# Unequal Schools, Unequal Chances

*The Challenges to Equal Opportunity in the Americas*

Edited by Fernando Reimers

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# The Challenges to Equal Opportunity in the Americas

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Fernando Reimers

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# Contents

A boy sells ice cream in the central market in Lima, Peru.
[UNICEF/96-0469/Alejandro Balaguer (Peru)]
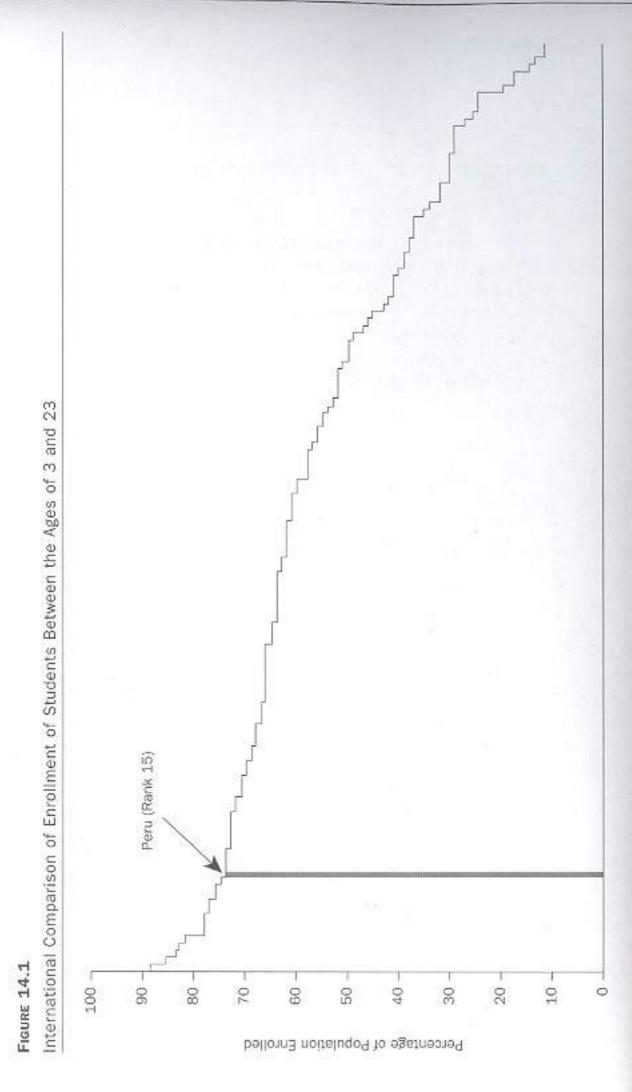
# 14

# Education and Poverty in Peru

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In the late 1980s and early 1990s, Peru experienced enormous economic and political upheavals. Hyperinflation reached 7,000 percent by 1990, and the country was torn by civil unrest. Structural reforms and the ending of the Shining Path insurgency brought stability to the country by 1994. Within three years, inflation was reduced to 7 percent and GDP growth reached 7 percent in real terms, among the highest in the region second only to that of Chile (World Bank 1999a). In 1997, Peru enjoyed a gross domestic product (GDP) per capita of $2,460 (World Bank 1998). Despite impressive growth, however, disparity in income distribution remains among the highest in the region. In 1997, about 49 percent of the population of 24 million people in Peru lived in poverty and 15 percent in extreme poverty, with a concentration in the highland and the jungle (World Bank 1999b).

Viewed against this larger political and economic background, Peru has achieved rates of participation in education that are particularly impressive. In 1997, the education system enrolled practically all of the six- to eleven-year-olds, nearly 80 percent of the twelve- to sixteen-year-olds, and over 30 percent of the seventeen- to twenty-five-year-olds. This progress was made from a very low base only half a century ago. Between 1950 and 1997, enrollment expanded 6.6 times, more than double the threefold increase of the population (Diaz et al. 1995). Total enrollment grew from a mere 14 percent of the population in 1950 to 36 percent in 1997. As a consequence, over the period, the average education level of the population of age fifteen and over increased from 1.9 years to 8.6 years, and the illiteracy rate was reduced from 58 percent to 11 percent. Female illiteracy was reduced from 70 to 18 percent, and rural illiteracy from over 60 to 29 percent. Other countries, by contrast, have achieved far less: Figure 14.1 shows Peruvian gross enrollment ratios in a remarkably favorable light in international comparison.

**FIGURE 14.1**

International Comparison of Enrollment of Students Between the Ages of 3 and 23

Peru (Rank 15)

Percentage of Population Enrolled

Source:   Edstats Database of the World Bank.

These accomplishments in education are all the more remarkable when taking into account Peru's historically low level of public spending on education, which stood at only 3 percent of GDP in 1997. When its level of public spending on education as a percentage of GDP is compared with other countries', as in Figure 14.2, Peru's position changes markedly from the enrollment position that Figure 14.1 portrayed. In comparison with a group of nonsocialist, lower-middle-income countries, Peru's level of public expenditure on education is lower than what should be expected of countries with its income level (Figure 14.3).

Furthermore, because pensions of retired teachers and administrators in Peru were paid out of the recurrent expenditure on education, actual government expenditures that went to operate the public education system were only about 2.4 percent of GDP in 1997. This was far below the Latin American and Caribbean regional average of about 4.5 percent (which were net of pensions) (UNESCO 1998). The Organization for Economic Cooperation and Development (OECD) average was around 4.6 percent (OECD 1998). Even if the level of public spending on education as a percentage of GDP had been similar, Peru's need for educational services is much greater because the proportion of its school-aged population is much higher (36 percent) than those in, for example, France and the United Kingdom (16 percent), Mexico (28 percent), Colombia (26 percent), and Chile (23 percent).

What can explain the puzzle that Peru has been able to achieve an unusually high participation rate with such a low level of public spending on education? Is it because public resources have been better used and targeted than those in other countries? Is it because Peruvian households have invested heavily in education? Has expansion of basic education come at the expense of qualitative improvement? This chapter[1] aims to answer these questions by examining public and private finance on education and their impact on quality, internal efficiency, and labor market outcomes. It will address these issues particularly from the perspective of the poor—of what the outcomes of policy for the poor have been and of how future education policies might best serve the task of poverty reduction.

This chapter argues that both the government's ability to contain personnel costs and limit spending on tertiary education and households' willingness to bear the direct and indirect costs of education have contributed to the attainment of high enrollment at a relatively low level of public spending on education. However, this achievement has come at the expense of quality and opportunities for the poor. The very low level of public spending, despite being distributed relatively evenly across consumption quintiles overall, has resulted in unequal outcomes because of the need for complementary financial inputs from households, which can impose a heavy burden on the poor. Increasing public expenditures on education and targeting specific assistance to the disadvantaged groups, particularly to indigenous people, is necessary to provide the educational opportunities for the poor that are essential to a long-term reduction in poverty.

## PUBLIC EXPENDITURES ON EDUCATION

Government allocation constitutes the most important source of funding for education, accounting for 17 percent of central government spending in 1997. Between 1970 and 1997, public expenditures on education fluctuated widely, peaking in 1972 at 3.7 percent
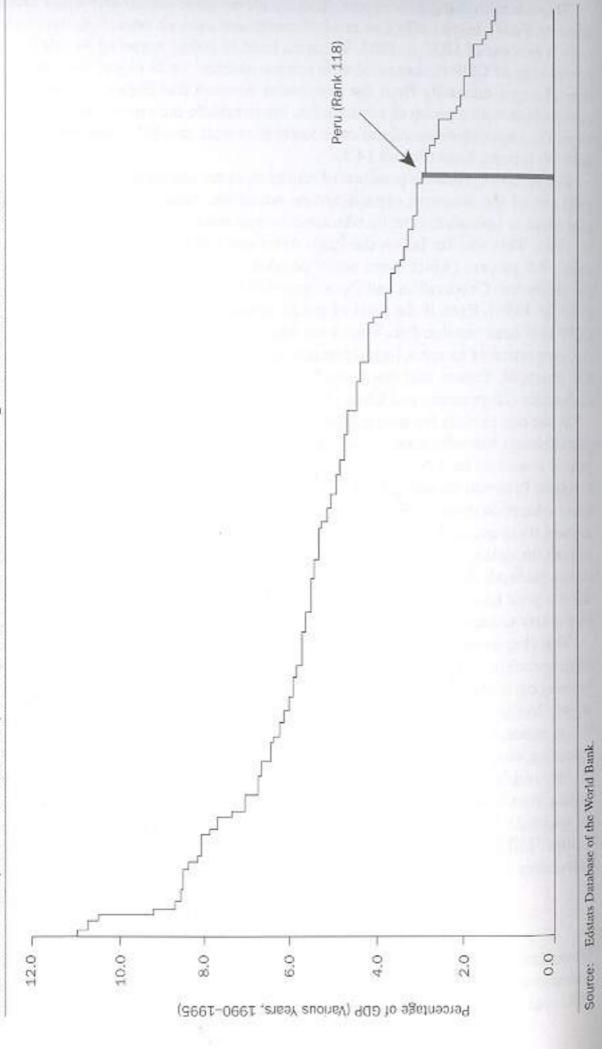
**FIGURE 14.2**

International Comparison of Public Expenditures on Education as a Percentage of Gross Domestic Product



Percentage of GDP (Various Years, 1990-1995)

Peru (Rank 118)

**FIGURE 14.3**

Public Spending on Education and GNP per Capita in Lower-Middle-Income Countries



of GDP, falling to 2.2 percent in 1988 at the lowest point, then gradually recovering to 3 percent in 1997.[2] Even though public expenditures on education were increased steadily throughout the 1990s, the level in 1997 was still lower than that of 1972 (see Figure 14.4). The enormous fluctuation of public expenditures on education over time reflected deep-seated instability and unpredictability in resource allocation, which made it difficult for any strategic planning and undermined program continuity (see Figure 14.5).

The trend of public spending in the 1990s showed recovery from the extremely low base in the late 1980s. Between 1990 and 1997, total public expenditures on education increased by 94 percent, while capital investments grew by 980 percent (see Figure 14.6). By contrast, salaries and compensation increased by 74 percent and pensions by 40 percent. Salaries and compensation accounted for only 57 percent of total public expenditures, while pensions accounted for about 22 percent. This level of personnel costs is low by international comparison because, in many countries, salaries often take up over 90 percent of the total education budget. Thus, Peru's ability to contain personnel costs is key to its ability to maintain fiscal discipline, although not without adverse effects on morale and quality of the teaching force.

In 1997, about 6 percent of total public expenditures was spent on initial education, 27 percent on primary education, 19 percent on secondary education, 2 percent on nonuniversity tertiary education, 16 percent on university education, and 21 percent on administration.[3]

Due to relatively slow growth of enrollment in public institutions, expansion of private education, and increased public spending on education between 1990 and 1997, per student recurrent public expenditures increased by 70 percent in initial education,

**FIGURE 14.4**

Public Expenditures on Education as a Percentage
of Gross Domestic Product, 1970–1997
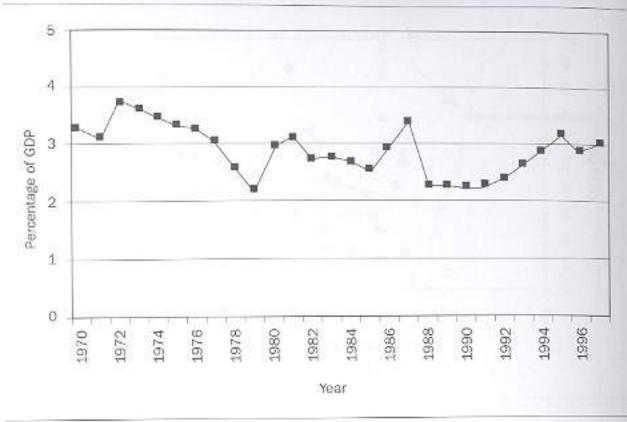


**FIGURE 14.5**

Total Recurrent and Capital Expenditures on Education, 1970–1997
(Constant 1997 Soles)
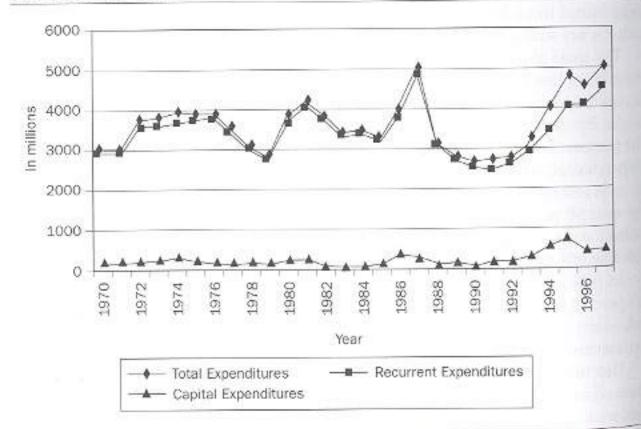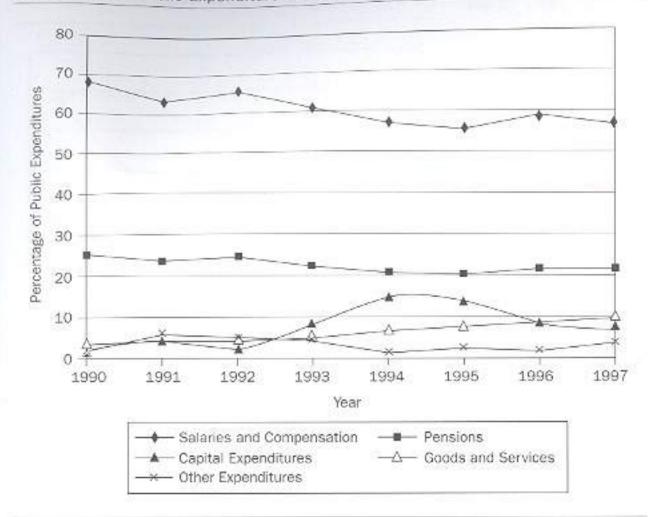
**FIGURE 14.6**

Composition of Public Expenditures on Education, 1990–1997
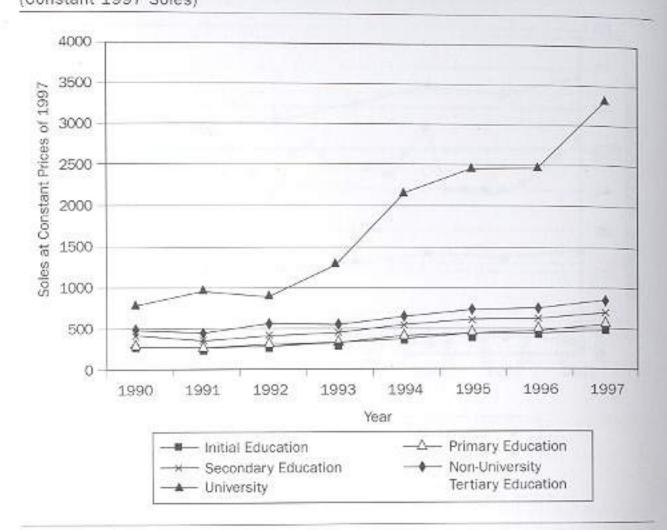


87 percent in primary education, 71 percent in secondary education, 79 percent in nonuniversity tertiary education, and 335 percent in university education (see Figure 14.7). While the percentage increase was impressive, it started from a very low base.

Converted to U.S. dollars,[4] per student public spending (inclusive of pensions) in 1997 was $175 in initial education, $201 in primary education, $260 in secondary education, $324 in nonuniversity tertiary education, and $1,255 in university education. The difference in the unit costs between higher education and primary education in Peru is six times. This is relatively lower than that in many countries of Latin America (which may be as high as twenty times). In many countries in the region, higher education unit costs are often above $2,000. The relative restraint in public spending on higher education is another factor contributing to Peru's ability to contain public expenditures on education.

To assess how equitable public expenditures are distributed among the rich and poor, a Lorenz curve[5] was constructed to reflect the proportion of recurrent expenditures on education which accrue to each consumption quintile. Because of the lack of information on unit cost by consumption quintile, it is not possible to estimate the variation in public spending in schools attended by children from different socioeconomic backgrounds. The Lorenz curves in Figures 14.8 and 14.9 were constructed under the assumption that unit costs are uniform for all quintiles. The Lorenz curve in Figure 14.8

**FIGURE 14.7**

Per Student Recurrent Public Expenditures on Education by Level, 1990–1997
(Constant 1997 Soles)



Legend:
- —■— Initial Education
- —✕— Secondary Education
- —▲— University
- —△— Primary Education
- —◆— Non-University Tertiary Education

shows that the distribution of public expenditures on education across consumption quintiles was *relatively* equitable.

Figure 14.9 shows a number of Lorenz curves with recurrent public expenditures disaggregated by level of education. Public spending on pre-primary and primary education was skewed toward the lowest income quintile (29 percent) because of the universal enrollment in primary education and because families in the top two quintiles tend to send their children to private schools, leaving the public system to the less well off. In contrast, public spending on higher education was skewed toward the highest income quintile because 47 percent of students in higher education were from the top quintile and only 4 percent were from the bottom quintile.

Given that per student spending varied substantially by department, the assumption of uniform unit costs across all quintiles may not hold. Therefore, four more simulations were run to test how equitable the distribution of public expenditures would be under various assumptions (see Figure 14.10). These were compared against the original in Figure 14.8, which is labeled Simulation 1 in Figure 14.10. Simulation 2 took pensions away from public expenditures. The curve became less equitable than Simulation 1 but did not differ substantially. Simulation 3 varied the unit costs by quintile to examine the impact. While the unit costs of the middle quintile were held

**FIGURE 14.8**

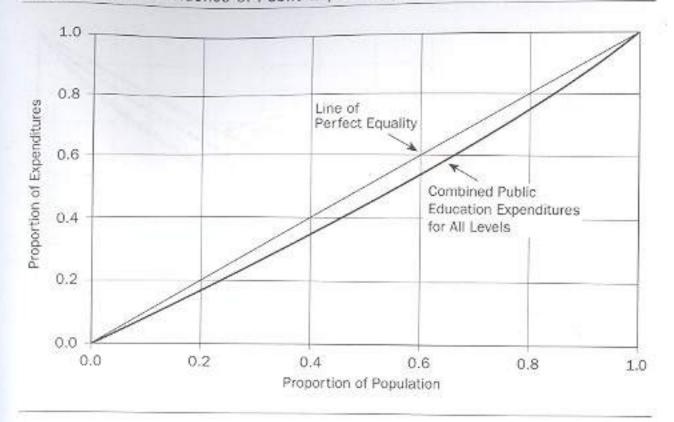Lorenz Curve for Incidence of Public Expenditures
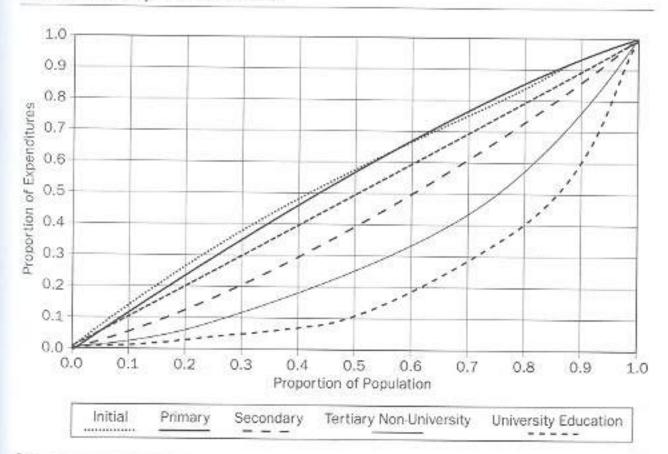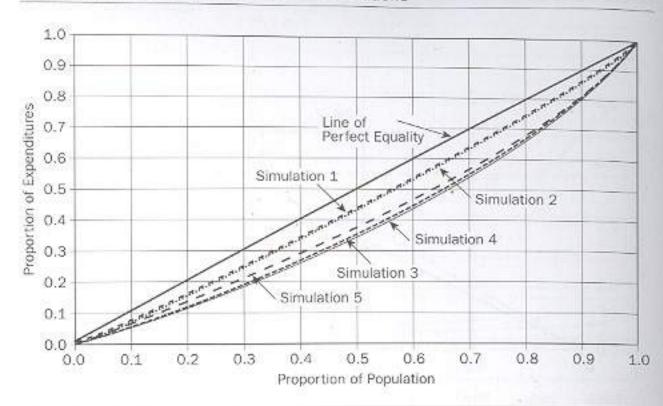


**FIGURE 14.9**

Lorenz Curves by Education Level



Legend:
Initial   Primary   Secondary   Tertiary Non-University   University Education

FIGURE 14.10

Lorenz Curves for Incidence with Five Simulations



FIGURE 14.11

Lorenz Curve for Incidence of Private Expenditures, All Levels



unchanged for all levels of education, that of the second quintile was reduced to 15 percent below that of the middle quintile, and that of the first quintile was reduced to 30 percent lower. Similarly, the unit costs of the fourth quintile were raised 15 percent higher than that of the third quintile, and the top quintile was 30 percent higher. The Lorenz curve of Simulation 3 was dramatically more unequal. Simulation 4 combined the principles of Simulations 2 and 3 and repeated the same experiment after taking out the pensions. Predictably, the distribution was the worst among all simulations.
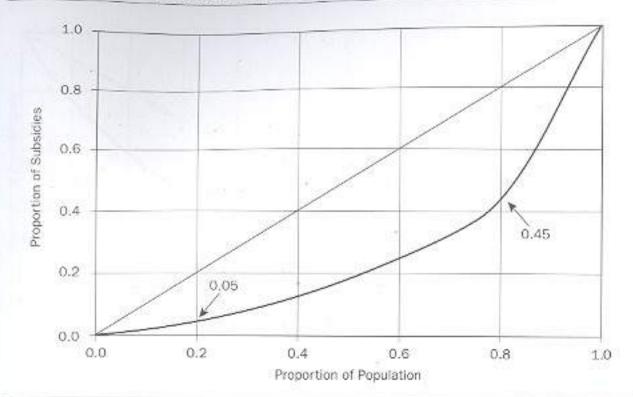
Simulation 5 tested the hypothesis of how higher unit costs of university education and uniform unit costs for all pre-university education affect the equity of distribution. The Lorenz curve of Simulation 5 was almost as unequal as those in Simulations 3 and 4. This experiment demonstrated that the relatively low unit costs of university education were very important to why the overall Lorenz curve looked equitable in Simulations 1 and 2. However, if school resources were distributed inequitably across quintiles, no matter how high enrollment ratios were in basic education, the Lorenz curve would look worse. The policy implication is that unless public expenditures are increased and targeted to the poor to ensure quality, the system would be unequal even if enrollment in primary education were universal.

## HOUSEHOLD EXPENDITURES ON EDUCATION

Peruvian households contribute relatively more to education than their counterparts in many countries, so that total expenditures on education in Peru (public and household) are more in line with the international comparators. Our analysis of Instituto Cuanto's

1997 household survey data for this study found that household expenditures on education were about 2 percent of GDP, higher than the 1.3 percent of GDP spent by households in the much richer OECD countries. This was also higher than that of other Latin American upper-middle-income countries such as Argentina (0.75 percent) but lower than Chile (2.5 percent) (OECD 1998).
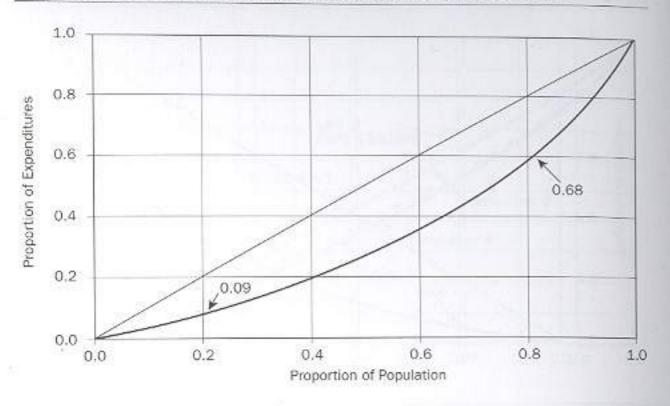
However, the key question is not whether households in Peru spend too much or too little in international comparison but what the high level of spending by households implies for educational policy in Peru. Are certain groups of Peruvians deprived of educational benefits because they are too poor to afford the necessary expenditures? What variables determine the variation in expenditures across households?

The Lorenz curve for total private expenditures (including spending on both private and public schools) shows the lowest quintile accounting for only about 4 percent of the expenditures and the upper quintile as much as 57 percent (see Figure 14.11). When only examining household expenditures on public schools, the Lorenz curve improves slightly (see Figure 14.12). Peruvian households spent approximately 41 percent for the education of children who were enrolled in public schools to complement the public spending on education. These household expenditures included registration fees and contributions to parents' associations, uniforms, school lunches, and transportation. Figure 14.13 shows the Lorenz curve of household expenditures on public primary schools; the situation was only worse in regard to secondary schooling.

The level of household expenditures on education varied tremendously by income level—the total amount spent on education by the richest quintile in Peru was thirteen times the total amount spent on education by the poorest quintile. Even this figure is

FIGURE 14.12

Lorenz Curve for Incidence of Private Expenditures, Only Public Schools



FIGURE 14.13

Lorenz Curve for Incidence of Private Expenditures, Only Primary Schools
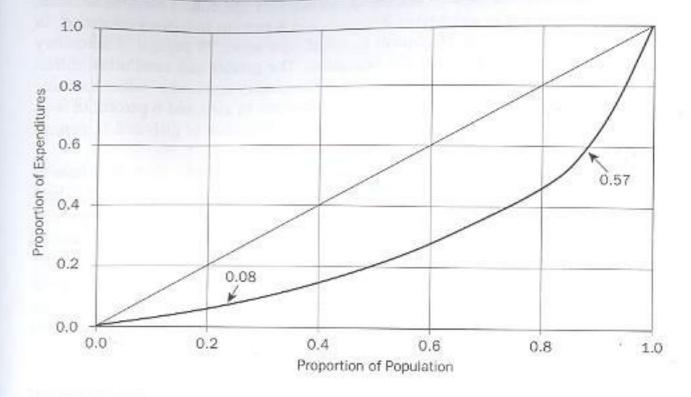


likely to be underestimated because the household survey questionnaire which provided the data for analysis did not include spending on extra tutoring and other school activities such as field trips.

Because recurrent public expenditures cover mostly salaries, household contributions in registration fees and to the parents' associations are often used by schools for repair and maintenance, educational materials and supplies, and water and electricity. The disparity in the ability of parents to pay, therefore, has contributed to the disparity in school resources. Our analysis of the Ministry of Education's 1994 survey of some 400 rural and urban public schools in Lima and Cusco found that the annual parents' contribution to very large urban schools (with an average of over 1,600 students) amounted to 11,735 soles, in contrast to only 279 soles of contribution to small rural schools (with an average of 96 students). Therefore, when taking into account household expenditures, the difference in total expenditures on the education of students from poor and rich households is striking. The very inadequacy in the level of public support makes basic education fall far short of becoming a socially equalizing force.

Nevertheless, Peruvians value education highly and would go to great lengths to make sure that their children have an education. Analysis of the behavioral aspect of household education expenditures (Engel curves) found that the income elasticity of demand was a low 27 percent. This means that education expenditures are considered to be a necessity by Peruvian households and that there is a strong underlying demand for education, by both rich and poor. The income elasticities were lower for the more disadvantaged groups—12 percent for the poorest quintile, 14 percent for rural populations, and 10 percent for indigenous people.

The finding resonated with that of Rodriguez and Alber (1997) for a sample of Peruvian children six to sixteen years old. They found that even if there was a positive relationship between income of the family and the probability of school attendance, the estimated marginal effects were small. Moreover, the magnitude of the negative effect of family income over participating in the labor force was also small. That is why enrollments did not decline, and child labor did not increase, during the time of economic crisis.

From the point of view of educational policy, however, the government cannot rely on general increases in income to bring about greater expenditures on education. For every doubling of household income, the budget share spent on education would go up by only a quarter on average. For the poor, rural people, and indigenous people, their budget share in education would go up by only 10 percent or so. Given that levels of household expenditures on education vary vastly by income level, there is a great need for specific policy instruments to address the inability of poorer households to incur additional expenditures.

## INTERNAL EFFICIENCY, QUALITY, AND LABOR MARKET OUTCOMES

The inadequacy of public spending on education, coupled with the inability of the poor to incur additional costs, translates into uneven access, large variability in learning outcomes, disparity in school completion rates, and unequal labor market outcomes. Although enrollment among the six to eleven age group (which corresponds to the age for primary education) has been universal irrespective of socioeconomic

status, gender, and urban or rural location, it has not been evenly distributed in other age groups which correspond to early childhood, secondary, and tertiary education. In 1997, in the rural areas only 15 percent of the relevant age cohort enrolled in initial education, 49 percent in secondary education, and 8 percent in tertiary education, in contrast to the urban areas' 16 percent in initial education, 78 percent in secondary education, and 30 percent in tertiary education. The gender and rural/urban differences in net enrollment ratios were striking at the tertiary level even within the same quintile. For example, in the rural areas, only 2 percent of girls and 6 percent of boys of the first quintile enrolled, but in the urban areas, 16 percent of girls and 11 percent of boys of the same quintile were in school.
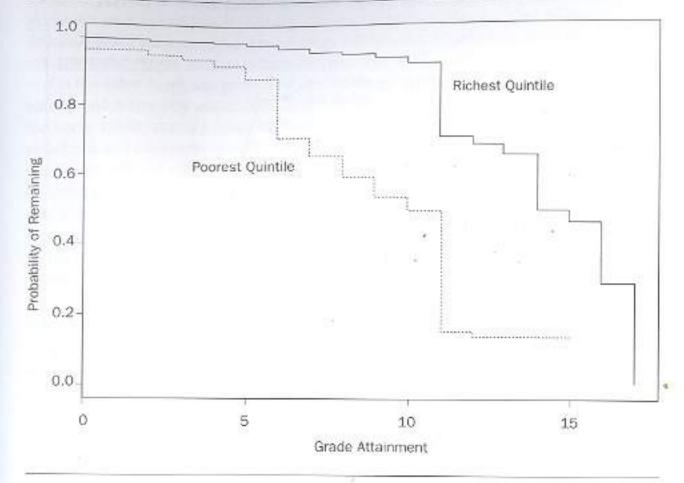
Rural children tend to enter late into the school system because they often have to walk to school and only older children can endure the journey. Due to the need to help their families and due to vulnerability to climatic factors, absenteeism and repetition are also high among rural students (Montero et al. 1998). The analysis by Saavedra and Felices (1997) of the 1994 Cuanto household survey confirmed the relationship among repetition, income, and rural location—the percentage of repeaters went from 17 in Lima, to 24 in other urban areas, and rose further to 35 in rural areas. Repetition is also much higher in public schools than in private schools. The study also revealed the relationship between income and dropout status (defined as the proportion of individuals in a cohort who have not finished an educational level and are not enrolled in any educational institution). For individuals aged seventeen to twenty-four, the dropout rates were 13 percent in metropolitan Lima, 20 percent in other urban areas, and 54 percent in rural areas.

Analyzing school survival rates using a 1997 household survey, we found that although children from rich and poor families started out the same in the first year of schooling, they rapidly diverged after the fourth grade (see Figure 14.14). Although inequality is not uncommon in developing countries, some countries have done a better job than others. Figure 14.15 provides a contrast with Jamaica (World Bank 1999c). Although the two methods used are different, they both indicate the extent to which the system retains students. In Jamaica, which has a GDP per capita of $1,690, the majority of students in the poorest quintile remain in school up to the ninth grade, in contrast to the rapid dropoff of poor students in Peru toward the end of primary education. Although the small size of Jamaica helps, it should be noted that the commitment of public resources to education is also much higher, reaching 7.6 percent of GDP in 1998.

Uneven school quality has compounded the disadvantages associated with student background and contributed to low internal efficiency and poor achievement. Analysis of the 1996 fourth-grade mathematics assessment test by Goldschmidt for this study found significant differences in the average 1996 fourth-grade mathematics outcomes among gender, school types, language groups, and regions (see Table 14.1). To the extent that the coefficient of variability is large on the country average, and much larger among certain subgroups, the disparity in students' mastery of cognitive skills is a key issue in education.

The between-school variance in achievement (that is, variance accounted for by differences in characteristics among schools, as opposed to differences among students) is an important indicator of inequality in learning outcomes; over 30 percent is normally considered to be serious. In studies done on achievement in primary education in

**FIGURE 14.14**

School Survival Rates by Poorest and Richest Consumption Quintiles, 1997



a number of countries, the least between-school variance in primary education was found in the Nordic countries (ranging from 5 to 9 percent in reading), while that in the developing world was found in Thailand (31 percent in third-grade mathematics) and Colombia (29 percent in third-grade Spanish). In Peru, about 54 percent of the variance in fourth-grade mathematics outcomes was between schools.

The indigenous people are the most disadvantaged group (see Table 14.1). Analysis of the determinants of the fourth-grade achievement found that Quechua-speaking students who were attending schools with a predominantly Quechua student population, as well as Quechua-speaking teachers and principals, were associated with lower achievement.[6] If indigenous Quechua-speaking students are already behind in fourth grade, their prospects of advancing through the education pyramid are dim; in turn, this poor outlook negatively affects their opportunity to break out of a cycle of poverty after they grow up.

The labor market consequence of poor quality and low internal efficiency will become even graver in the twenty-first century. The 1990s already showed rapidly increasing wage differentials among workers with various education levels, after Peru opened its economy to international trade and competition. This trend parallels the development in many Latin American economies such as Colombia (Cardenas and Gutiérrez 1997), Costa Rica (Gindling and Robbins 1994), Chile (Robbins 1996), and Argentina (Pessino 1995), where returns to education also increased after structural

FIGURE 14.15

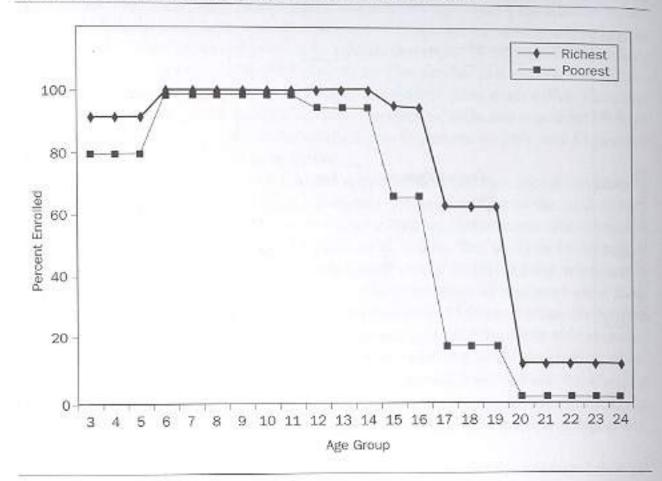Percentage Remained Enrolled by Quintile in Jamaica, 1998



TABLE 14.1

Index of Fourth-Grade Mathematics Outcomes, 1996

|  | Index of Mathematics Outcomes | Coefficient of Variability |
|---|---|---|
| Countrywide average | 1.00 | 0.47 |
| Male | 1.04 | 0.46 |
| Female | 0.96 | 0.48 |
| Public rural* | 0.85 | 0.54 |
| Public urban | 0.97 | 0.46 |
| Private | 1.37 | 0.34 |
| Spanish speakers | 1.04 | 0.46 |
| Quechua speakers | 0.73 | 0.54 |
| Aymara speakers | 0.99 | 0.44 |
| Coast | 1.10 | 0.43 |
| Mountain | 1.00 | 0.47 |
| Jungle | 0.83 | 0.50 |

* The sample of rural schools excluded single-teacher schools, which accounted for about 29 percent of all schools in the country. The variability of achievement, therefore, is likely to be much greater than what is shown here.

Note: The coefficient of variability is computed by dividing the value of the standard deviation by the corresponding mean of the group. While it is a very standard measure, the coefficients of variability in this table do not have a direct relationship with the index, except in the case of the countrywide average.

reforms. Table 14.2 shows that the earnings differentials in urban areas between workers who had no education and those who had primary education declined drastically from 50 to 33 percent between 1985 and 1996, signaling that the skills of primary school graduates are less and less in demand. Given the unsatisfactory quality of primary education, it is not surprising that the earnings differentials between people with a primary education and people with no education have narrowed.

On the other hand, the premia of secondary education, nonuniversity tertiary education, and university education, after having declined between the mid-1980s and the early 1990s, rapidly bounced back between 1991 and 1996 when the economy stabilized and economic growth resumed (Table 14.2). The magnitude of decline in the 1980s differed among workers of varied education levels—it was less steep for university-educated workers than others. When the premia bounced back, the increase was also steepest for university graduates. In 1996, the university premium was as high as 70 percent. This signals both the poor quality of secondary education and the increasing demand for a higher level of skills in an open economy that faces growing international competition and technological change.

It should be noted that the university premium for women increased much more than that for men, although women's level of earnings was lower than men's (Table 14.2). Given the very low enrollment ratio of women in higher education in the rural area, and among the lower quintiles, the beneficiaries of the rising university premium

TABLE 14.2

Urban Peru: Educational Premia, 1985, 1991, and 1996

|  | Education Premia | | | Change in Percentage Points | |
|---|---|---|---|---|---|
|  | 1985 % | 1991 % | 1996 % | 1985–1991 % | 1991–1996 % |
| Earnings differentials |  |  |  |  |  |
| Primary versus no education | 50 | 40 | 33 | –10 | –7 |
| Secondary versus primary | 45 | 7 | 17 | –38 | 10 |
| Nonuniversity tertiary |  |  |  |  |  |
| versus secondary | 43 | 13 | 25 | –30 | 12 |
| University versus secondary | 59 | 47 | 70 | –12 | 23 |
| Male |  |  |  |  |  |
| Primary versus no education | 3 | 64 | 7 | 61 | –57 |
| Secondary versus primary | 36 | 6 | 18 | –30 | 12 |
| Nonuniversity tertiary |  |  |  |  |  |
| versus secondary | 37 | 15 | 30 | –22 | 15 |
| University versus secondary | 66 | 58 | 71 | –4 | 13 |
| Female |  |  |  |  |  |
| Primary versus no education | 47 | 25 | 36 | –22 | 11 |
| Secondary versus primary | 57 | 5 | 13 | –52 | 8 |
| Nonuniversity tertiary |  |  |  |  |  |
| versus secondary | 54 | 12 | 23 | –42 | 11 |
| University versus secondary | 39 | 25 | 70 | –14 | 45 |

are women from upper quintiles. However, the increasing education premium will provide strong incentives for urban women in the middle quintiles to seek further education. This is also likely to set into motion a virtuous cycle of higher levels of private investment in education, mostly by women supporting themselves. Rural women, however, are not likely to have access to such opportunities without specific government interventions.

Investment in basic education, both in terms of qualitative improvement and quantitative expansion of secondary education, will have a positive effect on poverty alleviation, although returns to this level are probably lower because the initial general human capital is low. To ensure gender equity, the government needs to proactively institute policies to support women, particularly those in rural areas, to enable those with good academic standing to access higher education.

## POLICY IMPLICATIONS

Peru's achievement in attaining universal primary education in spite of its geographical and ethnic diversity and its recent history of macroeconomic instability and civil unrest is undoubtedly remarkable. Its fiscal policy in the 1990s of containing costs while steadily increasing public expenditures on education within overall budget constraints is prudent. But there have been costs. The ability of households to incur schooling expenditures varies across income groups, and constrained public finance entails grave implications regarding the inequity of educational opportunity in Peru. If schooling is to be used as an instrument for poverty alleviation, the instrument clearly needs to be more effective in addressing the basic educational deficits faced by the poor, particularly indigenous students.

Analysis of the determinants of achievement provides a preliminary road map that could be further refined to guide policy. The analysis both identified the key issues and found a message of hope. After controlling for a number of explanatory variables, some departments were doing a better job than others. Aymara students performed as well as Spanish-speaking students. Quechua students could have achieved as much as others if they were not studying in predominantly Quechua schools, thereby indicating the potential for policy to reduce the disparity. Teachers who graduated from universities and from teacher training institutes, teachers who have had longer years of service, and teachers who have had more in-service training courses were positively associated with higher student achievement. The nonavailability of textbooks was associated with lower achievement. Parental expectations helped shape outcomes. Even within the limitations of this first assessment effort, the findings are sufficiently important to warrant attention for the policy possibilities to equalize educational outcomes and improve quality more generally.

Because many indigenous teachers and principals were disadvantaged in their own preparation, in-service and pre-service training can provide special support through compensatory education in subject areas and pedagogical programs to strengthen teaching in bilingual, multicultural, and multigrade settings. Provision of bilingual programs and bilingual textbooks to students could ease the transition from the mother tongue to Spanish. Improvement of facilities and resources (textbooks, library, etc.) of schools

attended by the disadvantaged groups, particularly indigenous students and teachers, could provide the necessary infrastructure for teaching and learning to take place.

To finance these interventions, public resources have to be both increased and targeted to the disadvantaged groups, most notably indigenous teachers and students. By increasing public expenditure levels to only the Latin American average of 4.5 percent of GDP, Peru has the opportunity to enhance markedly the intellectual ability and competitiveness of its disadvantaged citizens and alleviate poverty within a generation. No policy challenge is more significant.

## NOTES

1. This chapter is condensed and revised from a World Bank sector study on education in Peru (World Bank 1999a). The views and opinions in the chapter do not necessarily reflect the position of either the World Bank or the Peruvian government.

2. The primary source of public expenditures on education comes from the Peruvian Ministry of Finance and Economy. The review of public expenditures for this study was carried out by Silva and Miranda and was built on an earlier study by Saavedra and Felices (1997).

3. Administration includes all the principals, school administrators, and inspectors; disaggregated information is not available by level. Separate accounting of administrative expenses makes spending by each level low and administration rather high.

4. In 1997 the exchange rate was 2.55 soles to $1.

5. The Lorenz curve is an easy diagram to read—the heavy straight black line joining the two corners as shown in Figures 14.8, 14.9, and 14.10 is the line of "perfect equality" or the line that would obtain if each consumption quintile received an equal amount of educational expenditure—for instance, if 20 percent of expenditures accrued to the poorest quintile just as to the richest quintile. The Lorenz curves shown in these figures represent the distribution of expenditures by quintile. The closer the curves are to the diagonal, the more equitable is the distribution of expenditures.

6. However, Quechua students who were not attending predominantly Quechua schools performed as well as Spanish-speaking students. The difference in the performance of Aymara students compared to Spanish-speaking students was not statistically significant. Data are not available to explain the reasons for the differences between the Quechua and the Aymara. It has been hypothesized that Aymara students are exposed more to a Spanish-speaking environment because of the Aymara's commercial activities. Further research on this topic is needed.

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# Commentary

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I enjoyed reading this interesting and thought-provoking chapter. I take the basic theme to be that aggregate trends on school enrollment rates in Peru are deceptive. While school enrollment rates in Peru are remarkably high, a closer look at the numbers shows that family incomes play a large role in determining educational opportunities. At the primary school level, almost all children are in school. But children from poor families and from families living in rural areas start school late and do not progress well. They are underrepresented in secondary education and even more underrepresented in postsecondary education. Kin Bing Wu and her co-authors argue that this pattern is partly due to the level of public expenditures on education—which is low as a percentage of gross domestic product. It is also partly due to the allocation of government educational expenditures—public expenditures per student on university students are six times those the level of public expenditures on primary school students. The basic policy message from the chapter is that the government must find a way to increase public expenditures on primary school education.

I find the basic argument of the chapter convincing. Most of my comments concern possible strategies for implementing the basic recommendations.

I am not sure that it makes sense to argue that the government financing of pensions for retired teachers is simply a drain on the government education budget. My point is not to defend the public pensions. I do not know how important they are in attracting talent to the teaching profession and in retaining talent in teaching. This depends on the structure of the pensions, a topic that the chapter does not cover. However, assume that the pensions are valued by perspective teachers and do act as substitutes for current salaries in attracting talent to teaching. Under this assumption, the pension costs should be seen as part of the cost of delivering educational services, just as teachers' salaries are. This would be more clearcut if Peru fully funded the pension system— that is, put into a trust fund each year sufficient money to cover the future pension costs of today's current teachers. In fact, if the teaching force is growing in size, fully funding pensions would mean more resources devoted to pensions out of the current education budget than is the case under the current funding system.

A basic question that comes out of the chapter's conclusion is: Where should the money come from to increase public funding of primary and secondary education? Without knowing the structure of the tax system, it is not clear that increasing taxes would benefit the poor. It might be that they would pay a disproportionate share of increased taxes. Without knowing a lot about the allocation of public spending, it is not

obvious that cutting public spending in other areas to devote more spending to education unequivocally benefits the poor. It may, but it is not obvious. Given the history of inflation in Peru, deficit funding of government expenditures on education does not seem like a good idea. So it may be necessary to think about ways to reallocate government educational expenditures to increase resources devoted to primary education. One possible strategy for reallocating educational expenditures is to reduce the subsidy to postsecondary education. The logic underlying this is twofold. First, the information on relative earnings by education level suggests that the private economic payoff to postsecondary education is high. In other words, it is a good private investment for students to invest in a university education. Consequently, it is worthwhile to think about shifting more of the burden of paying for university education to students. Second, the relatively affluent are much more likely to be students at the university than are young people from poor families, so not only does cost recovery make sense on efficiency grounds, it also has attractive equity properties. If this strategy were followed, it is important that students be able to borrow to pay for university education. Thus some attention to capital markets makes sense.

Assume that cost recovery at the university level or an increase in government funding of education does free up public resources to increase funding for primary school education. How should the money be spent? There are two related issues here. The first is how to target the money to low-income families. The second is what to spend the money on. A possible answer to the first question is to allocate a large share of the money to schools in neighborhoods in which concentrations of poor families live. This is a strategy that the World Bank recommended for Vietnam.

The low-income elasticities indicate that it is not efficient to give income subsidies to low-income families or poor communities and expect them to spend it on education. What should be done with it? That is, of course, another study, one that concerns the determinants of a high-quality primary school education. Kin Bing Wu's chapter suggests that, as a start, building schools that are closer to the homes of poor families may be important because young children are more likely to attend school if it is close to their homes.

A critical, but difficult question concerns how to spend the money to improve the internal efficiency of education—that is, to promote the timely acquisition of skills. Donald Winkler's chapter shows how difficult this question is to answer. It is possible that spreading the money too thinly would be a mistake. It is worthwhile thinking about an evaluation strategy to learn whether particular investment strategies are effective in improving the internal efficiency of the education system—that is, in increasing the timely completion rate of low-income students.

Let me suggest one simple question to keep in mind in designing strategies to improve the education provided to children from low-income families: Does the intervention result in changes in children's day-to-day experiences? If the answer is no, then it is highly unlikely that the intervention will result in improved achievement. This may seem obvious, but the point is often neglected. For example, class size reductions, which are expensive, often do not result in improved student achievement because teachers teach in the same lecture style with a class of twenty-five that they did with a class of forty-five. From the perspective of the child's daily experience in school, the class size reduction made no difference.

A final question that is worth thinking about is whether the government should encourage relatively affluent families to use their own private resources to send their children to private primary schools. The chapter points out that many relatively affluent families do this currently. The advantage of encouraging affluent families to use private primary schools is that it removes the burden from government to fund primary schools for these children. A possible disadvantage is that these families may be the most able to articulate a demand for high-quality education. Moreover, their presence in schools may have positive effects on the education of other, less-privileged children.

In summary, this chapter is thoughtful and interesting. It identifies a critical problem. Inevitably, it leads to tough questions about how to deal with this problem.