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Education Inequalities in Latin America and the Caribbean

Raquel Fernández[*], Carmen Pagés[+], Miguel Székely[++], Ivonne Acevedo[++]

Education is a crucial asset for a country's economic prospects and for its inhabitants. In addition to its direct impact on growth via the accumulation of human capital, it is a critical ingredient in producing an informed citizenry, enhancing their ability to obtain and exert human and political rights and their facility to adapt to changing environments (generated by, e.g., technological or climatic change) among other benefits.

In this chapter, we study education inequality in LAC (both in quantity and quality), assess how it emerges and amplifies or dampens existing inequalities, and examine the interaction of education inequality with other forms of inequality, primarily income and labor market outcomes. Our analysis is based on primary data from multiple sources.

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1. Introduction

Education is a crucial asset for a country's economic prospects and for its inhabitants. In addition to its direct impact on income and economic growth via the accumulation of human capital, it is also a critical ingredient in producing an informed citizenry, enhancing each person´s ability to obtain and exert human and political rights and as well as their ability to adapt to changing environments among other benefits. Education is also normally regarded as one of the most powerful mechanisms for economic mobility and for creating a level playfield in society, allowing individuals born in less favored environments to access the same opportunities as others.[2]

In this chapter, we study education inequality in LAC (both in quantity and quality) and analyze how that inequality is related to family background, which is an indicator of the extent to which education is playing its role as an equalizer.[3]

In section 2, we analyze progress in education access along the region and show that large disparities in attainment between countries are still prevalent and that countries are progressing at different rates. While most countries have achieved practically universal attendance rates at the primary and lower secondary levels, they differ in the proportion of the school-age population that graduates from upper secondary (normally attended at ages 15-17). Consequently, large differences exist in the proportion of youth that can access and graduate from higher education.

Section 3 investigates the extent to which educational attainment (education *quantity*) is linked to family background, gender, and urban/rural location in LAC. A significant result is that having a parent with at least upper-secondary education determines, to a large extent, the educational attainment of their children, especially regarding higher education. The relationship between family background and children's educational attainment is considerably stronger than in the United States and Korea but similar to what is found in other comparator countries such as Spain and Turkey. Additionally, while the intensity of the relationship between family background and upper secondary completion for the current generations in LAC has been declining, completing tertiary education remains highly dependent on parental education and, in some countries, this relationship has become stronger in the last twenty years. Interestingly, while gender inequalities in education have practically vanished in the past 20 years – with gaps shifting in favor of females- – rural-urban gaps in educational attainment have increased in many countries, particularly for higher education.

[2] For example, a number of empirical studies have analyzed the association between human capital accumulation and income inequality (Blundell, 2022; Coady & Dizioli, 2018; Gasparini & Cruces, 2021).

[3] In developed countries, an extensive literature have analyzed how the intergenerational income transmission is associated with educational outcomes (Rothstein, 2019; Handy & Shester, 2022; von Stumm, Cave, & Wakeling, 2022), and for the Latin American region the literature has focused on the intergenerational mobility in education (Neidhöfer, Ciaschi, & Gasparini, 2021; Munoz, 2021; De La Mata, et al., 2022), or the association between income and education inequality (Trucco, 2014; UNDP, 2021; Busso & Messina, 2020).

In Section 4, we examine inequalities in the *quality* of education by comparing test scores of children around 15 years of age by parental education. We find that, in general, test scores in Latin America are low compared with other countries in the world, and that, within countries, the correlation between test scores and the parental education is high, although not significantly above what is observed elsewhere. This suggests that schools in the region generally perform poorly, regardless of students' socioeconomic backgrounds. However, we find that LAC is atypical in the large differences in average scores observed between public and private schools, with scores in public schools significantly lower than in other regions. In addition, school attendance in private schools is among the most socio-economically segregated in the world: children of high socioeconomic backgrounds that attend private schools relate, to a large extent, only with similarly high socioeconomic background peers. Another dimension in which LAC countries differ from comparators is that differences in education quality (as measured by test results) between urban and rural areas are atypically high. Section 5 discusses an important consequence of education inequality: its impact on income inequality, as measured by the economic returns to education. Finally, Section 6 offers some concluding remarks.

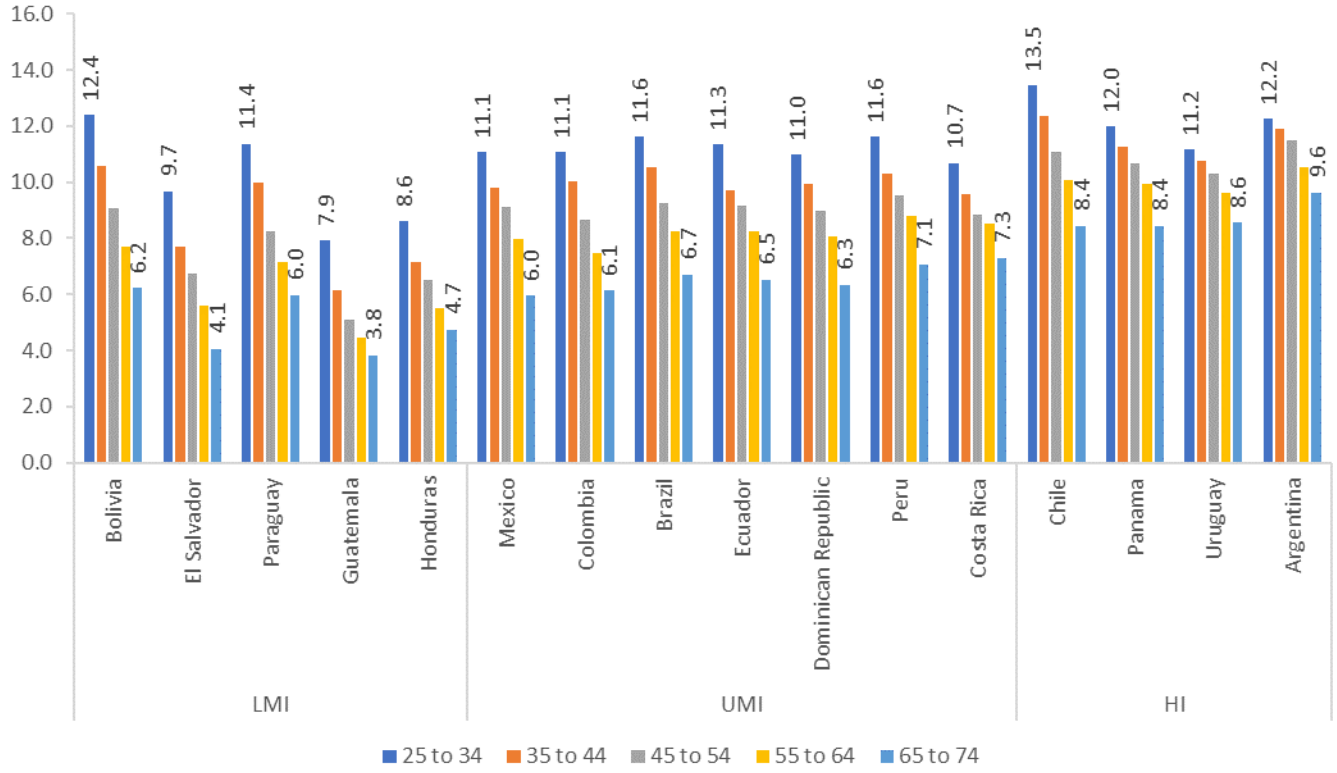
2. Progress in Education in LAC

The Latin American region is characterized by large differences in average education levels across countries. For the rest of the chapter, we use the World Bank income categories for the period 2010-2020 to classify Latin American countries in Low Middle Income (LMI), Upper-Middle Income (UMI), and High Income (HI).[4] As shown in Figure 1, according to data from household surveys circa 2019, the average years of schooling attained by the 25-34 cohort – the age at which the educational period has typically been completed—were well below 11 (equivalent to completing the second year of upper secondary education) in Guatemala, Honduras, El Salvador, and Costa Rica; they were between 11 and 11.6 in the Dominican Republic, Mexico, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Brazil, and 12, 12.2, 12.4 and 13.5, in Panama, Argentina, Bolivia, and Chile, respectively.

Education progress across generations also differs significantly among countries. Figure 1 shows the average years of education attained by different cohorts. Comparing the 25-34 and the 65-74 age cohorts, the average years of education increased by more than 5 years in El Salvador, Mexico, Paraguay, Chile, and Bolivia. In comparison, they increased by 4 years or less in Honduras, Costa Rica, Uruguay, Panama, and Argentina. In the rest of the countries, progress ranged between 4.1 and 5 years. This is not surprising as the first group of countries, with the exception of Chile, started at a much lower base.

[4] We classify countries according to the following criteria: (i) Lower-middle income (LMI) for countries classified as LMI at least in 2010-2020; (ii) Upper-middle income (UMI) for countries classified as UMI during the entire 2010-2020 period; (iii) High-Income for countries that were classified as HI at least once during 2010-2020.

Figure 1: Years of schooling by cohort, circa 2019



Source: Authors' calculations based on household or employment surveys. Argentina (only urban coverage) – EPH (2019) , Bolivia – ECH (2019), Brazil – PNADC (2019), Chile -CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). See Annex B for a detailed data description.

Table 1 shows attendance rates for children who are currently of school age circa 2019 in the same countries and illustrates that with the exceptions of Guatemala, Honduras and El Salvador, these rates are practically universal across the region for primary and lower secondary education -with an average of 97 and 94 percent, respectively.[5]

Differences emerge when reaching ages 15-17 and 18 and above. For ages between 15 and 17, when youth is expected to course upper secondary schooling -which normally ranges between 10th and 12th grades- attendance rates range from less than 60 percent in Guatemala and Honduras, to between 70 and 90 percent in Brazil, Colombia, the Dominican Republic, Ecuador, Mexico, Peru, Paraguay, El Salvador, and Uruguay. Only Argentina, Bolivia, Chile and Costa Rica register rates above 90 percent. This shows that the main bottleneck in LAC´s education systems is reaching and completing the upper secondary level and, consequently, being eligible for higher education. Therefore, in the rest of the paper, we focus on the factors behind reaching these education levels.

[5] Inequality in access to early childhood education is analyzed in a separate chapter by Attanasio and Lopez-Boo.

Table 1: Attendance rates circa 2019

Country	Primary	Lower Secondary	Upper Secondary	Higher Education
Argentina	99.1	97.7	92.4	52.5
Bolivia	98.9	96.3	91.1	56.2
Brazil	99.4	98.9	89.7	33.4
Chile	98.8	99.4	94.1	51.3
Colombia	96.7	93.9	77.8	34.3
Costa Rica	99.5	98.2	91.7	55.8
Dominican Republic	97.0	95.9	87.8	41.6
Ecuador	98.6	96.5	85.0	37.0
Guatemala	87.8	80.8	57.6	20.4
Honduras	95.5	74.3	55.5	24.4
Mexico	98.8	95.1	77.6	40.5
Panama	98.9	96.3	88.5	42.4
Peru	96.5	96.6	81.6	43.1
Paraguay	99.1	96.2	82.6	37.1
El Salvador	95.9	92.4	74.1	27.5
Uruguay	99.3	98.0	89.2	47.8
Average	97.5	94.2	82.3	40.3

Note: The attendance rates are calculated as the number of children from a cohort who attend school divided by the total population of children in that cohort. For primary, the theoretical age is 6 to 11 years old, for lower-secondary 12 to 14 years old, for upper-secondary 15 to 17, and for tertiary 18 to 23 years old.
Source: Authors' calculations based on household or employment surveys. Argentina (only urban coverage) – EPH (2019) , Bolivia – ECH (2019), Brazil – PNADC (2019), Chile -CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). See Annex B for a detailed data description.

3. Inequality in the quantity of education

In this section, we first assess the extent to which family socioeconomic status, as proxied by parents' educational attainment, is correlated with children's educational attainment. Second, we look at how the urban/rural and gender divides affect the probability of completing different levels of education. We analyze the education of the 25-34 cohort since at this age it is quite likely that a major part of a person´s investment in education has been completed. In all our figures, we group countries according to income groups.

Parental educational background

Most household surveys do not provide information on parents' education for the 25-34-year-old cohort. We therefore use OECD data from the Survey of Adult Skills (PIAAC) for the countries of the region for which these data are available (Chile, Ecuador, Mexico, and Peru). PIAAC is a skills proficiency survey taken to the adult population in more than 40 countries or territories. It assesses proficiency levels in literacy, numeracy and other skills. In addition, we utilize data from

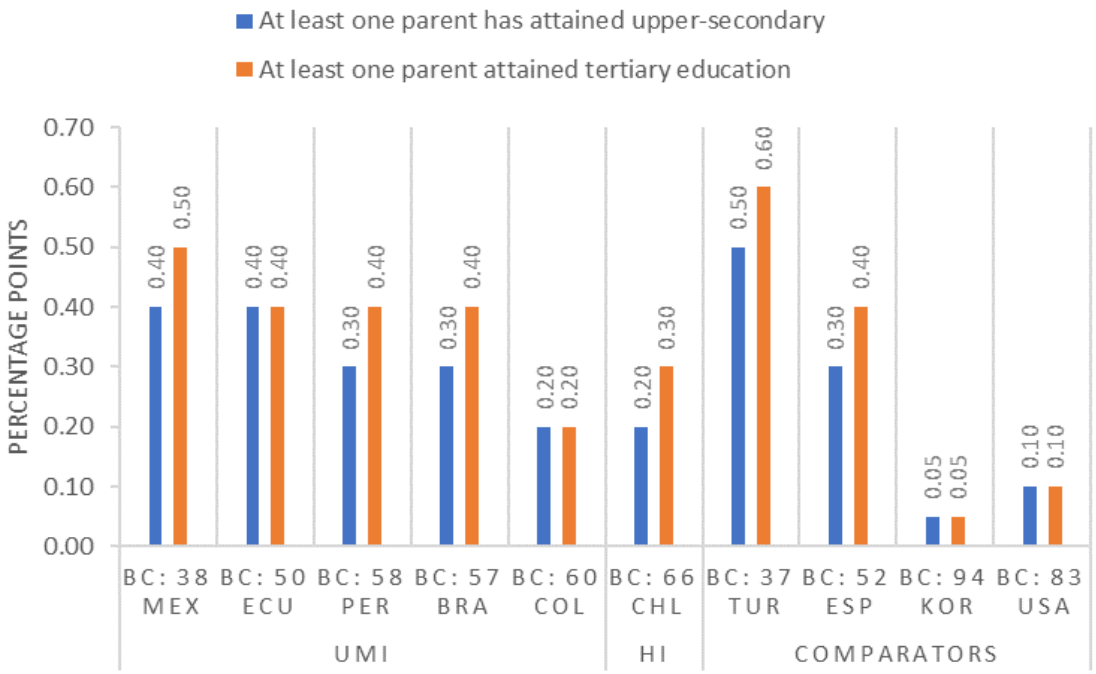
the National Survey of Quality of Life (2019) for Colombia and the PNAD 2014 for Brazil. For a description of these data sources, see Annex B.

Since PIAAC data is available for over 40 countries, we can compare the results for the region to those of other countries. We selected as comparators: Turkey, because it is a middle-income country, Spain and Korea because they were middle-income countries a few decades ago, and the U.S. because it is commonly used as a reference. Korea was also chosen due to its impressive educational performance.

Figure 2 shows the *increase* in the probability of attaining at least upper secondary for a person with parents of given education levels over a baseline level of someone whose parents did not complete an upper-secondary education. Adding the marginal probabilities to the value of the base category (indicated by "BC" in the figure) yields the total attainment rate for each parental education category. This is shown for individuals with: (i) at least one parent obtaining an upper-secondary education (blue bar) and (ii) at least one parent obtaining a tertiary level education (orange bar). The results are obtained from estimating a Logit model of the probability of completing at least upper secondary, controlling for the gender of the person and an age indicator (within the 25-34 age bracket). All probabilities are evaluated at the mean of the variables (See Table 1.A in Annex A for the full set of coefficients).

The results in Figure 2 indicate the importance of having at least one parent with an upper secondary education (the blue bar) for a child to also attain at least the same level. This effect is particularly high in Mexico, Ecuador, Peru, and Brazil and lowest in Colombia and Chile. It is noteworthy that this effect is much lower in two of the comparators -the United States and Korea. The effect of having at least one parent with higher education is also large, though only marginally greater than the effect of having at least one parent with upper secondary education. The results also indicate that in the six Latin American countries available in the sample, with the exception of Colombia, an individual with college-educated parents achieves upper secondary graduation rates of around 90% or greater, similar or higher that those attained by an individual with college-educated parents in the comparator country sample.

Figure 2: Marginal effects of parental education for upper-secondary school completion

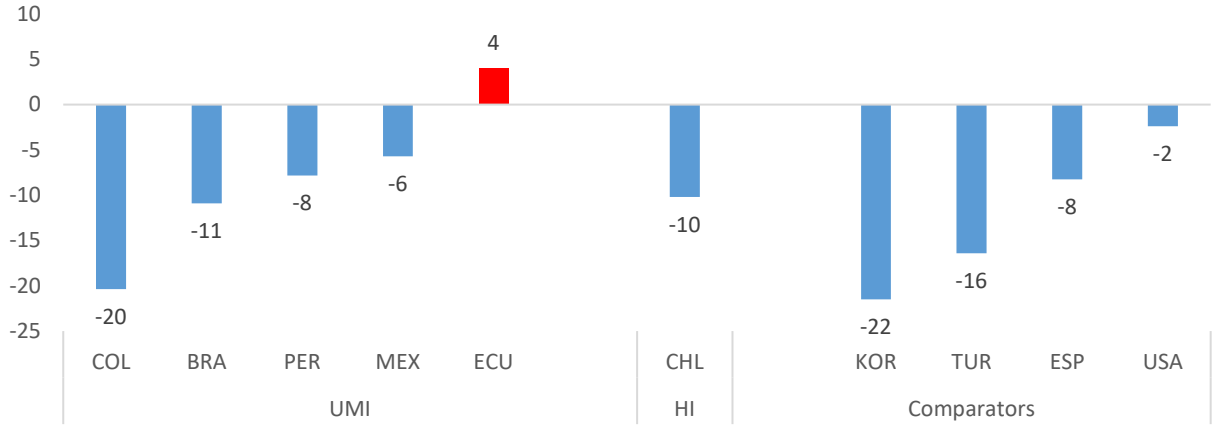


Note: Marginal effects (average partial effects) from a logit regression controlling for parental education, gender (female=1), and age fixed-effects. BC is the baseline category corresponding to "neither parent has attained upper-secondary" and the number beside it gives the percentage of the children with parents in that category that complete upper secondary. The cohort studied is of ages 25-34. BRA=Brazil, COL=Colombia, CHL=Chile, ECU=Ecuador, MEX=Mexico, PER=Peru, ESP=Spain, KOR=South Korea, TUR=Turkey, USA=United States.

Source: For Chile, Ecuador, Mexico, Peru, South Korea, Spain, Turkey, and the United States calculations using the PIAAC, 2017; for Spain, South Korea, the data was collected in 2011-2012; for Chile and Turkey, the data was collected in 2015, and for the rest of the countries is 2017. For Brazil, the estimates are calculated using the PNAD 2014-Supplement of Socio-employment Mobility and Supplement of Education and Professional Qualification surveys. For Colombia, the source is National Survey of Quality of Life (2019). For the United States, the specification does not include age fixed-effects.

The influence of parental education on secondary school completion has tended to decline over time. Figure 3 shows the evolution of the gap between the share of children who completed at least upper secondary with at least one parent holding tertiary education (S_H) and those whose parents have not completed upper secondary education (S_L). We examine two cohorts: one 25-34 years old and the other 45-54 years old (both in the same dataset). To study the evolution of this gap, we subtract the gap for the older cohort $(S_H - S_L)_{45-54}$ from the gap of the younger cohort $(S_H - S_L)_{25-34}$. For all Latin American countries analyzed, except for Panama, the gap has declined for the younger generation, with an especially large decline in Colombia. Overall, these results suggest a decline in the influence of family background on education attainment.

Figure 3: Difference in the share of children who complete upper secondary school by parental education (tertiary (H) versus less than upper secondary (L)) for two cohorts $(S_H - S_L)_{25-34} - (S_H - S_L)_{45-54}$



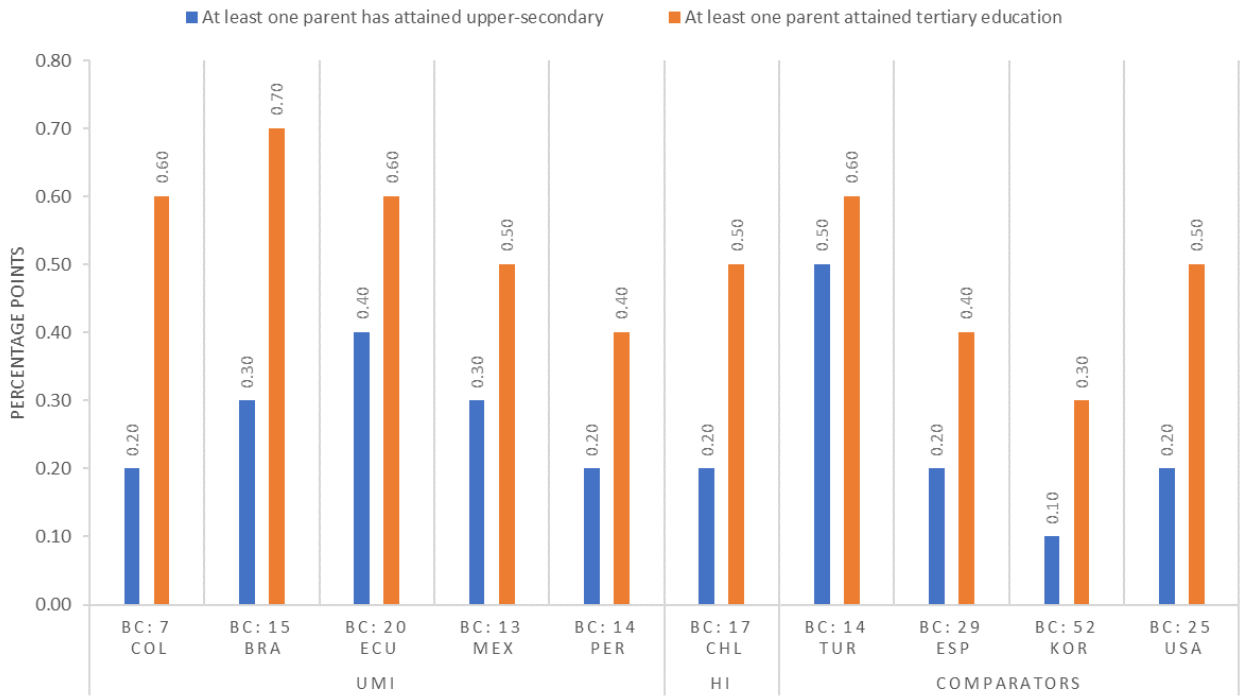
Note: S_H-S_L is the difference in the share of individuals who compete upper secondary education if at least one parent had a tertiary education versus neither parent had finished upper secondary. The two cohorts are 25-34 versus 45-54. BRA=Brazil, COL=Colombia, CHL=Chile, ECU=Ecuador, MEX=Mexico, PER=Peru, ESP=Spain, KOR=South Korea, TUR=Turkey, USA=United States.
Source: For Chile, Ecuador, Mexico, Peru, South Korea, Spain, Turkey and the United States calculations using the PIAAC, 2017; for Spain, South Korea, the data was collected in 2011-2012; for Chile and Turkey, the data was collected in 2015, and for the rest of the countries is 2017. For Brazil, the estimates are calculated using the PNAD 2014-Supplement of Socio-employment Mobility and Supplement of Education and Professional Qualification surveys. For Colombia, the source is National Survey of Quality of Life (2019).

The effect of parental education is substantially larger for the completion of tertiary education. Similar to Figure 2, Figure 4 plots the increase in the probability of completing a tertiary education for a person with parents of given education levels over a baseline level of someone whose parents did not complete an upper-secondary education. As before, the results are obtained from estimating a Logit model of the probability of tertiary education completion controlling for parental education, gender, and the age of the person within the 25-34 age bracket. In the analyzed Latin American countries, having at least one parent who completed tertiary education increases the likelihood of their offspring completing tertiary education by between 40 to 70 percentage points relative to someone whose parents did not finish upper-secondary. There is also an important jump in the probability of completing a tertiary education for people with at least one parent with tertiary education completed relative to those who have at least one parent who finished upper secondary but not tertiary. As it can be seen in the figure, there is a gap of 20 to 40 percentage points in the probability of a child attaining a tertiary education if at least one parent also has a tertiary degree relative to a child whose parents' highest degree is upper secondary.

Relative to the comparator countries, LA countries show much larger parental tertiary education dependence than Korea. In this country, having at least a parent with tertiary increases the

probability of tertiary completion by 30 percent (Figure 4). Dependence on parental education, however, is comparable to Turkey and the US.

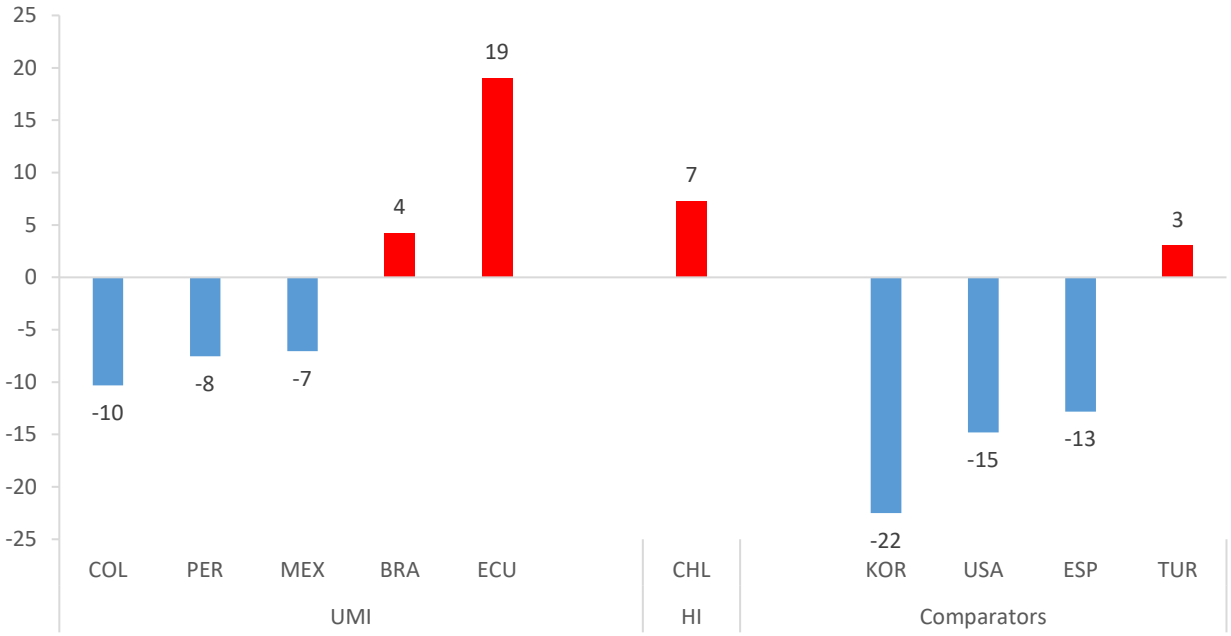
Figure 4: Marginal effects on parental education for the probability of completing tertiary education



Note: Marginal effects (average partial effects) from a logit regression controlling for parental education, gender (female=1), and age fixed-effects. BC is the baseline category for neither parent has attained upper-secondary and the number beside it gives the percentage of the children with parents in that category that do not attain a tertiary degree. This is for the cohort age 25-34. BRA=Brazil, COL=Colombia, CHL=Chile, ECU=Ecuador, MEX=Mexico, PER=Peru, ESP=Spain, KOR=South Korea, TUR=Turkey, USA=United States. Marginal effects (average partial effects) from a logit regression controlling for parental education, gender (female=1), and age fixed-effects. BC is the baseline category for neither parent has attained upper-secondary. This is for the cohort age 25-34.
Source: Same as in Figure 3. For the United States, the specification does not include age fixed-effects. All probabilities are evaluated at the mean of the explanatory variables.

Progress in reducing this gap has been less common than for upper secondary education. Figure 5 shows the difference in the share of tertiary education completion rates between children of parents with tertiary education ($\boldsymbol{T_H}$) relative to children of parents with unfinished upper secondary education ($\boldsymbol{T_L}$) by comparing the same two cohorts as before: the younger (25-34) and the older (45-54) age cohort, i.e., $(\boldsymbol{T_H} - \boldsymbol{T_L})_{\boldsymbol{25-34}} - (\boldsymbol{T_H} - \boldsymbol{T_L})_{\boldsymbol{45-54}}$. In three Latin American countries (Colombia, Mexico, and Peru), the gaps in tertiary completion rates across people with parents of high and low education declined, while these gaps became more prominent in Chile, Ecuador and Brazil. Even for those countries where the gap declined, the decrease was less pronounced than in Korea, the United States, and Spain during the same period.

Figure 5: Difference in the share of people that completed tertiary (T) between parents of high (H) and low (L) educational backgrounds for cohorts aged 25-34 and 45-54 years old. $(T_H - T_L)_{25-34} - (T_H - T_L)_{45-54}$



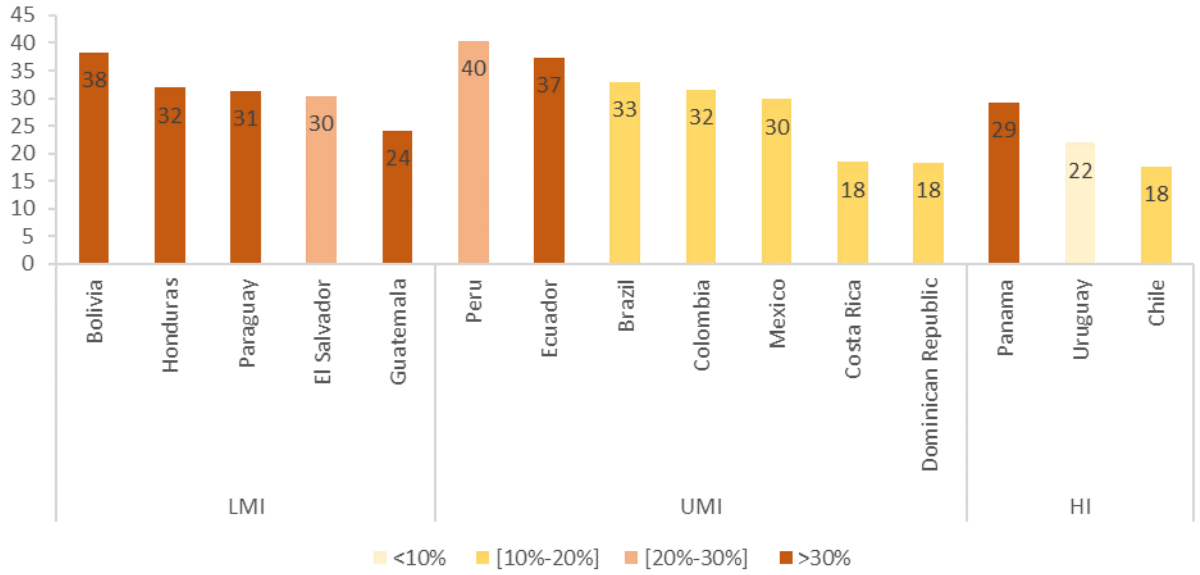
Note: BRA=Brazil, COL=Colombia, CHL=Chile, ECU=Ecuador, MEX=Mexico, PER=Peru, ESP=Spain, KOR=South Korea, TUR=Turkey, USA=United States.
Source: Same as in Figure 3.

In summary, parental education exerts a large influence on the educational attainment of the children, particularly for tertiary education. This dependency has tended to become smaller over the years for upper secondary and beyond, but less so for tertiary, where the relationship between parental education and offspring's education has become even stronger during the last decades in several countries.

Urban-rural differences

The gap in educational opportunities and outcomes across urban and rural areas is a generalized problem in the region. Household data shows large disparities in upper secondary and further completion rates in the 25-34 cohort across rural and urban areas (Figure 6). Moreover, these gaps tend to be largest where they matter the most, that is, in countries with a relatively larger share of a rural population. The urban-rural gap in the share that completed an upper secondary education is largest in Peru (40 percentage points difference), Bolivia (38), Ecuador (37), Brazil (33), Honduras (31) and Paraguay (31) and lowest in Chile (18) and Costa Rica (18).

Figure 6: Urban-rural gap in the share who completed upper-secondary, circa 2019

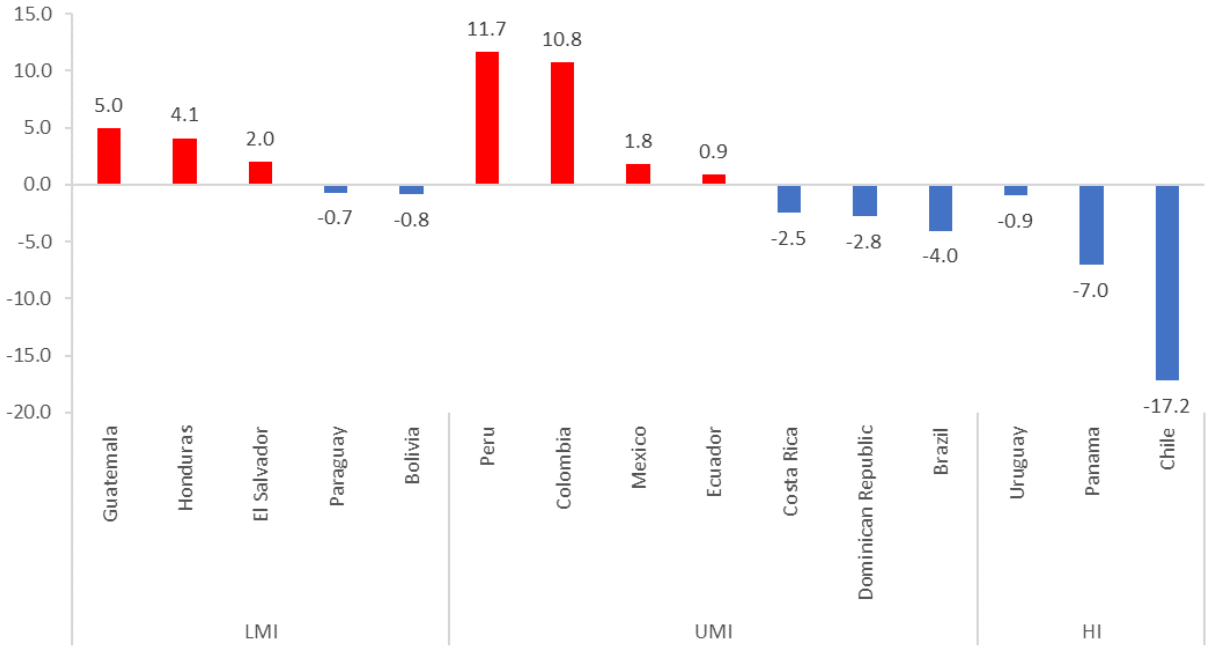


Note: The different colors indicate the share of the rural population in total population. We use four ranges/colors, as described in the legend above. The urban-rural gap is calculated for the cohort age 25-34.
Source: Authors' calculations based on household or employment surveys. Bolivia – ECH (2019), Brazil – PNADC (2019), Chile - CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). The percentage of population that is rural comes from the World Development Indicators corresponding to the survey year. See Annex B for a detailed data description.

Urban-rural gaps in education have become more pronounced in many countries. Figure 7 shows the difference in upper secondary completion shares between rural and urban areas, between the 45-54 and 25-34 age cohorts. In Peru, Colombia, Guatemala, Honduras, El Salvador, Mexico and Ecuador, urban-rural gaps are larger within the 25-34 age cohort than within the older group, indicating that urban completion rates are increasing faster than rural ones. In other countries, the urban-rural gap has decreased, most notably in Chile with a 17-percentage point fall.

Figure 7: Urban-Rural differences in the share that completed upper-secondary for the 25-34 versus 45-54 age cohort

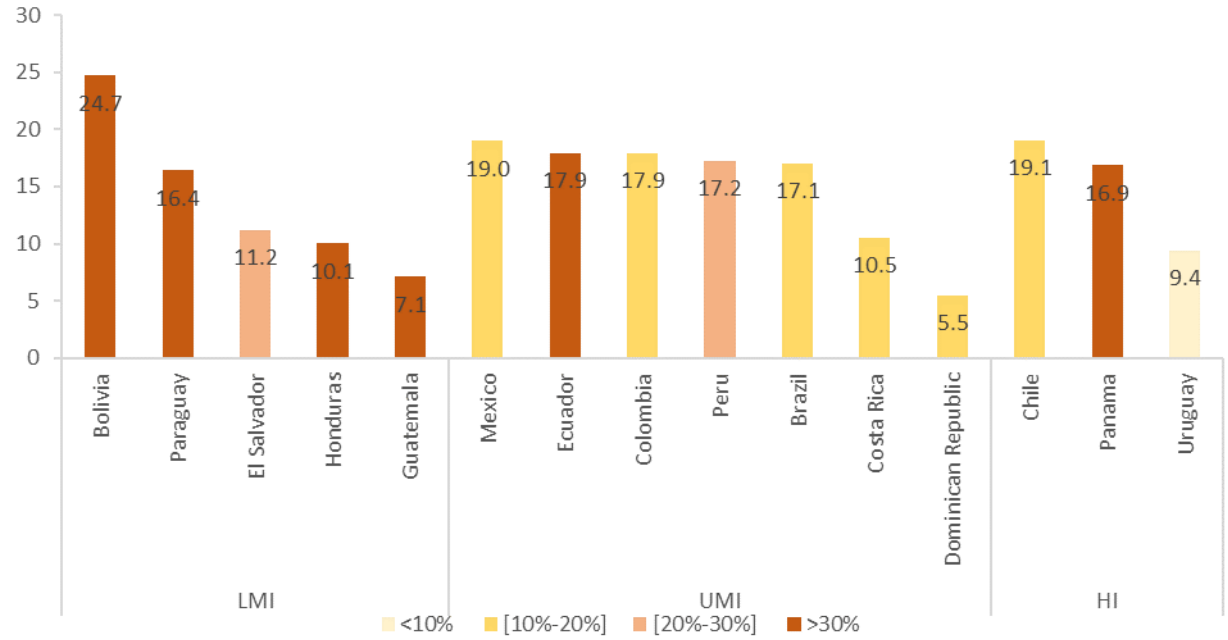
$$(S_{Urban} - S_{Rural})_{25-34} - (S_{Urban} - S_{Rural})_{45-54}$$



Note: Numbers are in percentage points. Source: Authors' calculations based on household or employment surveys. Bolivia – ECH (2019), Brazil – PNADC (2019), Chile -CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). See Annex B for a detailed data description.

Figure 8 shows the urban-rural gap in tertiary completion. The urban rural gap in tertiary education is largest in Bolivia, Chile, Mexico, Ecuador, and Colombia and lowest in the Dominican Republic and Guatemala. While the urban-to-rural gaps are smaller in tertiary than for upper secondary education, this is presumably because a relatively lower share of people anywhere complete tertiary than complete upper secondary education. Furthermore, tertiary attainment gaps are increasing substantially in most countries, as they are larger within the 25-34 age cohort than among the 45-54 one (Figure 9). As tertiary attainment rates increase, they do so at a faster pace in the urban areas, in most countries. Urban-to-rural gaps in tertiary attainment have increased fastest in Chile, Colombia, Mexico, Bolivia, and Ecuador, and have declined in Costa Rica, the Dominican Republic, Honduras, Panama and Uruguay.

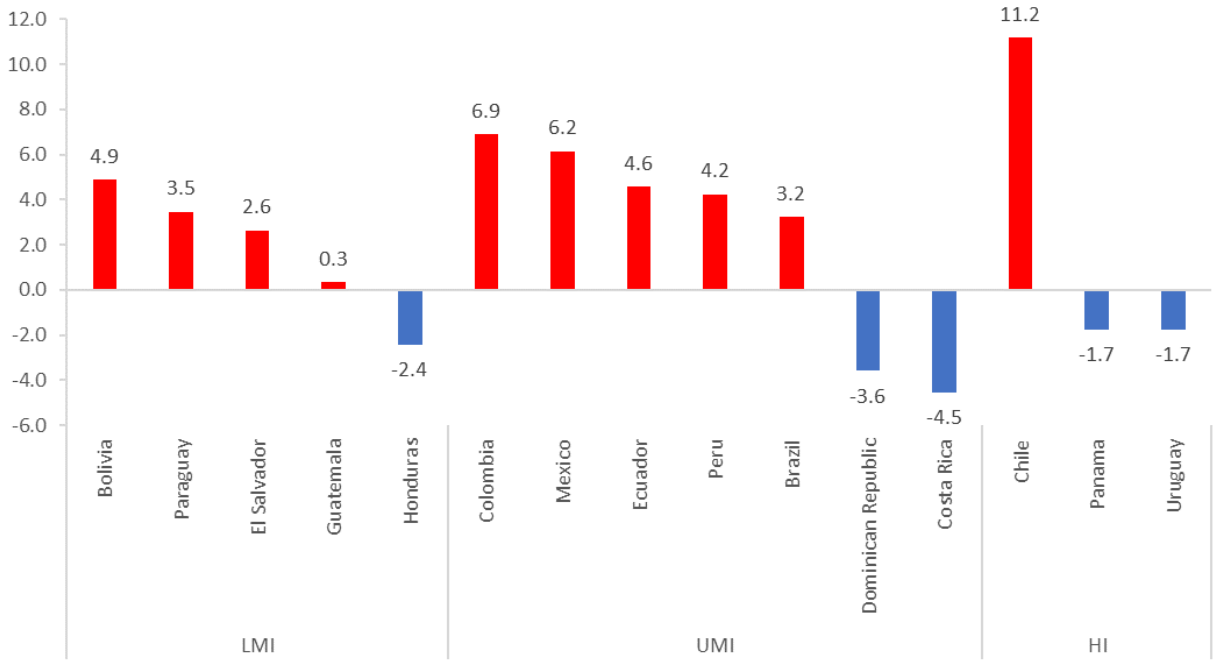
Figure 8: Urban-Rural differences in the share who completed tertiary education



Note: The different colors indicate the share of the rural population in total population. We use four ranges/colors, as described in the legend above. The urban-rural gap is calculated for the cohort age 25-34.
Source: Authors' calculations based on household or employment surveys. Bolivia – ECH (2019), Brazil – PNADC (2019), Chile - CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). See Annex B for a detailed data description.

Figure 9. Urban-Rural differences in the share who complete tertiary education for the 25-34 versus 45-54 age cohort

$$(T_{Urban} - T_{Rural})_{25-34} - (T_{Urban} - T_{Rural})_{45-54}$$



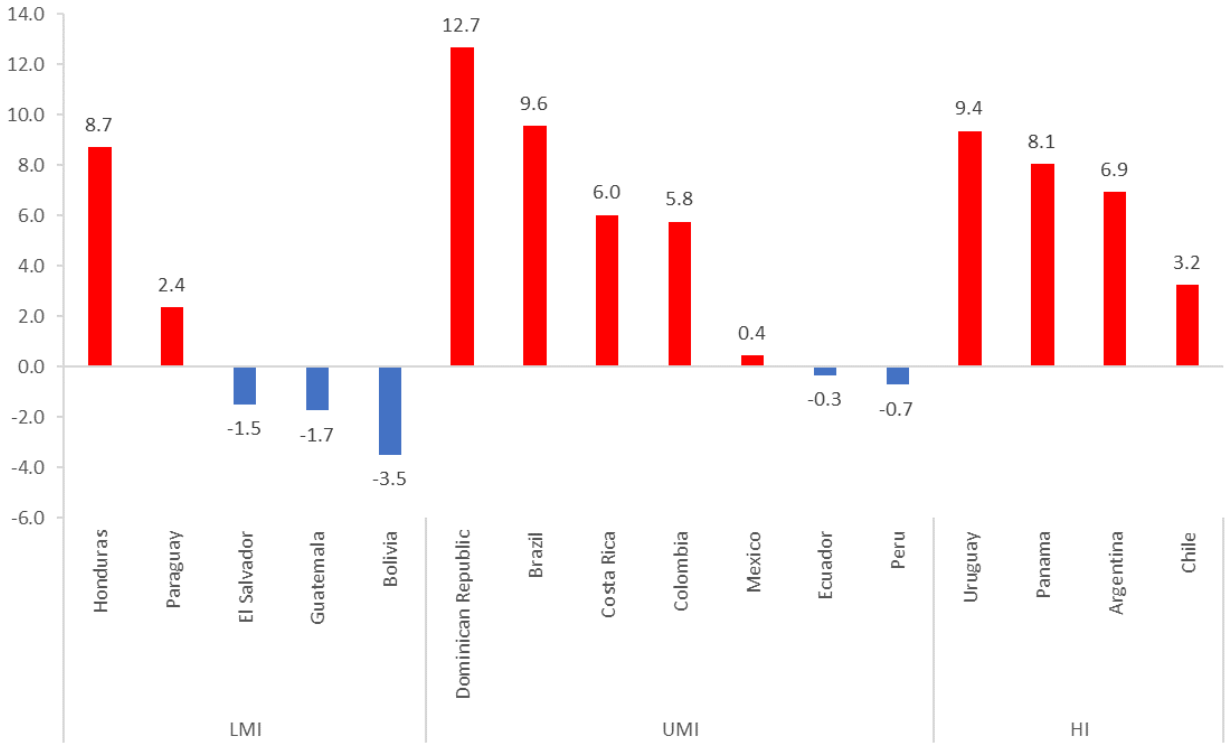
Note: Numbers are in percentage points. Source: Same as in Figure 8.

Gender differences

We next assess the extent to which there is unequal access to education by gender.[6] Figure 10 shows the female-male gap in at least upper secondary education among people 25-34 years old, based on household surveys, circa 2019. In most countries, women have higher completion rates for upper secondary and further compared to men. In some countries, such as the Dominican Republic, Brazil, Uruguay and Honduras, the gaps are very large, reaching almost 10 percentage points or more. Only in five countries, Peru, Ecuador, El Salvador, Guatemala, and Bolivia, more men graduated from upper secondary than women (although for the most part, these differences are small: men have between 0.3 and 3.5 percentage points higher graduation rates).

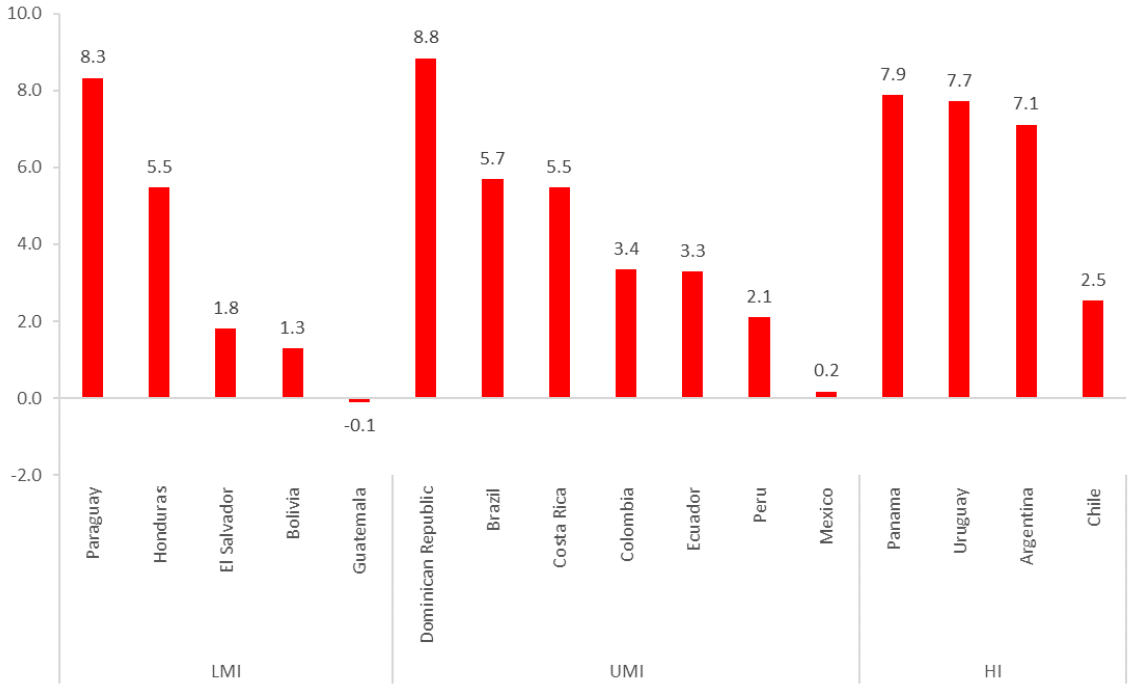
[6] A detailed analysis of the gender gap in education can be found in the chapter Gender Inequality in LAC.

Figure 10: Gender differences in the share who completed upper secondary



Note: This is for the cohort age 25-34. Numbers are in percentage points.
Source: Authors' calculations based on household or employment surveys. Argentina (only urban coverage) – EPH (2019), Bolivia – ECH (2019), Brazil – PNADC (2019), Chile -CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). See Annex B for a detailed data description.

Figure 11: Female-Male differences in the share who completed tertiary



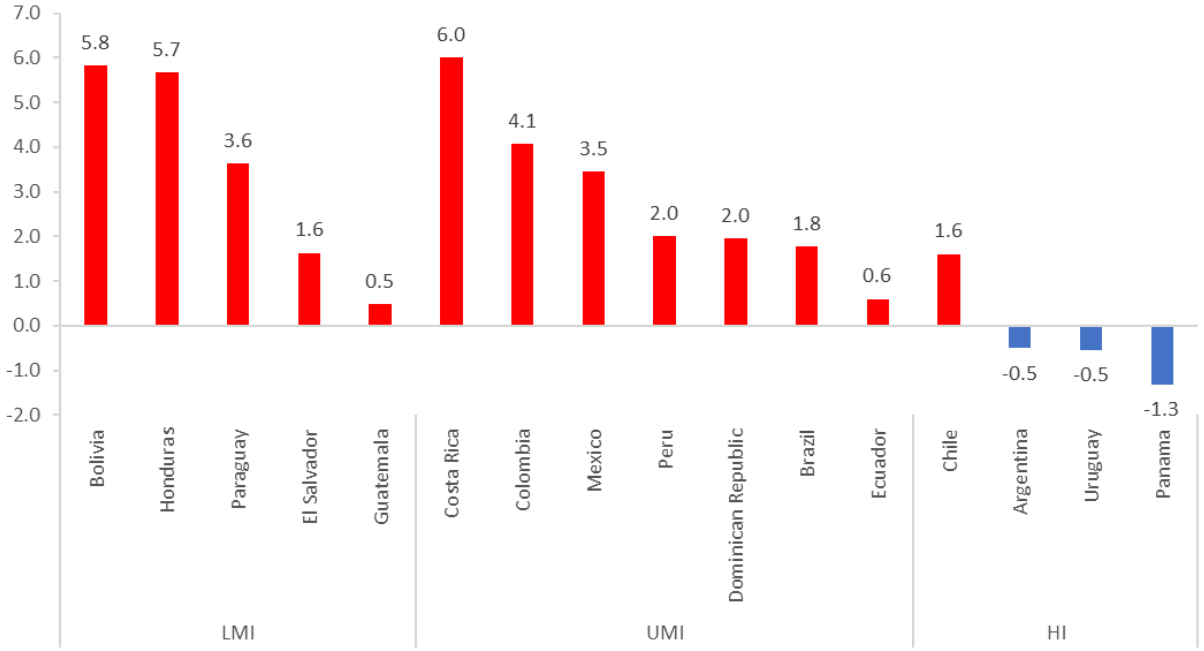
Note: This is for the cohort age 25-34. Numbers are in percentage points.
Source: Authors' calculations based on household or employment surveys. Argentina (only urban coverage) – EPH (2019) , Bolivia – ECH (2019), Brazil – PNADC (2019), Chile -CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). See Annex B for a detailed data description.

Despite the gap favoring men that existed in a few countries for the completion of upper secondary, for tertiary education the gap favors women everywhere except for Guatemala (Figure 11). These gaps are quite large in some countries: Dominican Republic (8.8 pp), Paraguay (8.3), Panama (7.9) and Uruguay (7.7). Given the large returns of tertiary education in the labor market, such large gaps may help to reduce raw wage gaps between men and women although, as pointed out in the chapter on gender inequality, this depends as well on field of study, occupation, and hours worked.

The female advantage in upper secondary completion rates has increased in the past 20 years in almost all countries in our sample. In Costa Rica, Bolivia and Honduras, for example, the completion gap in upper secondary between females and males has increased by 6, 5.8 and 5.7 percentage points, respectively. In contrast, in Uruguay, Argentina, and Panama the gap has decreased slightly (Figure 12).

Figure 12: Female-Male differences in the share who completed upper-secondary for cohorts age 24-34 vs 45-54

$$(S_F - S_M)_{24-34} - (S_F - S_M)_{45-54}$$



Source: Numbers are in percentage points. Argentina (only urban coverage) – EPH (2019) , Bolivia – ECH (2019), Brazil – PNADC (2019), Chile -CASEN (2017), Colombia – GEIH (2019), Costa Rica – ENAHO (2019), El Salvador -EHPM (2019), Ecuador – ENEMDU (2019), Guatemala-ENEI (2019), Honduras-EPHPM (2019), Mexico-ENIGH(2018), Panama-EPM (2019), Paraguay-EPHC (2019), Peru – ENAHO (2019), Dominican Republic-ENCFT (2019), Uruguay-ECH(2019). See Annex B for a detailed data description.

To conclude, there remain significant differences within countries in the access to education by socioeconomic background and by location. Socioeconomic background, measured by parental education, is a strong predictor of completion of at least upper secondary education, and even more so for tertiary education. Furthermore, there is a strong urban-rural divide, with children in rural areas much less likely to complete upper secondary and tertiary. Some of these gaps are becoming more accentuated over time in several countries, attesting that the strong expansion in education in the region has not been homogeneous for all. Finally, there is a large and increasing female lead in upper secondary and tertiary completion rates, as in all OECD countries.

4. Inequality in the quality of education

In addition to differences in the years of education and degrees, it is important to assess inequalities in the actual learning that takes place in the education system and the extent to which this learning makes up for differences in family and locational background. In this section, we assess the extent to which parental education shows up in learning, as measured by test score differences. In addition, we evaluate differences in test scores across public and private schools, school location (urban vs rural), and gender. Note that differences in test scores will reflect

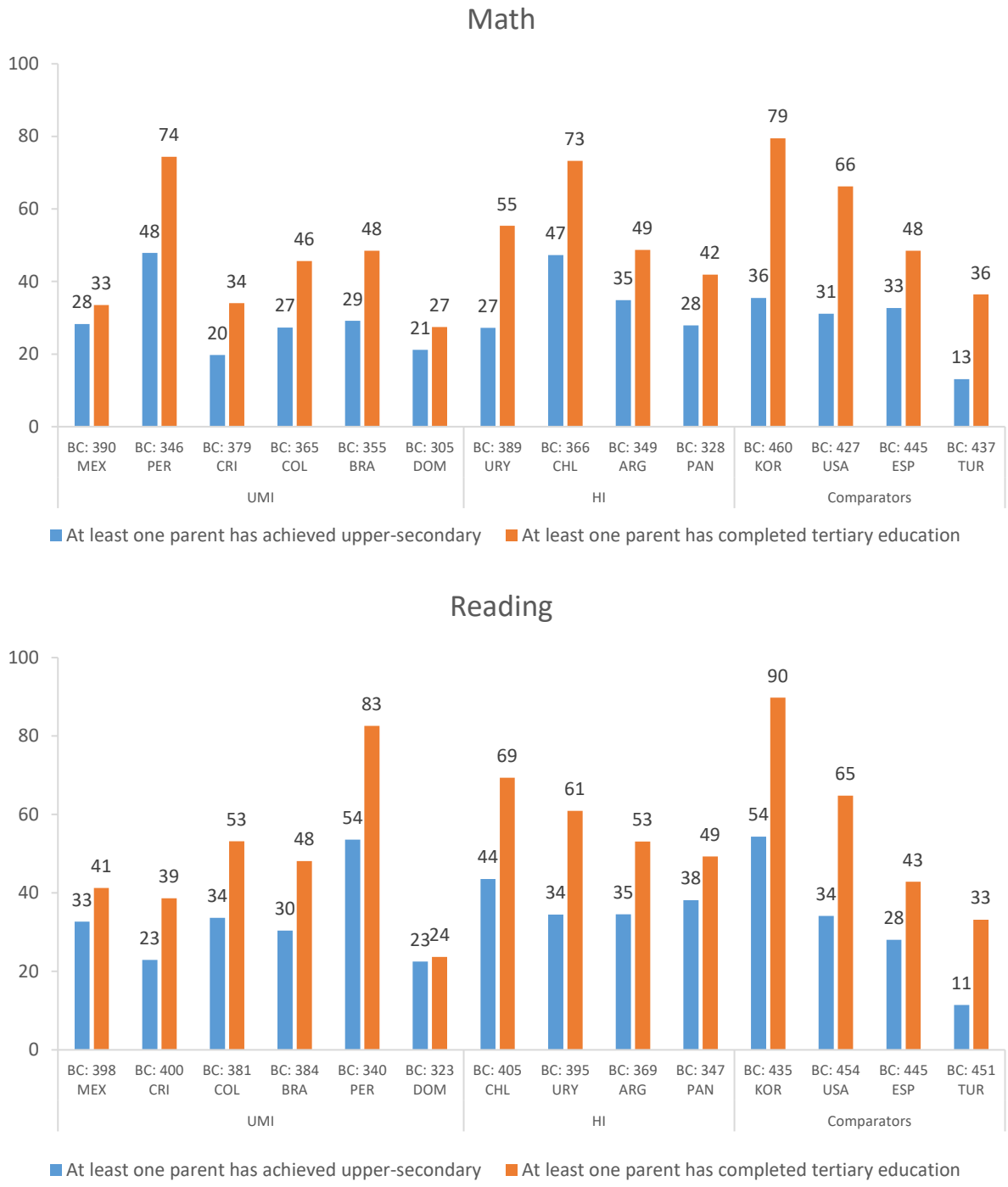
parental inputs generally speaking (e.g., time and money spent on activities that foster cognitive development) and peer effects, as well as the quality of the formal schooling received. We will nonetheless refer to outcomes as reflecting educational quality broadly speaking. When doing so, we are always cognizant of the fact that this "quality" reflects a large bundle of characteristics and inputs, but also calling attention to the fact that an important mission of schools is to compensate for background and locational differences.

To gauge gaps in students' knowledge and skills, we use data from the Program for International Student Assessment (PISA), elaborated by the Organization for Economic Cooperation and Development (OECD). These data summarize the results of internationally comparable assessment tests taken by 15-year-olds across 79 countries. PISA scores are scaled to approximate a normal distribution with a mean of approximately 500 points and a standard deviation of approximately 100 (OECD, 2019). They measure students' literacy in reading, mathematics, and science and their capacity to use them to solve problems in real contexts (for a more detailed description of the data see Annex B).

Parental educational background

To what extent do the offspring of more educated parents achieve higher scores in standardized tests? Figure 13 presents the differences in the average PISA scores in math and reading of 15-year-olds for whom at least one parent completed tertiary education (orange line) and for whom at least one of their parents completed upper secondary (blue), all relative to those for whom neither parent completed upper secondary. The latter is the baseline category and its value is reported along with the country name on the x-axis. In all countries, children with more educated parents achieve higher test scores. For the most part, the gap is similar to that found in the comparator countries, which themselves display a large range in the degree to which parental education matters. The importance of parental education stands out for being small in the Dominican Republic, but it is also the country for which the baseline score is the lowest, indicating a low overall quality of education.

Figure 13: Math and reading scores by parental education



Note: The baseline category (BC) is the PISA score for students whose parents who have education lower than upper-secondary.
Source: Authors' estimates using PISA 2018 dataset- OECD.

Adding the score of the base category to the incremental score associated with additional parental education yields the average scores for each parental education category. It is

noteworthy that the average scores of *all* children, regardless of their parents' educational attainment, are significantly lower in LAC than in the comparator countries, attesting to the low quality of education in the region (Table 2). The average scores of children for whom at least one parent completed tertiary education are much lower than those of their counterparts in Korea and the United States. Moreover, the differences with Korea (the country with the highest math scores in the sample of comparators) are larger for children from higher educational backgrounds than for children of parents of lower educational backgrounds indicating that the smaller dependence on parental education in LAC in comparison to Korea is likely to reflect poor educational outcomes.

Table 2: Math and reading scores by parents´ education

Income group (1987)	Country	Neither parent completed upper secondary	At least one parent completed upper secondary	At least one parent has completed tertiary	Difference relative to Korea		
					Neither parent completed upper secondary	At least one parent completed upper secondary	At least one parent has completed tertiary
A. Math Scores							
UMI	Peru	345.8	393.7	420.2	113.9	101.6	119.0
	Brazil	354.6	383.7	403.0	105.2	111.5	136.2
	Colombia	364.9	392.3	410.6	94.8	103.0	128.7
	Costa Rica	379.4	399.1	413.4	80.4	96.1	125.8
	Mexico	389.6	417.8	423.1	70.2	77.4	116.2
	Dominican Republic	304.8	326.0	332.3	154.9	169.2	206.9
HI	Uruguay	389.3	416.5	444.6	70.5	78.8	94.6
	Argentina	349.4	384.2	398.1	110.4	111.0	141.2
	Chile	365.9	413.2	439.2	93.8	82.0	100.0
	Panama	327.7	355.6	369.6	132.0	139.6	169.6
Comparators	Korea	459.7	495.2	539.2	0.0	0.0	0.0
	United States	426.6	457.8	492.9	33.1	37.4	46.3
	Spain	445.2	477.9	493.7	14.5	17.3	45.5
	Turkey	436.8	449.8	473.2	23.0	45.4	66.0
B. Reading Scores							
UMI	Peru	340.3	393.9	423.0	94.9	95.7	102.1
	Brazil	384.0	414.4	432.1	51.2	75.2	92.9
	Colombia	380.7	414.4	433.9	54.5	75.2	91.1
	Mexico	397.8	430.5	439.1	37.5	59.2	86.0
	Costa Rica	400.5	423.4	439.1	34.8	66.2	86.0
	Dominican Republic	322.8	345.3	346.5	112.4	144.3	178.5
HI	Uruguay	395.2	429.6	456.1	40.1	60.0	68.9
	Argentina	369.2	403.7	422.2	66.1	85.9	102.8
	Panama	346.7	384.9	396.0	88.5	104.8	129.1

	Chile	404.5	448.1	473.9	30.7	41.5	51.2
Comparators	Korea	435.2	489.6	525.0	0.0	0.0	0.0
	United States	454.1	488.2	519.0	-18.9	1.4	6.1
	Spain	445.2	473.2	488.1	-9.9	16.4	37.0
	Turkey	450.6	462.0	483.8	-15.3	27.6	41.3

Source: Authors' estimates using PISA 2018 dataset- OECD. The distance score with Korea is computed as the average score in Korea minus the average score in the country.

To further assess learning differences across children of different socioeconomic backgrounds for each country, we estimate a model of the PISA math and reading scores as a function of the maximum level of parental education, controlling for the gender of the child. Table 3 presents the results for each country (column 1). In column (2) we add a control for a rural indicator for the location of the school and in (3) we add a control for whether the school is public or private.

Table 3: Regression of PISA scores on parental education, location, and public/private school

A. PISA MATH SCORES															
PANEL A															
Variables	**ARG**			**BRA**			**CHL**			**COL**			**CRI**		
	(1)	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
Highest level of parental education															
Upper-secondary	33.8***	30.5***	22.0***	28.9***	26.5***	18.6***	47.5***	45.7***	39.6***	26.8***	23.4***	17.7***	19.5***	15.6***	14.3***
	(4.9)	(4.9)	(5.0)	(3.2)	(3.1)	(3.1)	(4.9)	(4.9)	(5.0)	(4.2)	(4.1)	(4.0)	(5.0)	(4.8)	(4.8)
Tertiary	47.7***	44.1***	27.5***	48.1***	45.4***	21.5***	73.0***	70.85***	59.4***	44.3***	40.7***	22.9***	32.7***	27.2***	15.8***
	(4.2)	(4.2)	(4.1)	(3.7)	(3.7)	(3.1)	(5.3)	(5.2)	(5.4)	(5.8)	(5.8)	(4.8)	(4.8)	(4.4)	(4.7)
Female	-13.2***	-13.1***	-16.4***	-7.0***	-7.3***	-8.2***	-7.0**	-7.8**	-9.8**	-17.5***	-18.0***	-18.6***	-15.5***	-16.3***	-17.1***
	(2.2)	(2.2)	(2.2)	(2.3)	(2.3)	(2.1)	(3.4)	(3.364)	(3.7)	(3.4)	(3.4)	(3.1)	(3.9)	(3.8)	(4.0)
Rural		-57.0***	-46.2***		-34.1***	-25.1***		-41.5***	-35.4***		-29.8***	-22.9***		-32.6***	-25.2***
		(11.3)	(11.5572)		(8.8)	(8.7)		(11.5)	(8.9)		(9.7)	(8.5)		(5.8)	(5.9)
Public School			-57.8***			-100.9***			-35.2***			-63.7***			-63.6***
			(5.3)			(6.5)			(5.2)			(7.6)			(8.1)
Constant	356.7***	363.1***	413.7***	358.3***	361.9***	460.5***	369.5***	372.9***	394.0***	374.5***	380.8***	441.2***	388.0***	399.3***	459.6***
	(3.7)	(4.0)	(6.1)	(2.9)	(3.1)	(6.7)	(5.3)	(5.3)	(5.9)	(4.5)	(4.7)	(6.7)	(3.3)	(3.9)	(8.8)
R-squared	0.07	0.10	0.19	0.05	0.06	0.21	0.09	0.09	0.13	0.06	0.07	0.16	0.05	0.08	0.15
Obs.	10,729	10,729	10,729	9,296	9,296	9,296	6,831	6,831	6,831	7,054	7,054	7,054	7,014	7,014	7,014
PANEL B															
Variables	**DOM**			**MEX**			**PAN**			**PER**			**URY**		
	(1)	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
Highest level of parental education															
Upper-secondary	21.2***	19.4***	15.74***	28.1***	18.8***	18.2***	28.0***	22.7***	17.9***	47.7***	36.9***	32.4***	27.2***	26.9**	23.6***
	(5.0)	(5.0)	(4.9)	(3.8)	(4.1)	(4.1)	(4.7)	(4.9)	(4.5)	(4.7)	(4.7)	(4.8)	(4.3)	(4.3)	(4.1)
Tertiary	28.0***	25.7***	16.9***	33.2***	22.3***	20.0***	41.7***	35.8***	18.2***	74.3***	59.3***	47.5***	55.0***	54.3***	39.8***
	(5.9)	(5.8)	(5.5)	(4.3)	(4.5)	(4.5)	(5.1)	(5.4)	(3.9)	(4.8)	(4.9)	(5.0)	(5.3)	(5.3)	(5.0)
Female	4.7	4.0	3.0	-11.9***	-12.3***	-12.8***	-7.0**	-8.2**	-8.2**	-16.2***	-17.3***	-15.8***	-7.5**	-7.5**	-8.7***
	(2.8)	(2.8)	(2.8)	(2.8)	(2.8)	(2.8)	(3.3)	(3.3)	(3.2)	(2.7)	(2.7)	(2.7)	(3.3)	(3.3)	(3.2)
Rural		-27.5***	-19.7***		-43.9***	-42.3***		-48.8***	-46.0***		-39.2***	-31.1***		-16.3	-8.8
		(6.3)	(6.3)		(6.5)	(6.5)		(12.5)	(9.6)		(5.0)	(5.1)		(9.9)	(10.3)
Public School			-51.4***			-16.9***			-68.0***			-46.5***			-58.0***
			(9.5)			(7.7)			(9.2)			(4.9)			(6.7)

Constant	302.2***	307.9***	356.4***	396***	409.8***	425.8***	331.3***	341.6***	405.6***	353.9***	377.2***	416.4***	393.3***	394.5***	449.6***
	(4.5)	(4.9)	(10.0)	(3.1)	(4.2)	(8.3)	(3.9)	(4.3)	(9.5)	(4.4)	(5.2)	(7.1)	(4.2)	(4.3)	(7.8)
R-squared	0.02	0.04	0.10	0.05	0.08	0.09	0.06	0.10	0.19	0.09	0.13	0.18	0.07	0.07	0.13
Obs.	5,225	5,225	5,225	6,324	6,324	6,324	5,701	5,701	5,701	5,979	5,979	5,979	4,759	4,759	4,759

PANEL C

Variables	ESP			KOR			TUR			USA		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Highest level of parental education												
Upper-secondary	32.7***	32.7***	31.0***	35.4***	35.3***	35.8***	13.1***	12.8**	13.2***	30.9***	31.5***	31.2***
	(3.3)	(3.3)	(3.3)	(13.7)	(13.6)	(13.7)	(3.9)	(3.8)	(3.7)	(5.9)	(6.0)	(6.08)
Tertiary	48.6***	48.6***	44.0***	79.4***	79.3**	78.7***	36.3***	35.8***	37.4***	65.7***	65.8***	64.8***
	(2.7)	(2.9)	(2.9)	(14.1)	(14.1)	(14.1)	5.1	(5.0)	(4.7)	(6.5)	(6.6)	(6.6)
Female	-7.5***	-7.5***	-7.4***	-4.1	-4.1	-4.7	-3.7	-3.6	-4.4	-6.7**	-6.6**	-6.8**
	(2.1)	(2.1)	(2.1)	(5.0)	(5.01)	(5.1)	(4.0)	(4.0)	(3.9)	(3.3)	(3.2)	(3.3)
Rural		-0.25	3.6		11.5	8.6		-35.4	-36.6		-20.9**	-19.9**
		(3.7)	(3.8)		(43.2)	(38.7)		(18.7)	(19.1)		(9.1)	(9.1)
Public School			-20.7**			-16.3**			13.3			-8.6
			(2.8)			(8.2)			(18.8)			(10.6)
Constant	448.9***	448.9***	466.0***	461.7***	461.7***	472.5***	438.6***	439.2***	427.2***	430.3***	431.2***	439.6***
	(3.0)	(3.0)	(3.7)	(13.5)	(13.5)	(14.3)	(3.8)	(3.8)	(17.2)	(5.8)	(5.9)	(12.5)
R-squared	0.05	0.05	0.06	0.04	0.04	0.05	0.03	0.04	0.04	0.06	0.06	0.06
Obs.	34,925	34,925	33,409	6,623	6,623	6,585	6,854	6,854	6,854	4,759	4,759	4,733

B. PISA READNING SCORES

PANEL A

Variables	ARG			BRA			CHL			COL			CRI		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Highest level of parental education															
Upper-secondary	36.1***	32.0***	22.6***	31.5***	28.1***	19.6***	43.1***	41.0***	35.4***	34.1***	29.7***	23.5***	23.2***	18.1***	16.7***
	(4.5)	(4.4)	(4.4)	(3.4)	(3.4)	(3.1)	(4.5)	(4.3)	(4.6)	(3.5)	(3.2)	(2.9)	(3.7)	(3.3)	(3.4)
Tertiary	54.5***	50.0***	31.1***	49.5***	45.6***	20.1***	70.1***	67.4***	56.9***	54.2***	49.6***	29.3***	40.1***	33.1***	20.5***
	(4.5)	(4.5)	(4.2)	(3.5)	(3.5)	(2.9)	(4.6)	(4.4)	(4.7)	(5.1)	(5.1)	(3.9)	(4.3)	(3.6)	(4.1)
Female	18.6***	18.7***	14.7***	27.3***	27.0***	26.0***	20.3***	19.3***	16.9***	13.0***	12.4***	11.9***	17.2***	16.1***	15.2***
	(2.4)	(2.4)	(2.5)	(2.1)	(2.1)	(2.0)	(3.5)	(3.4)	(3.7)	(3.3)	(3.3)	(2.9)	(3.3)	(3.9)	(3.4)
Rural		-70.3	-57.9***		-48.0***	-38.3***		-50.1***	-44.8***		-38.3***	-30.2***		-42.2***	-34.1***
		(13.1)	(13.6)		(10.7)	(10.6)		(9.6)	(6.9)		(9.8)	(8.5)		(5.9)	(6.0)
Public School			-66.8***			-108.3***			-34.3***			-72.4***			-70.0***
			(6.2)			(6.2)			(4.9)			(7.5)			(7.1)
Constant	358.7***	366.5***	425.0***	369.4***	374.4***	480.3***	394.3***	398.3***	419.4***	373.5***	381.6***	449.9***	390.9***	405.5***	471.9***
	(3.8)	(3.8)	(6.7)	(2.6)	(2.8)	(6.3)	(4.6)	(4.4)	(5.1)	(3.9)	(4.0)	(6.2)	(3.0)	-3.4	(7.6)
R-squared	0.06	0.10	0.18	0.06	0.07	0.20	0.08	0.09	0.118	0.06	0.08	0.17	0.05	0.09	0.17
Obs.	11,061	11,061	11,061	10,259	10,259	10,259	7,048	7,048	7,048	7,173	7,173	7,173	7,166	7,166	7,166

PANEL B

Variables	DOM			MEX			PAN			PER			URY		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Highest level of parental education															
Parent upper-secondary	23.0***	20.7***	16.4***	32.9***	21.7***	20.9***	38.0***	31.3***	25.8***	53.7***	41.5***	36.3***	34.4***	34.0***	30.8***
	(3.4)	(3.3)	(3.2)	(3.4)	(3.8)	(3.7)	(4.3)	(4.5)	(4.3)	(4.3)	-4.3	(4.3)	(4.2)	(4.2)	(4.0)

Parent tertiary	27.1***	24.3***	14.4***	41.6***	28.4***	24.9***	49.7***	42.4***	23.0***	82.7***	65.8***	52.1***	62.1***	61.3***	47.2***
	(4.7)	(4.5)	(4.1)	(4.3)	(4.4)	(4.2)	(5.5)	(5.6)	(4.1)	(4.8)	(4.9)	(4.8)	(4.9)	(4.9)	(4.6)
Female	32.8**	32.1***	31.2***	12.2***	11.8***	11.1***	15.3***	13.8***	13.6***	10.7***	9.4***	11.2***	24.2***	24.0***	23.0***
	(2.4)	(2.4)	(2.5)	(2.8)	(2.7)	(2.6)	(2.7)	(2.7)	(2.5)	(2.8)	(2.8)	(2.8)	(3.2)	(3.2)	(3.1)
Rural		-33.6***	-24.6***		-53.3***	-50.9***		-61.2***	-58.2***		-44.4***	-35.0***		-20.1	-12.9
		(6.5)	(6.4)		(6.1)	(6.1)		(14.7)	(11.7)		(5.5)	(5.5)		(12.9)	(13.3)
Public School			-59.5***			-24.9***			-75.0***			-53.9***			-56.0***
			(10.6)			(8.2)			(10.5)			(5.7)			(6.7)
Constant	304.5***	311.5***	367.5***	391.2***	408.0***	431.4***	338.8***	351.8***	422.5***	335.0***	361.3***	406.8***	382.2***	383.6***	437.9***
	(3.6)	(4.2)	(10.7)	(3.0)	(4.4)	(8.5)	(3.7)	(4.0)	(10.8)	(3.9)	(5.2)	(7.2)	(4.2)	(4.4)	(7.0)
R-squared	0.05	0.07	0.13	0.06	0.11	0.12	0.07	0.12	0.20	0.09	0.13	0.19	0.08	0.08	0.12
Obs.	5,471	5,471	5,471	6,460	6,460	6,460	5,759	5,759	5,759	6,045	6,045	6,045	5,054	5,054	5,054

PANEL C

Variables	ESP			KOR			TUR			USA		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Highest level of parental education												
Parent upper-secondary	28.2***	28.2**	26.7***	54.7***	54.4***	55.2***	11.2***	11.0***	11.3***	35.1***	35.8***	35.4***
	(2.9)	(2.9)	(2.9)	(12.3)	(12.2)	(12.4)	(4.0)	(4.0)	(3.8)	(5.8)	-5.9	(6.0)
Parent tertiary	42.5***	42.4***	38.4***	90.2***	90.0***	89.9***	34.4***	34.***	35.7***	66.8***	66.9***	65.5***
	(2.2)	(2.2)	(2.2)	(12.3)	(12.3)	(12.3)	(4.9)	(4.9)	(4.6)	(7.1)	(7.2)	(7.2)
Female	25.3***	25.3***	25.3***	23.4***	23.4***	22.9***	26.5***	26.5***	25.7***	25.3***	25.3***	25.3***
	(1.7)	(1.7)	(1.8)	(4.7)	(4.7)	(4.8)	(3.7)	(3.7)	(3.7)	(3.6)	(3.6)	(3.6)
Rural		-4.9	-1.2		24.1	21.6		-28.4	-29.6		-22.72**	-21.3**
		3.9	(3.9)		(27.6)	(24.0)		(19.9)	(20.2)		(9.3)	(9.3)
Public School			-18.4***			-13.4			13.3			-14.8
			(3.8)			(7.6)			(17.9)			(15.4)
Constant	432.9***	433.1***	448.1***	423.7***	423.7***	432.3***	437.0***	437.5***	425.5***	440.2***	441.1***	455.5***
	(2.4)	(2.4)	(4.2)	(12.3)	(12.3)	(12.8)	(3.8)	(3.8)	(16.1)	(6.4)	(6.5)	(16.6)
R-squared	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Obs.	33,409	33,409	33,409	6,585	6,585	6,585	6,854	6,854	6,854	4,733	4,733	4,733

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

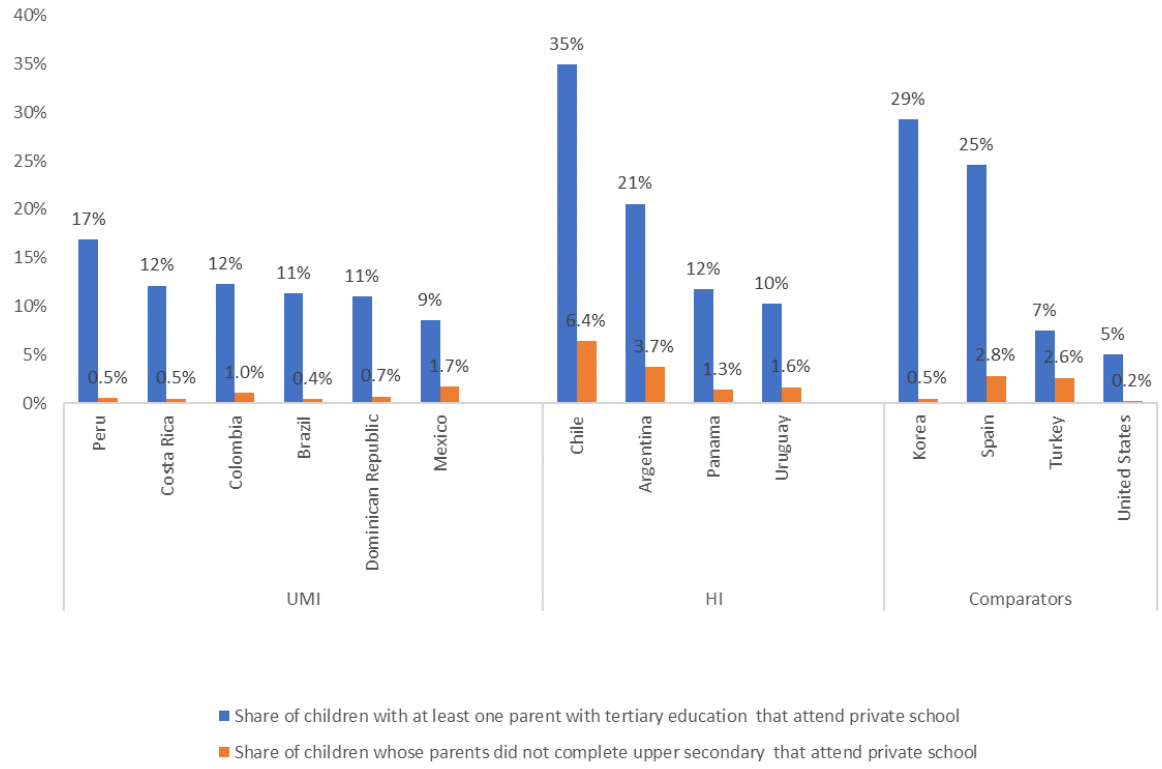
Source: Authors' calculations based on PISA 2018 Dataset. The omitted education variable is parents with less than upper secondary education.

Notes: The results are from an ordinary least squared (OLS) regression of reading/math scores on socioeconomic characteristics. The rural variable is derived from the location of the school. Thus, rural is defined as schools located in communities described as a village, hamlets, or rural areas with fewer than 3000 people. The variable for public schools takes the value of zero for private independent schools and private Government-dependent schools. PISA scores are scaled to approximate a normal distribution with a mean of approximate 500 points and a standard deviation of 100. ARG=Argentina, BRA=Brazil, COL=Colombia, CHL=Chile, CRI= Costa Rica, DOM=Dominican Republic, MEX=Mexico, PAN=Panama, PER=Peru, URY= Uruguay, ESP=Spain, KOR=South Korea, TUR=Turkey, USA=United States.

Once we include the additional controls (for each country, moving from column 1 to column 3), the effect of parental education on children´s scores diminishes noticeably in importance, often by 30 to 50 percent. This is a very different pattern than that displayed by the comparator countries in which the importance of parental education stays relatively constant across columns. This indicates that a rural vs urban location matters in LAC and, especially, that attending a public vs private schooling play a very important role in the region. We next turn, therefore, to examining the role of public vs private schooling Latin American countries.

Figure 14 shows the proportion of children in the PISA sample that attend private school by parental education attainment in Latin America and in the comparator countries.

Figure 14: Share of children that attend private school by parental education



Source: Estimates using PISA 2018 dataset- OECD.

In all countries of LA, parents with high educational attainment are much more likely to send their children to private schools than parents of low educational attainment, but the difference in this propensity is comparable or lower to that observed in Korea and Spain, although higher than that in Turkey and the United States. To study the role of private education more closely, Figure 15 shows the marginal effect of attending private school on PISA math and reading scores, once we account for the parents´ highest educational background, school location, and the gender of the child (i.e., we report the coefficient on public school in the third column in the preceding regression table). The results indicate that, in all countries of the region, attending public school has a negative, significant, and very sizable effect on math scores and that these effects are, for almost all countries (except Mexico relative to Spain and Korea in math) much higher in LA than in the comparator countries. Attending a public school is especially negative in Brazil, where the average child in a public school attains a score that is almost 101 points below what is attained by a child in a private school. Children in Argentina, Colombia, Costa Rica, Panama, and Uruguay also suffer large differences in schooling quality between private and public schools, with children in public schools obtaining math scores which are 58 to 68 points lower than their private school counterparts. Mexico is where the private/public school

distinction matters least, and at with public school students obtaining scores around 17 points lower than those in private schools. The corresponding figures for the comparator countries are 20.7 in Spain and 16.3 in Korea, and not statistically different from zero in Turkey and the United States.

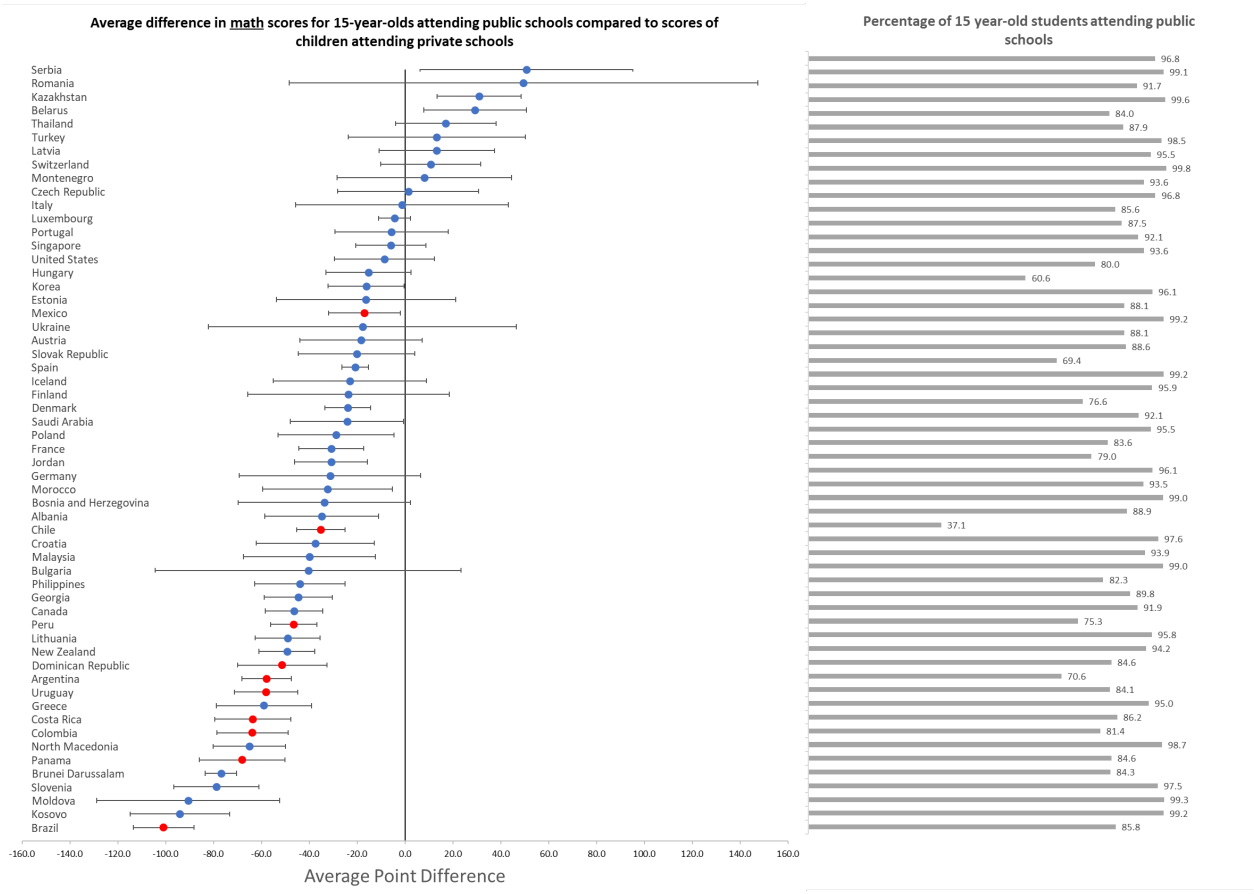
The results are similar, albeit even more extreme, for reading scores. In most countries, children in public schools in LA countries suffer an even larger penalty in reading test scores than children in private schools. With the exception of Spain, there are no significant differences in reading ability between private and public schools in the comparator countries.

Figure 15: Conditional differences in PISA math and reading scores in public versus private schools

Note: The results are from an ordinary least squared (OLS) regression of reading/math scores on socioeconomic characteristics. The variable for public schools takes the value of zero for private independent and private government dependent. The values are the coefficients of a regression of the math/reading scores on parental education, gender (female=1), location of school (rural=1) and public schools. If the coefficient is not statistically significant at conventional levels, we set it equal to zero. PISA scores are scaled to approximate a normal distribution with a mean of 500 points and a standard deviation of 100.
Source: Authors' estimates using PISA 2018 dataset- OECD.

It is noteworthy that the effects of being in a private school are large in LAC, not only in the context of the selected comparator countries but also when compared to all other countries that participated in PISA. As shown in Figure 16, in most Latin American countries (in red) the marginal effect on math test scores of being in a private school, controlling for gender, parental education, and urban/rural, is among the largest of the PISA sample, with Brazil being the country where children suffer the largest learning penalty for attending a public school.

Figure 16: PISA math score difference in public relative to private school



Note: The results are from an ordinary least squared (OLS) regression of reading/math scores on socioeconomic characteristics. The variable for public schools takes the value of zero for private independent schools and private Government-dependent schools. For Chile, the public-school percentage excludes voucher schools which are then classified as private. The values reported above are the coefficients on public school of a regression of the math scores on parental education, sex, rural vs urban, and public vs private schools. The range of the 95% confidence interval is indicated. PISA scores are scaled to approximate a normal distribution with a mean of around 500 points and a standard deviation of around 100. The grey bars on the right show the percentage of students that attend public school in each country.
Source: Estimates using PISA 2018 dataset- OECD.

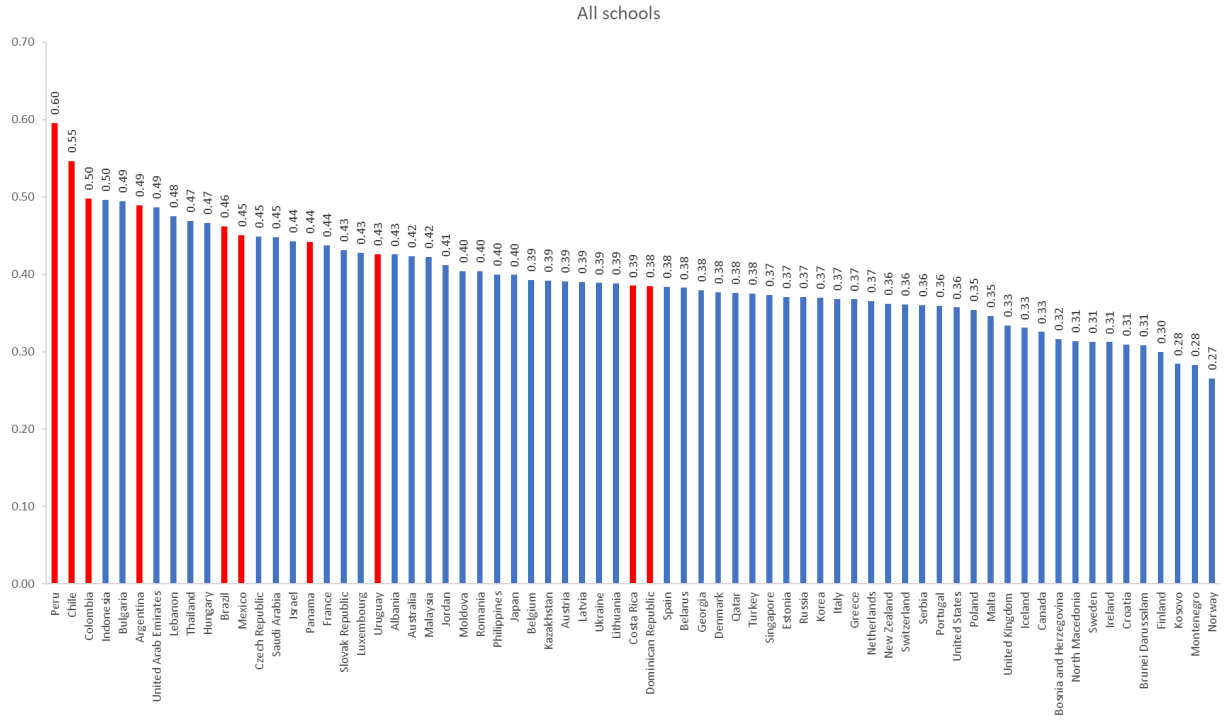
Overall, the results in this section indicate that only some children of high, and very few of low socioeconomic backgrounds, escape a low-quality education by attending private school, while everyone else, including a sizeable share of children from high socioeconomic backgrounds, learns relatively little in public schools as compared to their counterparts in other countries.

Another important aspect related to inequality is the level of school segregation based on parental socioeconomic status. A highly segregated schooling system can have consequences beyond learning and their effects on future earnings and economic mobility (Chetty, et al., 2022) impacting the degree to which citizens share common values, develop a sense of belonging to the same community, or trust, and empathize with people of different backgrounds (Cox, 2010). Figure 17 presents the results of measuring segregation by means of the Duncan dissimilarity index for all schools for each country. This index measures how much the distribution across schools of children of the bottom socioeconomic quartile deviates from what would be observed had they been distributed randomly across schools. It takes values between 0 and 1; a value of 1 indicates complete segregation of children of low socioeconomic background and a value of 0 indicates no segregation. As a proxy of socioeconomic status, we use the PISA index of economic, social, and cultural status, which is calculated using the information from the highest parental education in years of schooling index, the highest parental occupational status index, and the home possessions estimates. We classify the lowest quartile in this distribution as "low" socioeconomic background. A Duncan index of 0.5, for example, represents the share of the low socioeconomic population that would need to be moved in order to create a uniform distribution of this group across schools.

The results suggest that children of low socioeconomic backgrounds in Latin America attend highly segregated schools.[7] Peru, Chile, and Colombia display the highest level of socioeconomic segregation of the whole PISA sample. Moreover, all LA countries in PISA, with the exception of Costa Rica and the Dominican Republic, fall in the top half most segregated countries.

[7] Busso and Messina (2020) also observed this phenomenon.

Figure 17: Dissimilarity Index, 2018



Note: The Duncan dissimilarity index compares the students in the bottom quartile of the socioeconomic index to the students in the rest of the distribution. The dissimilarity index can be expressed as $D = \frac{1}{2}\sum_{j=1}^{N}\left|\frac{n_j^a}{N^a} - \frac{n_j^b}{N^b}\right|$, where a and b stand for the type of students, a for low socioeconomic status, and b students with higher socioeconomic status, respectively, in each school j. N represents the number of students with type a or b in the country. It represents the share of the low socioeconomic population that would need to be moved in order to create a uniform distribution of this group across schools.
Source: Authors´ estimates using PISA 2018 dataset- OECD.

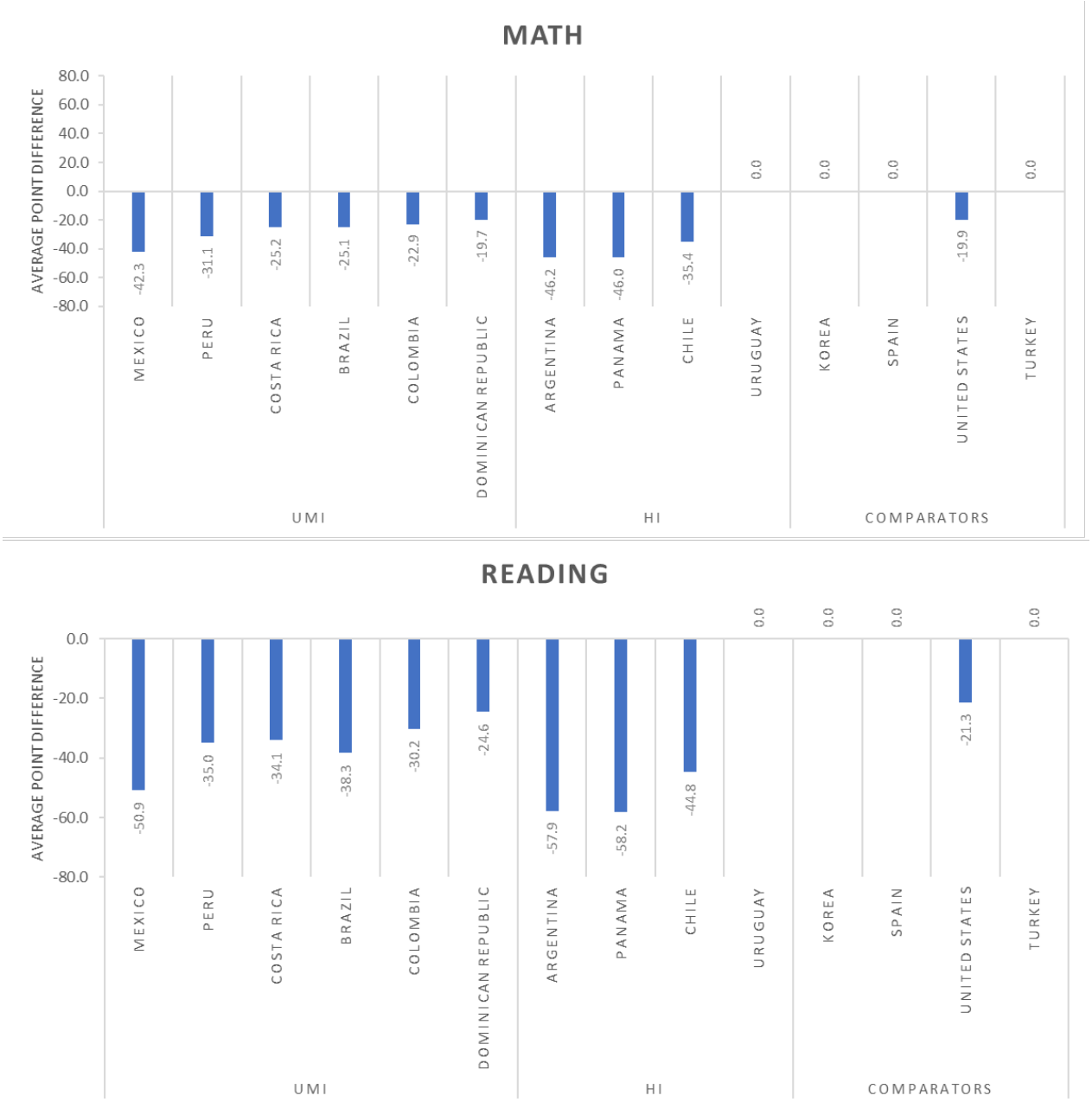
To summarize, in Latin America, attending a private or public school makes a large difference in terms of actual learning. Schools, furthermore, are highly segregated by parental socioeconomic background. Remarkably, a considerable share of children of all backgrounds learns little, on average, in public schools as reflected in their PISA scores.

Urban-rural differences

Another important source of inequality in the quality of the education is reflected in the urban-rural divide. Figure 18 presents the coefficients on rural schools from the regression of the math or reading scores from column 3 of Table 4: which controls for parental education, private or public school, and the child´s gender. It shows that average scores in urban schools are higher than in rural ones in all countries in the region. Moreover, rural-to-urban score gaps are higher in LAC than in the comparator countries; the average of this gap across the Latin American countries included in PISA is 42 points in reading, or a bit under half a standard deviation, and 33 points in math. Argentina and Panama are the countries with the largest rural-to-urban math and reading score gaps. Mexico and Chile also exhibit sizeable learning gaps between rural and urban

schools. At the other end, the countries with the smallest score gaps between rural and urban schools are the Dominican Republic and Colombia. It is noteworthy that the rural-to-urban gaps are not significant in most comparator countries, except for the United States.

Figure 18: Rural-Urban gap in PISA Scores



Note: The results are from an ordinary least squared (OLS) regression of reading/math scores on socioeconomic characteristics. The rural variable is derived from the location of the school. Thus, rural is defined as schools located in communities described as a village, hamlets, or rural areas with fewer than 3 000 people The values are the coefficients of a regression of the reading/math scores on parental education dummies as well as dummies for gender (female=1), rural, and public schools. If the coefficient is not statistically significant at conventional levels, we set it equal to zero. PISA scores are scaled to approximate a normal distribution with a mean of 500 points and a standard deviation of 100.
Source: Estimates using PISA 2018 dataset- OECD.

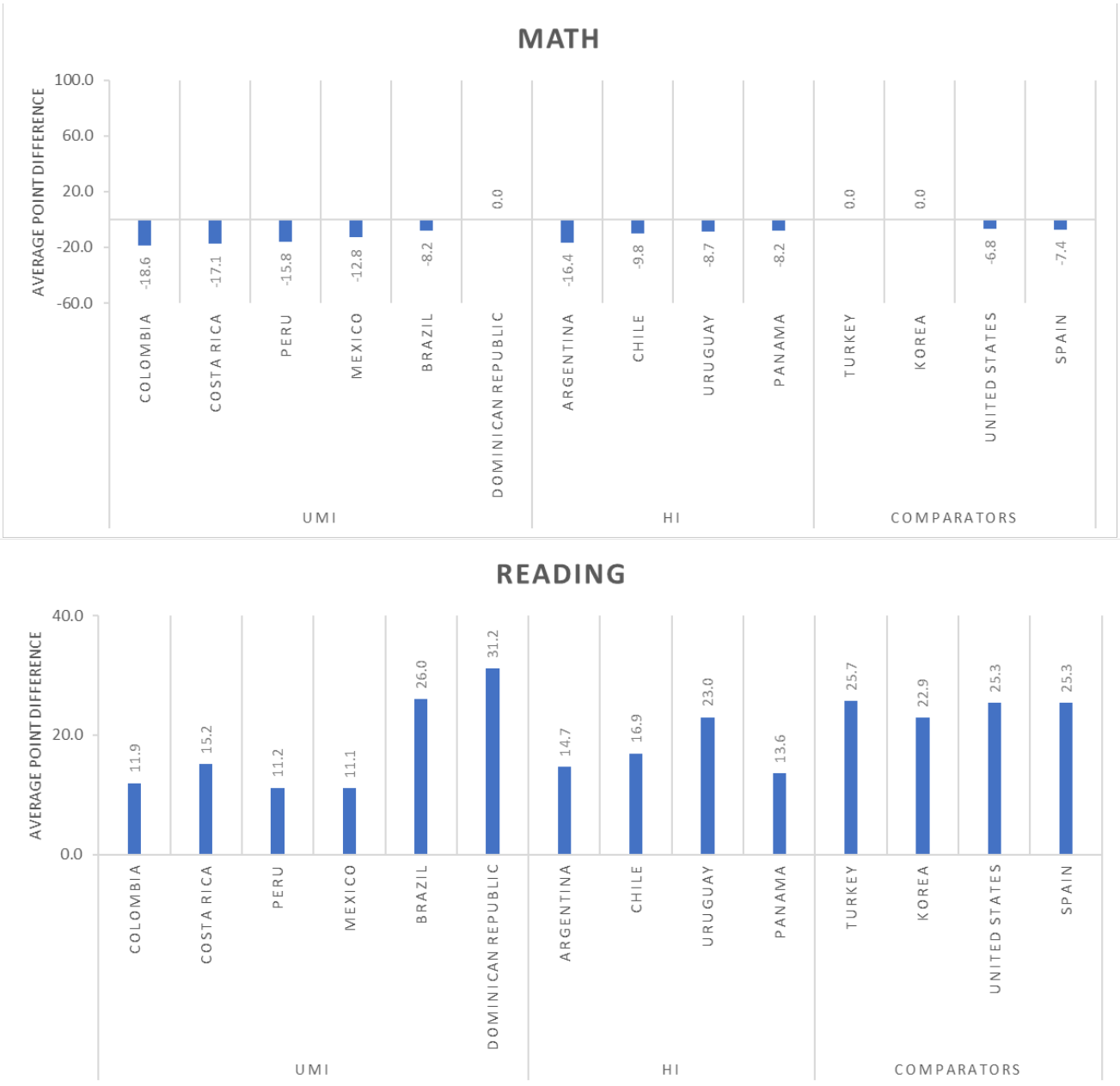
Gender Inequality in Education Quality

Lastly, we assess gender differences in PISA scores (see the chapter on Gender Inequality in LAC for a more in-depth analysis of gender gaps in education). Figure 19 plots the coefficient on female from the same regression discussed before. In almost all countries in the region, women attain lower math scores, ranging from 8.2 points below in Brazil and Panama to 18.6 in Colombia, with the sole exception of the Dominican Republic which has no gender gap. On the other hand, women attain much higher reading scores everywhere, ranging from 11.1 in Mexico to 31.2 in the Dominican Republic.

These results differ from the ones obtained for the comparator countries. Regarding math scores, the Unites States and Spain show a relatively small male lead in math scores of 6.8 and 7.4 points, respectively, whereas no gap exists in Korea and Turkey. For reading, the comparators also show a score advantage by women but this advantage tends to be larger in the comparator countries (except in Brazil, Dominican Republic and Uruguay, where the female lead is comparable to the one measured in higher-income countries)

In conclusion, school quality as reflected in PISA scores at age 15 varies substantially across several dimensions in the region. In addition to the educational attainment of a child's parents, the private-public status of the school matters and in many countries this dimension plays an even larger role. Another important divide is given by the rural/urban dimension: children in rural schools learn less than children in urban schools, a gap that is not present in the majority of the comparator countries. Finally, boys lead girls in math, whereas girls lead boys by even more in reading and language ability, although these differences tend to be smaller than the gaps stemming from parental education, public/private schools, or rural-urban schools.

Figure 19: Gender gap in PISA scores



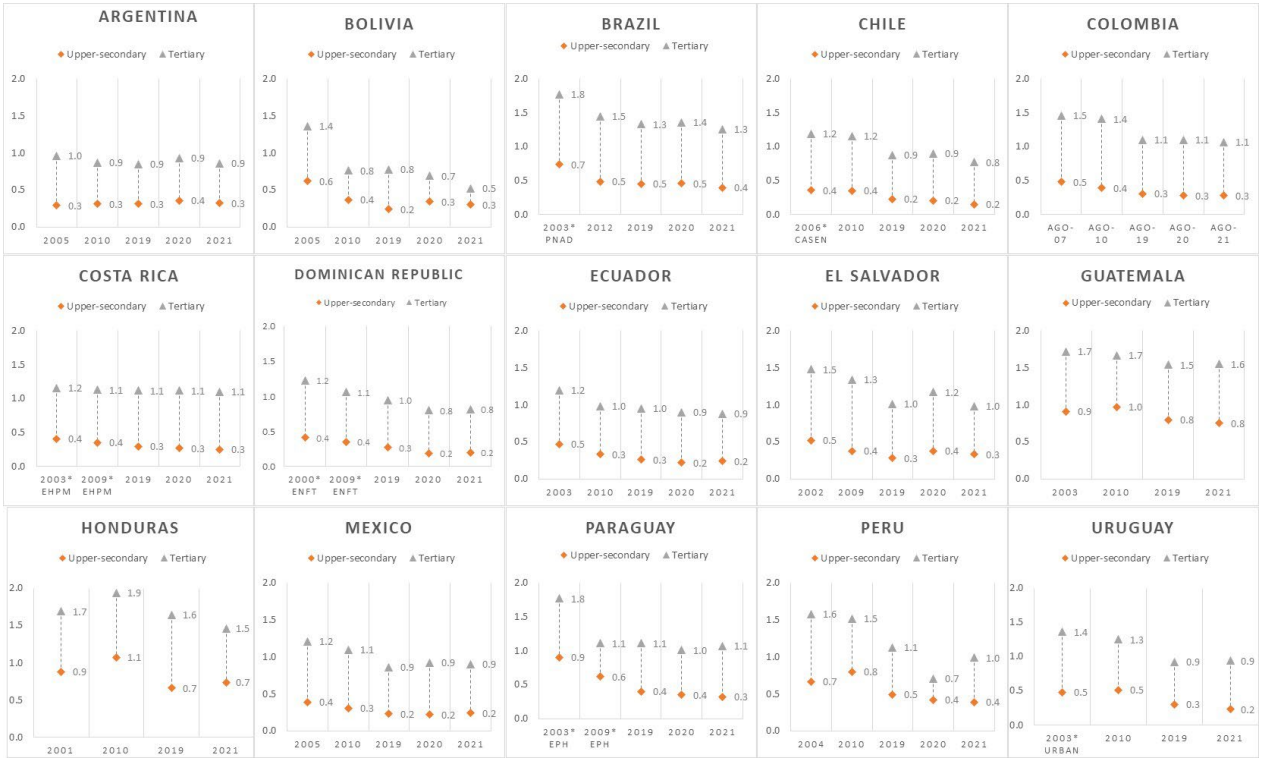
Note: The results are from an ordinary least squared (OLS) regression of reading/math scores on socioeconomic characteristics. The values are the coefficients on female of a regression of scores on parental education, gender (female=1), rural, and public schools. PISA scores are scaled to approximate a normal distribution with a mean of approximately 500 points and a standard deviation of around 100. If the coefficient is not statistically significant at conventional levels, we set it equal to zero.
Source: Estimates using PISA 2018 dataset- OECD.

5. Wage returns to education

The former sections showcase that education in Latin America is unequal both in quantity and quality. Because education is an important determinant of income, high inequality in education is likely to translate into high wage and income inequality. In this section, we assess the degree to which education affects wages and how this influences wage inequality. In order to do so, we first present estimates of the economic returns to education using household and employment survey data for the past 20 years for Latin America, where the dependent variable is the log of post-tax hourly wages in the main occupation, and the independent variables consist of a categorical variable for the individual's education (the baseline category is less than upper-secondary), gender, potential experience –approximated as age minus years of schooling—and potential experience squared. The sample is restricted to the prime-age working population between 25 and 55 years old. Only individuals who are working for non-zero wages are included. As there are multiple years, the evolution of the return to various levels of education can be followed over time.

Figure 20 shows that circa 2021, on average, the post-tax wage of a person with tertiary education is 170 percent or more above that of a person without an upper secondary education in Brazil, Paraguay, Guatemala, and Honduras, and close to 100 percent above in the rest of countries in the sample. An upper secondary education has a post-tax wage premium ranging from 20 to 40 percent in most countries, with the exceptions of Guatemala, Honduras, and Paraguay where it is around 90 percent.

Figure 20: Returns to education in Latin American countries (Mincer regressions)



Note: For the following countries the data are not strictly comparable over time due to methodological changes in the survey: Brazil, PNAD and PNADC; Costa Rica, EHPM and ENAHO; EPH and EPHC for Paraguay; and the Dominican Republic, ENFT and ENFTC. The coefficients are statistically significant at p<0.05. The results show the estimates of an OLS regression where the dependent variable is the natural logarithm of the post-tax hourly wage in the main occupation for wage earners and self-employed. The controls include a categorical variable for educational attainment, where the base category is having less than upper-secondary, upper secondary, and tertiary education; a dummy variable for females, potential experience (age – years of schooling) and potential experience squared. For Argentina and Uruguay, the rural dummy variable is excluded.

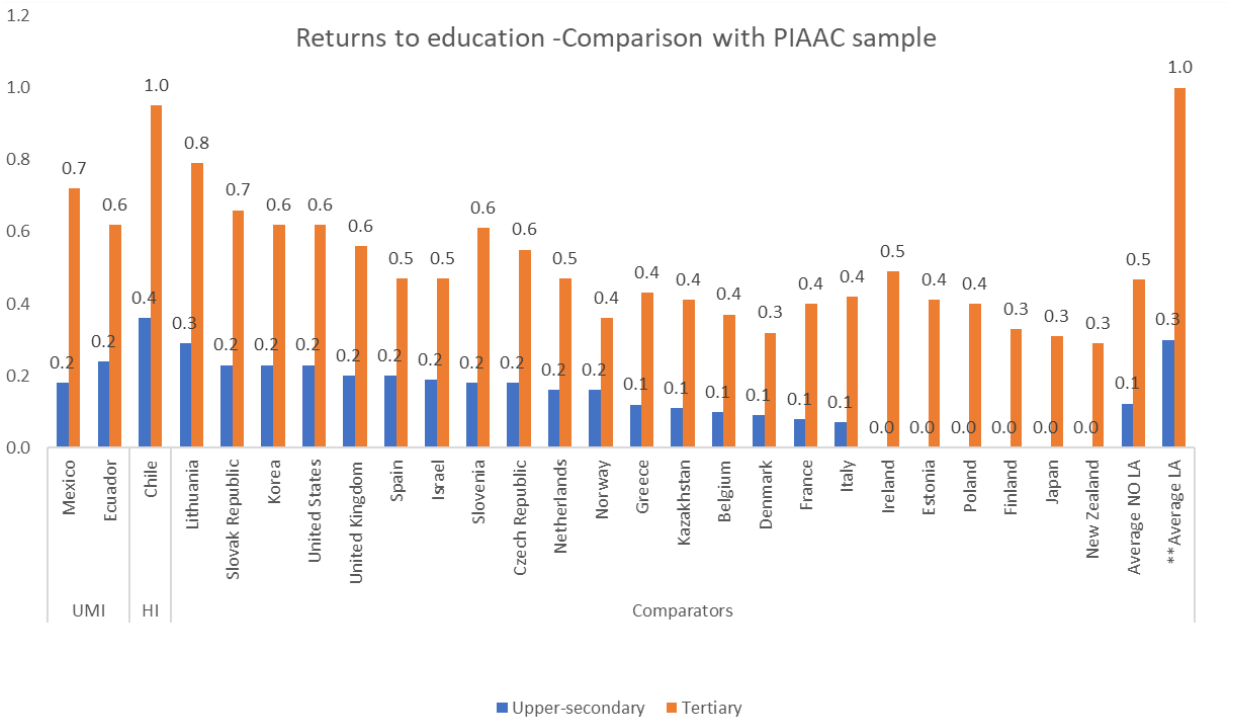
Source: Székely et al. (2023). Argentina (urban) – EPH (2003, 2010, 2019, 2020, 2021), Bolivia – ECH (2005, 2010, 2019, 2020, 2021), Brazil– PNAD (2003), PNADC (2012, 2019, 2020, 2021), Chile – CASEN (2006), ENE-ESI (2010, 2019, 2020, 2021), Colombia- GIEH (2007, 2010, 2019, 2021), Costa Rica-EHPM (2003, 2009), ENAHO (2019, 2020, 2021), Dominican Republic – ENFT (2000, 2009), ENFTC (2019, 2020, 2021), Ecuador –ENEMDU (2007, 2010, 2019, 2021), Guatemala–ENEI (2003, 2010, 2019, 2021), Honduras– EPHPM (2001, 2010, 2019, 2021), Mexico –ENOE (2005, 2010, 2019, 2020, 2021, 2022), Peru- ENAHO (2004, 2010, 2019, 2020, 2021), Paraguay– EPH (2003, 2009), EPCH (2019, 2020, 2021t4), El Salvador –EHPM (2002, 2009, 2019, 2020, 2021), Uruguay- EPH (2003 (urban), 2010, 2019, 2021).

Figure 20 shows that there has been a marked decline in both the tertiary and higher secondary

education premia since the beginning of this century, albeit with some heterogeneity. The tertiary education premium has been stable in Argentina, Costa Rica and Honduras and has declined in the rest of countries. The fall has been particularly acute in Brazil, El Salvador, Mexico, Paraguay, Peru and Uruguay, where it fell by 50 percentage points or more during the last two decades. Falling returns to education have been observed in other regions, and have been associated with a variety of factors including the expansion of education levels in the past generations (documented in Section 1 above) (Montenegro & Patrinos, 2014), as well as with changes in the demand for different types of skills (Lustig et al., 2016; Psacharopoulos & Patrinos, 2018), and with reductions in education quality (Fink & Peet, 2016).

Despite the decline in education premia in most LA countries, these are still high. Figure 21 shows returns to upper secondary and tertiary education in comparator countries estimated with the PIAAC dataset. This data set uses pre-tax wages, making a direct comparison with the post-tax wage data used previously impossible. Note, however, that even comparing post-tax wages of Figure 21 with the pre-tax wages of Figure 20 suggests that returns to education are considerably larger in Latin American countries (assuming that taxes are progressive). In most LA countries, the post-tax wages of workers with higher education are approximately double those of workers without upper secondary, as compared to 40% greater in the comparator countries (Figure 21). It is also noticeable that the returns to upper secondary are three times greater in LA than in the sample of PIAAC countries excluding LA (0.3 in LA versus 0.1 in comparators). If we focus on the smaller subset of countries used as comparators in the earlier sections, we find that the returns to higher education tend to be high for Korea and the United States (0.6 for both countries), but still well below the average of the three Latin American countries in the PIAAC sample (0.8).

Figure 21: Returns to education in comparator countries (Mincer regressions)

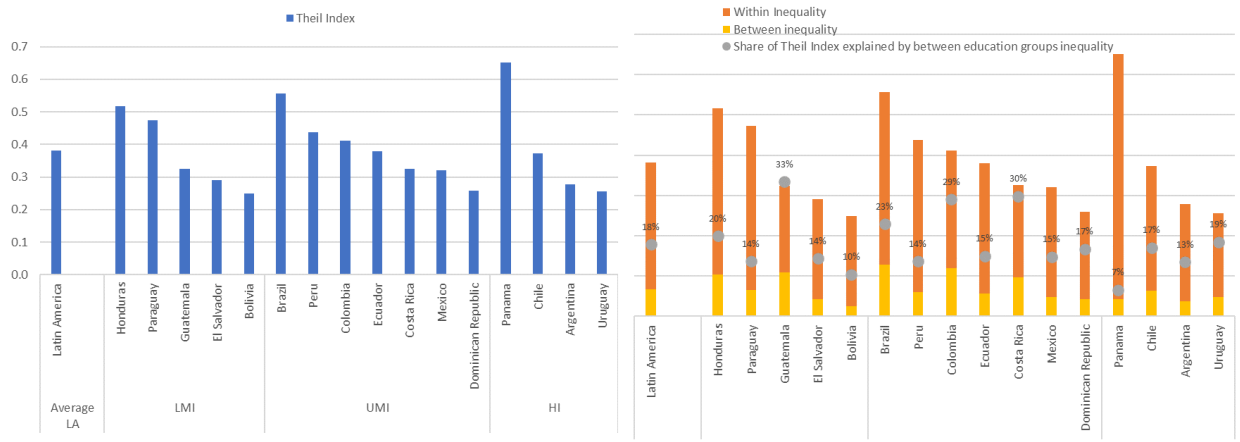


Note: The coefficients are statistically significant at p<0.05. The results show the estimates of an OLS regression where the dependent variable is the natural logarithm of the pre-tax hourly wage in the main occupation for wage earners and self-employed. The controls include a categorical variable for educational attainment, where the base category is having less than upper-secondary, upper secondary, and tertiary education; a dummy variable for females, potential experience (age – years of schooling) and potential experience squared. For the United States, the estimates are calculated using the Current Population Survey (CPS) for 2019, all weekly earnings are adjusted following Autor et al. (2008). **The Average for LA is calculated as the simple average using the data shown in Figure 20 circa 2021. Average NO LA indicates the average wage premia excluding the LAC countries.
Source: Székely et al. (2023), PIAAC, 2017, and the CPS 2019 for the United States. For Spain, South Korea, the PIAAC data was collected in 2011-2012; for Chile and Turkey, the data was collected in 2015, and in 2017 for the remaining countries.

One way to assess the extent to which educational differences are associated with overall wage inequality is by computing the Theil index which allows one to decompose total inequality into two components – inequality within a subgroup and inequality across subgroups – given a classification of the population into groups according to some characteristic of interest (here education). The inequality *between* subgroups is the inequality due to differences in the average wages across education levels. Figure 22 presents the Theil Index decomposition for 16 LAC countries using post-tax wage data from recent household surveys. The average value of the Theil index is 0.4 (left panel), of which 0.07 points on average are from inequalities between education groups and 0.33 points on average are from within group inequalities (right panel). Hypothetically, i.e., if there were no other changes, the within component averaging 0.33 points would be the level of post-tax wage inequality regionally in the absence of inequality across education groups. As shown in the right panel of Figure 22, the average share of overall post-tax wage inequality that can be attributed to inequality between education groups, is 18 percent,

although with significant variation across the region from 33, 30, and 29 percent in Guatemala, Costa Rica and Colombia, respectively, to shares of 23, 20 and 19 percent in Brazil, Honduras and Uruguay, and shares below 17 percent in the rest of the countries.

Figure 22. Theil Index decomposition for the hourly post-tax wage in Latin American countries

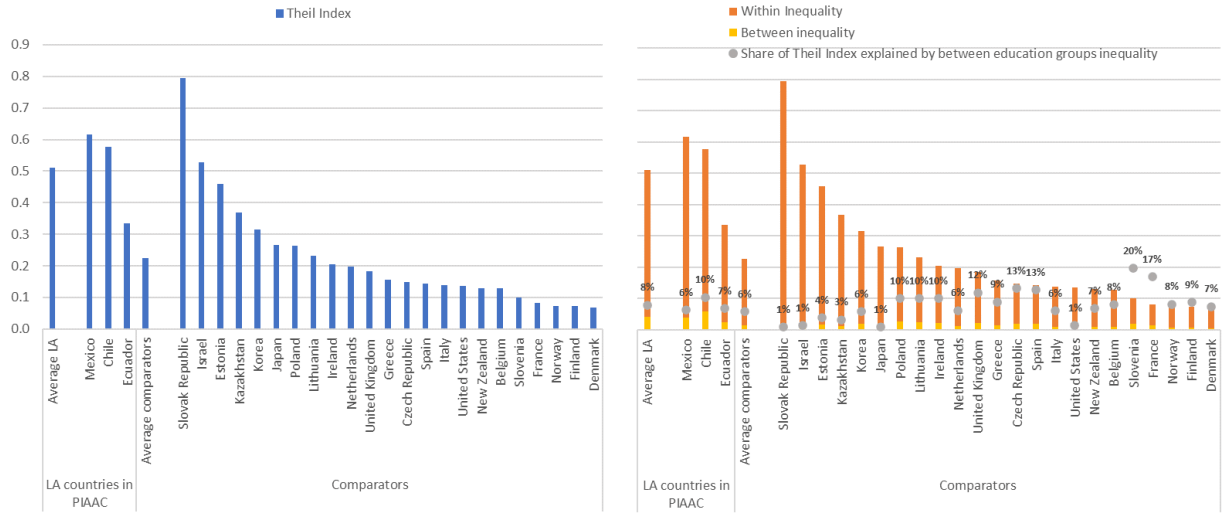


Note: The Theil Index is calculated for the post-tax hourly wage in the main occupation for wage earners and self-employed. For educational attainment, the categories are: less than upper-secondary, upper secondary, and tertiary education. The circle marker (and number just above it) in the right panel shows the share of Theil Index explained by the between inequality, expressed as a percentage.

Source: Authors' calculations based on household or employment surveys for Latin America. Argentina (urban) – EPH (2019), Bolivia – ECH (2019), Brazil–PNADC (2019), Chile –ENE-ESI (2019), Colombia-GIEH (2019), Costa Rica-ENAHO (2019), Dominican Republic –ENFTC (2019), Ecuador –ENEMDU (2019), Guatemala–ENEI (2019), Honduras– EPHPM (2019), Mexico –ENOE (2019), Panama-EPM(2019), Peru- ENAHO (2019), Paraguay–EPCH (2019), El Salvador –EHPM (2019), Uruguay- EPH (2019).

Figure 23 presents the Theil Index decomposition using pre-tax wage data for the PIAAC sample that includes comparator countries outside the region but unfortunately only three countries within the region. As can be seen in the panel on the left, the overall Theil inequality index for pre-tax wages for Mexico, Chile, and Ecuador is more than twice as large as the average value of the index for the comparators. With the exception of the Slovak Republic, Mexico and Chile are the countries with the highest pre-tax inequality levels in the PIAAC sample, while Ecuador ranks as 6th amongst the 26 countries included. The right panel repeats the decomposition of the Theil index into the shares explained by between and within education groups. The average value of the between inequality component of the Theil index is of 0.04 and 0.01 points for the LAC and comparator countries, respectively, that is, four times greater in LAC. This component represents 8 percent of the overall Theil index in LAC vs. 6 percent in the comparators.

Figure 23: The Theil Index and its decomposition for the pre-tax hourly wage



Note: The Theil Index decomposition is applied to the pre-tax hourly wage in the main occupation for wage earners and self-employed. For educational attainment, the categories are: less than upper-secondary, upper secondary, and tertiary education. The circle marker in the right panel shows the share of Theil Index explained by the between inequality, expressed as a percentage.
Source: Estimates using PIAAC 2017 and CPS 2019 for the United Sates.

6. Conclusions

The picture of education in Latin America is mixed. Although the average years of education have increased in all countries, especially in the lower middle-income countries that started with a significantly lower educational attainment, the quality of education, as reflected in the PISA scores of 15-year-old students, is low compared to other regions.

The importance of parental education is seen both in the quantity and quality of the education obtained by their children. In particular, having a parent with a tertiary education significantly increases the probability of a child obtaining an upper-secondary and especially tertiary schooling. For some countries this relationship has increased over time whereas in others it has fallen. The degree to which PISA test scores depend on parental education is similar to that of comparable countries. What is more atypical is the large differences in average PISA test scores between public and private schools. Controlling for parental education, test scores in public schools are significantly lower than in other regions of the world and also differ markedly from test scores obtained by children who attend private school. In addition, private school attendance is among the most socio-economically segregated in the world: children of high socioeconomic backgrounds that attend private schools relate, to a large extent, only with similarly high socioeconomic background peers. These associations affect the production and reproduction of education inequality in the region.

Education inequality is important as well for other dimensions of inequality, such as wages. Returns to education, albeit decreasing over time, remain extremely high in Latin America

compared to other regions. This increases income inequality and education accounts for a larger share of overall wage inequality than in comparator economies. Wage and education inequality, in turn, leads to high inequality on a large number of outcomes, such as health or wealth that are analyzed in other chapters of this volume.

Finally, it should be said that the relationship between education and inequality has many dimensions and while this chapter touches on key aspects, others are left to be explored. In particular, the impact of COVID-19 on education inequality and, more generally, how policies impact inequality in education are not examined in the present chapter.[8]

[8] Covid and its repercussion on education are studied, among others, in Acevedo et al. (2023) and World Bank (2022). Almeyda et al. (2023), Molina-Millan et al. 2016 have good summaries of the large literature on policies and education inequality.

ANNEX A

Table 1.A: Marginal effects of the probability of completing at least upper-secondary for the 25-34 age cohort, relative to those whose neither parent attained upper-secondary

Variables	BRA		COL		CHL		ECU		MEX		PER		ESP		KOR		TUR		USA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Highest Level of Mother's education																				
Attained upper-secondary		0.2***		0.2***		0.1***		0.3***		0.4***		0.2***		0.2***		-0.0		0.4***		0.1
		(0.01)		(0.02)		(0.04)		(0.03)		(0.04)		(0.03)		(0.04)		(0.02)		(0.09)		(0.05)
Attained tertiary		0.3***		0.1***		0.1		0.3***		0.2***		0.3***		0.2***		-		-		0.1**
		(0.02)		(0.04)		(0.07)		(0.06)		(0.09)		(0.03)		(0.05)						(0.04)
Highest level of Father's education																				
Attained upper-secondary		0.2***		0.1***		0.1***		0.2***		0.2***		0.2***		0.2***		0.1***		0.5***		0.0
		(0.02)		(0.02)		(0.05)		(0.03)		(0.06)		(0.02)		(0.04)		(0.01)		(0.03)		(0.03)
Attained tertiary		0.3***		0.1***		0.2***		0.3***		0.4***		0.2***		0.4***		0.1***		0.5***		0.1
		(0.02)		(0.03)		(0.05)		(0.05)		(0.04)		(0.04)		(0.03)		(0.02)		(0.06)		(0.03)
Highest level of parental education																				
At least one parent has attained upper-secondary	0.3***		0.2***		0.2***		0.4***		0.4***		0.3***		0.3***		0.05***		0.5***		0.1**	
	(0.01)		(0.01)		(0.04)		(0.02)		(0.04)		(0.03)		(0.03)		(0.01)		(0.03)		(0.05)	
At least one parent attained tertiary education	0.4***		0.2***		0.3***		0.4***		0.5***		0.4***		0.4***		0.05***		0.6***		0.1***	
	(0.01)		(0.02)		(0.04)		(0.03)		(0.03)		(0.03)		(0.03)		(0.01)		(0.03)		(0.05)	
Female	0.1***	0.1***	0.0***	0.0***	0.0	0.0	-0.0	-0.0	-0.0	-0.02	-0.1***	-0.1***	0.1***	0.1***	0.0	0.0	-0.1***	-0.1***	-0.0	-0.0
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.0)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Age fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Pseudo R-squared	0.134	0.130			0.14	0.18	0.15	0.17	0.14	0.16	0.18	0.19	0.12	0.13	0.11	0.11	0.2	0.15	0.08	0.12
Obs.	6,869	6,869	23,56	23,56	1,082	1,082	1,266	1,266	1,293	1,293	1,572	1,572	1,139	1,139	1148	1,044	1,421	1,392	602	602

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Source: For Chile, Ecuador, Mexico, Peru, South Korea, Spain, Turkey and the United States calculations using the Programme for the International Assessment of Adult Competencies (PIAAC) 2017; for Spain, South Korea, the data was collected in 2011-2012; for Chile and Turkey, the data was collected in 2015, and for the rest of the countries is 2017. For Brazil, the estimates are calculated using the PNAD 2014-Supplement of Socio-employment Mobility and Supplement of Education and Professional Qualification surveys. For Colombia, the source is National Survey of Quality of Life (2019). 40For the United States, the specification does not include age fixed-effects.

Table 1.A CONT: Marginal effects of the probability of completing tertiary education for the 25-34 age cohort, relative to those whose neither parent attained upper-secondary

Variables	BRA		COL		CHL		ECU		MEX		PER		ESP		KOR		TUR		USA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Highest Level of Mother's education																				
Attained upper-secondary		0.2***		0.2***		0.2***		0.3***		0.3***		0.1***		0.1*		0.1*		0.3***		0.1*
		(0.02)		(0.02)		(0.05)		(0.04)		(0.05)		(0.04)		(0.05)		(0.04)		(0.08)		(0.08)
Attained tertiary		0.4***		0.1***		0.4***		0.2**		0.1**		0.3***		0.2***		-0.0				0.4***
		(0.03)		(0.04)		(0.09)		(0.09)		(0.06)		(0.06)		(0.06)		(0.07)				(0.07)
Highest level of Father's education				0.1***																
Attained upper-secondary		0.2***		(0.02)		0.1*		0.2***		0.1*		0.2***		0.2***		0.0		0.4***		0.1
		(0.02)		0.1***		(0.05)		(0.05)		(0.05)		(0.03)		(0.05)		(0.04)		(0.04)		(0.08)
Attained tertiary		0.5***		(0.03)		0.3***		0.4***		0.4***		0.2***		0.4***		0.2***		0.4***		0.1
		(0.03)				(0.07)		(0.08)		(0.06)		(0.05)		(0.05)		(0.05)		(0.08)		(0.07)
Highest level of parental education																				
At least one parent has attained upper-secondary	0.3***		0.2***		0.2***		0.4***		0.3***		0.2***		0.2***		0.1**		0.5***		0.2***	
	(0.02)		(0.01)		(0.04)		(0.04)		(0.04)		(0.03)		(0.04)		(0.03)		(0.04)		(0.08)	
At least one parent attained tertiary education	0.7***		0.6***		0.5***		0.6***		0.5***		0.4***		0.4***		0.3***		0.6***		0.5***	
	(0.02)		(0.02)		(0.04)		(0.05)		(0.05)		(0.03)		(0.04)		(0.04)		(0.06)		(0.07)	
Female	0.1***	0.1***	0.0***	0.0***	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1***	0.1***	0.1***	0.1***	-0.1***	-0.1***	0.0	0.0
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Age fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Pseudo R-squared	0.20	0.22	0.22	0.20	0.16	0.18	0.17	0.18	0.16	0.19	0.11	0.13	0.11	0.11	0.07	0.08	0.20	0.18	0.07	0.09
Obs.	6,869	6,869	23,560	23,560	1,082	1,082	1,266	1,266	1,293	1,293	1,572	1,572	1,139	1,139	1,251	1,251	1,421	1,392	602	602

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Source: For Chile, Ecuador, Mexico, Peru, South Korea, Spain, Turkey and the United States calculations using the Programme for the International Assessment of Adult Competencies (PIAAC) 2017; for Spain, South Korea, the data was collected in 2011-2012; for Chile and Turkey, the data was collected in 2015, and for the rest of the countries is 2017. For Brazil, the estimates are calculated using the PNAD 2014-Supplement of Socio-employment Mobility and Supplement of Education and Professional Qualification surveys. For Colombia, the source is National Survey of Quality of Life (2019). For the United States, the specification does not include age fixed-effects.

Annex B. Data Description

A. National Employment and Household Surveys

To approximate the years of schooling for the adult population in Latin America and the Caribbean (LAC), we use cross-sectional data from national household or employment surveys for 16 countries in the region for 2019 or the latest year available before 2020. The surveys are the following:

- **Argentina: The Permanent Household Survey** (*Encuesta Permanente de Hogares* – EPH, in Spanish) for the third quarter of 2019. It is a quarterly survey with only urban coverage and is carried out by the National Institute of Statistics and Censuses (INEC, by its acronym in Spanish). The survey covers household characteristics, education, employment, and income.
- **Bolivia: The Household Survey** (*Encuesta de Hogares* – ECH, in Spanish) for 2019. The survey has national coverage and is nationally representative. The Institute of Statistics (INE, by its acronym in Spanish) conducts the survey annually, covering household characteristics, employment, income, education, and health.
- **Brazil: The Continuous National Sample Survey** (*Pesquisa Nacional por Amostra de Domicilio Contínua* – PNADC, in Portuguese) for 2019 is nationally representative. The survey is carried out quarterly by the Brazilian Institute of Geography and Statistics (IBGE, by its acronym in Portuguese). We use the annual version, which collects data on education, housing, sociodemographic characteristics, and income from all sources. The database corresponds to the updated version published on February 24, 2022 –which incorporates the new weighting structure for the survey.
- **Chile: The Economic Characterization Survey** (*Encuesta de Caracterización Socioeconómica Nacional* – CASEN, in Spanish) for 2017, which is nationally representative. The survey has a biannual or triennial frequency, covering topics such as education, employment, income, social programs, etc.
- **Colombia: The Great Integrated Household Survey** (*Gran Encuesta Integrada de Hogares* – GEIH, in Spanish) for August 2019, carried out by the National Administrative Department of Statistics (DANE, by its acronym in Spanish). The survey is nationally representative, with data collected throughout the year, covering education, employment, income, and household demographics, among others. The survey uses the 2005 sampling framework.
- **Costa Rica: The National Household Survey** (*Encuesta Nacional de Hogares* – ENAHO, in Spanish) for 2019 and is nationally representative. The National Institute of Statistics and Censuses (INEC, by its acronym in Spanish) conducts the survey annually, collecting information about living conditions.
- **Dominican Republic: Continuous National Labor Force Survey** (*Encuesta Nacional Continua de Fuerza de Trabajo* – ENCFT, in Spanish) for the fourth quarter of 2019. The

quarterly survey is nationally representative and collects data on education, labor force, and income indicators.

- **Ecuador: The National Employment, Unemployment and Under-employment Survey** (*Encuesta Nacional de Empleo, Desempleo y Subempleo* – ENEMDU, in Spanish) for the third quarter of 2019. It is a quarterly survey with national coverage and is carried out by the National Institute of Statistics and Censuses (INEC, by its acronym in Spanish), covering topics such as education, employment, and income.
- **El Salvador: The Household Survey for Multiple Purposes** (*Encuesta de Hogares de Propósitos Múltiples* – EHPM, in Spanish) for 2019, which is nationally representative. The National Office of Statistics and Censuses (ONEC, by its acronym in Spanish) conducts the survey annually, covering housing, household characteristics, education, employment, and income.
- **Guatemala: The National Employment and Income Survey** (*Encuesta Nacional de Empleo e Ingresos*- ENEI, in Spanish) for 2019 with national coverage. The National Statistics Institute (INE, by its acronym in Spanish) conducts the survey once or twice a year, collecting variables on housing, household characteristics, education, employment, and income.
- **Honduras: The Permanent Household Survey for Multiple Purposes** (*Encuesta Permanente de Hogares de Propósitos Múltiples*, in Spanish) for 2019. The survey is nationally representative and is carried out by the National Statistics Institute (INE, by its acronym in Spanish), covering household characteristics, education, employment, and income.
- **Mexico: The Household Income and Expenditure Survey** (*Encuesta Nacional de Ocupación y Empleo* – ENIGH, in Spanish) for 2018. The survey has national coverage and is carried out biannually by the National Institute of Statistics and Geography (INEGI, by its acronym in Spanish). The survey covers topics such as household income and expenditure, employment, and sociodemographic characteristics.
- **Panama: The Survey for Multiple Purposes** (*Encuesta de Propósitos Múltiples* – EPM, in Spanish) for 2019, which is nationally representative. The survey has an annual frequency and is conducted by the National Institute of Statistics and Census (INEDC, by its acronym in Spanish). The survey collects data on household characteristics, employment, education, and income.
- **Paraguay: The Continuous Permanent Household Survey** (*Encuesta Permanente de Hogares Continua* – EPHC) for 2019 with national coverage. The survey is carried and quarterly for labor indicators and it is published annually for labor outcomes and other socioeconomic indicators.
- **Peru: The National Household Survey** (*Encuesta Nacional de Hogares* – ENAHO) for 2019, which is nationally representative. The National Institute of Statistics and Informatics (INEI, by its acronym in Spanish) conducts the survey on a quarterly basis. The survey collects data on employment, income, education, expenditures, social programs, and household characteristics.
- **Uruguay: The Continuous Household Survey** (*Encuesta Continua de Hogares* – ECH, in Spanish) for 2019. The survey is carried out by the National Institute of Statistics (INE, by its acronym in Spanish) and is nationally representative.

- **United States: The Current Population Survey (CPS)** for 2019. The survey is carried out on a monthly basis by the Bureau of Labor Statistics and conducted by the U.S. Census Bureau.

For Brazil and Colombia, we use additional surveys to explore the association between parents' education and their children's education. For Brazil, we use the PNAD 2014-Supplement of Socio-employment Mobility and Supplement of Education and Professional Qualification, which are nationally representative and were carried out by IBGE in 2014. For Colombia, we use the National Survey of Quality of Life for 2019, conducted annually by the DANE, which collects data on the living conditions of the Colombian population and is nationally representative.

The surveys described above allow for data disaggregation by age cohort, gender, and urban/rural areas –except for Argentina, which only has urban coverage. Also, we use the appropriate survey weights to estimate the population parameters and to make a valid inference about the population. Finally, for cross-country comparisons, we standardize the educational attainment assuming: six years for primary education, three years for lower secondary, three years for upper secondary, and some tertiary for more than 12 years of schooling that can be counted toward postsecondary qualifications.

B. Programme for the International Assessment of Adult Competencies (PIACC)

The Programme for the International Assessment of Adult Competencies (PIAAC) is a program for evaluating adults' skills. One important tool is the survey for assessing adults' cognitive skills, such as literacy, numeracy, and problem-solving skills, for adults 16 to 65 years old. We use PIAAC 1st cycle data, which covers 39 countries, including four from the Latin American region: Chile, Ecuador, Mexico, and Peru. For Chile, data was collected in the second round during 2014-2015. As for Ecuador, Mexico, and Peru, data was collected during the third wave in 2017. Besides evaluating literacy and numeracy skills, the PIAAC survey collects information about the respondents' backgrounds, such as current work, education, training, and parental education. The survey allows for cross-country comparisons and is a representative sample of the adult population in each country. For comparators, we use South Korea, Spain, Turkey, and the United States, with data collection in 2011-2012 for South Korea and Spain, 2014-2015 for Turkey, and 2017 for the United States.

PIAAC uses the 1997 International Standard Classification of Education (ISCED) for coding the education variables. Thus, the educational attainment level of an individual is the highest ISCED level successfully completed, which indicates successful completion of a formal educational program. For parental education, PIAAC considers the following categories (UNESCO, 2006):

- Neither parent has attained upper secondary, which includes no formal education, ISCED1 and 2 including 3C shorter 2 years –referring to no schooling, primary education or first stage education, and lower secondary or second stage of basic education;
- At least one parent has attained secondary and post-secondary, which includes non-tertiary= ISCED 3 + 4 excluding 3C short. These levels refer to upper-secondary, post-and secondary non-tertiary education;

- At least one parent has attained tertiary, which includes ISCED 5 + 6, the first level of tertiary education, and the second stage of tertiary education, respectively. For the individual's highest level of educational attainment, the education variables followed the same categories as the parental education variables.

All the estimates and regressions using PIAAC data are weighted by the sampling weights.

C. PISA: Data for progress in education in LAC

The Programme for International Student Assessment (PISA) is an international program for assessing knowledge in reading, math, and science for 15-year-old students in a set of participating countries. For this chapter, we use PISA 2018 dataset, which covers 79 countries and economies. PISA 2018 includes ten countries in the LAC region, Argentina, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Panama, Peru, and Uruguay. In addition to assessing the knowledge in reading, math, and science, the data includes information about students' backgrounds, such as parental education, home conditions, learning experiences, and school.

PISA scores are scaled to approximate a normal distribution with a mean of approximate 500 points and a standard deviation of approximate 100 (OECD, 2019). Thus, PISA (2019) suggests expressing point differences in terms of effect size (Cohen's d), i.e., a 10 point-difference is equivalent to an effect size of 0.10.

Finally, survey weights are used with the PISA dataset for estimating the population parameters and standard errors.

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