

Educational Equity in Central America: A pending issue for the public agenda

Introduction

Diverse research has shown that there is a significant relationship between education and both family income and national economic development. In this regard, nations should use their school systems not only as a tool to promote economic development but also to redistribute wealth and secure the welfare of the most vulnerable citizens. However, sometimes the complete opposite occurs and nations invest heavier in the education of the most privileged sectors of society, reinforcing social inequality and excluding large sectors from economic development.

The objective of this document is to discuss and quantify educational inequalities in Guatemala, El Salvador, Honduras, and Nicaragua as well as to provide information for dialogue on public policies that contribute to the effective development of the CA-4 countries. Using the most recent household surveys available, a series of indicators have been analyzed in order to better understand the educational inequalities and disparities that exist in each of these countries. In addition, inequalities related to access, retention, and investment are also highlighted. The issue of educational quality has not been addressed at this time due to the fact that only Honduras has participated in regional studies to measure student learning. The Second Regional Comparative and Evaluative Study (SERCE) is scheduled to be conducted this year. As a result, this issue may be included in future investigations.

This study is divided into four sections. First, access to education is evaluated in regards to location, gender, and socioeconomic status. Second, inequality in education distribution is quantified and retention rates are estimated, highlighting the differences between the highest and lowest income quintiles as well as the repetition and desertion rates per location, gender, and socioeconomic status. Subsequently, disparities in public investment in regards to income level are evaluated and the level of success of focusing education interventions is analyzed. Finally, the document provides conclusions and recommendations, based on the findings of this study.

Equity in Access to Education

The majority of development economists agree that education played a fundamental role in the economic growth of the countries known as the “Asian tigers”. Close to 58 percent of Japan’s growth rate and 87 percent of Thailand’s growth rate have been attributed to the education of their workforces. Thanks to the investments that these countries made in their educational systems, 100 percent of the workforce of South Korea, Hong Kong, and Singapore had finished primary school by 1965 and 25 percent had finished secondary school.

Income levels, infrastructure and the general welfare of the population in southeast Asia, especially Thailand, Malaysia, and Singapore, were well behind those of Central America in



the 1960s. However, the efforts made by these Asian nations during the 1950s and 1960s to improve and increase access to education undoubtedly produced results. (Porta, 2006a)

It is important to highlight that these countries didn't limit themselves to simply declaring education to be a priority. Political discourse was accompanied by increased investment of state funds in education. Some of these countries allocated up to half of their budgets to increase education access and quality for their citizens.

Aside from education being correlated with the economic development of these nations, it has also been demonstrated that there is a strong relationship between the number of school years per capita and income levels. As such, investment in education is considered to be profitable not only for society as a whole but also for individual citizens. In addition, education has proven to be a good strategy for reducing poverty and social inequality. It has also been shown to have a positive effect on productivity, individual health, crime, democratic values, and other social matters.

These findings suggest that it is desirable for all citizens to have access to education—at least to a minimum number of years of study that will allow them to participate in the contemporary world. It is for this reason that the Dakar and Millennium goals include stipulations that all boys and girls should have the opportunity to complete primary education. (CEPAL, 2005)

In recent years, the Central America region has made considerable efforts to improve education coverage and education quality. However, the magnitude of the existing shortcomings in the region, when compared with developed countries, suggests that these efforts need to be intensified. This is especially true given the accelerated manner in which these countries are becoming integrated into an increasingly globalized world.

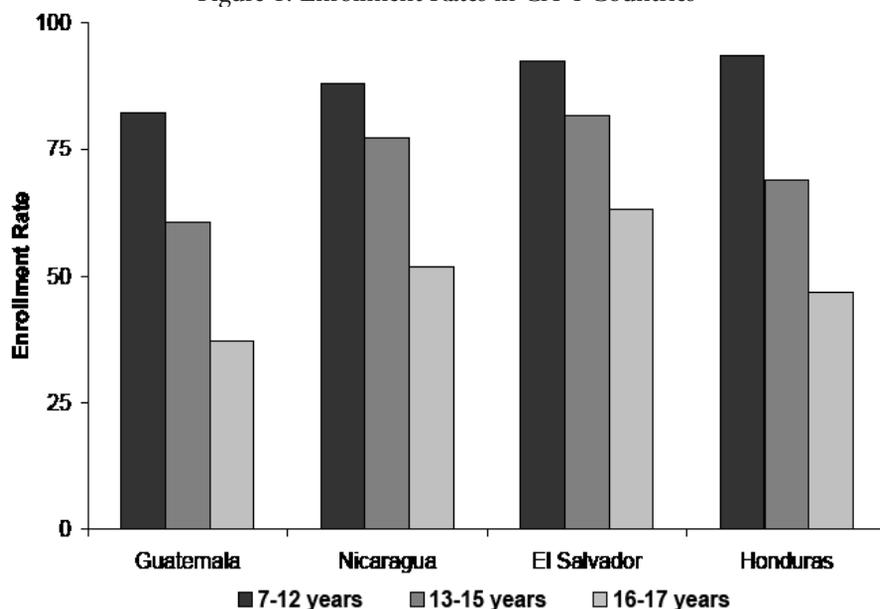
Improving education access and quality in the region is not only ethical but also economically justifiable in order to be competitive in the new age of globalization. In this light, education policies to attain greater education relevance should be implemented in the mid-term in order to reduce poverty and existing inequalities that aggravate conditions for development. (UNESCO, 2000)

However, the economic obstacles that these countries face require their governments to make additional efforts to better focus their education interventions. In this regard we will start by identifying population groups that need greater support in order to have access to education as well as quantifying observed inequalities. It is understood that equity in access to education refers to individuals having an equal opportunity to access school systems without regard to sex, location, socioeconomic status, ethnicity, and other factors.

Inequalities in enrollment rates

Figure 1 shows the enrollment rates for three age groups that correspond to different primary and secondary education levels. Greater enrollment can be observed for the 7–12 age group. It is worth mentioning that Honduras has the greatest coverage for this age group, while Guatemala lags the farthest behind. In addition, there is an evident pattern of decreasing participation in the educational systems with increase in age.

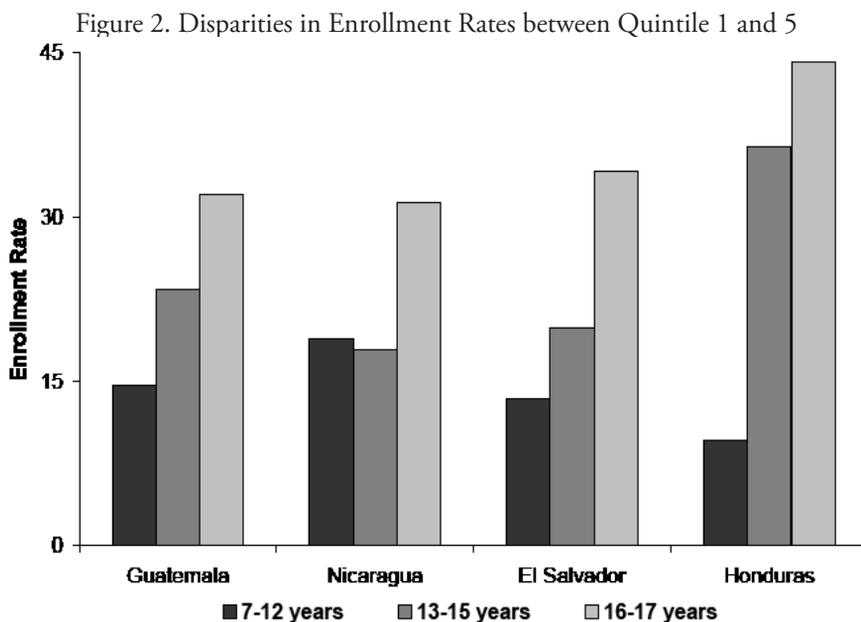
Figure 1. Enrollment Rates in CA-4 Countries



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

Honduras and Guatemala show the greatest coverage reduction for the 13–15 age group. In addition, it is interesting to notice the 16–17 age group (the age when official secondary education is concluded) is where the lowest levels of enrollment are present. This problem is more acute in Guatemala and Honduras. El Salvador shows the greatest participation rate in the school system for youths in this age range.

As averages hide internal disparities, it is relevant to analyze enrollment rates per socioeconomic status. A useful indicator in this regard is the difference in the enrollment rate of the poorest 20 percent (quintile 1 or lowest) and the richest 20 percent (quintile 5 or highest). Figure 2 shows the disparities in enrollment rates between the poorest 20 percent and the wealthiest 20 percent of the population, showing that the gap is wider among the older age groups and that the educational disparities among students in these two socioeconomic quintiles are higher for older students, as disadvantaged students tend to abandon the system at a younger age. For the 7–12 age group, the country with the greatest disparity in school enrollment is Nicaragua, with a difference of almost 20 percentage points in schooling between children in the poorest quintile and children in the richest quintile. Honduras presents greater equity in this age group. However, for the other two age groups Honduras suffers the greatest disparities.



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

An investigation of educational disparities per location shows that all CA-4 countries’ citizens living in rural areas have a disadvantage in terms of access to education compared to those residing in urban areas. Nicaragua and Guatemala have the greatest disparities between rural and urban populations for the 7–12 age group. These differences are greater than 30 percentage points for the 16–17 age group. This finding highlights the importance of extending secondary education coverage in rural areas of these countries (See Appendix A2).

In terms of educational inequities per gender, it is interesting to note that while Guatemala and El Salvador have disparities in detriment to girls, the opposite is true for Nicaragua and Honduras. This type of situation is why educational interventions shouldn’t be standardized processes and should take into account the different characteristics of each country (See Appendix A3). In Guatemala and Nicaragua there is also evidence that children belonging to different ethnic groups have enrollment rate discrepancies higher than 10 percentage points.

Inequalities in illiteracy rates

One of the consequences of a lack of access to education is illiteracy—adults that can neither read nor write. Table 1 shows that Guatemala has the greatest adult illiteracy rates in the region, especially in rural areas and among women. On the other hand, Honduras presents the lowest illiteracy rates. For all CA-4 countries, illiteracy is greatest in rural areas. It should also be pointed out that the poorest quintile has the greatest levels of illiteracy (See Appendix A4). In light of these circumstances, design of strategic interventions that concentrate resources on disadvantaged households in rural areas is needed urgently.

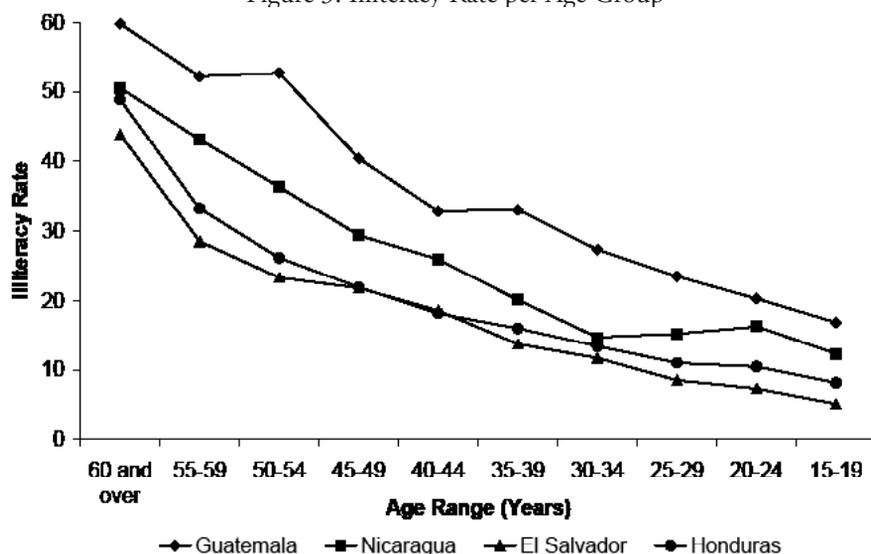
Table 1. Illiteracy rate for people 15 years of age and older per location and sex

Country	Location		Sex		Total
	Urban	Rural	Male	Female	
Guatemala	16.5	43.0	22.8	39.8	31.7
Nicaragua	13.5	35.9	22.0	22.3	22.2
El Salvador	10.4	28.1	14.0	19.7	17.1
Honduras	9.2	26.9	16.6	17.2	16.9

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

Figure 3 shows that although Guatemala is the country with the greatest illiteracy rate, it is also the country that has made the most significant progress in reducing illiteracy over time. Almost 60 percent of the population 60 years-of-age and greater is illiterate but only 16.8 percent of the 15–19 age group is illiterate.

Figure 3. Illiteracy Rate per Age Group



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

It is also important to highlight that El Salvador is the only country that has illiteracy rates below 10 percent for individuals less than 25 years-of-age. The data show that for the 15–19 age group, there is only a 5 percent illiteracy rate. These findings show that the educational policies implemented over the past decade have had an important impact.

Another situation that should be highlighted is the fact that almost half of Guatemalans belonging to indigenous ethnic groups are illiterate while in Nicaragua it is only a third. Recent data for Guatemala show that the great disparities among ethnic groups continue to hold true even for youth. The literacy rate for young Mayans between 10 and 19 years of age is 74%, while it is 90% for ladinos—non-indigenous. (Shapiro, 2005)



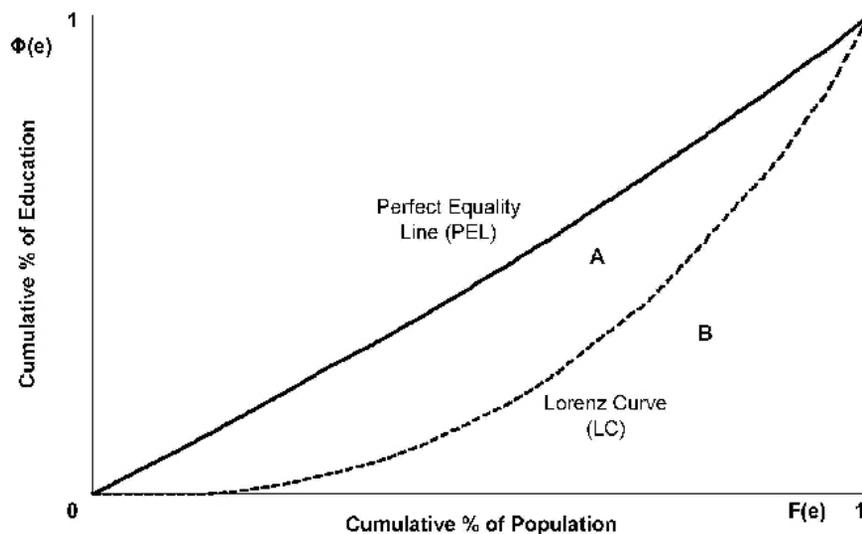
Quantification of educational inequalities: The Gini Index

On multiple occasions, CEPAL has indicated that Latin America is the region of the world with the most unequal distribution of wealth, even when compared to other regions where there is less social development and greater poverty indices. This disparity can be seen when considering that the poorest 40 percent of the population in the region has only 13.6 percent of the wealth, while the richest 10 percent of the population has 36.1 percent of the wealth. In the 1990s, the average Gini coefficient for Latin America was 0.522, while it was much lower for OECD, Eastern Europe and Asia—0.342, 0.328, and 0.412 respectively—during the same time frame.

The most common method to represent this inequality is the Lorenz Curve (LC). This tool was developed in 1905 with the purpose of illustrating health inequality. Since its development, its use has been popular with economic inequality researchers. SITEAL (2005) has developed an Education Lorenz Curve that enables the visualization of inequality in education distribution.

The Education Lorenz Curve is the cumulative percentage of education attained by the cumulative percentage of the population ordered by educational level. The diagonal line that divides the chart in two equal parts is the perfect equality line (PEL), which represents the distribution of education when every person has the same level of education (see Figure 4). The greater the area between the LC and the PEL, the greater the inequality existing.

Figure 4. Education Lorenz Curve

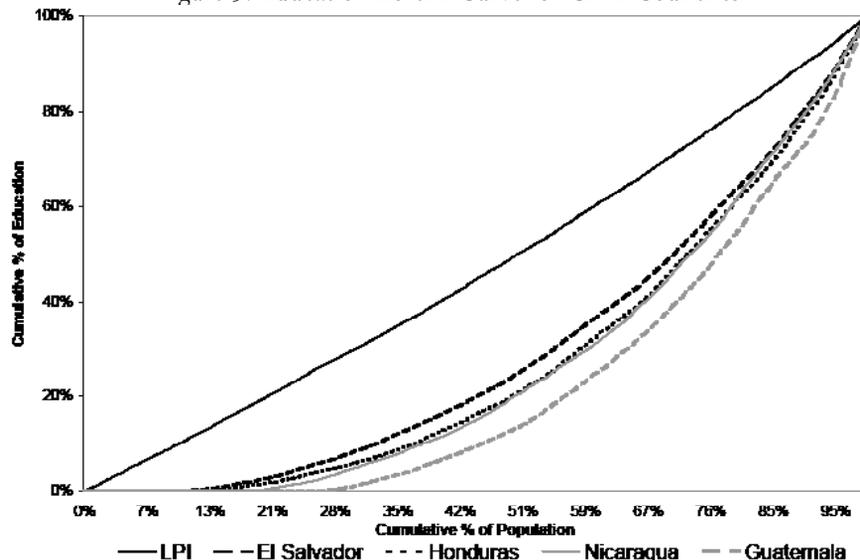


Source: SITEAL (2005).

The Lorenz Curve in Figure 5 represents the population between 25 and 45 years of age, an age group that is characterized by greater levels of participation in the work force and by having finished their education. Figure 5 shows that the school systems in Central America are still greatly affected by inequality, which perpetuates both social and economic inequality among different population groups in these countries. It should be pointed out that Guatemala is the country with the greatest degree of educational inequality. El Salvador

appears to be the most equitable, which is consistent with the prevalence of low illiteracy levels in the country during the same time period. In Nicaragua and Honduras, the curves cross each other at various points making it difficult to conclude which distribution is more equitable without estimating the Gini coefficient.

Figure 5. Education Lorenz Curve for CA-4 Countries



Source: ENCOVI 2000, EMNV 2001, EHPM 2004, EHPM 2004.

The Education Lorenz Curve for CA-4 countries indicates that a significant percentage of the population aged 25 to 45 has not accumulated any school enrollment—in other words, these are uneducated citizens. For individual countries, the percentage of those that haven't accumulated any school enrollment is 30 percent in Guatemala, 21 percent in Nicaragua, 15 percent in El Salvador, and 11.6 percent in Honduras.

For Guatemala, a closer analysis of the Lorenz Curve shows that while the poorest 40 percent of the population has only accumulated 3.5 percent of the total enrollment for the country, the richest 10 percent has accumulated 31 percent of the total enrollment for the country. This is a worrisome situation given that the population between the age of 25 and 45 forms a large part of the work force that will be in a position to avail itself of the opportunities arising from the implementation of the Dominican Republic–Central American Free Trade Agreement (DR-CAFTA).

When two Lorenz curves intersect each other no conclusive comparisons can be made without calculating the Gini coefficient. In simple terms, the Gini coefficient measures the area between the Lorenz curve and the diagonal PEL ("A" in Figure 4) in relation to the total area of the triangle below the PEL ("A" + "B" in Figure 4). The values range between 0 (perfect equality) and 1 (perfect inequality).



The Gini coefficient is an excellent inequality indicator that is used in the majority of related studies. It can also be applied to variables regarding educational assistance, funding, and results. A more detailed summary of the Gini coefficient is provided below:

$$G = 1 - \sum_{i=1}^n x_i (2Y_i - y_i)$$

where:

- x_i is the accumulated population percentage
- Y_i is the accumulated percentage of years of schooling in the population
- y_i is the percentage years of schooling of the individual

Table 2 shows the education Gini coefficient for each of the CA-4 countries. Guatemala presents the greatest inequality in enrollment distribution, followed by Nicaragua and Honduras. El Salvador presents the best education distribution.

Table 2. Education Gini Coefficient

Country	Education Gini Index
Guatemala	0.5590
Nicaragua	0.4351
Honduras	0.4096
El Salvador	0.3898

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

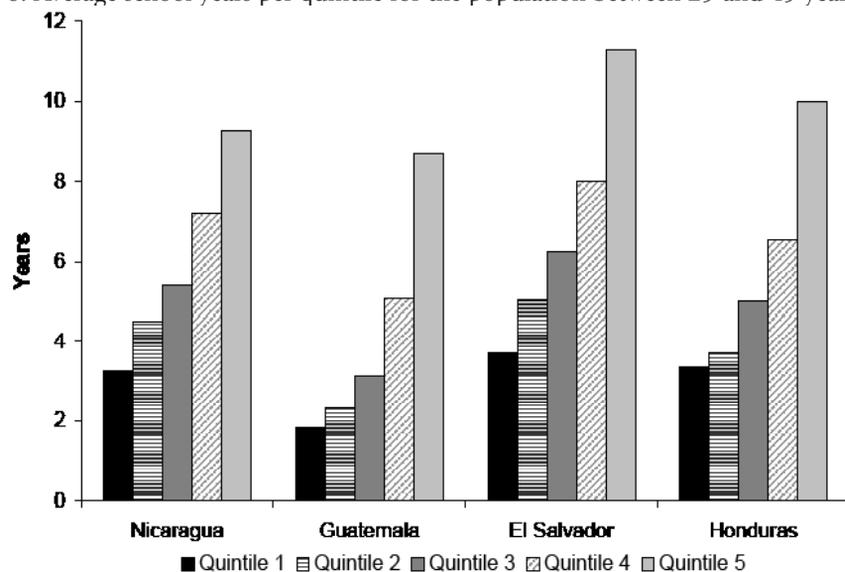
As can be observed in the preceding chart, the school systems of the CA-4 countries replicate the pattern of inequality in education distribution that characterizes the region. It should be pointed out that, within Latin America, education distribution in CA-4 countries is worse than that of the rest of the region. The education Gini coefficient for these countries is greater than that of the regional average. Guatemala has the second greatest inequality in the region, followed only by Haiti (World Bank, 2006).

As a complement to the education Gini coefficient, it is useful to analyze the disparities that exist between the average number of school years per quintile (see Figure 6). In this regard, it is interesting to note that El Salvador has the greatest absolute difference between the poorest 20 percent and the richest 20 percent of the population. However, it is also the country with the greatest enrollment averages per quintile. On the other hand, Guatemala is the country that has the lowest levels of average enrollment in the outermost quintiles.

In light of this situation, an analysis of the progress made during the past decade to raise enrollment among the poorest 20 percent of the population was conducted. For this analysis, the average number of school years was calculated for the population between 15 and 24 years of age as well as for the population between 25 and 45 years of age. The results were compared in order to estimate the differences in or gains made by the younger age group.

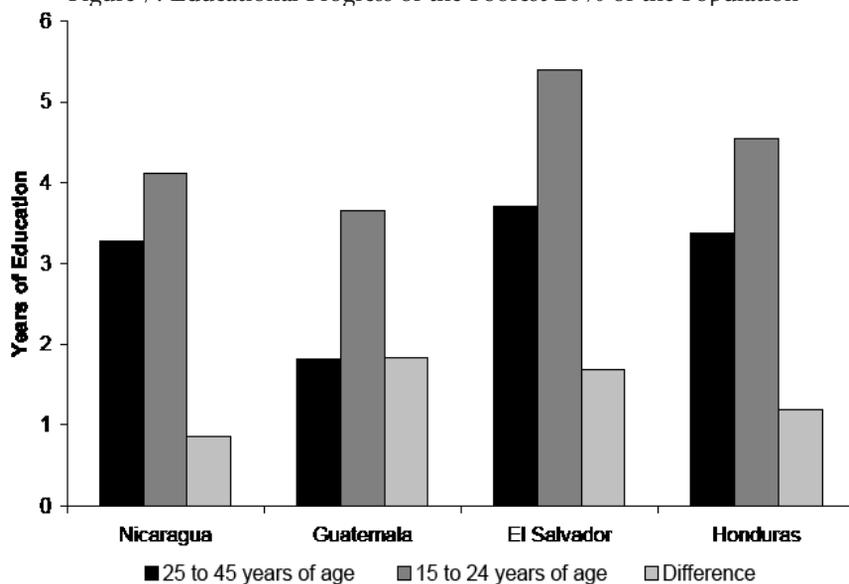
Figure 7 shows that El Salvador is the country whose poor (lowest 20% of income distribution) have shown the greatest educational progress, with an increase of two years in average school enrollment—an increase similar to that of the Asian Tigers during the 1960s. The country with the worst indicator is Nicaragua, which presented only a slight increase of 0.6 school years. In Guatemala, despite the fact that the poorest segment of the population is acquiring greater stock in human capital, it also continues to have the lowest enrollment rates in the Central American region.

Figure 6. Average school years per quintile for the population between 25 and 45 years of age



Source: ENCOVI 2000, EMNV 2001, EHPM 2004, EHPM 2004.

Figure 7. Educational Progress of the Poorest 20% of the Population



Source: ENCOVI 2000, EMNV 2001, EHPM 2004, EHPM 2004.



Equity in the Internal Efficiency of the School Systems

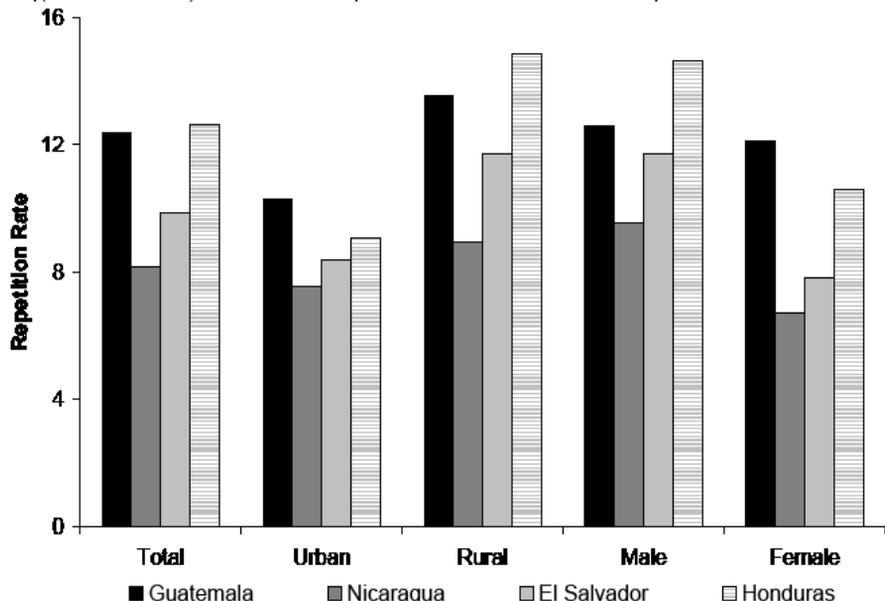
As UNESCO (2005) pointed out in its most recent report on school systems in Latin America, in order to achieve universal primary education graduation coverage, it is necessary for students not only to enroll in primary school but also continually advance until they finish. The report indicates that, “the opportunities that children have to finish primary school and continue on with additional education are clearly affected by school delay. In fact, as school delay increases, the pressure to take on other types of responsibilities and the probability of desertion also increase.” In this regard, reducing the high desertion and grade repetition rates constitutes one of the main challenges of school systems in the region. These challenges must be met in order for a greater percentage of students to complete the primary and secondary education cycles.

Grade repetition: Who are the most affected?

Grade repetition increases costs for school systems, as a repeat student uses 2 or more times as many resources assigned for a specific grade than others. This represents an opportunity cost that limits the capacity of the State to provide coverage for students without access to the school system.

Figure 8 shows the repetition rates for primary education by location and sex. One can note that Honduras is the country that presents the greatest primary education repetition rate, while Nicaragua has the lowest rate. The primary education repetition problem exists in all CA-4 countries and these rates are highest among boys and residents of rural areas. In addition, when the analysis of primary education repetition is broken down by income quintile, Honduras is the country where students from the poorest 20 percent of the population suffer the greatest disparities compared with those from the richest 20 percent of the population (see Appendix A10).

Figure 8. Primary Education Repetition in CA-4 Countries per Location and Sex



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

On multiple occasions it has been shown that primary education repetition occurs most frequently in the early grades and all CA-4 countries have made efforts to combat this problem through automatic promotion programs, remedial classes, etc. However, we still are observing repetition rates of two digits. For first grade, the countries with the highest repetition rates are Guatemala, Honduras, and El Salvador (Table 3). In light of this situation, there is a need to design strategies that reverse this situation without affecting the educational quality for minors at risk of school failure.

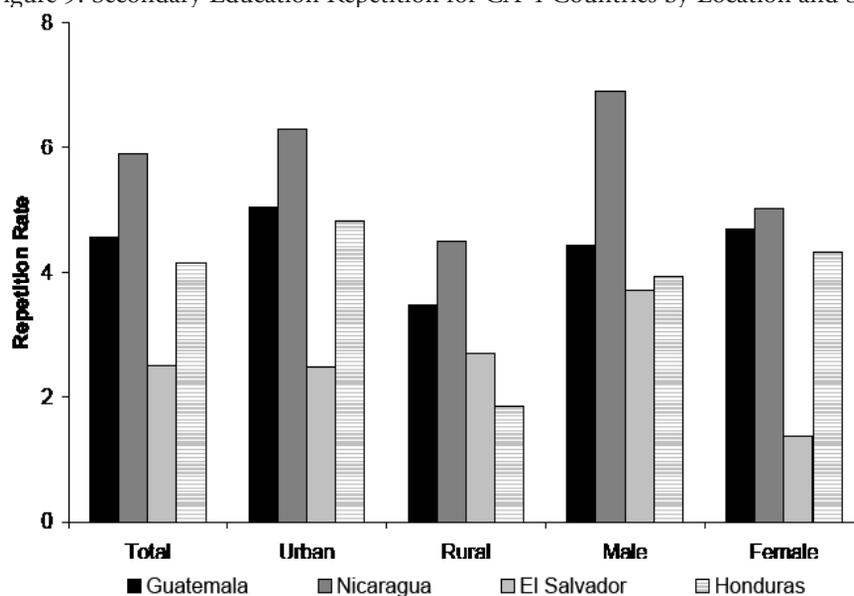
Table 3. Repetition for Primary Grades

Grades	El Salvador	Honduras	Nicaragua	Guatemala
Grade 1	20.9	20.9	12.3	21.7
Grade 2	13.4	17.1	10.2	13.4
Grade 3	7.0	11.5	8.5	8.6
Grade 4	10.0	8.1	5.6	7.7
Grade 5	6.5	6.9	5.2	3.5
Grade 6	4.0	5.1	2.8	5.0

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

In terms of secondary education, Figure 9 shows that Nicaragua has the highest repetition rate in all cases, followed by Guatemala and Honduras. These three countries also have the highest repetition rates in rural areas. In terms of gender disparity, Nicaragua has the highest repetition rate for boys, while in Guatemala girls are affected by greater levels of secondary education repetition.

Figure 9. Secondary Education Repetition for CA-4 Countries by Location and Sex



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

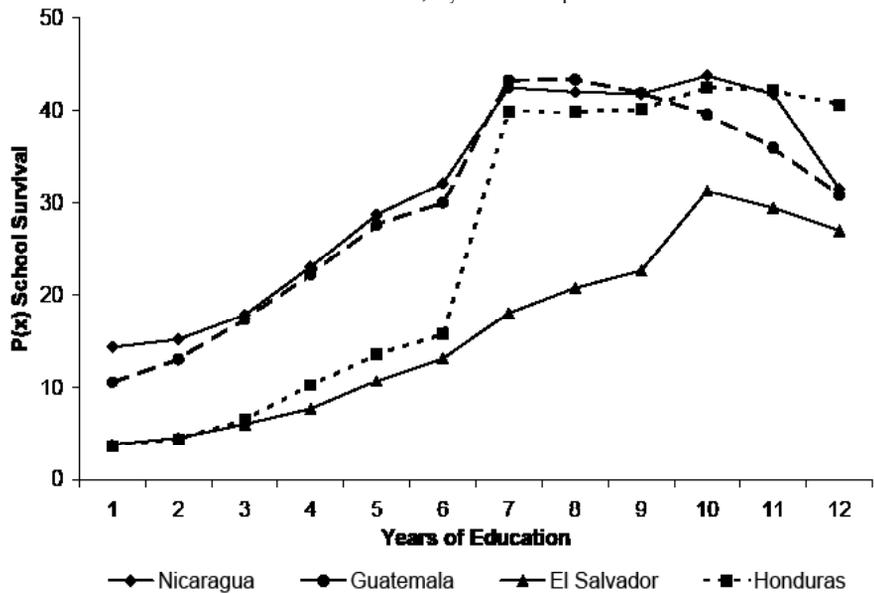


Disparities in the probability of school retention

Recently the World Bank calculated school retention rates for Central America, which enables the progress of a cohort of students to be estimated over time. As can be observed in Appendix A11, students in Central America desert school throughout the educational cycle. Guatemalan and Honduran students are least likely to remain in the school system and, consistent with results from other indicators, the country with the greatest student retention is El Salvador.

Using the survival functions method, retention rate tables have been developed for each of the CA-4 countries. The data has been broken down by income quintile, location, sex, and ethnicity (ladino and non-ladino). However, in order to simplify the understanding of existing gaps for the reader, the authors have devised a graphical interpretation of retention disparity between the poorest 20 percent and the richest 20 percent of the population, as well as urban-rural, male-female, and ladino-no-ladino disparities.

Figure 10. Disparities in the probability of school retention for CA-4 countries, by income quintile



Source: ENCOVI 2000, EMNV 2001, EHPM 2004, EHPM 2004.

It should be noted that Nicaragua is the country that presents the greatest disparities between the two income quintiles in terms of school retention probability. Figure 10 shows that students from the upper quintile are 70 percent more likely to complete secondary school (grade 11) than those from the poorest quintile. These results are observed for the other CA-4 countries as well, although to a lesser degree.

The relevance of this situation increases if we consider that a great many studies have shown the importance of increasing access to secondary education due to the fact that students do not acquire the human capital needed to overcome poverty until the secondary level. In this light, the design of interventions that make underprivileged groups a high priority is needed

so that these groups can learn to read and write as well as acquire key skills and tools that will enable them to break the cycle of poverty.

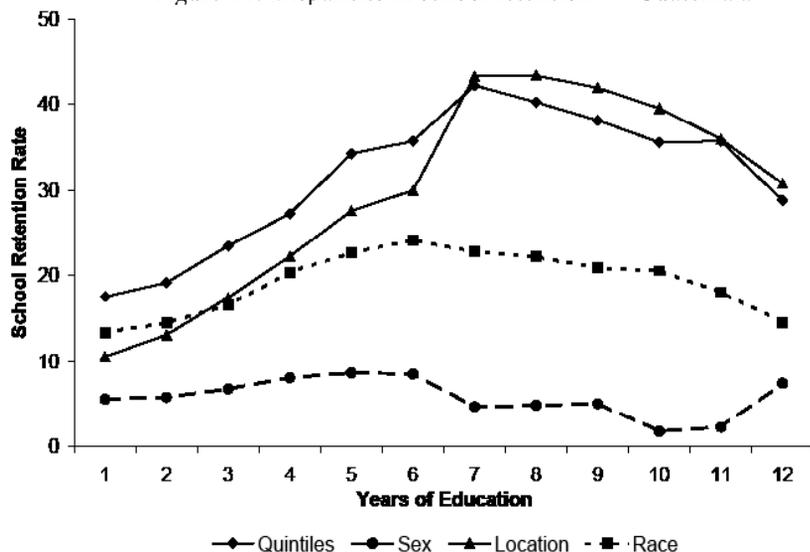
In terms of gender, El Salvador is the country with the greatest equity in school retention, while Nicaragua and Honduras present situations where there is a greater number of male school dropouts. Guatemala is the only country where girls are in a disadvantageous situation in terms of school retention (see Appendix A12).

In terms of retention disparities between rural and urban areas, students from rural areas show a higher dropout rate in Nicaragua and Guatemala. In these countries, students in sixth grade and higher from urban areas are 40 percent more likely to complete secondary school than their counterparts in rural areas (see Appendix A12). On the other hand, Honduras and El Salvador present a school retention disparity of less than 15 percent for the first five primary grades, reflecting a relatively small disparity between rural and urban areas in these countries.

Information on ethnicity is only available for Nicaragua and Guatemala. It is interesting to point out that while there is little school retention disparity among ethnic groups in Nicaragua, Guatemalans belonging to an indigenous ethnic group are significantly more likely to drop out of school than those not belonging to an ethnic group (see Appendix A12).

Figure 11 summarizes the analysis of school retention disparities in Guatemala. One can observe that people living in rural areas as well as those in the poorest 20 percent of the population have very little probability of remaining in the school system. In addition, these results suggest that rural students from the poorest 20 percent of the population comprise a target group where significant investment should be made in order to reduce the disparities in education equity in the country.

Figure 11. Disparities in school retention — Guatemala

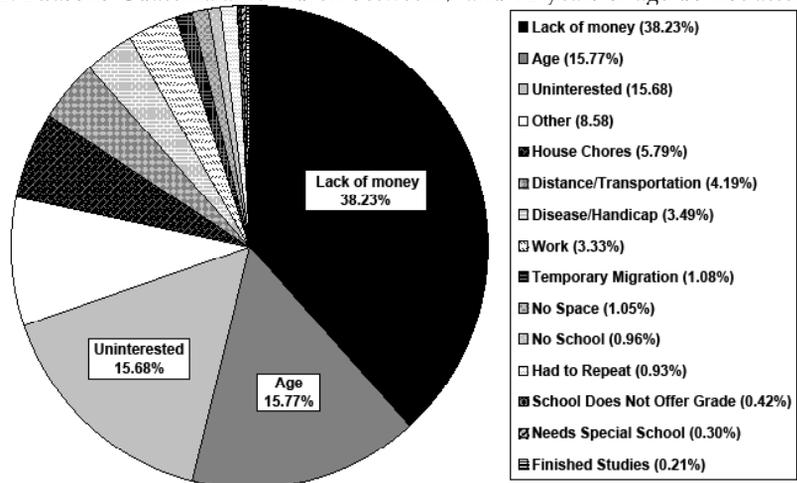


Source: ENCOVI 2000.



As has previously been mentioned, education has proven to be a good strategy to reduce poverty. However, as we saw in the preceding section, the poor have the greatest difficulty in accessing education. Primary education is free and obligatory in CA-4 countries. However, there are costs associated with going to school: transport, materials, uniforms, and other obstacles to student enrollment. In addition, child labor is still common in these countries for which attending class is often seen as an opportunity cost. As can be observed in Figure 12, in Guatemala a lack of money has been attributed to 38 percent of school non-attendance for the 7 to 12 age group.

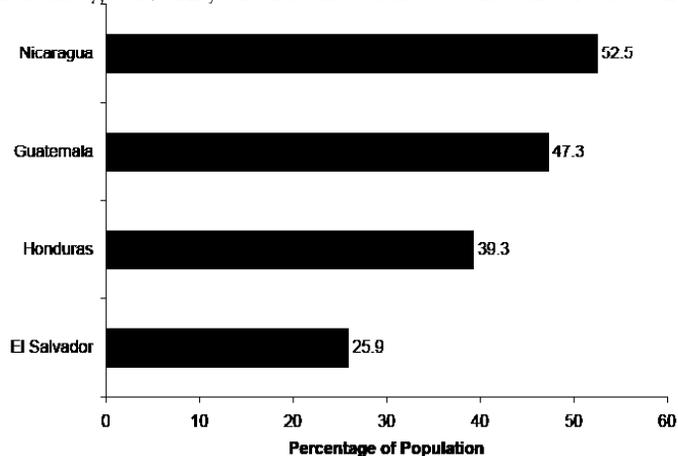
Figure 12. Reasons Guatemalan children between 7 and 12 years of age do not attend school



Source: ENCOVI 2000.

This same pattern repeats itself in the other CA-4 countries as shown in Figure 13. When responses associated with a lack of financial resources—lack of money, house chores, and work—are grouped together, we see how household economic limitations can account for 25 percent of school absenteeism—50 percent for Guatemala and Nicaragua.

Figure 13. Percentage of 7-12 year-olds that do not attend school due to financial problems



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

Probability model for school attendance

As a complement to the analysis discussed in the preceding section regarding school retention disparity by gender, location, income quintile, and ethnic group, a statistical verification of the degree to which these variables effectively link school attendance probability for school-age children and youths in the different countries has been conducted. For this purpose a probit model was developed for children and youths between 7 and 18 years of age:

$$\text{AttendOk} = \Phi_0 + Y_i \Phi_1 + Z_i \Phi_2 + \varepsilon_i$$

The “AttendOk” variable is a dichotomous variable (binary, with a value of either 0 or 1) that indicates whether an individual attends school or not. Y_i is a series of explanatory variables associated with student characteristics such as sex, location, work (whether or not the student works), and ethnicity (whether or not he/she belongs to an ethnic group). Z_i is a series of variables associated with the household of the individual such as number of people that live in the household, educational environment (years of study of the head of household), level of poverty, and if parental professions correspond to the primary sector (agriculture, livestock or hunting).

The results of the probit model can be observed in Table 4. One can note that for all the CA-4 countries, the factors that reduce the probability of school attendance—from 26 percent to 57 percent—are: the older age of students (confirming the risk of school delay), belonging to a large family, child labor, and belonging to an indigenous ethnic group. In terms of the level of education of heads of households and parents, the higher the years of study the greater the probability of school attendance—representing an external factor that has a positive effect on the educational level of the population. In appendices 12 to 15, one can observe that the coefficients obtained are statistically significant and have an affect on the prediction of the dependent variable (R2).

In addition, these results show that being a male in Guatemala increases the probability of school attendance by 50 percent, while in Honduras it decreases the probability by 29 percent. In Nicaragua, rural residents are less likely to attend school, while in El Salvador rural children have a greater likelihood of attending school than their urban counterparts. The data also confirm that children from households with lower income levels are at a disadvantage in terms of school attendance. However, the case of El Salvador suggests that designing education interventions that are focused on disadvantaged groups is an excellent positive discrimination mechanism.

In order to end the long history of inequality in Latin America and the Caribbean, the World Bank (2003) has proposed that nations make comprehensive reforms of their political, social and economic institutions, increase income of poor families, implement specific public policies to benefit disadvantaged citizens, and improve access to basic services, especially education.



Table 4. Results of the School Attendance Probability Model

Variables	Guatemala	Nicaragua	El Salvador	Honduras
Child sex: Male	51.1%	-0.7%	7.8%	-28.8%
Location: Rural	-3.8%	-12.1%	16.0%	-2.8%
Child age	-21.0%	-3.6%	-5.3%	-19.6%
Years of study, Head of household	N/A	0.2%	4.6%	7.8%
Years of study, Father	5.8%	N/A	N/A	N/A
Years of study, Mother	6.5%	N/A	N/A	N/A
Household among the poorest 20% of the population	-38.5%	-6.0%	10.3%	-20.0%
Number of people living in the household	-0.3%	-0.2%	-2.5%	-2.5%
Child works	-20.0%	-19.2%	-22.5%	-22.5%
Belongs to an ethnic group	-15.7%	-3.1%	N/A	N/A
Profession: Primary sector	29.8%	-8.1%	N/A	N/A
Model correction (R2)	0.5504	0.1911	0.4724	0.3528

Source: Appendices 13-16. Note: N/A means that the question doesn't apply for the survey model used for a specific country, due to limitations in household surveys.

Equity in Educational Investments

Nations should invest in the education of the underprivileged, providing children of poor parents with educational opportunities that they were denied. This will help to break the vicious cycle of poverty that has overwhelmed generations of Latin Americans. Education in developed societies such as that of the United States, has made what many call the “American dream” possible, where children from poor families receive high quality education that enable them to achieve greater levels of education and income generation than that of their parents.

However, as we will see below, state resources are not necessarily targeted at those with the greatest needs. Occasionally, a large part of available resources are exploited by privileged sectors of the population, which perpetuates social inequality and excludes the poor from economic development.

Investing in education: Where do we invest more?

Public investment in education provides a sense of the educational priorities of each country. One indicator that is commonly used is the education budget as a percentage of the gross domestic product (GDP). This indicator enables a comparison of priorities between different countries. The authors used this indicator to compare the efforts made by the CA-4 countries in terms of education investment, breaking down the results by income quintile and education programs, in order to determine how progressive or regressive investment was in each program. The estimates were based on cost per student using the calculations established by Di Gropello (2004), multiplied by the number of matriculating students in the school system and then divided by the GDP of the country for the year when the survey was conducted.

Figure 14a shows that the total investment in education made by the government in Honduras and El Salvador is progressive while it is severely regressive in Nicaragua. The trend in Guatemala is not clear, as it is regressive when observing the lower three quintiles but progressive when observing the upper two quintiles. In addition, one can see that Honduras is the country that invests most heavily in education while Guatemala is the country that invests the least.

In terms of public investment in primary education (see Figure 14b), one can observe that, with the exception of Guatemala, all countries follow a progressive trend. In this light, Guatemala should invest greater resources in improving enrollment and retention for children from the most disadvantaged sectors of society.

Public investment is more regressive for secondary education (see Figure 14c), with more resources going to groups with higher income levels. In Guatemala, about 8 million dollars are invested in students from the richest 20 percent of the population while only 2.5 million dollars are invested in the poorest 20 percent of students. In Honduras, investment ranges between 12 and 13 million for these two groups.

As can be seen in Figure 14d, Honduras and Nicaragua invest considerable amounts to finance higher education. These countries also are the ones that present the most regressive expenditures. Honduras invests 1 percent of its GDP to finance higher education for the highest income quintile, while Nicaragua invests 0.5 percent, equivalent to 72 and 25 million dollars respectively. With the 72 million dollars that Honduras invests in providing higher education to the highest income quintile, it could provide coverage to more than 900,000 preschool students, 400,000 primary students or more than 250,000 secondary students.

Although Guatemala, when compared to the other CA-4 countries, invests relatively few resources in higher education, it should be pointed out that 70% of these resources are invested in students from the highest income quintile. With these resources, the country could provide coverage to a little more than 77,000 primary students or 100,000 pre-school students.



Figure 14a. Public Investment in Education as a percentage of GDP by Income Quintile - All Programs

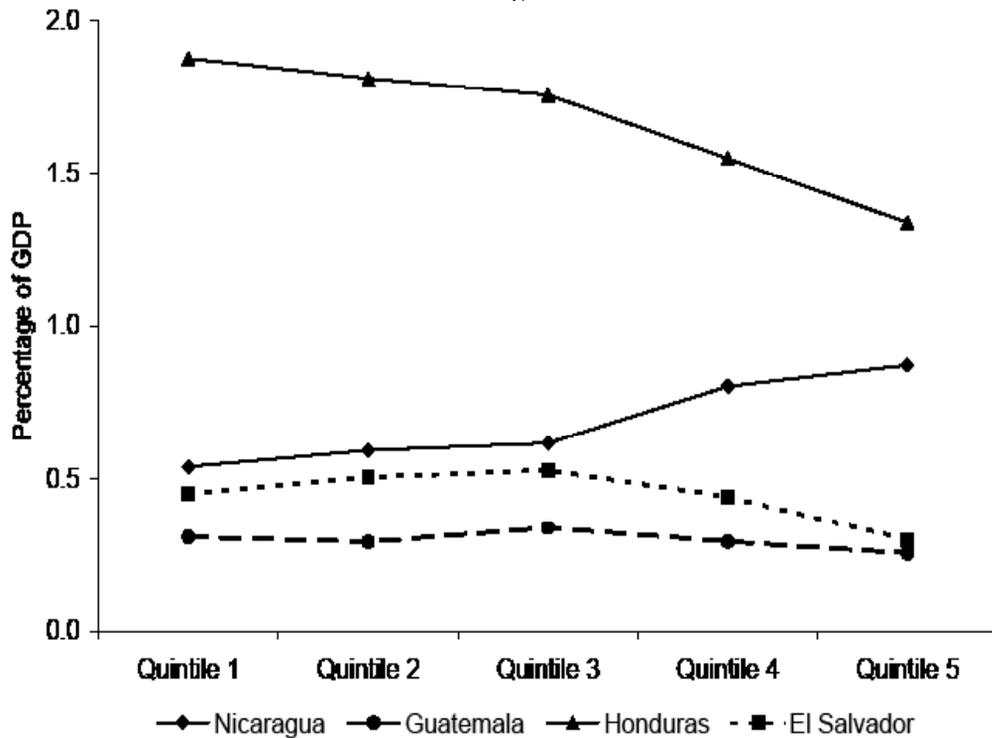


Figure. 14b Public Investment in Education as a percentage of GDP by Income Quintile - Primary

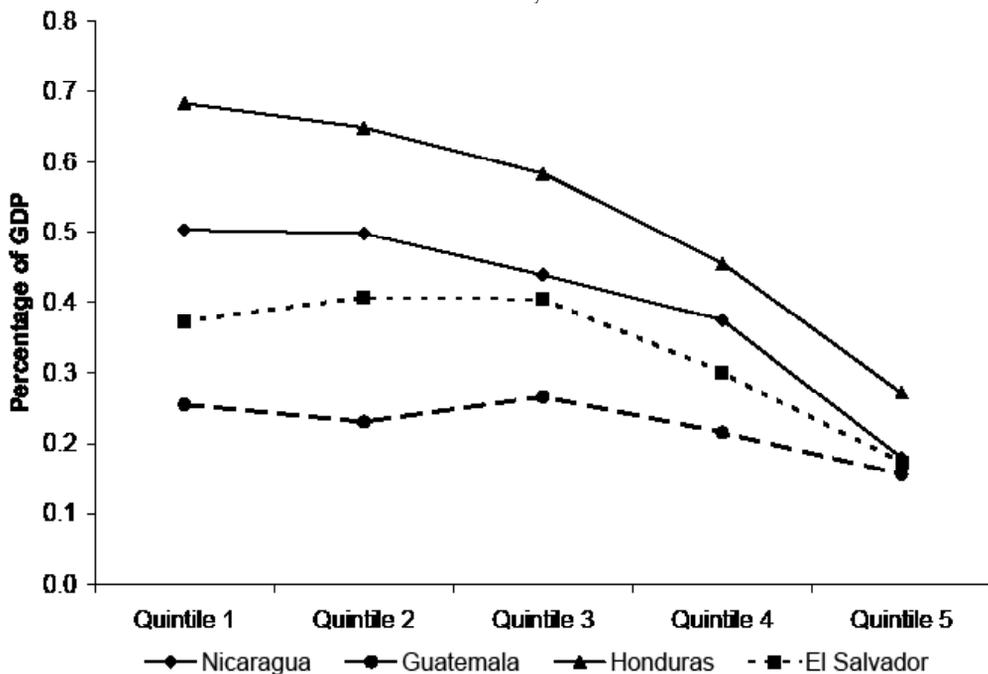


Figure 14c. Public Investment in Education as a percentage of GDP by Income Quintile - Secondary

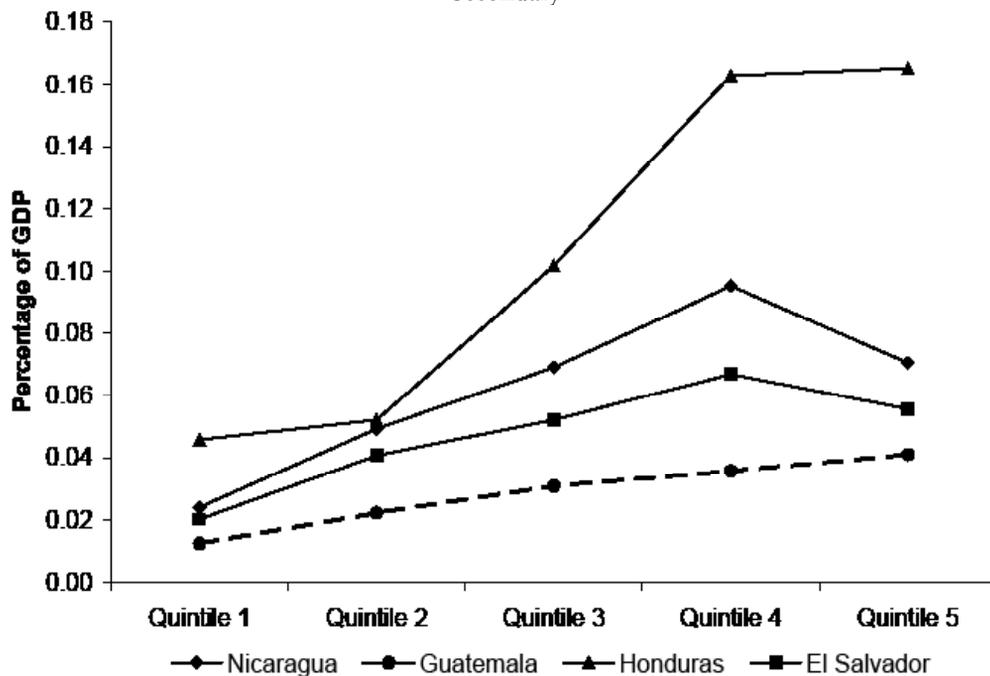
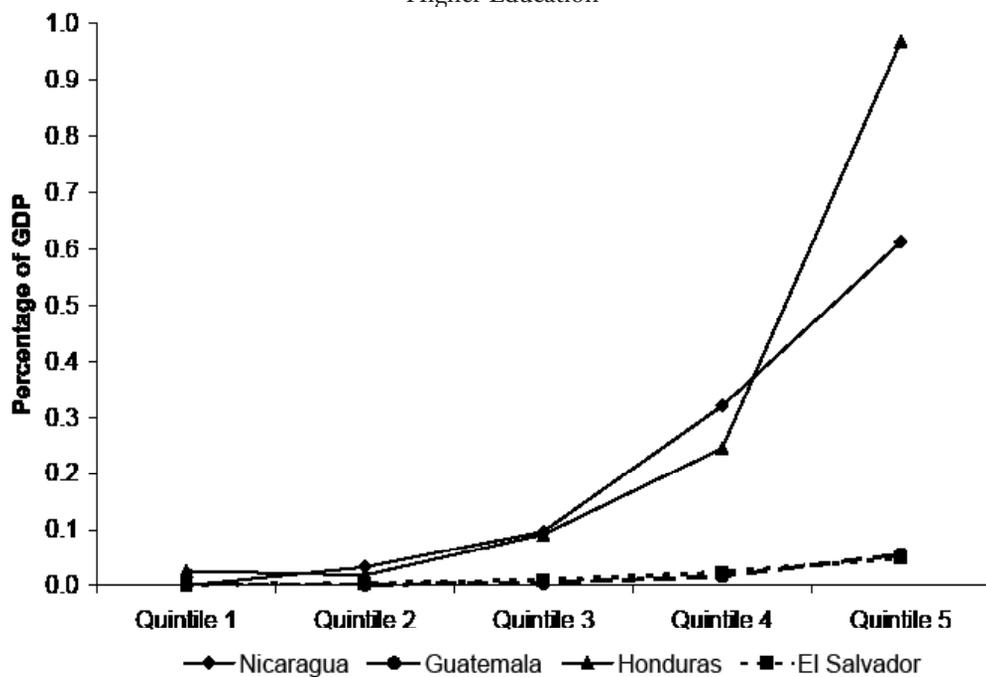


Figure 14d. Public Investment in Education as a percentage of GDP by Income Quintile - Higher Education



Source: ENCOVI 2000, EMNV 2001, EHPM 2004, EHPM 2004.



Based on the preceding information, we can categorically confirm that aside from the need to increase investment in education in Central America, these countries also have to face the challenge of making access to educational opportunities more equitable so that historically excluded can progress. The economic integration that the region is experiencing as a result of DR-CAFTA requires a considerable increase in the level of education of both the current and potential working class, especially for those that come from disadvantaged families.

Efficiency in public investment in education

For all of the CA-4 countries, the majority of state resources for education are used to pay teachers. Investment in support programs to foment enrollment and retention with the most disadvantaged sectors of the population is relatively low. In general, these programs are implemented through projects, which tend to be the first to be affected when budget cuts are made.

Despite this situation, it is helpful to determine whether these support programs are well focused. Due to a limited amount of information we are only able to evaluate the focus of some programs. With the exception of Honduras, all countries take advantage of household surveys to collect information regarding the distribution of school texts. Table 5 shows that the distribution of textbooks is efficient. However, distribution should be better focused, considering that almost a quarter of the textbooks are distributed to students from families that are among the richest 40% of the population.

Table 5. Percentage of free textbooks distributed by the government, per income quintile

Country	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Guatemala	28.7%	26.9%	20.6%	15.9%	7.9%
Nicaragua	28.9%	23.0%	26.0%	14.5%	7.5%
El Salvador	29.0%	25.9%	23.6%	14.3%	7.2%

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

In Nicaragua, the information collected from household surveys permits the analysis of the concentration of subsidies such as food, backpacks and clothing. The greatest percentage of beneficiaries is in the middle of the distribution (see Table 6), suggesting that efforts should be made to improve the parameters used in the distribution of these subsidies.

Table 6. Percentage of free subsidies distributed in Nicaragua, per income quintile

Subsidy	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Food	14.5%	27.3%	34.5%	19.2%	4.5%
Clothing/Backpack	24.7%	24.6%	29.6%	17.5%	3.6%

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

Finally, an analysis of the Guatemalan experience in the distribution of free notebooks and supplies shows a good distribution of resources that benefits a greater percentage of disadvantaged families.

Table 7. Percentage of free subsidies distributed in Guatemala, per income quintile

Subsidy	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Notebooks/Supplies	38.5%	21.9%	23.0%	9.5%	7.2%

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

Conclusions and Recommendations

This document reiterates the need to allocate greater resources for education. At the same time it stresses the need to improve how resources are invested in order to benefit the most disadvantaged sectors of the population and develop the human capacity necessary to increase standards of living and economic growth. The results make clear that there are significant gaps and inequalities in education among different populations in Guatemala, El Salvador, Honduras, and Nicaragua. At a time when markets are opening, the quantification of these inequalities can be used to generate dialogue on public policy and effective national development.

The main findings of this document that should be highlighted include the following:

- There is a correlation between increase in age and less participation in the school systems in the region and these disparities are greater among students from the two extremes of the socioeconomic spectrum, as students from disadvantaged families tend to abandon the school system at earlier ages.
- For all CA-4 countries, residents in rural areas have a disadvantage in terms of access to education.
- Differences manifested for gender inequality highlight the need for education interventions to take into account the distinct characteristics of each country rather than incorporating standardized plans.
- Although Guatemala is the country with the highest illiteracy rate, it is also the country that has made the most significant gains in reducing illiteracy over time.
- The use of the Gini coefficient index confirms that Guatemala is the country with the greatest inequality in enrollment distribution, followed by Nicaragua and Honduras. El Salvador presents the best education distribution among the different sectors in the country.
- El Salvador has made the greatest educational progress with the poorest 20% of the populations, showing an increase of two average school years in a decade (a rate similar to that of the Asian Tigers in the 1960s). Nicaragua has made little progress among the most disadvantaged sectors of the population with just 0.6 school years.
- All of the CA-4 countries suffer from problems of school repetition, with the highest rates being among males and students in rural areas. It should be highlighted that Honduras has the greatest repetition disparity between the different income quintiles.
- The existence of two-digit repetition rates in the early grades highlights the need to design strategies that reverse this situation without affected to quality of learning of minors at risk of school failure.
- The possibility of school survival decreases for each additional year that a student advances in the school system, especially among the poorest 20% of the population.
- Students from the highest income quintile have a much greater possibility of completing secondary school (11th grade) than those from disadvantaged families.
- The preceding situation is even more relevant when considering that secondary students



- are less likely to be poor. Intervention designs that prioritize disadvantaged groups are needed so that students from disadvantaged families not only learn to read and write, but also develop the fundamental skills and tools necessary to break the cycle of poverty.
- The disparities in the probability of remaining in the school system suggest that students from rural areas and students from the poorest 20% of the population should be the target of significant investment in order to reduce education inequalities in the region.
 - In terms of investing in education, it can be observed that the total investment made by the government in education is progressive in Honduras, El Salvador and Guatemala but highly regressive in Nicaragua. It should be mentioned that of the CA-4 countries, Honduras invests the greatest percentage of resources in education while Guatemala invests the lowest percentage.
 - It is important to point out that the countries with the most regressive investment in higher education are Honduras and Nicaragua, which invest 72 million (1%) and 25 million (0.5%) dollars respectively in providing higher education to students from the richest income quintile. Thousands of poor children and youths from these two countries are not enrolled in school, as they have no access to pre-school, primary or secondary education opportunities.
 - There is no doubt that Central America needs to increase and improve investment in education. At the same time, these societies have to face the challenge of working towards social justice and equality. Achieving peace as well as social and economic development in these countries depends, in large part, on meeting these challenges.

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Appendices

A1. Enrollment Rates among CA-4 Countries (poorest quintile and wealthiest quintile)

School-age population	Guatemala		El Salvador		Nicaragua		Honduras	
	Poorest 20%	Wealthiest 20%						
7-12 years	79.6	94.3	77.5	96.5	84.8	98.2	88.8	98.5
13-15 years	54.9	78.3	69.1	87.0	71.9	91.8	53.8	90.3
16-17 years	28.1	60.2	36.2	67.6	47.5	81.8	27.7	71.8
Total	67.2	83.3	69.3	87.8	76.5	93.0	71.5	90.3

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

A2. Rural/Urban disparities in Enrollment Rates among CA-4 Countries

School-age population	Guatemala	Nicaragua	El Salvador	Honduras
7-12 years	10.2	11.3	4.8	5.6
13-15 years	25.8	21.4	15.8	26.0
16-17 years	33.7	34.4	26.6	33.9
Total	17.1	16.9	11.2	13.8

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.



A3. Gender disparities in Enrollment Rates among CA-4 Countries

School-age population	Guatemala	Nicaragua	El Salvador	Honduras
7-12 years	5.1	-1.4	0.3	-0.9
13-15 years	6.4	-6.5	2.8	-2.5
16-17 years	9.2	-12.2	2.6	-4.8
Total	6.7	-4.3	1.7	-1.9

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

A4. Illiteracy Rate, by income quintile

Country	Quintile					Total
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	
Guatemala	52.3	47.2	35.3	24.1	11.0	31.7
Nicaragua	40.9	32.4	24.8	17.9	8.4	22.2
El Salvador	34.8	23.9	19.3	12.7	6.2	17.1
Honduras	31.8	27.7	18.7	11.9	5.0	16.9

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

A5. Illiteracy rates for individuals 15 years of age and older, per age group

Age group	Guatemala	Nicaragua	El Salvador	Honduras
60 and older	59.8	50.5	43.9	48.87
55-59	52.2	43.1	28.5	33.24
50-54	52.7	36.3	23.4	26.19
45-49	40.4	29.4	21.8	21.94
40-44	32.8	26.0	18.5	18.12
35-39	33.0	20.1	13.7	15.95
30-34	27.4	14.7	11.7	13.39
25-29	23.5	15.2	8.5	10.96
20-24	20.3	16.2	7.3	10.43
15-19	16.8	12.3	5.1	8.11

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

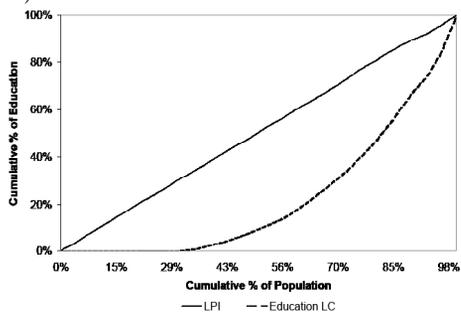
A6. Education accumulation, by percentile

Percentile	El Salvador	Honduras	Nicaragua	Guatemala
10	0.0%	0.0%	0.0%	0.0%
20	0.8%	2.5%	0.3%	0.0%
25	2.1%	4.9%	2.0%	0.0%
40	8.7%	15.4%	10.5%	3.5%
50	16.1%	23.9%	19.3%	9.4%
75	45.9%	52.7%	49.2%	38.8%
80	54.9%	60.7%	57.1%	47.3%
90	73.5%	78.5%	75.6%	69.0%

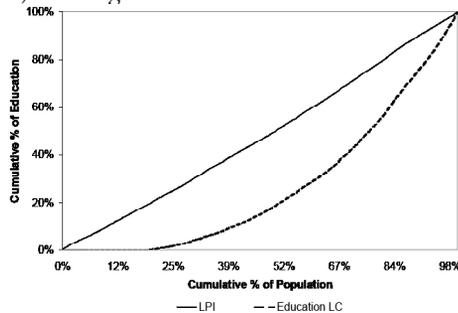
Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

A7. Country Lorenz Curves

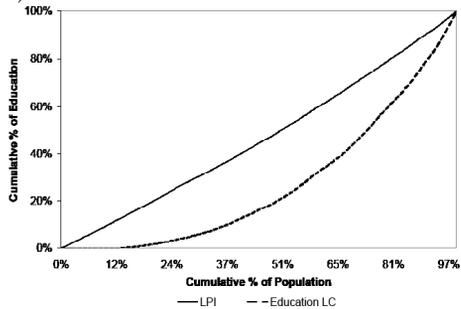
a) Guatemala



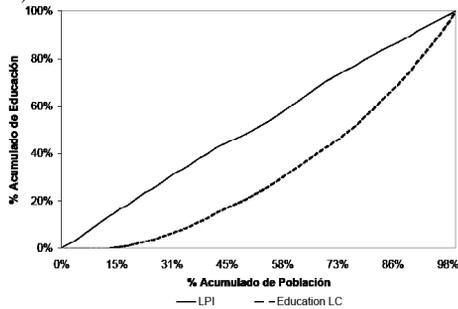
b) Nicaragua



c) El Salvador



d) Honduras



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.



A8. Average years of education, by income quintile (25 to 45 years of age)

Quintile	Nicaragua	Guatemala	El Salvador	Honduras
Quintile 1	3.3	1.8	3.7	3.4
Quintile 2	4.5	2.3	5.1	3.7
Quintile 3	5.4	3.1	6.2	5.0
Quintile 4	7.2	5.1	8.0	6.6
Quintile 5	9.3	8.7	11.3	10.0
Total	5.9	4.6	7.6	6.0

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

A9. Average years of education, by income quintile (15 to 24 years of age)

Quintiles	Nicaragua	Guatemala	El Salvador	Honduras
Quintile 1	3.9	3.0	5.4	4.6
Quintile 2	4.9	3.8	6.4	4.8
Quintile 3	5.9	5.2	7.4	6.1
Quintile 4	7.0	6.6	8.8	7.2
Quintile 5	8.8	8.6	10.2	9.0
Total	6.4	5.9	7.9	6.5

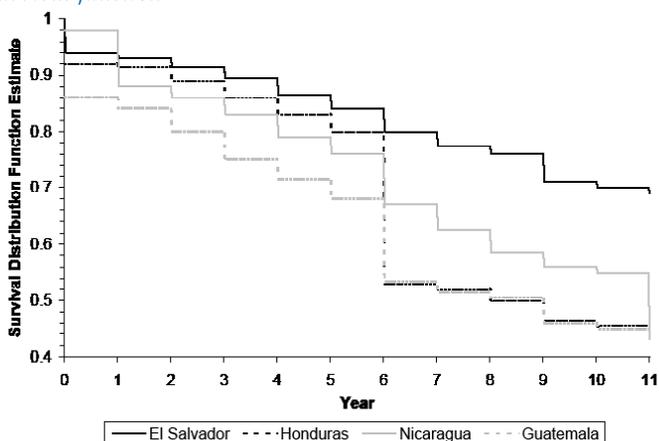
Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

A10. Primary repetition rate, by income quintile

Country	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Guatemala	15.2	15.4	13.5	9.8	5.5
Nicaragua	9.9	8.7	8.0	9.1	4.1
Honduras	28.6	28.4	23.4	12.8	6.8
El Salvador	12.9	11.7	9.4	7.4	7.0

Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

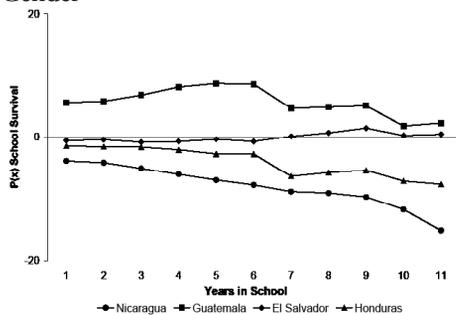
A11. School survival function



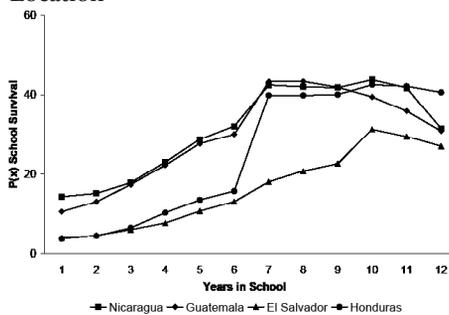
Source: World Bank (2005)

A12. Disparities in the probability of remaining in the school system

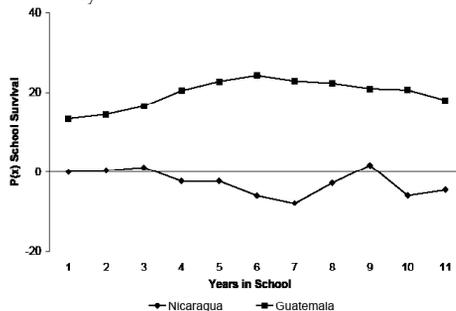
Gender



Location



Ethnicity



Source: ENCOVI 2000, EMNV 2001, EPHPM 2004, EHPM 2004.

A13. School attendance probability model for children between 7 and 18 years of age - Guatemala

Marginal Impacts

Number of obs = 34218	Log pseudo-likelihood = -1992.65	Prob > chi2 = 0.000000
Pseudo R2 = 0.5504	Wald chi2(10) = 6549.08	

attendok	dF/dx	Robust Std. Err.	z	P>z	x-bar	[95% Conf. Interval]	
Male*	0.5107	0.0103	44.54	0.0000	0.5126	0.4906	0.5308
Rural*	-0.0381	0.0085	-4.54	0.0000	0.6579	-0.0547	-0.0215
Age	-0.2098	0.0037	-65.57	0.0000	15.1765	-0.2170	-0.2027
Education of father	0.0579	0.0021	27.88	0.0000	3.3748	0.0537	0.0620
Education of mother	0.0647	0.0024	27.73	0.0000	2.1504	0.0600	0.0694
Q1* (poorest 20%)	-0.3851	0.0084	-36.77	0.0000	0.2551	-0.4015	-0.3687
Members of household	-0.0031	0.0014	-2.29	0.0220	5.5814	-0.0057	-0.0004
Child Labor*	-0.2002	0.0112	-17.12	0.0000	0.4196	-0.2222	-0.1782
Ladino*	-0.1569	0.0081	-19	0.0000	0.3774	-0.1727	-0.1410
Agriculture*	0.2979	0.0077	37.64	0.0000	0.5382	0.2829	0.3130
obs. P		0.3518908					
Pred. P		0.3347854	(at x-bar)				

(*) dF/dx is for discrete change of dummy variable from 0 to 1

Source: developed by the authors, based on ENCOVI 2000



A14. School attendance probability model for children between 7 and 18 years of age – Nicaragua
Marginal Impacts

Number of obs = 1649125	Log pseudo-likelihood = -735677.8
Pseudo R2 = 0.1911	Wald chi2(9) = 2.70E+05

attendok	dF/dx	Robust Std. Err.	z	P>z	x-bar	[95% Conf. Interval]	
Male*	-0.0074	0.0007	-10.81	0.0000	0.5106	-0.0088	-0.0061
Rural*	-0.1212	0.0008	-147.7	0.0000	0.4421	-0.1228	-0.1196
Age	-0.0356	0.0001	-309.6	0.0000	12.3042	-0.0358	-0.0354
Education of head of household	0.0017	0.0000	54.79	0.0000	5.6126	0.0016	0.0018
Q1* (poorest 20%)	-0.0600	0.0010	-65.28	0.0000	0.1923	-0.0619	-0.0581
Members of Household	-0.0022	0.0001	-19.24	0.0000	7.1488	-0.0025	-0.0020
Child Labor*	-0.1916	0.0010	-204.69	0.0000	0.1937	-0.1936	-0.1896
Ladino*	-0.0309	0.0016	-18.28	0.0000	0.9603	-0.0340	-0.0277
Agriculture*	-0.0807	0.0009	-95.36	0.0000	0.3474	-0.0824	-0.0790
obs. P		0.759657					
Pred. P		0.801031	(at x-bar)				

(*) dF/dx is for discrete change of dummy variable from 0 to 1

Source: developed by the authors, based on EMNV 2001

A15. School attendance probability model for children between 7 and 18 years of age – Honduras
Marginal Impacts

Number of obs = 7981	Log pseudo-likelihood = -3095.1649	Prob > chi2 = 0.000000
Pseudo R2 = 0.3528	Wald chi2(7) = 2726.57	

attendok	dF/dx	Robust Std. Err.	z	P>z	x-bar	[95% Conf. Interval]	
Male*	-0.2877	0.0124	-26.33	0.0000	0.6295	-0.3081	-0.2672
Rural*	-0.0281	0.0144	-1.92	0.0550	0.2854	-0.0517	-0.0044
Age	-0.1955	0.0179	-11.64	0.0000	17.3989	-0.2250	-0.1661
Education of Head of Household	0.0781	0.0026	25.94	0.0000	5.8341	0.0738	0.0824
q2* (poorest 40%)	-0.1997	0.0065	-20.63	0.0000	0.0950	-0.2105	-0.1890
Total members of household	-0.0250	0.0033	-7.4	0.0000	2.9602	-0.0305	-0.0195
Child Labor*	-0.2252	0.0223	-10.54	0.0000	0.4769	-0.2619	-0.1885
obs. P		0.286806					
Pred. P		0.192662	(at x-bar)				

(*) dF/dx is for discrete change of dummy variable from 0 to 1

Source: developed by the authors, based on EPHPM 2004

A16. School attendance probability model for children 7 and 18 years of age – El Salvador

Marginal Impacts

Number of obs = 7660	Log pseudo-likelihood = -1992.65	Prob > chi2 = 0.000000
Pseudo R2 = 0.4724	Wald chi2(7) = 2010.93	

attendok	dF/dx	Robust Std. Err.	z	P>z	x-bar	[95% Conf. Interval]	
Male*	0.0782	0.0063	10.28	0.0000	0.6655	0.0679	0.0886
Rural*	0.1600	0.0083	25.18	0.0000	0.5860	0.1464	0.1736
Age	-0.0533	0.0019	-20.69	0.0000	17.4330	-0.0565	-0.0501
q1* (poorest 20%)	0.1027	0.0096	12.93	0.0000	0.0799	0.0869	0.1184
Members of household	-0.0252	0.0027	-11.97	0.0000	2.6672	-0.0297	-0.0208
Education of head of household	0.0456	0.0016	27.22	0.0000	6.4474	0.0430	0.0482
Child Labor*	-0.2248	0.0145	-23.03	0.0000	0.6251	-0.2487	-0.2009
Obs. P		0.194778					
pred. P		0.050438	(at x-bar)				

(*) dF/dx is for discrete change of dummy variable from 0 to 1

Source: developed by the authors, based on EHPM 2004.



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