic development strategies. The high stakes associated with expanding education led to prompt implementation of education policies by dynamic and motivated institutions. Second, motivated by the desire to bring skilled, educated workers into the workforce, the government's education policies focused on both access and quality from the earliest days of expansion, for all sections of the society. Third, the high value placed on a good-quality education by the Korean society helped push forward the expansion efforts. In pursuit of the prestige education brought to the family, parents willingly internalized the costs of education. Consequently, Korean education policies, which focus mostly on supply-side constraints at the secondary level, delivered considerably successful results compared with many other countries that followed similar paths. Fourth, the country expanded one education cycle at a time, starting with basic education.

The Korean school system consists of a nine-year basic education cycle (which includes six years of primary school and three years of middle school), a three-year upper secondary cycle, and two to four years of tertiary education. Basic education is compulsory. Primary education is freely available for all eligible students, but parents must pay tuition for secondary schools. Tuition rates for both public and private secondary schools are strictly regulated—and similar—and rates almost double when students start the upper secondary cycle. Private schools are extensive; 1 in 5 middle school students and more than half of the high school students attend private schools. Technical and vocational high schools make up 40 percent of upper secondary enrollments.

(*Continued*)

Between the 1950s and 1990s, Korea focused on expanding one education cycle at a time, starting with basic education. During the 1950s and 1960s, when public funds targeted mainly increasing access and quality at the primary cycle, secondary schools financed almost half of their expenses through monies raised by the parent teacher associations (after 1962, by school sponsoring associations, which are now replaced by school councils). By the end of this period, rapid expansion at the primary level created enormous pressure on secondary schools. Competition among students to enroll in a good secondary school became rampant. In preparation for entrance exams—Koreans called this the "examination hell"—elementary school children frequently repeated grades, and families gave up sometimes up to a quarter of their annual incomes for private tutoring.

In the face of criticisms of the pressure entrance examinations put on youngsters (and financially, on their families), in 1968, the Korean government implemented a national equalization program, which banned the entrance examinations, established catchment areas for middle schools, and instituted a lottery for schools in high demand. When schools lost control over admission decisions, enrollments soared, and private providers stepped up to provide the needed capacity. The equalization program guaranteed any deficit in operating cost (but not in capital cost) of all private schools. By 1971 most private schools were receiving direct financial assistance, subsidies, and tax exemptions. In return for access to public funding, private schools fell largely under public control; they had to give up their control over many key decisions such as curriculum, tuition rates, and teachers' salaries.

Although it improved enrollments, the middle school equalization program removed the competition among the elite schools, and quality at the top declined. The examination hell resurfaced at the end of the lower secondary cycle, and with declining quality, students preparing for high school entrance examinations relied on private tutoring even more. In response, the government adopted the high school equalization program in 1974, opening enrollments at high schools. Penultimate goals of the high school equalization program included reversing the migration from rural to urban areas by reducing the quality differences between urban and rural high schools and increasing enrollments in vocational schools to help provide skilled laborers for the fast-expanding manufacturing sector.

As early as the 1960s vocational and technical education was an important part of Korea's education development plans. Through the 1970s, the government invested in building vocational schools and, for a quick entry into labor

(*Continued*)

markets, reorganized the structure of five-year technical schools into separate high school and junior college components. By the end of the 1980s the Korean manufacturing sector was still experiencing a shortfall of laborers; the nonacademic curriculum made vocational and technical education a less desirable alternative for most students who opted to go to college in pursuit of jobs in the service sector. In 1991 the government pushed forward new policies to increase the share of students attending vocational schools to half of total upper secondary enrollments. But, without any curriculum changes, vocational education remained largely a terminal degree with poor odds of succeeding in the university entrance examinations, and enrollment trends did not change much. In addition, advances in automation removed the pressure on the manufacturing sector to find laborers, and the policies were abandoned by 1998.

Although the mixture of "private funding/public control" worked well in the earlier years of expansion, there is increasing pressure to bring more public funding into secondary education, allow more flexibility and autonomy (accompanied by accountability) in school management, and replace the rigid, achievement oriented curriculum with a more individualized curriculum that focuses on lifelong skills. Recent education reforms in Korea focus on those three areas. Public funds allocated to secondary education, as a percentage of GDP, grew by 7 percent annually between 1999 and 2003. In addition, the government relaxed its controls over school management, instituted school councils to facilitate parental involvement, and legalized teachers' unions. Recent revisions to curriculum introduce lifelong skills such as foreign languages and information technology at earlier ages and allow for more individualization in learning. Last, but not least in importance, efforts are in place to reform the vocational and technical schools to improve curricula, diversify the types of high school tracks, and link vocational high schools with technical colleges so that rather than terminal degrees, vocational high school becomes a prerequisite for advanced studies.

Sources: Yilmaz on the basis of Gill and Chon-Sun (2000); Kim (2002); Kim and Lee (2002); and Paik (1995).

Annex 1.1: Structure of Secondary Education

Table A1.1: Structure of Primary and Secondary Education in Latin America

Country / *Latin America*	*Compulsory education duration (years)*	*Entrance age and duration of first and second level* — *Age*																	
		4	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Costa Rica	9			1	2	3	4	5	6	1	2	3	1	2				
Cuba	9			1	2	3	4	5	6	1	2	3	1	2	3			
Dominican Republic	10			1	2	3	4	5	6	7	8	1	2	3	4			
El Salvador	9				1	2	3	4	5	6	7	8	9	1	2	3		
Guatemala	6				1	2	3	4	5	6	1	2	3	1	2	3		
Honduras	6				1	2	3	4	5	6	1	2	3	1	2			
Mexico	6			1	2	3	4	5	6	1	2	3	1	2	3			
Nicaragua	6				1	2	3	4	5	6	1	2	3	1	2			
Panama	6			1	2	3	4	5	6	1	2	3	1	2	3			
Argentina	7			1	2	3	4	5	6	7	1	2	3	1	2			
Bolivia	8			1	2	3	4	5	6	7	8	1	2	3	4			
Brazil	8				1	2	3	4	5	6	7	8	1	2	3			
Chile	12			1	2	3	4	5	6	7	8	1	2	3	4			
Colombia	5			1	2	3	4	5	1	2	3	4	1	2				
Ecuador	10			1	2	3	4	5	6	1	2	3	1	2	3			
Paraguay	6			1	2	3	4	5	6	1	2	3	1	2	3			
Peru	6			1	2	3	4	5	6	1	2	1	2	3				
Uruguay	6			1	2	3	4	5	6	1	2	3	1	2	3			
Venezuela, R. B. de	10			1	2	3	4	5	6	7	8	9	1	2				
	LEGEND:	Primary								Secondary					Lower Sec			Upper Sec

Source: UNESCO Institute of Statistics.

Table A1.2: Structure of Primary and Secondary Education Structure in East Asia

Country	*Compulsory education duration*	*Entrance age and duration of first and second level*																	
		Age																	
East Asia	*(years)*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Cambodia	6			1	2	3	4	5	6	1	2	3	1	2	3			
China	10				1	2	3	4	5	1	2	3	1	2				
Hong Kong (China)	9			1	2	3	4	5	6	1	2	3	4	5	1	2		
Indonesia	9				1	2	3	4	5	6	1	2	3	1	2	3		
Japan	9			1	2	3	4	5	6	1	2	3	1	2	3			
Korea, Democratic People's Republic of	10			1	2	3	4	1	2	3	4	5	6					
Korea, Rep. of	9			1	2	3	4	5	6	1	2	3	1	2	3			
Lao PDR	5			1	2	3	4	5	1	2	3	1	2	3				
Macao SAR (China)	5			1	2	3	4	5	6	1	2	3	4	5	6			
Malaysia	6			1	2	3	4	5	6	1	2	3	1	2	3	4		
Mongolia	8					1	2	3	4	1	2	3	4	1	2			
Myanmar	5		1	2	3	4	5	1	2	3	4	1	2					
Nepal	5			1	2	3	4	5	1	2	1	2	3					
Philippines	6				1	2	3	4	5	6	1	2	3	4				
Singapore	6			1	2	3	4	5	6	1	2	3	4	1	2	3		
Thailand	6			1	2	3	4	5	6	1	2	3	1	2	3			
Timor-Leste	6			1	2	3	4	1	2	3	4	5	1	2				
Vietnam	5			1	2	3	4	5	1	2	3	4	1	2	3			
	LEGEND:	Primary								Secondary			Lower Sec			Upper Sec		

Source: UNESCO Institute of Statistics.

Annex 1.2: Share of Total Secondary Enrollment Attending Private Schools (2002 data)

Countries: LAC	*Primary*	*Secondary*	*Countries: East Asia*	*Primary*	*Secondary*
Antigua and Barbuda	38**	20**	American Samoa	..	..
Argentina	20	25	Cambodia	1	0
Barbados	11	5	China	..	..
Belize	87	74	Fiji	..	..
Bolivia	20	28	Indonesia	16	43
Brazil	9	11*	Kiribati	..	..
Chile	47	50***	Korea, Democratic People's Republic of	..	..
Colombia	17	24	Lao PDR	2	1
Costa Rica	7	12	Malaysia	1	3
Cuba	..	..	Marshall Islands	24*	34*
Dominica	28	32	Micronesia, Fed. Sts.	..	..
Dominican Republic	15	24	Mongolia	2	2
Ecuador	28	33	Myanmar	..	..
El Salvador	10	20	N. Mariana Islands	..	..
Grenada	76	60	Palau	..	29**
Guatemala	12	74	Papua New Guinea	1*	2*
Guyana	1*	1*	Philippines	7	20
Haiti	..	..	Samoa	..	32*
Honduras	..	..	Solomon Islands	..	..
Jamaica	5	2	Thailand	14	8
Mexico	8	16	Timor-Leste	..	..
Nicaragua	16	29	Tonga	9*	73**
Panama	10	15	Vanuatu	4*	13*
Paraguay	16	26	Vietnam	0	11
Peru	14	17	**EAP Average**	**6.75**	**19.35**
St. Kitts and Nevis	15	3			
St. Lucia	3	5			
St. Vincent and the Grenadines	5	33			
Suriname	48	21			
Trinidad and Tobago	28	28			
Uruguay	13	21			
Venezuela, R. B. de	14	25			
LAC Average	**21.41**	**24.46**			

Source: UIS.
* 2001 data, ** 1999 data, *** 2000 data.

Annex 1.3: Share of Total Secondary Enrollment Attending Technical and Vocational Schools

Country	*% of secondary students in TVET (2002–03)*	*Change in TVET enrollment 1998–99 to 2002–03*	*Country*	*% of secondary students in TVET (2002–03)*	*Change in TVET enrollment 1998–99 to 2002–03*
EAP	***11***	***39***	***LAC***	***13***	***19***
Cambodia	3	78	Argentina	32	128
China	12	–8	Barbados	2	
Indonesia	13	2	Belize	4	
Korea, Rep. of	15		Bolivia	4	9
Lao PDR	1	58	Brazil	2	–68
Malaysia	6	13	Chile	26	10
Mongolia	5	76	Colombia	8	
Papua New Guinea	9	16	Costa Rica	19	23
Thailand	11		Cuba	29	74
Vietnam	3	74	Dominica	5	
			Dominican Republic	5	–16
			Ecuador	22	24
			El Salvador	20	–6
			Grenada	7	
			Guatemala	29	29
			Jamaica		–15
			Mexico	16	–9
			Nicaragua	5	17
			Panama	41	1
			Paraguay	9	100
			Peru		–53
			St. Lucia	3	
			St. Vincent and the Grenadines	18	
			Suriname	9	
			Trinidad and Tobago	2	28
			Uruguay	9	
			Venezuela, R. B. de	3	69

Source: UIS.

Annex 1.4: Secondary School Enrollment Statistics, 2002–03

	Total enrollment (thousands)	*Gross enrollment rate*	*Net enrollment rate*
Antigua & Barbuda	…	…	…
Argentina	3,976.2	99%	81%
Barbados	20.9	106%	90%
Belize	27.8	78%	69%
Bolivia	996.6	86%	71%
Brazil	26,789.2	110%	75%
Cambodia	560.2	25%	24%
Chile	1,557.1	89%	79%
China	95,624.8	70%	81%
Colombia	3,723.3	71%	55%
Costa Rica	289.0	66%	53%
Dominica	7.9	114%	92%
Dominican Republic	658.2	59%	36%
Ecuador	972.8	59%	50%
El Salvador	462.5	59%	49%
Fiji	96.4	80%	76%
Grenada	14.9	149%	100%
Guatemala	608.4	43%	30%
Guyana	…	95%	78%
Haiti	225.9	…	19%[b]
Honduras	346.6	50%[c]	35%[c]
Hong Kong (China)	51.1	107%	74%
Indonesia	15,872.5	61%	54%
Jamaica	228.3	84%	75%
Kiribati	10.3	104%	…
Korea, Rep. of	2,389	90%	87%
Lao PDR	353.4	44%	35%
Malaysia	2,300.1	70%	70%
Marshall Islands	6.4	76%	65%
Mexico	10,188.2	79%	63%
Micronesia	…	…	…
Mongolia	312.8	84%	77%
Nicaragua	383.0	61%	39%
Palau	…	89%	…
Panama	251.2	71%	63%
Papua New Guinea	185.0	26%	24%
Paraguay	519.1	65%	51%
Peru	2,539.7	90%	69%
Philippines	6,069.1	84%	59%
Samoa	22.9	76%	62%
Singapore	…	…	…
Solomon Islands	46.1	61%	…

(*Continued*)

	Total enrollment (thousands)	*Gross enrollment rate*	*Net enrollment rate*
St. Kitts and Nevis	4.2	106%	95%
St. Lucia	13.0	87%	76%
St. Vincent and the Grenadines	9.6	69%	58%
Suriname	41.0	74%	64%
Thailand	5,009.8	77%	…
Timor-Leste	46.7	35%	20%
Tonga	14.6	103%	72%
Trinidad and Tobago	107.9	82%	72%
Uruguay	332.2	106%	73%
Vanuatu	9.6	28%	28%
Venezuela, R. B. de	1,866.1	70%	59%
Vietnam	9,265.8	72%	65%
TOTAL	**194,834.2**	**77%**	**62%**
Low income	**11,152.9**	**51%**	**38%**
Lower-middle income	**162,141.6**	**74%**	**59%**
Up. mid - High	**21,539.7**	**92%**	**76%**
EAP	**138,246.0**	**70%**	**57%**
LAC	**56,588.2**	**82%**	**65%**

Source: UNESCO 2005.

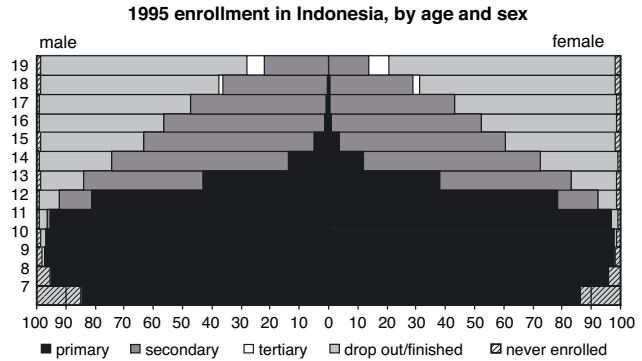
a. Data from school year 2001–02.

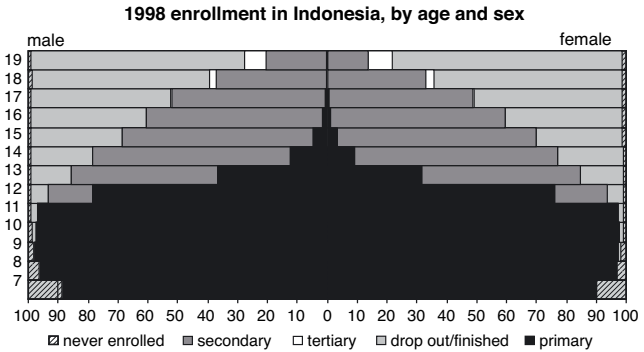
b. Data from the Summit of the Americas.

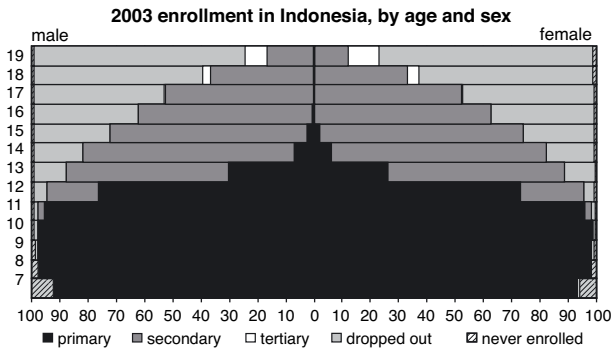
c. Data from year 2002: World Bank 2005c.

Annex 1.5: Enrollment by Age and Sex

Indonesia

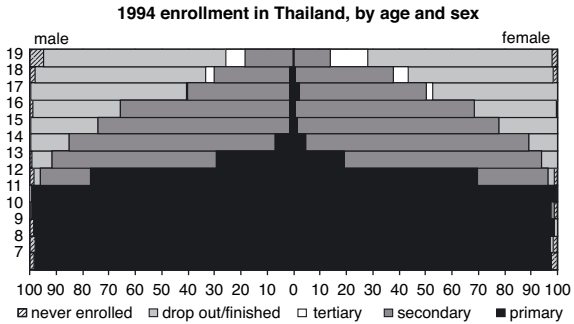


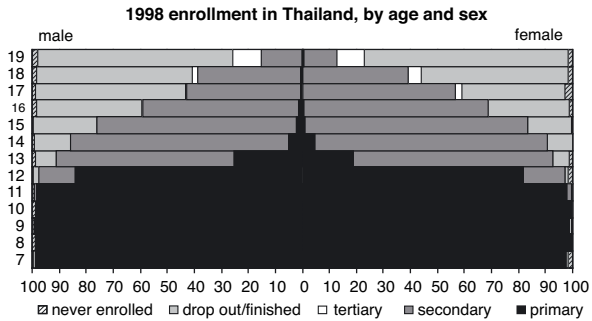


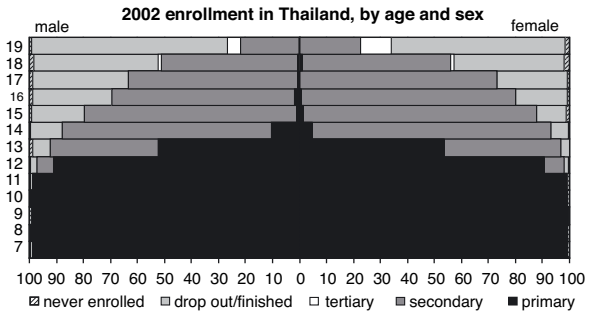


(*Continued*)

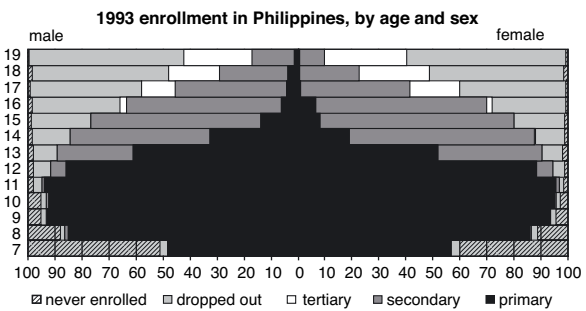
Thailand

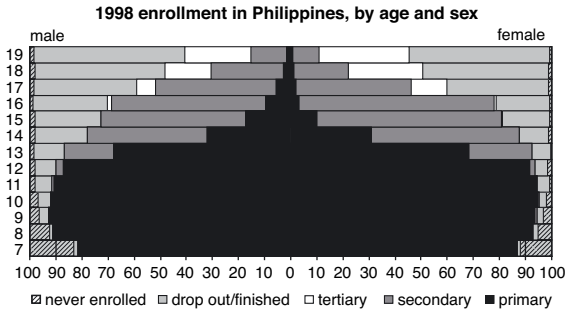

1994 enrollment in Thailand, by age and sex
male
female
19 18 17 16 15 14 13 12 11 10 9 8 7
100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100
never enrolled
drop out/finished
tertiary
secondary
primary


1998 enrollment in Thailand, by age and sex
male
female
19 18 17 16 15 14 13 12 11 10 9 8 7
100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100
never enrolled
drop out/finished
tertiary
secondary
primary

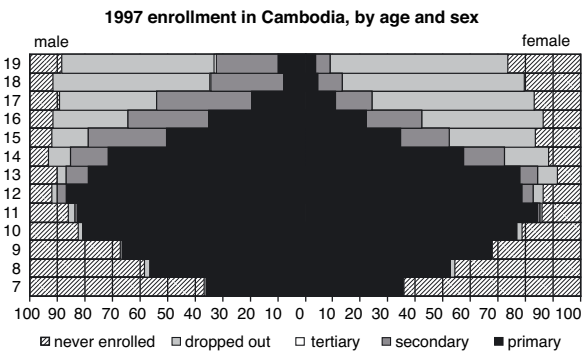

2002 enrollment in Thailand, by age and sex
male
female
19 18 17 16 15 14 13 12 11 10 9 8 7
100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100
never enrolled
drop out/finished
tertiary
secondary
primary

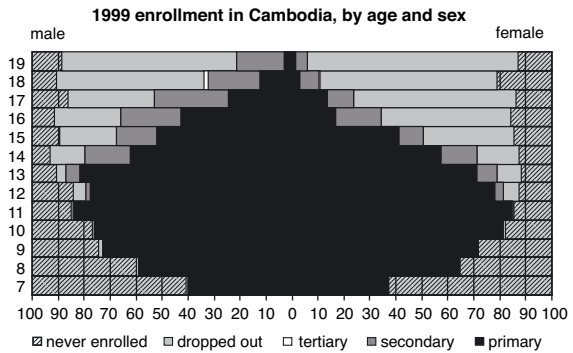
Philippines





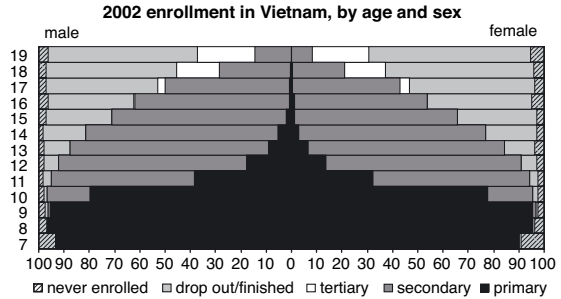
Cambodia



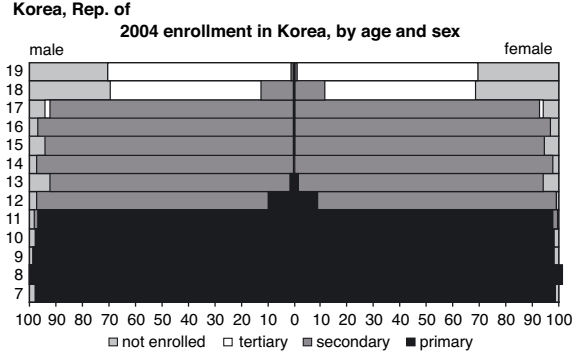


(*Continued*)

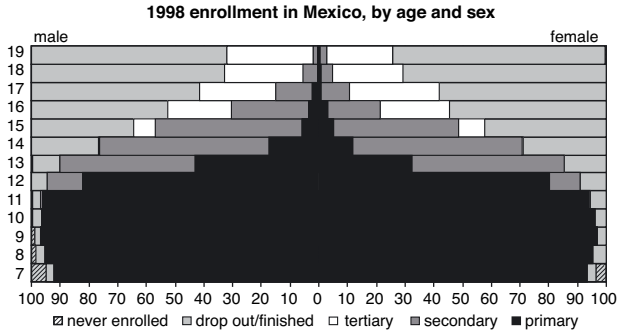
Vietnam

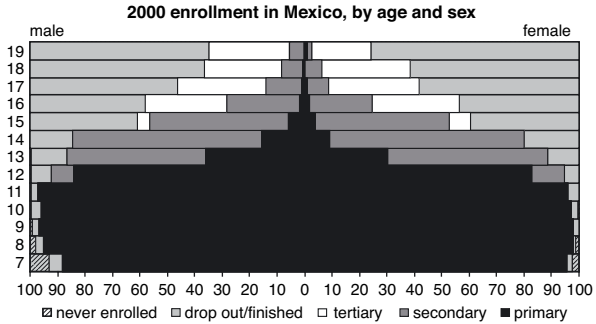


Korea, Rep. of

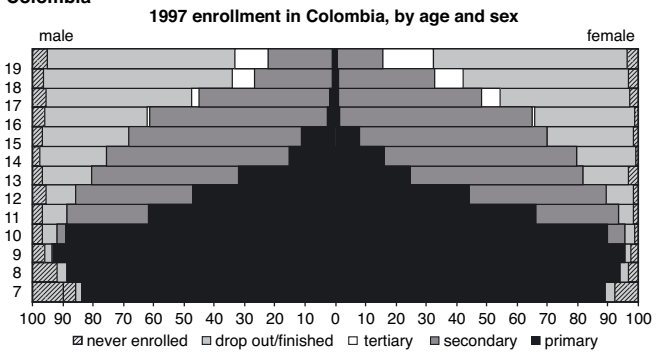


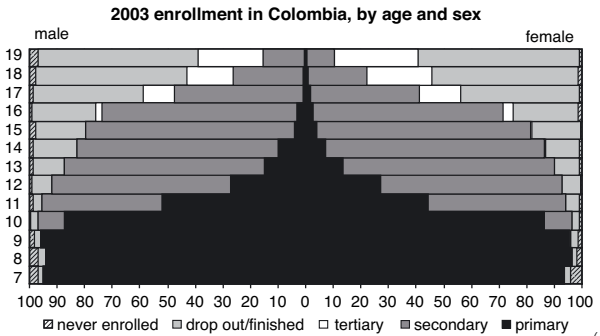
Mexico





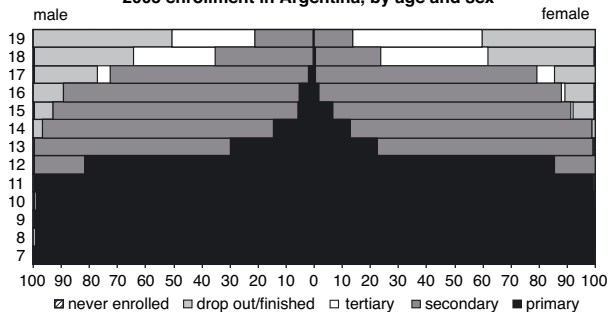
Colombia



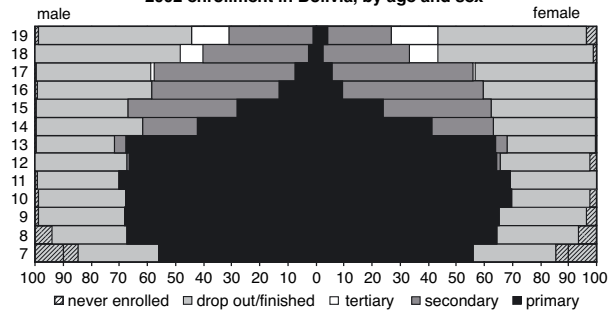


(*Continued*)

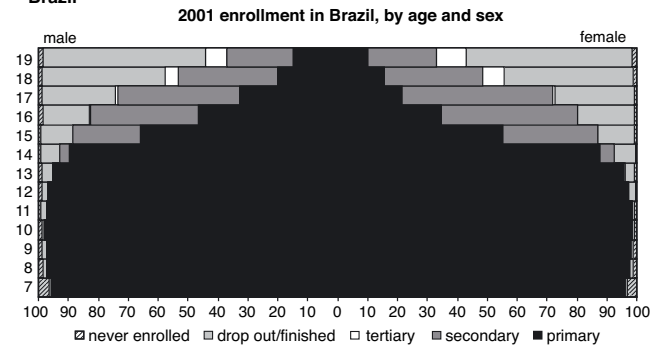
Argentina



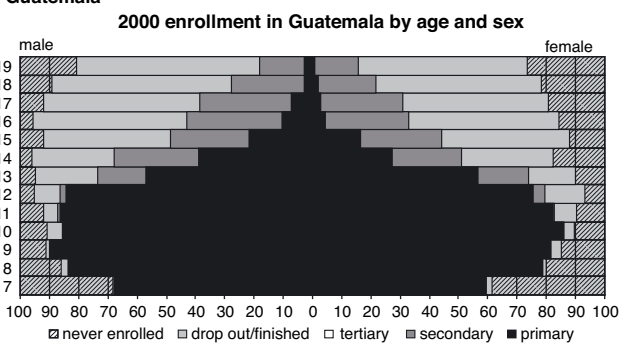
Bolivia



Brazil



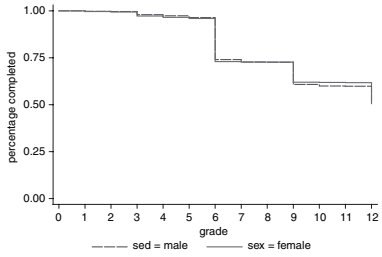
Guatemala



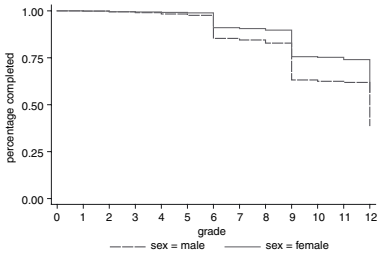
Sources: Indonesia SUSENAS 1995, 1998, & 2003; Philippines DHS 1993 & 1998; Thailand SES 1994, 1998, 2003; Cambodia SES 1997 & 1999, Vietnam MICS 2000, LSMS 2002, Korea KEDI Yearly Annual Statistics, Argentina Household Survey 2003 Bolivia LSMS 2002, Brazil PNAD 2001, Colombia 1997 & 2003, Guatemala LSMS 2000, and Mexico Income and Expenditure Survey 1998, 2000, & 2002.
Note: Vietnam MICS 2000 graphs only to age 17, as data not available for ages 18 and 19.

Annex 1.6: Completion Graphs for Children Ages 13–19

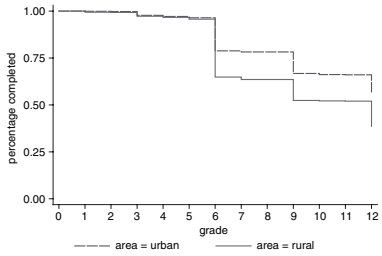
Thailand, 1994, by gender:



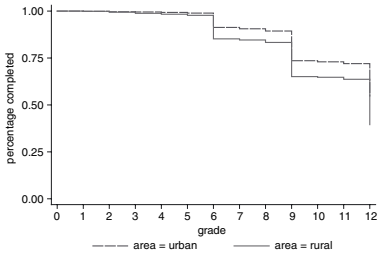
Thailand, 2002, by gender:



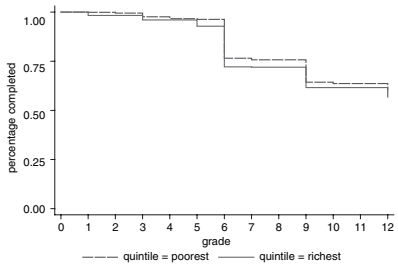
Thailand, 1994, by urban/rural location:



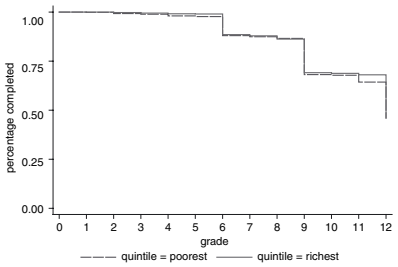
Thailand, 2002, by urban/rural location:



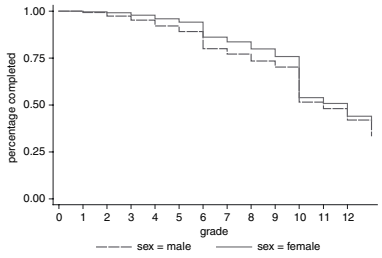
Thailand, 1994, by income quintile:



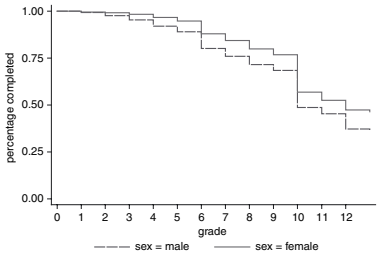
Thailand, 2002, by income quintile:



Philippines, 1993, by gender



Philippines, 1998, by gender



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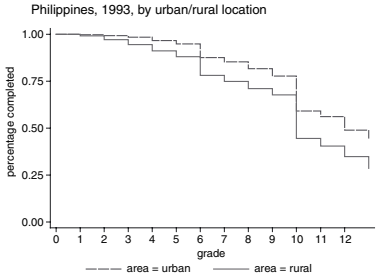
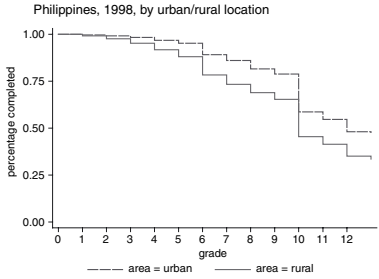
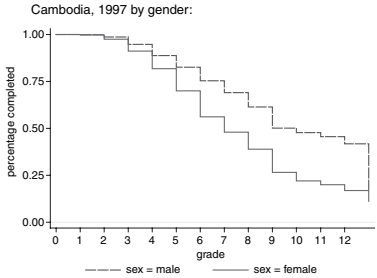
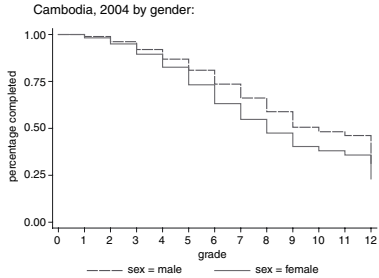
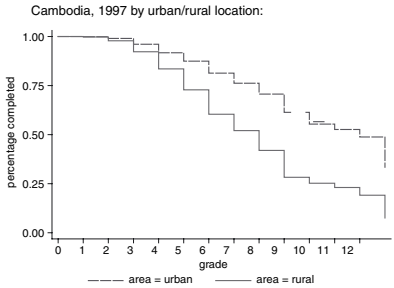
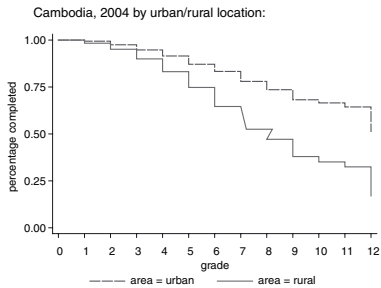

Philippines, 1993, by urban/rural location
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
area = urban
area = rural

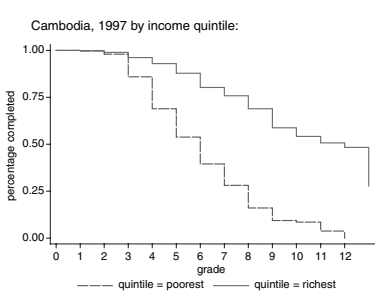

Philippines, 1998, by urban/rural location
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
area = urban
area = rural

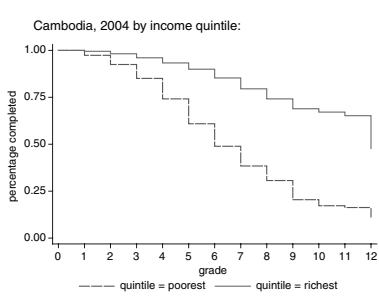

Cambodia, 1997 by gender:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
sex = male
sex = female

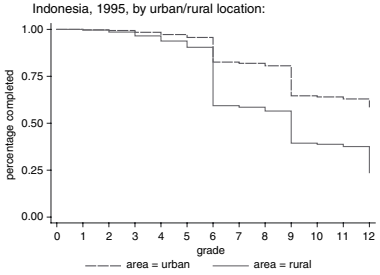

Cambodia, 2004 by gender:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
sex = male
sex = female

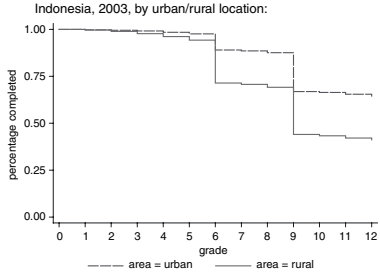

Cambodia, 1997 by urban/rural location:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
area = urban
area = rural

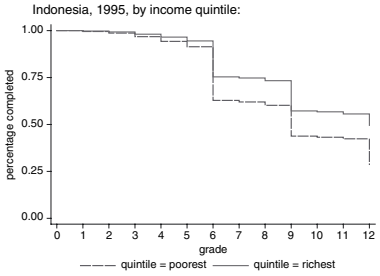

Cambodia, 2004 by urban/rural location:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
area = urban
area = rural

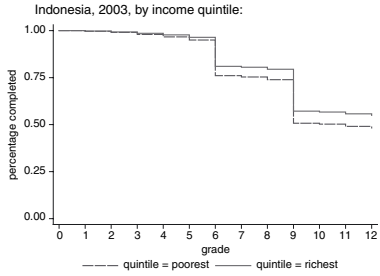

Cambodia, 1997 by income quintile:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
quintile = poorest
quintile = richest

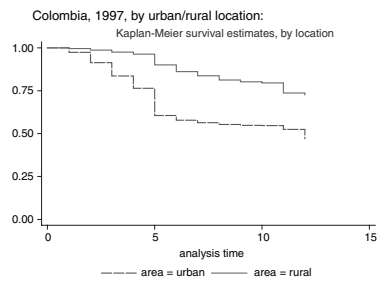

Cambodia, 2004 by income quintile:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
quintile = poorest
quintile = richest

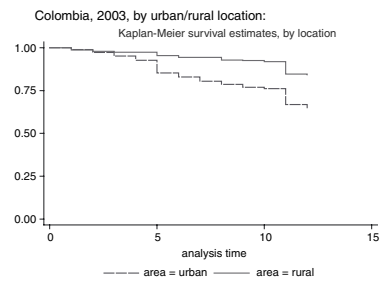

Indonesia, 1995, by urban/rural location:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
area = urban
area = rural

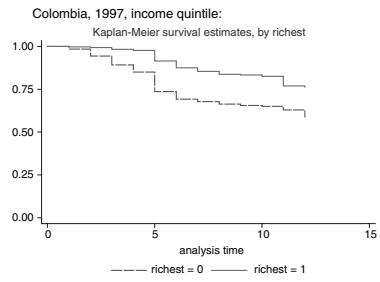

Indonesia, 2003, by urban/rural location:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
area = urban
area = rural

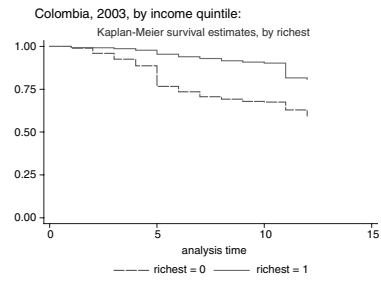

Indonesia, 1995, by income quintile:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
quintile = poorest
quintile = richest


Indonesia, 2003, by income quintile:
percentage completed
1.00
0.75
0.50
0.25
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
grade
quintile = poorest
quintile = richest


Colombia, 1997, by urban/rural location:
Kaplan-Meier survival estimates, by location
1.00
0.75
0.50
0.25
0.00
0 5 10 15
analysis time
area = urban
area = rural

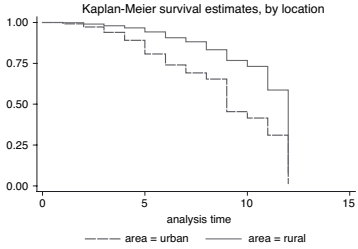

Colombia, 2003, by urban/rural location:
Kaplan-Meier survival estimates, by location
1.00
0.75
0.50
0.25
0.00
0 5 10 15
analysis time
area = urban
area = rural


Colombia, 1997, income quintile:
Kaplan-Meier survival estimates, by richest
1.00
0.75
0.50
0.25
0.00
0 5 10 15
analysis time
richest = 0
richest = 1

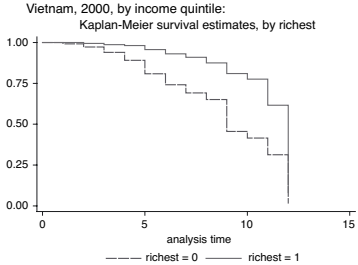

Colombia, 2003, by income quintile:
Kaplan-Meier survival estimates, by richest
1.00
0.75
0.50
0.25
0.00
0 5 10 15
analysis time
richest = 0
richest = 1

(*Continued*)

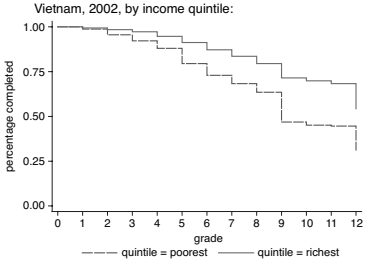
Vietnam, 2000, by urban/rural location:



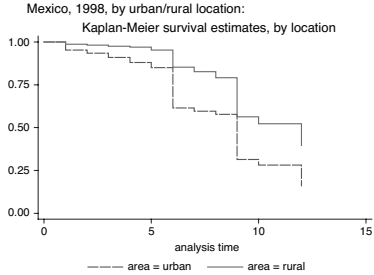
Vietnam, 2000, by income quintile:



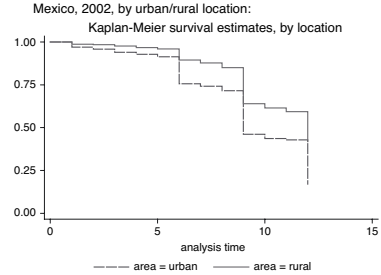
Vietnam, 2002, by income quintile:



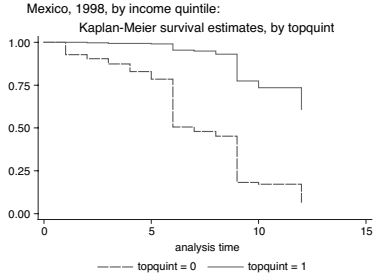
Mexico, 1998, by urban/rural location:



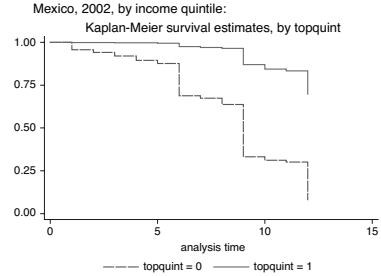
Mexico, 2002, by urban/rural location:

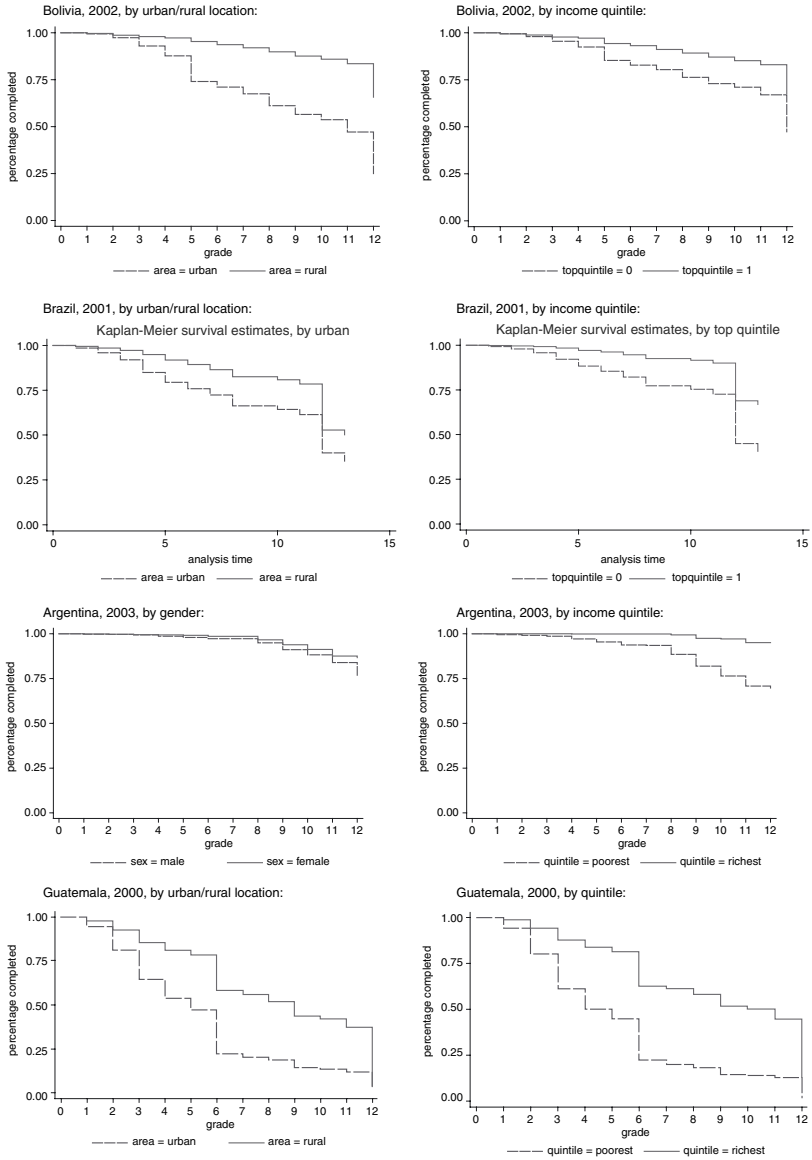


Mexico, 1998, by income quintile:



Mexico, 2002, by income quintile:





Source: Household Surveys.

Annex 3.1: Sources of Finance: Secondary Education, school year 2002–03

	Secondary Education expenditure % of GDP	*Sec. Ed. Expenditure 2002–03 (in millions)*	*Sec. Ed. Expenditure $ PPP (in millions)*	*Share of public funds*	*Growth of public funds (1998–2003) as % of GDP*
Antigua & Barbuda	1.35	$10.20	$10.91	100%	4.26%
Argentina	1.95	$2,530.37	$8,691.78	82%	4.40%
Barbados	2.76	$72.62	$117.59	97%	13.14%
Belize	1.58	$15.62	$30.05	86%	−4.66%
Bolivia	1.48	$116.31	$337.12	100%	3.20%
Brazil	1.69	$8,327.39	$23,268.32	100%	−4.16%
Cambodia	…	…	…	…	…
Chile	2.19	$1,586.95	$3,551.51	74%	4.83%
China	0.78	$11,045.46	$50,245.26	116%	19.96%
Colombia	2.53	$1,988.44	$7,554.25	58%	5.39%
Costa Rica	1.62	$282.15	$622.81	100%	4.53%
Dominica	3.21	$8.31	$12.44	100%	…
Dominican Republic	0.27	$44.52	$160.47	100%	−39.42%
Ecuador	0.36	$97.20	$169.25	100%	−17.49%
El Salvador	0.68	$100.64	$211.26	100%	6.01%
Fiji	2.76	$56.12	$135.36	100%	−2.44%
Grenada	2.03	$8.93	$16.92	91%	…
Guatemala	…	…	…	…	…
Guyana	1.98	$14.67	$64.30	138%	…
Haiti	…	…	…	…	…
Honduras	…	…	…	…	…
Hong Kong (China)	3.00	$4,700.38	$5,557.56	65%	−6.36%
Indonesia	0.76	$1,580.41	$5,474.00	58%	5.69%
Jamaica	3.72	$303.29	$403.73	…	…
Kiribati	…	…	…	100%	1.36%
Korea, Rep. of	2.43	$14,728.11	$19,441.11	100%	2.84%
Lao PDR	0.53	$11.18	$52.45	100%	9.16%
Malaysia	2.72	$2,820.97	$6,408.23	100%	15.89%
Marshall Islands	4.36	$4.62	$32.68	79%	1.05%
Mexico	1.92	$12,042.37	$18,038.25	100%	…
Micronesia	2.25	$5.48	$5.48	100%	…
Mongolia	2.38	$30.35	$109.25	73%	…
Nicaragua	0.48	$19.40	$84.95	100%	9.88%
Palau	1.07	$1.34	$1.18	100%	−4.83%
Panama	1.30	$167.92	$266.49	100%	7.47%
Papua New Guinea	0.56	$17.85	$80.82	67%	−3.39%
Paraguay	1.84	$111.10	$487.02	100%	−3.26%
Peru	0.83	$501.30	$1,181.71	51%	−5.56%
Philippines	1.27	$1,024.83	$4,479.35	100%	…
Samoa	1.14	$3.05	$11.88	100%	…

Singapore	…	…	…	100%	19.27%
Solomon Islands	…	…	…	100%	…
St. Kitts and Nevis	1.18	$4.09	$6.86	95%	1.43%
St. Lucia	2.03	$14.09	$18.65	100%	…
St. Vincent and the Grenadines	1.73	$6.42	$11.55	100%	−2.31%
Suriname	…	…	…	100%	12.51%
Thailand	1.19	$1,701.73	$5,606.81	100%	−4.17%
Timor-Leste	…	…	…	100%	7.81%
Tonga	1.41	$2.29	$9.99	…	…
Trinidad and Tobago	1.58	$166.32	$223.61	…	…
Uruguay	0.89	$99.09	$248.00	…	
Vanuatu	6.34	$17.97	$39.25	…	…
Venezuela, R. B. de	…	…	…	…	
Vietnam	…	…	…	…	…
EAP& LAC Combined	**1.82**	**$66,391.84**	**$163,480**	**94%**	**1.88%**
Low income (average)	**0.99**	**$19.70**	**$81.87**	**90%**	**5.87%**
Lower-middle income (avg.)	**1.86**	**$1423.23**	**$5256.42**	**94%**	**−1.42%**
Upper-middle/ high(avg.)	**1.94**	**$1963.59**	**$3164.05**	**94%**	**4.28%**
EAP (avg.)	**2.06**	**$37,752.16**	**$97,690.65**	**93%**	**4.42%**
LAC (avg.)	**1.66**	**$28,639.69**	**$65,789.80**	**95%**	**0.01%**

Source: UIS.

Annex 3.2: Domestic per Pupil Expenditure at the Secondary Level, Measured in $PPP and as % of GDP per Capita, 2003

	Domestic expenditure per pupil as % of GDP per capita.	*Domestic Exp. Per pupil PPP $ 2003*
Antigua & Barbuda	…	…
Argentina	19.02	$2,185.94
Barbados	36.53	$5,613.81
Belize	15.21	$1,080.56
Bolivia	12.74	$338.28
Brazil	11.49	$868.57
Cambodia	…	…
Chile	22.04	$2,280.82
China	10.53	$525.44
Colombia	28.29	$2,028.89
Costa Rica	21.83	$2,155.32
Dominica	28.41	$1,582.16
Dominican Republic	3.59	$243.81
Ecuador	4.80	$173.98
El Salvador	9.46	$456.78
Fiji	24.83	$1,403.68
Grenada	12.21	$1,138.88
Guatemala	…	…
Guyana	21.80	$931.67
Haiti	…	…
Honduras	…	…
Hong Kong (China)	20.50	$5,576.82
Indonesia	11.23	$344.87
Jamaica	43.84	$1,768.28
Kiribati	…	…
Korea, Rep. of	49.10	$8823.93
Lao PDR	8.83	$148.42
Malaysia	27.30	$2,786.11
Marshall Islands	38.74	$5,143.34
Mexico	19.58	$1,770.51
Micronesia	…	…
Mongolia	20.65	$349.28
Nicaragua	6.52	$221.83
Palau	…	…
Panama	15.77	$1,060.77
Papua New Guinea	16.05	$436.76
Paraguay	21.43	$938.28
Peru	8.85	$465.30
Philippines	17.73	$738.06
Samoa	8.85	$517.82
Singapore	…	…
Solomon Islands	…	…

St. Kitts and Nevis	10.87	$1,624.22
St. Lucia	25.40	$1,435.97
St. Vincent and the Grenadines	20.97	$1,200.00
Suriname	…	…
Thailand	15.03	$1,119.16
Timor-Leste	…	…
Tonga	10.45	$686.03
Trinidad and Tobago	16.03	$2,072.79
Uruguay	9.02	$746.60
Vanuatu	131.64	$4,084.26
Venezuela, R. B. de	…	…
Vietnam	…	…
Average EAP and LAC	**19.60**	**$1,614.00**
Low income	**13.01**	**$289.07**
Lower-middle income	**17.00**	**$1,038.00**
Upper-middle/high	**21.75**	**$2,537.37**
EAP	**20.00**	**$2,042.00**
LAC	**17.83**	**$1,375.36**
OECD Average	**26.00**	**$6,687.82**

Source: Author's calculations on the basis of UIS.
Note: Averages exclude Vanuatu.

Annex 3.3: Discussion of the Methodology

The static estimates follow the method developed by Colclough and Lewin [1993:43] and make use of the relation between enrollment, expenditure and student base. Specifically, the gross enrollment rate (*GER2*) is expressed as a function of domestic secondary education expenditure as a percentage of GDP[1] (x), domestic expenditure per secondary school student as a percentage of GDP per capita (c), and the proportion of secondary school age children to the total population (a):

$$GER2 = \frac{x}{a \cdot c} \cdot$$

To see this relation, consider the following: If *SEE* stands for secondary education expenditure, *N* for the total enrollments at the secondary level, *P* for total population, and *A* for the secondary school cohort, then we can rewrite the above expression as

$$GER2 = \frac{SEE/GDP}{\frac{A}{P} \cdot \frac{SEE/N}{GDP/P}} \cdot$$

Simplifying this expression gives us the definition of the gross enrollment rate.

$$GER = \frac{N}{A} \cdot$$

Current Fiscal Gap:

The current fiscal gap (GAP_i) for each country i is the difference between percentage of GDP required to achieve a targeted gross enrollment rate ($GER2^{TARGET}$) and the actual total secondary education expenditure ($x_{i,2003}$), keeping the per pupil expenditure ($c_{i,2003}$) and proportion of school age children ($a_{i,2003}$) constant

$$GAP_{i,2003} = GER2^{TARGET} \cdot a_{i,2003} \cdot c_{i,2003} - x_{i,2003} \cdot$$

Forward looking estimates:

The forward-looking estimates also make use of the relation between access and cost variables as described in the previous section.

Additionally for every country i, the model incorporates the projected change in the secondary school age cohort for any given year t ($a_{i,t}$) as well

as a gradual move towards gross enrollment rate and per pupil expenditure targets, where each country improves its enrollment and expenditure by the same amount every year through 2015. So, the expenditure need in year t for country i is:

$$x_{i,t} = \left(GER2_{i,t-1} + \frac{GER2^{TARGET} - GER2_{i,2003}}{12} \right) \cdot \left(c_{i,t-1} + \frac{26 - c_{i,2003}}{12} \right) \cdot a_{i,t}$$

The first term of this estimate simply calculates the level GER2 must reach if gross enrollment rates grow smoothly between 2003 and 2015 (The difference between the target GER2, and the GER2 in 2003 is divided by 12, which is the number of periods.) The second term calculates the unit costs, again, assuming that the per pupil expenditures will grow smoothly between 2003 and 2015 and will reach 26 percent of per capita income by 2015. The final term is the expected share of secondary school cohort in the total population in 2015. The model uses the 2003 conversion rates to calculate PPP converted dollars for the year 2015. Thus, the expenditure need for country i for year 2015 is $x_{i,2015} = GER2^{TARGET} \cdot 26 \cdot a_{i,2015}$.

Note

1. The original model uses GNP rather than GDP. Because education is a domestic service, we use GDP in these calculations.

Annex 3.4: Fiscal Gap Estimates for Various GER2 Targets

2003 Fiscal Gap estimates with current cost structures

GER Target		*Resources needed as % of GDP*	*Fiscal gap as % of GDP*	*Fiscal GAP without capital improvements (billion PPP)*	*… with capital improvements (billion PPP)*
75%	Low income	1.07	0.55	$0.09	$0.28
	Lower-middle income	1.46	0.25	$1.8	$6.9
	Upper-middle/ high income	1.87	0.22	$0.1	$0.2
	EAP	1.20	0.42	$1.8	$6.8
	LAC	1.66	0.24	$0.2	$1.5
	Two regions combined	**1.05**	**0.29**	**$2.1**	**$7.3**
85%	Low income	1.54	0.55	$0.21	$0.29
	Lower-middle income	1.94	0.34	$8.3	$17.0
	Upper-middle/ high income	2.15	0.34	$0.2	$2.1
	EAP	2.11	0.43	$8.1	$16.1
	LAC	1.87	0.34	$0.5	$3.3
	Two regions combined	**1.94**	**0.37**	**$8.7**	**$19.4**
95%	Low income	1.71	0.73	$0.3	$0.4
	Lower-middle income	2.23	0.54	$17.5	$27.3
	Upper-middle/ high income	3.00	1.00	$2.3	$5.8
	EAP	2.57	0.57	$16.6	$26.2
	LAC	2.15	0.52	$3.5	$7.3
	Two regions combined	2.29	0.54	$20.1	$33.5
15% above current rates	Low income (68%)	1.30	0.32	$0.08	$0.13
	Lower-middle income (86%)	2.14	0.46	$9.0	$18.4
	Upper-middle/ high (106%)	2.59	0.52	$2.2	$10.1
	EAP (83%)	2.33	0.38	$8.7	$20.6
	LAC (98%)	2.21	0.51	$2.5	$8.1
	Two regions combined (93%)	**2.25**	**0.46**	**$11.3**	**$28.7**

Source: Yilmaz 2005.

2003 Fiscal Gap Estimates with Per Pupil Expenditure Benchmarked at OECD Level

GER Target		*Resources needed as % of GDP*	*Fiscal gap as % of GDP*	*Δ in per pupil expenditure % of GDP per capita*	*Fiscal gap (billion PPP)*
75%	Low income	2.73	1.74	12.99	$1.0
	Lower-middle income	2.46	1.37	14.12	$110.0
	Upper-middle/ high income	2.40	0.73	8.50	$5.8
	EAP	2.1355	1.49	12.59	$98.1
	LAC	2.45	1.07	11.49	$18.7
	Two regions combined	**2.47**	**1.18**	**11.78**	**116.8**
85%	Low income	3.10	2.11	12.99	$1.1
	Lower-middle income	2.77	1.46	12.03	$136.3
	Upper-middle/ high income	2.60	0.83	7.16	$10.9
	EAP	2.73	1.29	9.34	$119.5
	LAC	2.74	1.27	10.47	$28.9
	Two regions combined	**2.74**	**1.28**	**10.01**	**$148.3**
95%	Low income	3.46	2.47	12.99	$1.3
	Lower-middle income	3.09	1.78	12.03	$163.3
	Upper-middle/ high income	2.91	1.13	7.16	$17.00
	EAP	3.06	1.62	9.35	$141.7
	LAC	3.07	1.59	10.47	$36.6
	Two regions combined	**3.06**	**1.60**	**10.11**	**$181.6**
Increase by 15%	Low income (68%)	2.52	1.53	12.99	$0.8
	Lower-middle income (86%)	2.96	1.65	12.03	$153.01
	Upper-middle/ high (106%)	3.27	1. 29	5.33	$18.3
	EAP (83%)	2.74	1.30	9.78	$119.2
	LAC (98%)	3.16	1.54	9.00	$52.9
	Two regions combined (93%)	**3.04**	**1.48**	**9.22**	**$172.1**

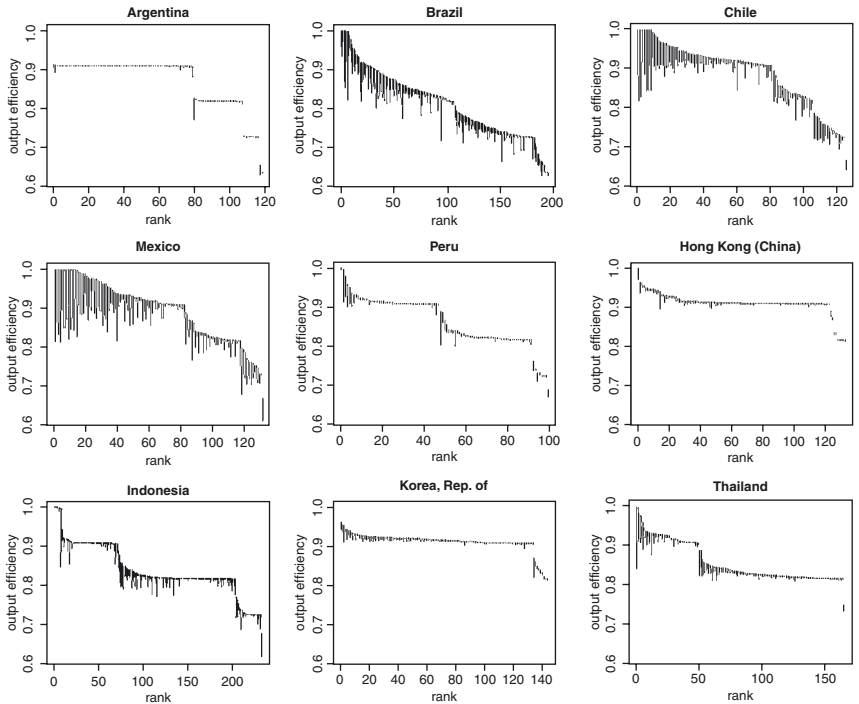
Source: Yilmaz 2005.

2015 Fiscal Gap Estimates with per pupil expenditure benchmarked at OECD level

GER Target		*# of countries*	*Resources in 2003 (% of GDP)*	*Resources needed 2015 (% of GDP)*	*Annual incremental funds (% of GDP)*	*Fiscal Gap billions of $2003 PPP*	*Fiscal Gap (Annualized)*
75%	Low income	3	0.52	2.51	0.17	$0.8	$0.6
	Lower-middle income	10	1.00	2.15	0.10	$188.0	$68.0
	Upper-middle/high income	5	1.49	2.12	0.05	$1.91	$0.3
	EAP	5	0.78	2.21	0.12	$154.9	$63.7
	LAC	13	1.30	2.20	0.08	$34.52	$5.23
	Two regions combined	**18**	**1.05**	**2.20**	**0.09**	**$190.04**	**$69.0**
85%	Low income	3	0.52	2.84	0.19	$0.9	$0.6
	Lower-middle income	11	1.09	2.41	0.11	$203.5	$84.9
	Upper-middle/high income	8	1.65	2.30	0.06	$11.39	$0.9
	EAP	5	0.78	2.50	0.14	$168.10	$78.1
	LAC	17	1.34	2.41	0.09	$47.6	$8.3
	Two regions combined	**21**	**1.21**	**2.43**	**0.10**	**$215.8**	**$86.4**
95%	Low income	3	0.52	3.18	0.22	$1.0	$0.8
	Lower-middle income	11	1.09	2.69	0.13	$219.0	$101.7
	Upper-middle/high income	9	1.64	2.48	0.07	$12.40	$2.61
	EAP	5	0.78	2.79	0.17	$181.3	$92.4
	LAC	18	1.35	2.64	0.11	$51.0	$11.5
	Two regions combined	**23**	**1.23**	**2.67**	**0.12**	**$232.3**	**$103.9**
Increase	Low income (68%)	4	0.99	2.07	0.09	$0.8	$0.5
by 15%	Lower-middle income (86%)	11	1.08	2.56	0.12	$211.6	93.2
	Upper-middle/high (106%)	12	2.01	2.73	0.06	$18.0	2.0
	EAP (83%)	6	1.05	2.12	0.09	$168.5	$78.4
	LAC (98%)	19	1.40	2.68	0.11	$61.4	$18.2
	Two regions comb. (93%)	**28**	**1.31**	**2.54**	**0.11**	**$229.9**	**$96.6**

Source: Yilmaz 2005.

Annex 4.1: School Confidence Intervals Estimates — Output Efficiency — PISA 2000



Annex 4.2: Budget Data

	Total public expenditure on education		*Educational expenditure by nature of spending as a % of total educational expenditure in public institutions*			
			Primary and secondary and post-secondary non-tertiary			
2001–2002	*As a % of GDP*	*As a % of total government expenditure*	*Salaries, all staff*	*Other current*	*Total current*	*Capital*
Barbados	6.5	16.7	62**	24.1**	86.1**	13.9**
Belize, 2000–01	6.2	20.9	78.1*	12.2	90.3	9.7
Costa Rica	4.7	21.1	100	NA	100	NA
Cuba	9	16.8	54.9	34.4	89.3	10.7
Dominican Republic	2.4	13.2	x	x	93.8	6.2
El Salvador, 2000–01	2.5**	19.4**	84.8	7.2	92	8
Guatemala	1.7	11.4	90.6	9.4	100	-
Jamaica (p)	6.4	12.3	78.3	16	94.3	5.7
Mexico (p)	5.1		91	6.2	97.2	2.8
Panama	4.3	7.3	75.1**	21.7**	96.9**	3.1**
St. Kitts and Nevis	7.7	19.1	40.7	7.2	47.9	52.1
St. Lucia, 2000–01	7.3**	20.7**	…	…	98.7	1.3
St. Vincent and the Grenadines	9.3	13.4**	…	…	…	…
Trinidad and Tobago	4	13.4	78.3	8.8	87	13

Argentina (p), 2002–03	4.6**	13.7**	89.0	11.5	98.4	1.6
Bolivia	6	18.4	…	…	…	…
Brazil (p), 2000–01	4	10.4	73.9	19.4	93.3	6.7
Chile (p), 2002–03	4.4	18.7	50.9	32.6	83.5	16.5
Colombia	4.4	18*	…	…	…	…
Ecuador	1**	8**	…	…	…	…
Paraguay (p), 2002–03	4.7**	9.7**	82.4	13.1	95.5	4.5
Peru, 2002–03	3.0	17.1	93.0	5.2	98.2	1.8
Uruguay (p), 2000–01	2.8	11.8	81.6	13.7	95.3	4.7
2001–02	3.2	12.8	45.8	50.9	96.6	3.4
Cambodia	2	15.3	62a	…	…	…
Indonesia (p)	1.3	9.8	80.6	13.3	93.9	6.1
Lao PDR	3.2	10.6	67.4b	…	…	…
Malaysia (p)	7.9	20	48.3	14.9	63.2	36.8
Mongolia, 2000–01	6.5**	…	…	…	…	…
Philippines (p)	3.2	14	78.4	13.2	91.6	8.4
Korea, Rep. of 2002–03	4.2	15.5	58.7	22.8	81.5	18.5
Thailand	5	28.3	…	…	…	…

(Continued)

Annex 4.2: Budget Data *(Continued)*

	Total public expenditure on education		*Educational expenditure by nature of spending as a % of total educational expenditure in public institutions*			
			Primary and secondary and post-secondary non-tertiary			
2001–2002	*As a % of GDP*	*As a % of total government expenditure*	*Salaries, all staff*	*Other current*	*Total current*	*Capital*
Fiji	5.5**	19.4**	…	…	…	…
Palau	11**		…	…	…	…
Papua New Guinea	2.3**	17.5**	…	…	…	…
Samoa	4.5**	14.6**	…	…	…	…
Solomon Islands	3.4**	…	…	…	…	…
Tonga	5	13.1	…	…	…	…
Vanuatu	10.5	26.7	…	…	…	…

Sources: UNESCO 2004, 2005.

… No data available.

* National estimation.

** UIS estimation.

NA Not applicable.

X Data included in another category or column.

(a) Cambodia: Enhancing Service Delivery through Improved Resource Allocation and Institutional Reform. September 2003. Data refers to 2001.

(b) Laos PDR: Public Expenditure Review. Country Financial Accountability Assessment. June 2002. Data refers to 1999–2000.

Annex 4.3: Annual Recurrent Cost of Repetition in LAC and EAP, 2000

	Repetition rate		*Annual Cost: Primary*		*Annual Cost: Secondary*	
	Primary	*Secondary*	*Current $*	*Percent of public education spending*	*Current $*	*Percent of public education spending*
EAP						
Cambodia	16.5%	2.5%	6,986,066	10.7%	399,555	0.6%
China	0.3%	0.3%	n.a.	n.a.	16,563,286	0.1%
Hong Kong, China	1.0%	6.0%	n.a.	n.a.	147,493,698	1.8%
Indonesia	6.2%	0.3%	54,210,490	2.4%	2,682,762	0.1%
Lao PDR	19.8%	2.3%	3,473,367	8.8%	189,585	0.5%
Mongolia	0.7%	0.1%	244,111	0.3%	20,431	0.0%
Myanmar	3.2%	0.7%	n.a.	n.a.	n.a.	n.a.
Philippines	2.0%	2.0%	31,560,753	1.2%	11,453,123	0.4%
Samoa	1.0%	2.8%	43,040	0.4%	67,016	0.7%
Thailand	3.5%	n.a.	n.a.	n.a.	n.a.	n.a.
Tonga	6.2%	7.6%	245,102	2.9%	176,758	2.1%
Vietnam	2.4%	1.3%	n.a.	n.a.	n.a.	n.a.
Unweighted mean	5.2%	2.3%	13,823,275	3.8%	19,894,024	0.7%
Weighted mean	1.5%	0.4%	45,160,290	2.6%	14,270,816	0.1%
LAC						
Argentina	5.9%	6.7%	285,211,803	2.2%	319,622,363	2.4%
Belize	9.8%	7.1%	3,506,206	6.7%	1,296,556	2.5%
Bolivia	3.2%	4.2%	7,004,185	1.5%	3,710,769	0.8%
Brazil	25.0%	18.3%	2,147,818,810	9.5%	1,488,646,741	6.6%
Chile	2.8%	5.9%	27,100,529	0.9%	59,939,711	2.0%
Colombia	5.4%	4.0%	79,082,665	2.0%	53,420,886	1.3%
Costa Rica	8.1%	8.0%	32,271,068	4.6%	16,228,397	2.3%
Guatemala	14.5%	3.6%	31,736,534	9.7%	1,325,671	0.4%
Guyana	2.3%	9.9%	23,091	0.1%	109,473	0.4%
Jamaica	5.0%	2.2%	7,289,322	1.6%	3,567,732	0.8%
Mexico	5.5%	2.2%	567,343,598	2.2%	168,194,878	0.7%
Panama	6.0%	4.7%	13,792,079	2.3%	9,679,081	1.6%
Paraguay	7.7%	1.3%	15,711,361	4.2%	1,453,798	0.4%
St. Lucia	3.2%	0.2%	486,545	1.2%	22,023	0.1%
Trinidad and Tobago	6.3%	3.1%	9,643,917	3.1%	3,149,514	1.0%
Uruguay	8.9%	12.9%	16,110,884	2.9%	27,152,043	4.9%
Unweighted mean	7.5%	5.9%	202,758,287	3.4%	134,844,977	1.8%
Weighted mean	14.0%	10.0%	1,085,023,903	5.5%	708,742,032	3.5%

Sources: EFA Global Monitoring Report 2003–04 and EdStats 2004; World Bank's World Development Indicators 2003 (enrollment, cost estimates, and primary repetition rates).

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Primary school enrollment rates have been rising in many developing countries since the middle of the 20th century to near-universal-coverage levels, causing the numbers of children eligible for secondary education to swell. As a result, secondary education has emerged as the next big challenge for scores of countries, among them those in Latin America and East Asia.

The scarcity and inefficient use of resources allocated to secondary education in East Asia and Latin America are illustrated by low education spending per pupil as a percentage of GDP per capita, persistent constraints in household demand for education, low accountability of service delivery, poor teacher performance, and costly curricular structures. That said, countries in these two regions do offer a broad range of policies and programs as they strive to address these constraints. These include public-private partnerships, revenue decentralization, cross-sectoral funding for education, school self-financing, demand-side interventions, school-based management, and technical and vocational reforms.

Using data, analytical findings, and case studies from the two regions as a springboard, *Meeting the Challenges of Secondary Education* tackles, among others, the following questions: How can countries build up their education systems responsibly and efficiently? How do the multiple challenges they face, as well as the appropriate responses, vary with development levels? The book identifies the primary constraints to the expansion and improvement of secondary education in Latin America and East Asia and suggests appropriate measures, emphasizing policies that increase the mobilization and use of resources.

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