The Geography of Intergenerational Mobility in Latin America and the Caribbean[*]

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Abstract

In this paper, I estimate intergenerational mobility (IGM) in education using data from 91 censuses that span 24 countries in Latin America and the Caribbean (LAC) over half a century. I measure upward mobility as the likelihood of obtaining at least a primary education for individuals whose parents did not finish primary school, whereas downward mobility as the likelihood of failing to complete primary education for individuals whose parents completed at least primary school. In addition, I explore the geography of educational IGM using nearly 400 "provinces" and more than 6,000 "districts". I document wide cross-country and within-country heterogeneity. I document a declining trend in the mobility gap between urban and rural populations, and small differences by gender. Within countries, the level of mobility is highly correlated to the share of primary completion of the previous generation, which suggests a high level of inertia. In addition, upward (downward) mobility is negatively (positively) correlated to distance to the capital and the share of employment in agriculture, but positively (negatively) correlated to the share of employment in industry.

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I Introduction

Intergenerational mobility (IGM) has gained interest in the economic literature among other things thanks to its importance for equity, social cohesion, and economic growth. Its observed correlation with income inequality, commonly named "the Great Gatsby Curve", has contributed to the desire for understanding IGM given the documented rise of inequality over the last decades in rich countries (see Corak, 2013).

In the case of the developing economies, the Latin America and the Caribbean (LAC) region is of particular interest because of its historically documented high levels of income inequality relative to other regions of the world.[1] However, the scarcity of high-quality data (e.g. long panel data sets or tax records with linked generations) has limited the study of IGM in income. These constraints are also common in other regions (e.g., Africa), so the efforts to document IGM on a global scale has taken an alternative path given by the measurement of mobility in education. These measures are of interest in and of themselves, but they are also a proxy for economic status given the close relationship between education and income.

Recent studies have used household and public opinion surveys with retrospective information about parents' education to document the levels of IGM in education in LAC at the country-level (for an example, see Hertz et al., 2007; Narayan et al., 2018; Neidhöfer, Serrano, & Gasparini, 2018). However, analyzing IGM at a more geographically disaggregated level, as argued in Narayan et al. (2018), is valuable because it can help researchers understand the importance of localized patterns and drivers of IGM, as shown for the case of developed countries. Along these lines, Chetty, Hendren, Kline, and Saez (2014) state that the United States can be better described as a collection of societies, some of which are "lands of opportunity" with high rates of mobility across generations, and others in which only a few children escape poverty. Thus far, this type of analysis has not been conducted in LAC countries as a whole due to the inadequacy of most survey data for this purpose. This

[1] See for example Messina and Silva (2019) for an analysis of wage inequality over the last two decades.

paper fills that gap in the literature by generating estimates of IGM in education at smaller geographical levels.

In this paper, I estimate intergenerational mobility in education for LAC countries at a disaggregated regional level using data from 91 censuses. The analysis covers 24 countries spanning more than half a century (between 1960 and 2012). I rely on samples of co-residents (i.e., children living with their parents or older relatives). To minimize the impact of co-residence, I investigate mobility in education at the bottom of the educational attainment distribution by focusing on primary education, which can be measured with a high degree of confidence between ages 14 and 18. Furthermore, an important share of the population does not attain more than primary education in the period analyzed and this focus allows me to create indicators that are directly comparable to the estimates recently generated for 27 countries in Africa (see Alesina, Hohmann, Michalopoulos, & Papaioannou, 2021), a continent that share the feature of having high levels of income inequality despite its lower levels of income and higher poverty rates.

The estimates of upward (and downward) mobility measured as the likelihood of finishing (or failing to finish) primary education, conditional on having parents who failed to finish (or who were able to finish) primary school, show wide cross-country and within-country heterogeneity. In LAC, the distance between the most and least upwardly mobile country is similar to what has been recently documented in Africa, although the least mobile countries in Africa are less mobile than the least mobile country in LAC. I find only small differences by gender, but I do document a declining trend in the mobility gap between urban and rural populations. At the sub-national level, there is heterogeneity in mobility across districts/provinces, and some countries show lower levels of mobility in the northern regions (e.g., Brazil), whereas the opposite is true for Mexico. However, the variability is much lower in countries with lower number of regions and less population. The level of mobility at the sub-national level is highly positively correlated to the share of primary completion of the previous generation, which suggests a high level of inertia. In addition, geographical correlates do not appear to be highly correlated to mobility except for distance to the capital. Similarly, some proxies of economic development like the share of employment in industry and agriculture at the beginning of the sample period seem to be associated to the levels of mobility at the district-level.

This paper contributes to several strands of the economic literature. First, it adds to the literature about intergenerational mobility in general (see Black & Devereux, 2011, for a survey) but specifically to the literature focusing on the geography of socioeconomic mobility that recently received more attention in part because of the work of Chetty et al. (2014), which shows important variation across commuting zones in the United States. Second, it adds to the recent wave of research that looks at intergenerational mobility in education (see Emran & Shilpi, 2019; Torche, 2019, for recent surveys focused on developing countries). This set of papers include on one hand those that use household survey data or opinion surveys. For example, Hertz et al. (2007), Narayan et al. (2018), and Van der Weide, Lakner, Gerszon Mahler, Narayan, and Ramasubbaiah (2021) that document IGM for a very large set of countries across the world[2], and Neidhöfer et al. (2018) that focus on 18 countries from Latin America. This paper expands over them in terms of country coverage of the region and cross-country comparability. In addition, these estimates use the same type of data of recent estimates available for Africa, allowing a cross-regional comparison that was not available.[3] On the other hand and more closely related to this paper, it contributes to pool of studies using administrative data or census data. For instance, Asher, Novosad, and Rafkin (2020) study mobility among different marginalized groups and analyzes geographic differences in India; Card, Domnisoru, and Taylor (2018) use 1940 census data to study the role of school quality in mediating upward mobility in the US; Van der Weide, Ferreira de Souza, and Barbosa (2020) study mobility at sub-national level in Brazil; and most closely

[2] The former documents mobility for 42 countries (7 from LAC) and the latter 153 countries (16 from LAC).

[3] Narayan et al. (2018) and Van der Weide et al. (2021) allow regional comparison but pooling together estimates generated with retrospective information and those with coresident samples, which may be problematic (see Munoz & Siravegna, 2021).

related to this paper, Alesina et al. (2021) document patterns of IGM in Africa using census data and estimate regional childhood exposure effects using migrants. To the best of my knowledge, this is the first paper to document IGM at a very dissagregated regional level for almost the entire population in LAC.

The paper is organized as follows. Section II describes data and methodology. Section III reports the main descriptive results at country level and the geography of mobility. Section IV looks at correlates of intergenerational mobility. Finally, section V concludes with final remarks.

II Data and Methodology

Three sources of data have been typically used to estimate intergenerational mobility. 1) cross-sectional samples of adult populations with retrospective questions about parental education. For example, Narayan et al. (2018) use household survey data that covers the 96% of the world population; 2) panel data long enough in its time dimension to include the socioeconomic or educational attainment of two generations. For example, Celhay, Sanhueza, and Zubizarreta (2010) use the Chilean CASEN to estimate mobility in schooling and income; and 3) administrative/registry data with linked information for parents and adult children. For example, Chetty et al. (2014) use tax records in the U.S. to estimate income mobility.

In the case of Latin America, most of the literature has used household survey data or public opinion surveys (see for example, Hertz et al., 2007; Narayan et al., 2018; Neidhöfer et al., 2018) given that long panel data as well as administrative/registry data that allow the researcher to link generations are rare. In contrast, in this paper, I use census data obtained from IPUMS International (Integrated Public Use Microdata Series, IPUMS, 2019), hosted at the University of Minnesota Population Center, which reports harmonized representative samples (typically 10%) of full census micro data sets for a large number of countries. In particular, I use 91 samples of population and housing censuses from 24 countries, which are run to compute the total population and contain an educational attainment question in their questionnaire.[4] The key advantage of this data set is that it contains the entire population (or at least a large share of it publicly available) at a point in time, allowing me to analyze mobility at a very disaggregated geographical level. However, the main disadvantage of this data set is that does not link all the individuals with their parents because both (individual and parents) need to be part of the same household. Below, I explain how this is addressed and I refer to recent evidence showing that the coresidence bias is likely to be very small for the indicators used in this paper.

II.1 Countries and smaller administrative units

The 24 countries under study are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Trinidad and Tobago, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Saint Lucia, Suriname, and Venezuela (see Table A1 in the Appendix for the details about the fraction of the data available by census), and they represent 91 samples of these 24 countries drawn at various points from 1960 to 2012.

In terms of geography, IPUMS reports residence at the time of the interview for at most two levels of administrative units in which the households were enumerated. These variables contain the geographies for every country harmonized spatio-temporally to provide spatially consistent boundaries across samples in each country. This allows me to assign individuals to "coarse" (roughly similar to states in the U.S.) and "fine" administrative units (roughly similar to counties in the U.S.). The sample spans 400 provinces (admin-1 units) and 6,684 districts (admin-2 units). The baseline estimates will make use of the former to avoid issues derived from having a reduced number of observations per administrative unit but estimates using the latter are also reported in the Appendix.

[4]Because the individuals are not organized into households, I do not use Chile 1960, Colombia 1964, Costa Rica 1963, Dominican Republic 1960 and 1970, Ecuador 1962, Honduras 1961 and Mexico 1960. I also omit the 1995, 2005 and 2015 inter decennial Census counts of Mexico.

II.2 Linking generations and coresidence

The data collection is organized at the household level, so it is possible to link only those individuals who live in the same household at the time of the interview. The data set includes a variable that by means of 62 different values details the relationship between the individual and the head of the household. Based on this variable, I classify individuals into five different generations where the head corresponds to generation zero (see Table 1), and based on the generation number I use individuals who live with at least one member of the immediately previous generation, where these old generation members are considered as "pseudo-parents".[5] Table 1 provides the details of the assignment.

Table 1: Relationship to household head and identification of different generations

Relationship to the head	Generation	Relationship to the head	Generation
Grandparent	-2	Sibling of sibling-in-law	0
Great grandparent	-2	Ex-spouse	0
Parent/parent-in-law	-1	Child	1
Parent	-1	Biological child	1
Stepparent	-1	Adopted child	1
Parent-in-law	-1	Stepchild	1
Aunt/uncle	-1	Child-in-law	1
Head	0	Spouse/partner of child	1
Spouse/partner	0	Unmarried partner of child	1
Spouse	0	Nephew/niece	1
Unmarried partner	0	Foster child	1
Same-sex spouse/partner	0	Tutored/foster child	1
Sibling/sibling-in-law	0	Tutored child	1
Sibling	0	Grandchild	2
Stepsibling	0	Grandchild or great grandchild	2
Sibling-in-law	0	Great grandchild	2
Cousin	0	Great-great grandchild	2

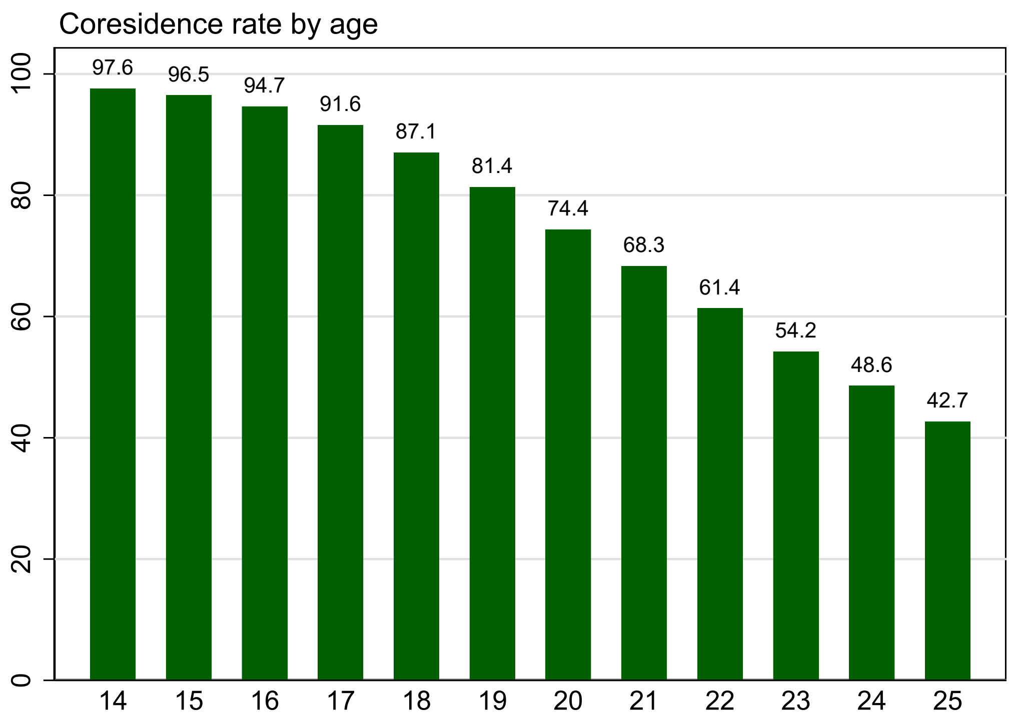
Notes: Categories not classified are: Other relative, not elsewhere classified; other relative with different family name; non-relative; friend; housemate/roommate; visitor; godparent; godchild; domestic employee; relative of employee; spouse of servant; child of servant; other relative of servant; roomer/boarder/lodger/foster child; boarder; boarder or guest; lodger; employee, boarder or guest; other specified non-relative; agregado; temporary resident, guest; group quarters; group quarters, non-inmates; institutional inmates; non-relative, n.e.c.; other relative or non-relative; unknown.

Figure 1 shows the unweighted average rate of co-residence by age in the sample pooling

[5] A similar approach is followed by Alesina et al. (2021) with Census data from Africa.

all the countries and years. There are rates above 90% for individuals before reaching 18 years old that then start decreasing more rapidly getting close to 40% for people who are 25 years old. When the coresidence rate is computed with samples that distinguish urban/rural or gender, I find negligible differences in the former and a steeper fall in the rate of coresidence by age for women relative to men (see Figure A1 in the Appendix).

Figure 1: Coresidence rate by age

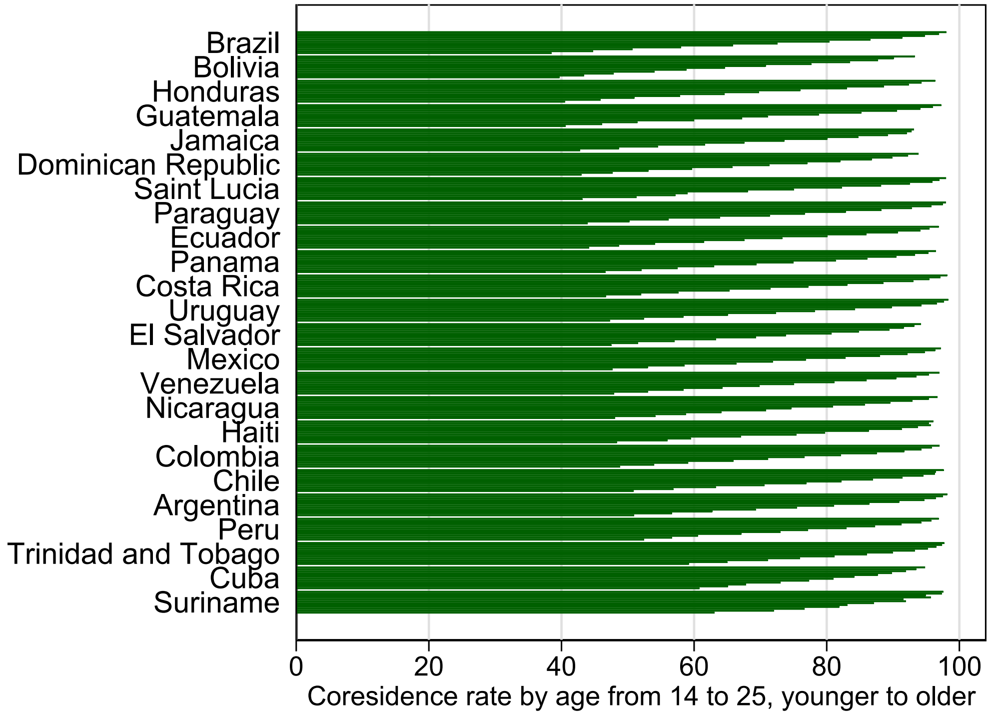


Notes: Coresidence is defined as living with at least one relative of the immediately previous generation. The data in the graph is unweighted.

Figure 2 disaggregates the coresidence rate by country displaying some variability in the magnitude of the fall of it with age. This figure also suggest that the fall in coresidence around age 25 is driven by Brazil, which is the most populated country in Latin America. Table A3 in the Appendix provides co-residence rates by country for different age groups.

A concern associated to the use of co-residents is that it may generate bias in the estimates of IGM as individuals who reside with their parents may systematically differ from those not

Figure 2: Coresidence rate by age and country



Notes: Coresidence is defined as living with at least one relative of the immediately previous generation. The data in the graph is unweighted.

residing with them (see for example, Emran, Greene, & Shilpi, 2018; Emran & Shilpi, 2019; Francesconi & Nicoletti, 2006). However, Munoz and Siravegna (2021) show that the average coresidence bias when computing upward mobility (measured as the likelihood of completing primary for those whose parents did not complete primary) for individuals aged 21-25 years (with coresidence rates of less than 50% on average) is approximately 2%. In addition, the ranking obtained using these coresident samples closely follow the one obtained with a sample that include all children (the Spearman rank correlation between the estimates with full sample and those with coresident samples is 0.91). Given these findings, the potential for coresidence bias in my estimates is small as they are computed using individuals aged 14-18 (or 14-25) years, a group with much higher rate of coresidence.[6]

[6]Figure A2 in the Appendix display visually how the estimates computed in Munoz and Siravegna (2021) with all children compare to the estimates with coresidents.

II.3 Education

Why is education a suitable variable by which to measure IGM? Education as a measure of socioeconomic status relative to income in the context of developing countries has at least three advantages: 1) it contains less measurement error, reducing potential attenuation bias (see Solon, 1992); 2) it is fixed early in the life cycle, which avoids the life-cycle bias found in studies that use income (see Haider & Solon, 2006). In addition, education is closely linked to income and it is important by itself in terms of human development; 3) it can be completely attributed to a specific individual, while income sometimes is hard to assign within a household (e.g., a household with multiple persons and home production, which may be specially relevant in the case of rural populations in poor countries).

There are two questions about educational attainment in the data set. The first one reports the total years of schooling completed by each individual (formal schooling regardless of the track or kind of study), and the second one is re-coded by IPUMS to capture educational attainment in terms of the level of schooling completed[7] and contains four categories: 1) Less than primary completed, 2) primary completed, 3) secondary completed, 4) university completed. In the main analysis of the paper I use the latter variable, which has a lower number of missing values and it is available for more countries than the former.[8] This variable applies, to the extent possible, the United Nations standard of six years of primary schooling, three years of lower secondary schooling, and three years of higher secondary schooling.

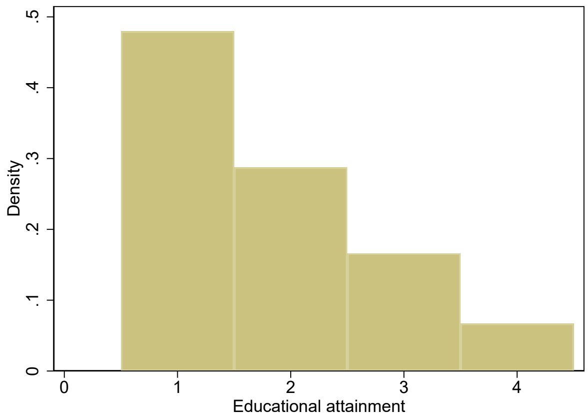
In the sample, a majority of individuals report levels of education that correspond to less than completed secondary and near 50% less than primary (see Figure 3a), which supports the focus on primary completion that I will detail later as most of the action happens at lower levels of completion.[9] In addition, although the level of education in Latin America

[7]It does not necessarily reflect any particular country's definition of the various levels of schooling in terms of terminology or number of years of schooling.

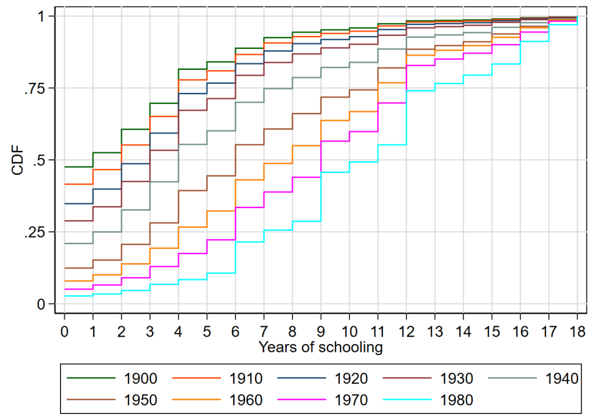
[8]Years of schooling is not available for Brazil 2010, Cuba 2002, Saint Lucia 1991, Suriname 2012, Trinidad and Tobago 1970, and Uruguay 2011.

[9]An additional reason to focus on primary completion is that these estimates are directly comparable to

Figure 3: Educational Attainment



(a) Histogram of attainment



(b) CDF of years of schooling

Notes: The graphs use different samples as years of schooling is not available or is top-coded in six country-year samples (Brazil 2010, Colombia 1993 and 2005, Peru 1993 and 2007, and Uruguay 2011). The graph includes only individuals older than 25 from decade cohorts 1900 to 1980. The plot on the right shows the CDF by birth decade (e.g., 1980 considers those born between years 1980 and 1989).

and the Caribbean has been increasing across cohorts (see Figure 3b), the continent still shows a share of around sixty percent with at most nine years of schooling in the most recent cohort (those born in the 1980s), which roughly corresponds to the completion of lower secondary education. Nonetheless, I also provide an Appendix using estimates that focus on the completion of secondary level.

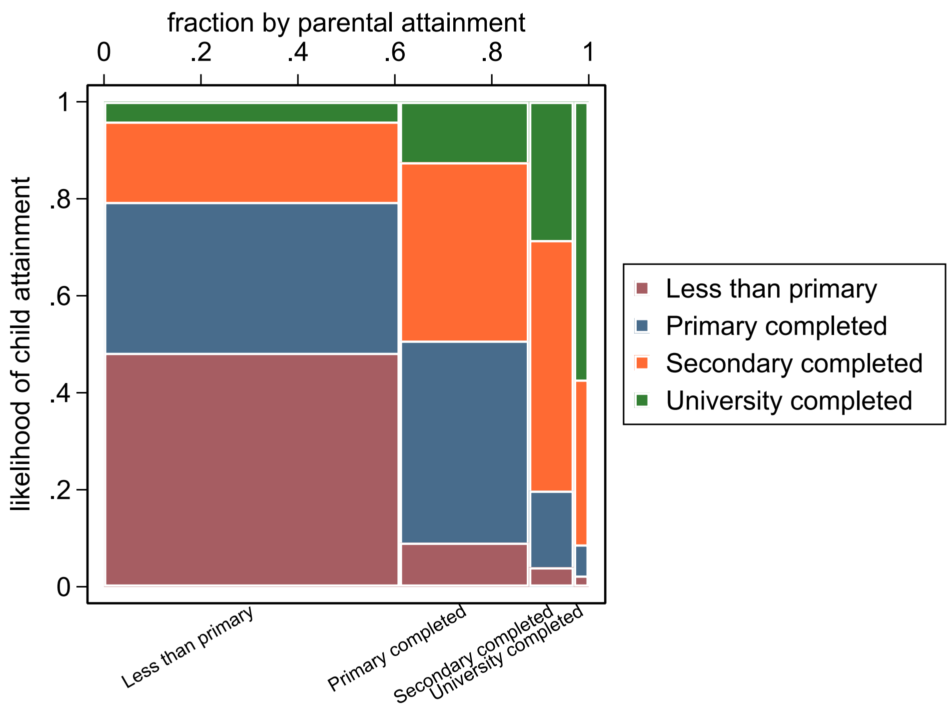
Figure 4 shows the transition matrix for individuals older than 25 to get a rough idea of the patterns of intergenerational education mobility present in the data set.[10] This plot highlights that the action is terms of mobility happens in the lower two levels of educational attainment, qualitatively similar to what can be seen in Alesina et al. (2021) for the African continent. The same mosaic plot can be found by country in the Appendix. Two countries that stand out in terms of low and high levels of parental attainment of primary education

the ones recently documented in Alesina et al. (2021) for Africa.

[10] I use individuals older than 25 years as younger ones are unlikely to have completed their education. The main analysis uses younger individuals as the focus is on primary completion. Figure A3 in the Appendix reproduces this mosaic with individuals aged 14-25 years.

are Jamaica and Guatemala[11] (see Figure 5).[12]

Figure 4: Educational Attainment Transition Matrix



Notes: The sample is constructed with individuals older than 25 that coreside with at least one individual of the generation above. The figure displays the transition matrix between the educational attainment of individuals in the sample and their parents. The horizontal axis is divided according to the share of parents with each level of educational attainment. The height of each rectangle within the figure is the likelihood of child educational attainment conditional on the attainment of their parents.

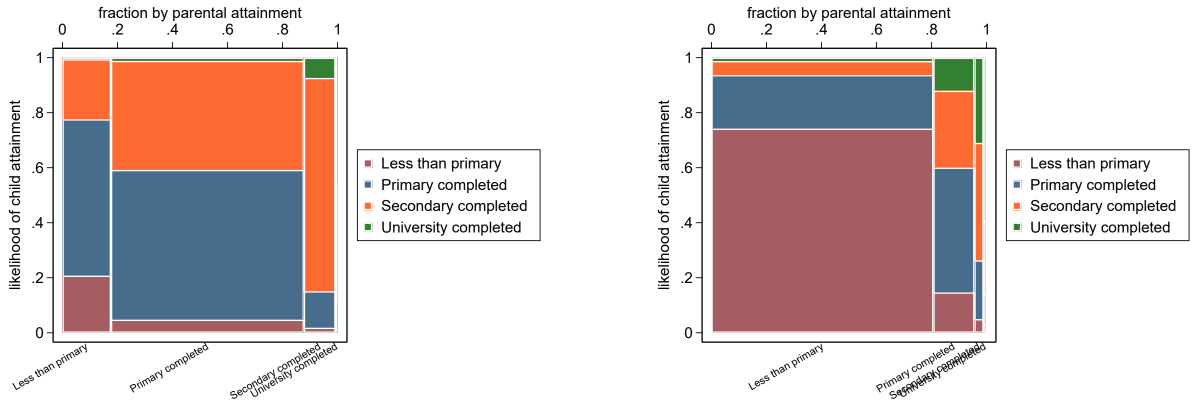
II.4 Methodology

For each individual in the sample, I analyze the relationship between its own educational attainment against the average attainment of individuals one generation older living in the same household, rounded to the nearest integer. For this I consider a measure of absolute

[11] Saint Lucia shows similar patterns but contains a much smaller population.

[12] The same plot using individuals aged 14-25 years can be found in the Appendix (see Figure A4).

Figure 5: Transition matrix for selected countries



(a) Jamaica

(b) Guatemala

Notes: The sample is constructed with individuals older than 25 that coreside with at least one individual of the generation above. The figures display the transition matrix between the educational attainment of individuals in the sample and their parents. The horizontal axis is divided according to the share of parents with each level of educational attainment. The height of each rectangle within each figure is the likelihood of child educational attainment conditional on the attainment of their parents.

intergenerational mobility that reflects the likelihood that a children complete a strictly higher or lower education level than the members of the immediately previous generation in the household (parents and/or extended family members, such as aunts and uncles).

Upward mobility at the country level. To estimate upward IGM, I estimate the following econometric specification, pooling observations from all the censuses and countries:

$$y_{icoyt}^{up} = \alpha_c^{up} + \gamma_o^b + \gamma_y^b + \theta_t + \epsilon_{icoyt} \tag{1}$$

where y_{icoyt}^{up} is a dummy variable that takes a value equal to one when individual i completes at least primary education and zero otherwise. The parameters γ_o^b, γ_y^b, θ_t refer respectively to fixed effects by decade-cohort of the individual i, decade-cohort of the generation above that co-resides with individual i, and census year. This regression uses a sample of individuals with ages between 14 and 18 (or 14 to 25), for whom the generation above (parents or older relatives) have on average less than primary education. Hence, α_c^{up} is the parameter of interest and measures the likelihood of completing primary for children whose "parents" did not complete primary net of cohort and census year effects.

This empirical approach has been used in Alesina et al. (2021) with data from Africa and delivers a measure of mobility comparable between countries that captures some long-term patterns over half a decade by netting out common (across countries) birth cohorts and census year effects.

Downward mobility at the country level. To estimate downward IGM, I use a similar econometric specification, pooling observations from all the censuses and countries:

$$y_{icoyt}^{down} = \alpha_c^{down} + \gamma_o^b + \gamma_y^b + \theta_t + \epsilon_{icoyt} \tag{2}$$

where y_{icoyt}^{down} is a dummy variable that takes a value equal to one when individual i does not complete primary education and zero otherwise. The parameters γ_o^b, γ_y^b, θ_t again refer respectively to fixed effects by decade-cohort of the generation above that co-resides with individual i, decade-cohort of the individual i, and census year. This regression uses a sample of individuals with ages between 14 and 18 (or 14 to 25), for whom the generation above (parents or older relatives) have on average completed at least primary education.[13] Hence, α_c^{down} is the parameter of interest and measures the likelihood of failing to complete primary for children whose "parents" completed at least primary school net of cohort and census year effects.

Upward and downward mobility at finer geographical level. To estimate IGM at a more disaggregated level (i.e., provinces or districts), I use the following econometric specifications run country by country:

$$\begin{aligned} y_{icroyt}^{up} &= \alpha_{cr}^{up} + \gamma_o^b + \gamma_y^b + \theta_t + \epsilon_{icroyt} \\ y_{icroyt}^{down} &= \alpha_{cr}^{down} + \gamma_o^b + \gamma_y^b + \theta_t + \epsilon_{icroyt} \end{aligned} \tag{3}$$

[13] I use the average attainment of the generation above instead of the maximum to make these estimates directly comparable to those in Alesina et al. (2021). However, this decision makes little difference as I explain in the robustness section later.

where the variables and subscripts in common have similar interpretation as in Equation 1 and 2, and the additional subscript r refers to the district or province according to the level of geographical dis-aggregation used in the analysis (provinces as the baseline estimates and districts as an additional exercise reported in the Appendix).

Why is primary education a suitable variable by which to measure IGM? The focus on primary education is based on the fact that a non-negligible share of the population in Latin America and the Caribbean has an educational attainment of less than primary as shown in the previous subsection. Furthermore, this focus makes the analysis directly comparable to the recent work of Alesina et al. (2021) in Africa and allows me to minimize the potential bias that comes from using samples of co-residents. Nonetheless, the focus on the lowest level of education can also be justified from a conceptual point of view. Development policy discussions often claim that the poorest should not be left behind and this focus is related to the school of moral philosophy exemplified by the principle of justice proposed by Rawls (1971).[14]

Robustness. As a robustness check, I compute upward and downward mobility using some alternative options in terms of data construction. First, I use the maximum attainment of the generation above instead of average. This change produces estimates with differences that are negligible (for example, Pearson correlation coefficient between the measures using average versus maximum at the country, province, and district level are approximately 1). Second, I estimate mobility using a sample of individuals linked to (probable) parents as done by IPUMS (2019). This change produces estimates that are also highly correlated (for example, Pearson correlation coefficient between the measures using average versus maximum at the country, province, and district level are 0.98, 0.97 and 0.93, respectively).

Alternative measures of IGM. I estimate a set of additional measures of intergenerational mobility, which are less focused on the bottom of the educational attainment distribution. In contrast to the estimates that focus on primary education, these measures

[14]See Ravallion (2016) as an example of the focus on the poorest in the context of poverty measurement.

are computed using individuals with ages between 19 and 25. First, I estimate upward and downward mobility considering secondary education instead of primary. Second, I estimate upward mobility as the likelihood of finishing at least secondary education for those whose generation above were not able to complete primary school. These indicators are more prone to suffer from coresidence bias but they still provide valuable information. For example, Munoz and Siravegna (2021) show that the rank correlation between indicators of upward mobility using secondary level computed with all children versus coresidents is approximately 0.86.[15]

III Intergenerational Mobility in LAC

III.1 Country-level estimates

Table 2 summarizes the estimates of mobility at the country-level. On average, close to fifty percent of children with parents that did not finish primary education (from now on, illiterate parents) are able to complete primary. On the other hand, downward mobility is close to ten percent, as one out of ten children with parents that finished primary education (from now on, literate parents) do not complete primary.

There is substantial heterogeneity within LAC countries. The probability of completing primary for children of illiterate parents ranges from 18% in Guatemala to 87% in Jamaica. In the case of downward mobility, the estimated probability of not completing primary for children of literate parents ranges from being null in Jamaica to 23% in Haiti. The heterogeneity found in upward mobility in Latin America (e.g., the 69 percentage points gap between Jamaica and Guatemala) is relatively similar to the one documented for African countries (e.g., the 75 percentage points gap between South Africa and South Sudan) by Alesina et al. (2021), although with higher minimum and maximum values. Furthermore, the level of upward mobility among countries in LAC shows substantial overlap with that

[15] Using 72 country and 5-year birth cohorts that span 18 countries in Latin America.

of Africa. Countries such as Haiti, Guatemala, and Nicaragua with the lowest levels of upward mobility in LAC are more upwardly mobile than five lowest (Malawi, Ethiopia, Sudan, Mozambique, and South Sudan) out of the 27 countries for which Alesina et al. (2021) provide estimates.

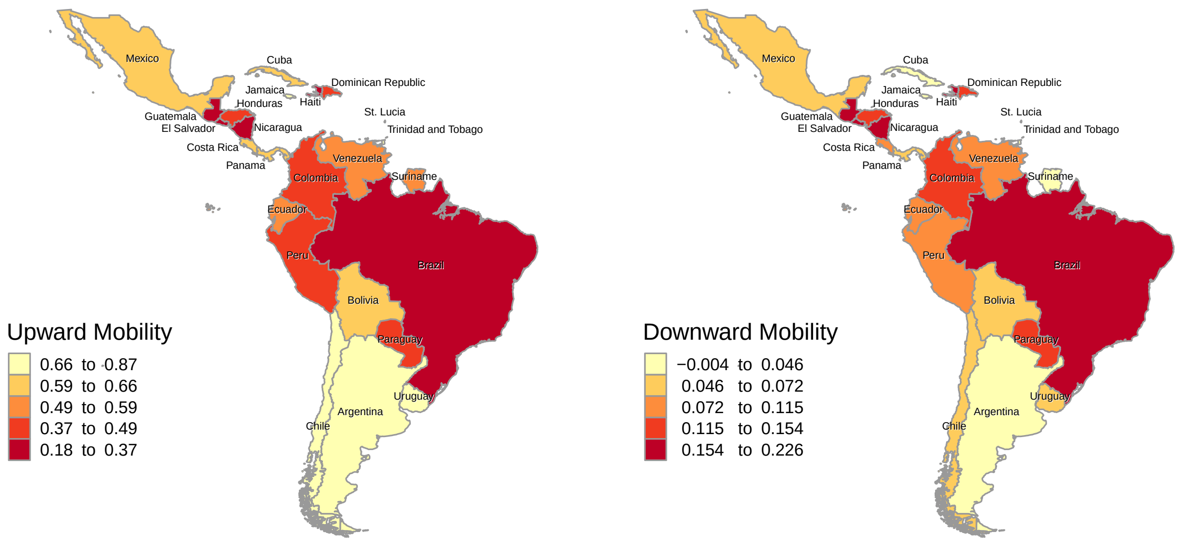
Table 2: Country-Level Estimates of Educational Intergenerational Mobility

		(1)	(2)	(3)	(4)	(5)	(6)
mobility / N	census years	upward	upward	downward	downward	N	N
age range		14-18	14-25	14-18	14-25	14-18	14-25
Jamaica	1982,1991,2001	.868	.864	-.004	.003	43,404	77,227
Trinidad and Tobago	1970,1980,1990,2000,2011	.839	.833	.023	.023	41,253	81,100
Argentina	1970,1980,1991,2001,2010	.762	.789	.035	.034	1,068,471	2,017,618
Chile	1970,1982,1992,2002	.682	.709	.05	.044	344,149	651,737
Uruguay	1963,1975,1985,1996,2006,2011	.668	.685	.064	.052	108,528	199,653
Cuba	2002,2012	.662	.688	.027	.024	101,268	214,486
Panama	1960,1970,1980,1990,2000,2010	.635	.665	.049	.04	86,527	157,906
Costa Rica	1973,1984,2000,2011	.634	.643	.086	.068	107,088	197,018
Bolivia	1976,1992,2001,2012	.609	.634	.068	.057	206,745	358,013
Mexico	1970,1990,2000,2010	.602	.622	.048	.042	2,811,581	4,961,471
Ecuador	1974,1982,1990,2001,2010	.543	.572	.089	.074	373,130	667,055
Suriname	2012	.535	.563	.042	.031	2,999	6,141
Venezuela	1971,1981,1990,2001	.533	.587	.096	.08	517,834	940,766
Saint Lucia	1980,1991	.523	.492	.126	.142	2,089	3,679
Peru	1993,2007	.48	.524	.115	.088	357,472	668,806
Paraguay	1962,1972,1982,1992,2002	.432	.463	.116	.096	118,082	207,766
Colombia	1973,1985,1993,2005	.402	.437	.142	.114	886,765	1,605,718
Honduras	1974,1988,2001	.398	.433	.151	.133	109,458	182,786
Dominican Republic	1981,2002,2010	.376	.442	.15	.124	173,340	312,654
Brazil	1960,1970,1980,1991,2000,2010	.367	.422	.171	.128	10,755,296	18,713,402
El Salvador	1992,2007	.342	.374	.164	.138	85,402	150,582
Haiti	1971,1982,2003	.212	.266	.226	.178	104,465	183,588
Nicaragua	1971,1995,2005	.194	.238	.223	.18	93,635	167,740
Guatemala	1964,1973,1981,1994,2002	.181	.212	.159	.129	238,047	402,133
mean / total		.52	.548	.101	.084	18,737,028	33,129,045

Notes: Columns (1) and (2) give upward-IGM estimates. They reflect the likelihood that children, aged 14-18 and 14-25, whose parents have not completed primary schooling will manage to complete at least primary education. Columns (3) and (4) give downward-IGM estimates. They reflect the likelihood that children, aged 14-18 and 14-25, whose parents have completed primary schooling or higher will not manage to complete primary education. Columns (5) and (6) give the number of observations used to estimate the country-specific IGM statistics (children whose parental education is reported in the censuses). Countries are sorted from the highest to the lowest level of upward IGM in the 14-18 sample (column (1)). "mean" gives the unweighted average of the 24 country-estimates.

Figure 6 maps the country-level estimates of upward and downward mobility in education. They highlight the heterogeneity found across the continent, show that the patterns of upward mobility are inversely related to downward mobility and that there are combinations of low and high mobility countries in South America, as well as in Central America and

Figure 6: Intergenerational Educational Mobility in LAC



(a) Upward Mobility

(b) Downward mobility

Notes: Upward mobility reflects the likelihood that children, aged 14-18, whose parents have not completed primary schooling will manage to complete at least primary education. Downward mobility reflects the likelihood that children, aged 14-18, whose parents have completed primary schooling or higher will not manage to complete primary education. Both estimates are net of cohort and census year effects.

the Caribbean. The estimates of upward and downward mobility at the level of country are significantly negatively correlated (see Figure A13 in the Appendix).

Country-level estimates of intergenerational mobility focused on secondary education can be found in Table A7 of the Appendix. The level of upward (downward) mobility is considerable lower (higher) and the samples smaller. Similar to the estimates using primary education, we observed significant variation across countries. In the case of upward mobility measured as the likelihood that children complete at least secondary education when their parents were not able to complete primary, we see lower levels of mobility at the country-level as one may have expected (see Table A10 in the Appendix).

III.1.a Urban-rural

Given that an important feature of most developing countries is the gap in living standards between rural and urban residents (see Lagakos, 2020), I explore the heterogeneity in IGM between these populations and document how they have evolved across birth cohorts. I do so by estimating upward and downward mobility[16] by country, birth decade of the "children" and urban/rural status of their residence. Figure 7 reports the gap between the upward/downward mobility in urban-rural areas over birth cohort. I find a positive gap that has been declining from 36 percentage points (i.e., upward mobility in urban areas is on average 36 percentage points higher than in rural areas for the cohort born in years 1950-1959) to 20 percentage points as one moves towards older birth cohorts. Similarly, the gap in downward mobility is closing from below moving from 29 percentage points for 1950 birth decade to 15 percentage points for 1980 birth decade. Figure A14 and Figure A15 in the Appendix show estimates by sub-population rather than the gap between them for countries with data in at least 4 decades, suggesting that the gap has been decreasing because of an increase (decrease) in upward (downward) mobility.

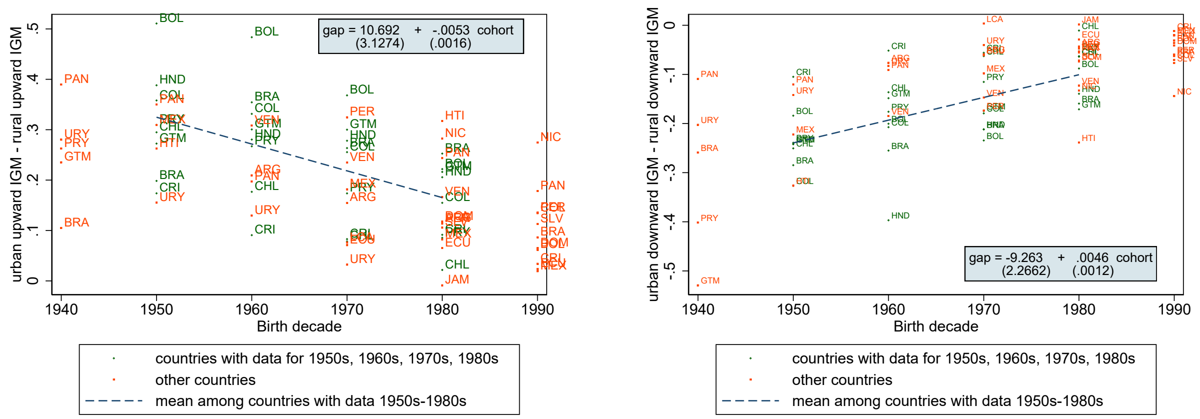
III.1.b Gender

As discussed in a recent survey on IGM in developing countries (see Torche, 2019), gender gaps in education have been disappearing or even moving in favor of women. I examine whether these patterns hold in this novel data set by estimating IGM for males and females separately and documenting how the gap between these populations have evolved across birth cohorts. I estimate upward and downward mobility[17] by country, birth decade of the "children" and gender. I do not find systematic differences by gender for older birth cohorts but it appears that there is a trend towards higher upward mobility for women as they

[16]The probability of completing at least primary education for those whose parents did not and the probability of not completing primary for those whose parents complete primary school, respectively.

[17]The probability of completing at least primary for those whose parents did not and the probability of not completing primary for those whose parents complete primary school, respectively.

Figure 7: Intergenerational Educational Mobility in LAC - Urban/rural



(a) Upward mobility **(b)** Downward mobility

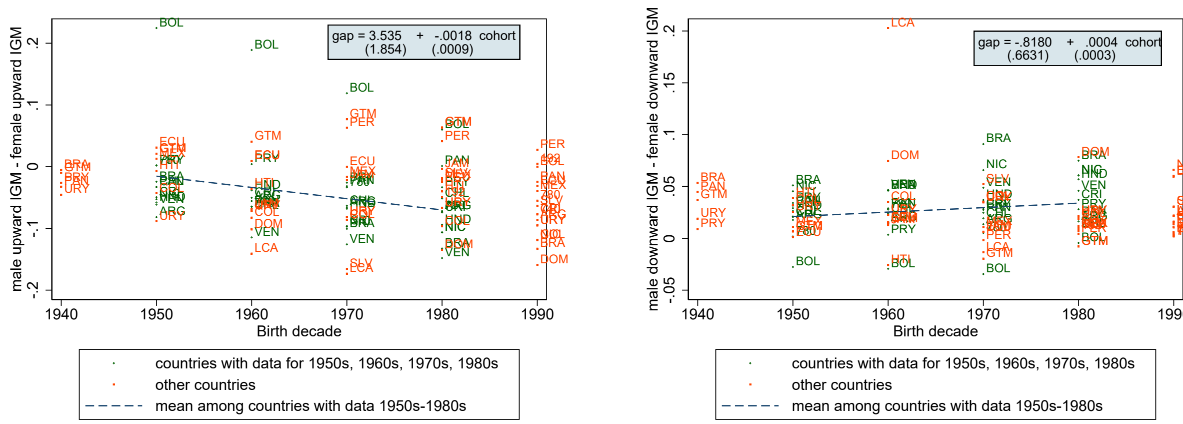
Notes: These estimates correspond to the probability of completing at least primary education for those whose parents did not finish primary school in the case of upward mobility and probability of not completing primary education for those whose parents completed primary school in the case of downward mobility. They are estimated for individuals aged 14-18 years by country, birth decade of the "children" and urban/rural status of the household residence.

have 3 percentage points higher upward mobility in 1980 birth cohort (see Figure 8) while the gap in downward mobility move around similar values (the gap in favor of women is approximately 3 percentage points for 1980s birth cohort) with a flatter trend. Figure A16 and Figure A17 in the Appendix show estimates by sub-population rather than the gap between them for countries with data in at least 4 decades, suggesting that the gap has been increasing in favor of women because of an increase (decrease) more than proportional for them in upward (downward) mobility.

III.1.c Evolution over time

As mentioned in the data section, the coverage over time is unbalanced with some countries spanning more years than others. This limits the analysis of trends over time and the conclusions that can be derived from comparisons between them at given points in time or for a given cohort. Nevertheless, I document estimates of mobility by country for the different

Figure 8: Intergenerational Educational Mobility in LAC - Gender



(a) Upward mobility **(b)** Downward mobility

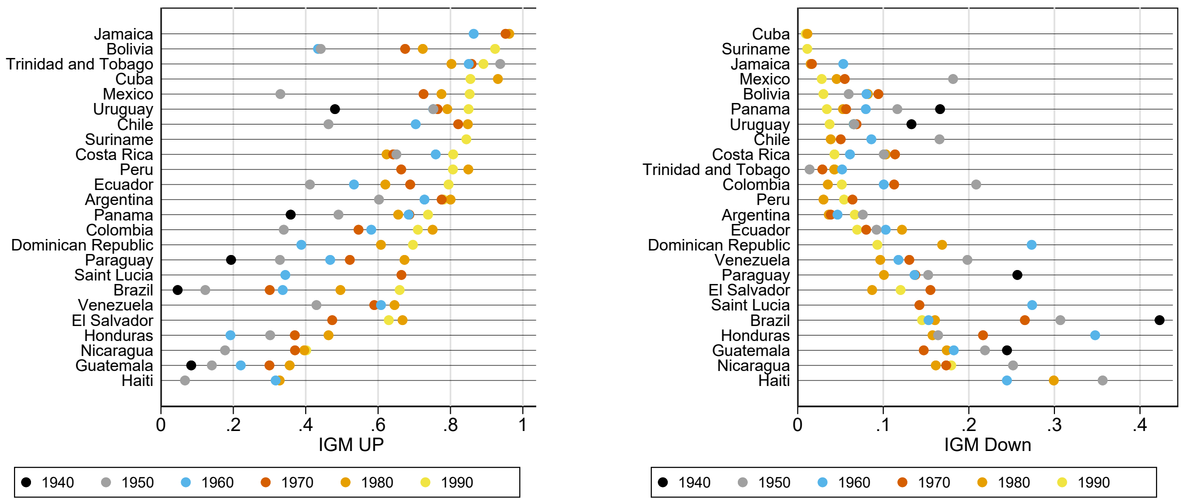
Notes: These estimates correspond to the probability of completing at least primary education for those whose parents did not finish primary school in the case of upward mobility and probability of not completing primary education for those whose parents completed primary school in the case of downward mobility. They are estimated by country, birth decade of the "children" and gender.

birth cohorts that are available. Figure 9 reports these estimates. It is clear how the level of upward mobility has been increasing at the same time that downward mobility has been falling. This is not surprising given the fact that educational attainment has increased in the region over the last decades.

III.2 Spatial variation of intergenerational mobility in LAC

Table 3 summarizes the estimates of mobility at the province-level. These results show that there are countries with substantial variance in mobility levels across provinces. This is for example the case of Paraguay, Mexico, Guatemala, Bolivia, and Peru, where the difference in upward mobility between the most upwardly mobile to the least upwardly mobile is more than half the range found in the case of countries in Latin America. However, there are also particular cases with either high or low upward mobility at the country level and a very small variation within country, such as Jamaica and Haiti, although somewhat expected as they correspond to countries with small number of administrative units and population.

Figure 9: Intergenerational Educational Mobility in LAC across cohorts



(a) Upward mobility **(b)** Downward mobility

Notes: The estimates are done by birth decade cohort of the children.

In the case of downward mobility, the variability is much smaller. However, Paraguay stands out as a case where the range between the province with the minimum and the maximum level of downward mobility is relatively wide.

Figure 10 and 11 maps the same estimates that are summarized in Table 3. We can see some interesting patterns in some countries. For example, Mexico shows a somewhat lower level of upward mobility in the south and you can identify a lighter spot in the middle of the country that corresponds to the region of the capital. In contrast, Brazil shows much lower level of mobility in the northern regions and higher mobility in the East coast near the states of Sao Paulo and Rio de Janeiro. Overall, the continent shows higher levels in the south, especially in the Pacific coast and some heterogeneous level in the case of Islands of the Caribbean region with important contrasts between Cuba and Haiti.

In the Appendix, I report similar estimates (see Table A6) and maps (see Figure A5 and A6) at the district-level, which corresponds to the finest administrative unit available in the data set. The patterns are qualitatively similar, however, given the level of dis-aggregation there are some districts with just few observations used for the estimation that produces estimates that end up outside the [0,1] range.

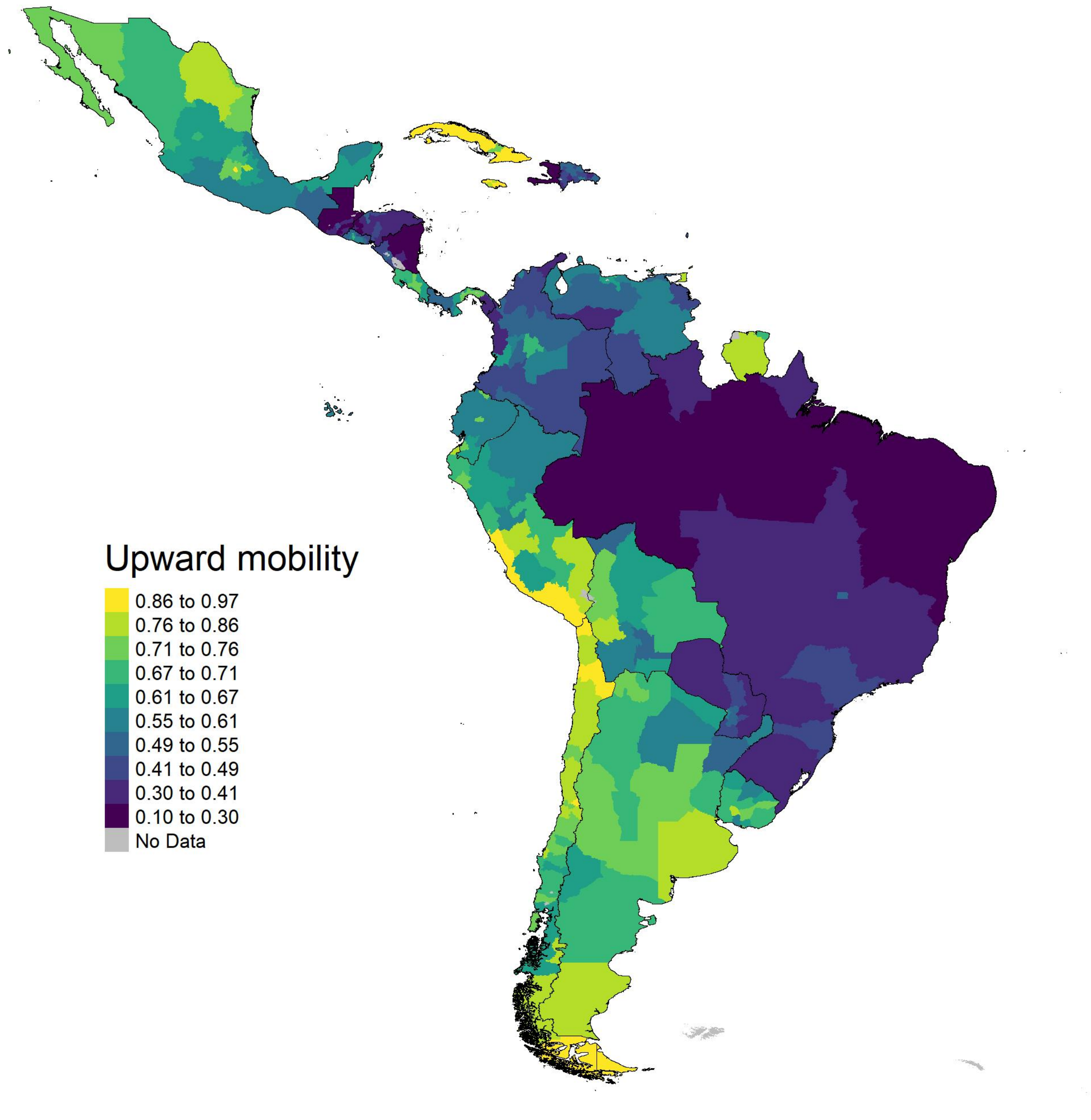
Similarly, summary statistics of alternative estimates of intergenerational mobility that consider secondary education at the province and district levels can be found in the Appendix (see Table A8, A9, A11, and A12). They are consistent with the country-level estimates, in the sense that relative to my baseline estimates using primary education, they show lower levels of upward mobility, higher levels of downward mobility, smaller samples, and significant within country variation.

Table 3: Summary Statistics: Province-Level Estimates of Educational IGM

		upward							downward						
country	provinces	mean	median	stdev	min	max	Nmin	Nmean	mean	median	stdev	min	max	Nmin	Nmean
Cuba	14	.917	.932	.056	.757	.972	63	146	.011	.011	.003	.006	.017	889	7104
Suriname	7	.897	.897	.095	.83	.965	56	73	.012	.013	.005	.005	.021	72	395
Jamaica	14	.888	.893	.029	.84	.936	106	322	.029	.028	.006	.018	.042	1193	2779
Trinidad and Tobago	4	.872	.871	.043	.822	.923	66	1763	.033	.034	.005	.027	.037	1272	8550
Chile	44	.773	.767	.066	.655	.915	93	1523	.064	.065	.019	.027	.113	256	4804
Peru	25	.749	.702	.115	.555	.93	298	5728	.07	.072	.028	.03	.139	699	8571
Argentina	24	.702	.691	.087	.545	.874	204	9763	.061	.058	.02	.021	.099	2329	34757
Costa Rica	7	.693	.693	.054	.623	.753	2261	4929	.083	.071	.023	.058	.112	5091	10369
Uruguay	19	.679	.677	.048	.598	.781	281	1418	.064	.065	.012	.04	.086	734	4294
Mexico	32	.674	.67	.079	.498	.899	2265	38282	.053	.052	.016	.015	.1	6269	49580
Bolivia	9	.651	.641	.097	.504	.814	534	9900	.071	.062	.025	.04	.125	968	13072
Ecuador	14	.622	.602	.057	.561	.718	1371	10618	.091	.082	.031	.06	.179	1322	16034
Panama	7	.596	.629	.108	.401	.744	802	3829	.084	.068	.051	.046	.197	481	8532
Venezuela	22	.545	.526	.079	.402	.708	801	10079	.131	.133	.025	.097	.193	707	13459
El Salvador	14	.538	.541	.062	.436	.669	1740	3346	.16	.158	.033	.098	.218	479	2754
Colombia	22	.519	.526	.094	.373	.724	164	19078	.118	.118	.033	.052	.179	897	21230
Saint Lucia	4	.474	.475	.049	.429	.516	325	446	.155	.155	.01	.148	.162	79	111
Paraguay	14	.458	.412	.118	.33	.777	1740	5381	.147	.138	.046	.04	.207	953	3701
Dominican Republic	23	.451	.469	.071	.302	.584	688	2176	.149	.149	.023	.109	.206	340	2693
Honduras	18	.381	.377	.094	.22	.575	211	4291	.219	.217	.066	.12	.397	255	1790
Nicaragua	12	.349	.366	.109	.205	.529	1211	5000	.211	.198	.063	.137	.35	246	2803
Brazil	25	.285	.249	.103	.144	.493	7290	332632	.21	.23	.052	.123	.299	5407	97580
Guatemala	22	.256	.256	.085	.099	.479	2399	8340	.229	.239	.037	.12	.282	548	2480
Haiti	4	.223	.218	.032	.191	.266	5399	20467	.341	.363	.052	.262	.375	832	5649
total	400	.587	.604	.203	.099	.972	56	29432	.112	.087	.076	.005	.397	72	17814

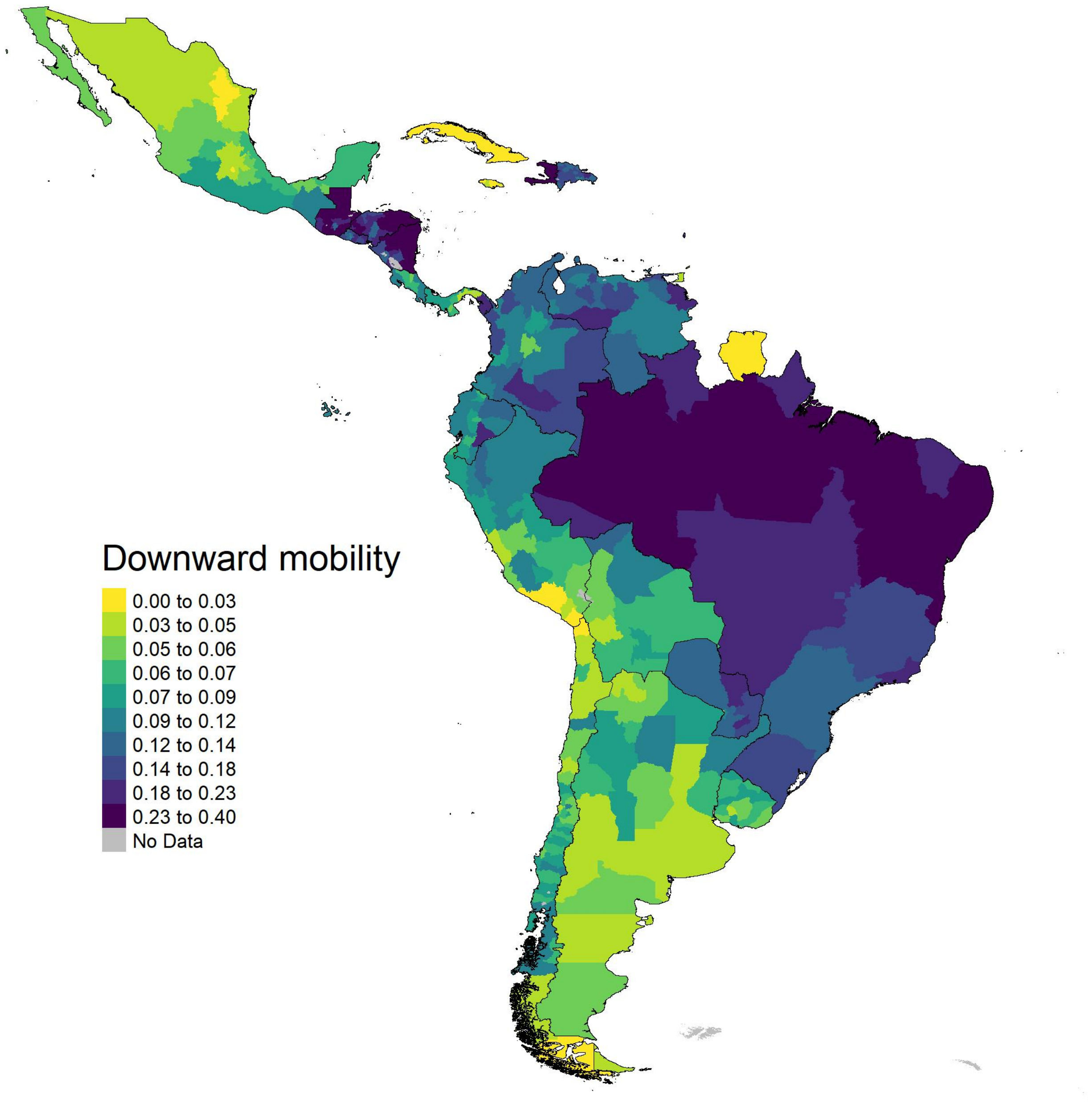
Notes: This table shows summary statistics for province level estimates of IGM. Upward reflects the likelihood that children, aged 14-18, whose parents have not completed primary schooling will manage to complete at least primary education. Downward reflects the likelihood that children, aged 14-18, whose parents have completed primary schooling or higher will not manage to complete primary education. "Total" shows the unweighted summary statistics across all provinces. The columns "Nmin" and "Nmean" report respectively the smallest and average sample size across provinces. Countries are sorted from the highest to the lowest average level of upward IGM across provinces (column "mean"). Provinces with less than 50 observations are omitted.

Figure 10: Upward Mobility in LAC



Notes: Upward mobility reflects the likelihood that children, aged 14-18, whose parents have not completed primary schooling will manage to complete at least primary education.

Figure 11: Downward Mobility in LAC



Notes: Downward mobility reflects the likelihood that children, aged 14-18, whose parents completed primary schooling will not manage to complete at least primary education.

IV Correlates of Intergenerational Mobility

In this section, I explore a set of correlates of regional IGM with the aim of uncovering a set of stylized facts that help characterize its geography. A necessary caveat is that the set is relative small given the difficulty of collecting data that is comparable for all the administrative units. An additional and perhaps more important caveat is that the analysis does not provide any causal interpretation and is solely descriptive.

I run univariate regressions pooling all the countries linking IGM to geographical and initial conditions that have been discussed in previous studies on intergenerational mobility outside the continent (for example, see Alesina et al., 2021). This is done by estimating the following econometric specification:

$$\alpha_{cr}^{d} = \eta_{c}^{d} + \beta^{d} Z_{cr} + \epsilon_{cr}^{d} \tag{4}$$

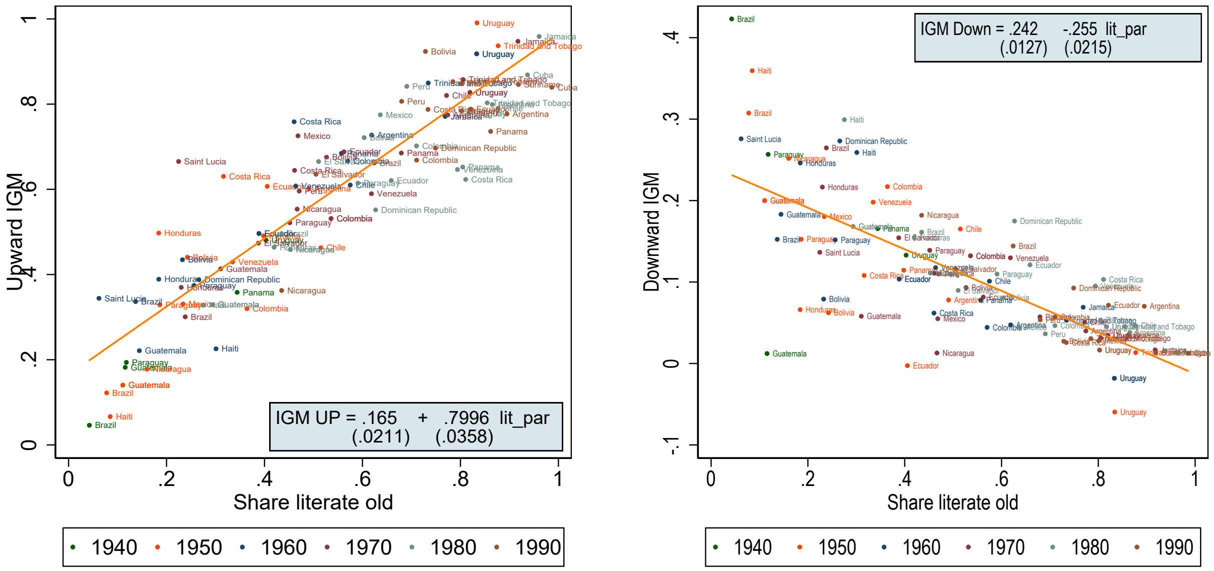
where $d = [up, down]$, the dependent variable corresponds to the measure of upward or downward intergenerational mobility previously estimated for province/district r in country c, η_c^d denote country fixed effects, Z_{cr} and β^d are respectively the covariate and the coefficient of interest. The latter summarizing the linear association between intergenerational mobility and the covariate.

IV.1 Education of the old generation

First I analyze the share of the old generation that was able to complete primary education. Alesina et al. (2021) finds this measure to be strongly associated with mobility in Africa. This correlate in part reflects the initial outcomes at the province/district-level for parents. I compute this variable using an econometric specification similar to the one used to compute mobility at regional level (see Equation 3) run country by country:

$$e_{icroyt} = \delta_{cr} + \gamma_{o}^{b} + \gamma_{y}^{b} + \theta_{t} + \epsilon_{icroyt} \tag{5}$$

Figure 12: Intergenerational Mobility and Literacy of the Old Generation



(a) Upward mobility

(b) Downward mobility

Notes: These estimates are computed by birth decade cohort of the children.

where e_{icroyt} is a dummy variable equal to 1 if the completed educational level of the old generation observed for individual i from country c region r is at least primary. Similar to before, γ_o^b and γ_y^b are birth-decade fixed effects for parents and children, and θ_t a census year fixed effect. In other words, δ_{cr} estimates the share of "parents" who complete primary by region netting out cohort and census year effects.

I find a strong positive (negative) correlation between upward (downward) mobility and literacy of the old generation (see Figure A18). This suggests the existence of a high level of inertia, confirming the findings of Alesina et al. (2021). Similar patterns are found at the country-birth cohort (see Figure 12).

IV.2 Other covariates

Given the high level of inertia, the correlation analysis of the remaining correlates is performed one by one and also partialling out the effect of the educational attainment of the old generation. The idea is to test whether any potential relationship with the covariate of interest remains after removing the effect of the covariate on “initial conditions”. This is done estimating the following specification (in addition to equation 4):

$$\alpha_{cr}^{up/down} = \eta_c + \beta Z_{cr} + \gamma W_{cr} + \epsilon_{cr} \tag{6}$$

where $m_{cr}^{up/down}$ corresponds to the measure of upward or downward IGM for province/district r in country c, η_c denote country fixed effects, W_{cr} is the share of literacy of the parents in region r, and Z_{cr} and β are respectively the covariate and the coefficient of interest.

Alesina et al. (2021) has shown that some geographical characteristics are also correlated to the level of intergenerational mobility. In this paper I consider distance to the capital, distance to the border, and distance to the coast. I also consider other characteristics of the districts that are proxies of the level of development at the beginning of the period of study. These are the urban share of the population, the share of employment in agriculture, the share of employment in industry, and the share of employment in service. These last four covariates are computed restricting the sample to only individuals born before 1960.

The results are reported in Figure 13 for upward and downward mobility respectively. Although upward mobility seems to be correlated with most of the proxies of development, the correlations become insignificant at the 5% when controlling by education of the old generation in all the cases. Only the share of employment in industry, which is positively associated with upward mobility, is statistically significant at the 10%. In the case of downward mobility, I find a significant correlation at the standard level, even conditioning on education of the old generation, with the share of employment in industry and agriculture, although with opposite signs. Higher share of employment in agriculture is associated with higher downward mobility while higher share of employment in industry is associated with lower downward mobility.

In the case of geographical correlates, distance to the border and coast are not significantly

Figure 13: IGM and Correlates

(a) Upward mobility

(b) Downward mobility

Notes: The graph plots the estimated coefficients and 95% confidence intervals computed clustering standard errors by country. The analysis is done at district-level running regressions by covariate as in equation 4 and 6. The coefficients are standarized.

correlated to either measure of mobility. This is in line with Alesina et al. (2021) in the case of the border but differ relative to their results for the coast. However, distance to the capital is negatively (positively) correlated to upward (downward) mobility although weakly (statistically significant at the 5% for upward and at 10% for downward mobility).

V Final Remarks

This paper examines intergenerational educational mobility for Latin American and the Caribbean countries at a disaggregated regional level using census data spanning more than half a century. I investigate mobility in education at the bottom of the educational attainment distribution by focusing on the likelihood of completion of primary education for those whose parents did not complete the level, which can be measured with a high degree of confidence between ages 14 and 18. Similarly, I measure downward mobility as the likelihood of not completing primary for those whose parents were able to complete at least primary school.

I find wide cross-country and within-country heterogeneity. In LAC, the distance between the most and least upwardly mobile country is relative close to what has been recently documented in Africa, although the least mobile countries in Africa are less mobile than any country in LAC. Similarly, the median country in LAC shows higher upward mobility than the median country in Africa. I do not find significant differences by gender but I do document a declining trend in the mobility gap between urban and rural populations.

Within country mobility shows a variety of patterns. For example, there are countries with higher mobility in the northern regions (e.g., Mexico), whereas others show higher mobility in the southern regions (e.g., Brazil). The level of heterogeneity within country also varies country by country with the lowest levels found in the smallest and less populated ones.

In terms of correlates within countries, the level of mobility is highly correlated to the share of primary completion of the previous generation, which suggests a high level of inertia. In addition, upward mobility appears weakly positively correlated to the share of employment in industry and distance to the capital, whereas downward mobility is significantly correlated to the shares of employment in industry and agriculture, and only weakly correlated to distance to the capital.

Given the unbalanced nature of the data set in terms of coverage over time and across countries, further research could shed more light on potential determinants of mobility in Latin America by focusing on the analysis of particular countries with a relatively high coverage such as Chile, Mexico, or Brazil, which makes the collection of correlates by administrative unit easier. This paper contributes to this goal by creating the estimates of mobility at a disaggregated geographical level and making them available in an online data appendix for future research.

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Appendices

In this Appendix I provide details on the sample construction and some additional tables and graphs.

Table A1 list the Census' samples obtained from IPUMS-International and the size of the extract.

Table A2 reports sample size from raw data to samples restricted by age and by availability of information on education.

Table A3 reports the rates of co-residency by country for different ages.

Table A4 reports the rates of co-residency by country-sample for different ages.

Figure A1 displays rates of coresidence by urban/rural population and by gender.

Figure A2 displays a comparison of estimates of upward mobility for the same country-cohort with all children versus coresident children. The source of these estimates is Munoz and Siravegna (2021).

Figure A3 displays the educational attainment transition matrix for individuals aged 14-25 years.

Figure A4 displays the educational attainment transition matrix for individuals aged 14-25 years in selected countries.

Table A5 summarizes the education level by cohort using data on individuals at least 25 years old.

Table A6 reports district-level estimates of intergenerational mobility.

Figure A5 and A6 displays maps of mobility at the district-level for LAC.

Figure A7 and A8 displays maps of mobility at the district-level for LAC using secondary education.

Table A7, A8, and A9 report estimates of IGM that consider secondary education.

Table A10, A11, and A12 report estimates of IGM that consider the likelihood of completing secondary education when parents completed less than primary.

Figure A13 displays the negative relationship between upward and downward mobility.

Figure A14 displays estimates of upward mobility by urban/rural status for selected countries.

Figure A15 displays the estimates of downward mobility by urban/rural status for selected countries.

Figure A16 displays estimates of upward mobility by gender for selected countries.

Figure A17 displays the estimates of downward mobility by gender for selected countries.

Figure A18 shows scatter plots between IGM and share of the old generation that completes at least primary education by district.

A Sample coverage and construction

Table A1: Census' samples

N	Country	Year	Fraction (%)	Households	Persons	N	Country	Year	Fraction (%)	Households	Persons
1	Argentina	1970	2	129,728	466,892	47	Haiti	2003	10	219,633	838,045
2	Argentina	1980	10	672,062	2,667,714	48	Honduras	1974	10	49,064	278,348
3	Argentina	1991	10	1,199,651	4,286,447	49	Honduras	1988	10	77,406	423,971
4	Argentina	2001	10	1,040,852	3,626,103	50	Honduras	2001	10	123,584	608,620
5	Argentina	2010	10	1,217,166	3,966,245	51	Jamaica	1982	10	54,526	223,667
6	Bolivia	1976	10	121,378	461,699	52	Jamaica	1991	10	62,291	232,625
7	Bolivia	1992	10	177,926	642,368	53	Jamaica	2001	10	64,317	205,179
8	Bolivia	2001	10	239,475	827,692	54	Mexico	1970	1	82,856	483,405
9	Bolivia	2012	10	292,117	1,003,516	55	Mexico	1990	10	1,648,280	8,118,242
10	Brazil	1960	20	3,066,365	14,983,769	56	Mexico	2000	10.6	2,312,035	10,099,182
11	Brazil	1970	25	5,111,039	24,789,716	57	Mexico	2010	10	2,903,640	11,938,402
12	Brazil	1980	25	6,716,885	29,378,753	58	Nicaragua	1971	10	36,063	189,469
13	Brazil	1991	10	4,024,553	17,045,712	59	Nicaragua	1995	10	82,815	435,728
14	Brazil	2000	10	5,304,711	20,274,412	60	Nicaragua	2005	10	119,339	515,485
15	Brazil	2010	10	6,192,502	20,635,472	61	Panama	1960	5	11,869	53,553
16	Chile	1970	10	199,041	890,481	62	Panama	1970	10	31,755	150,473
17	Chile	1982	10	282,356	1,133,062	63	Panama	1980	10	47,726	195,577
18	Chile	1992	10	373,964	1,335,055	64	Panama	1990	10	61,458	232,737
19	Chile	2002	10	486,115	1,513,914	65	Panama	2000	10	84,346	284,081
20	Colombia	1973	10	349,853	1,988,831	66	Panama	2010	10	95,579	341,118
21	Colombia	1985	10	571,046	2,643,125	67	Paraguay	1962	5	18,307	90,236
22	Colombia	1993	10	774,321	3,213,657	68	Paraguay	1972	10	43,883	233,669
23	Colombia	2005	10	1,054,812	4,006,168	69	Paraguay	1982	10	60,465	301,582
24	Costa Rica	1973	10	36,323	186,762	70	Paraguay	1992	10	100,704	415,401
25	Costa Rica	1984	10	56,186	241,220	71	Paraguay	2002	10	113,039	516,083
26	Costa Rica	2000	10	106,973	381,500	72	Peru	1993	10	564,765	2,206,424
27	Costa Rica	2011	10	124,693	430,082	73	Peru	2007	10	821,675	2,745,895
28	Cuba	2002	10	371,878	1,118,767	74	Saint Lucia	1980	10	2,674	11,451
29	Cuba	2012	10	416,577	1,115,643	75	Saint Lucia	1991	10	3,394	13,382
30	Dominican Rep	1981	8.5	103,904	475,829	76	Suriname	2012	10	14,037	53,636
31	Dominican Rep	2002	10	247,375	857,606	77	Trinidad and Tobago	1970	10	15,871	69,349
32	Dominican Rep	2010	10	309,624	943,784	78	Trinidad and Tobago	1980	10	23,870	105,464
33	Ecuador	1974	10	145,902	648,678	79	Trinidad and Tobago	1990	10	27,561	113,104
34	Ecuador	1982	10	195,401	806,834	80	Trinidad and Tobago	2000	10	35,715	111,833
35	Ecuador	1990	10	243,898	966,234	81	Trinidad and Tobago	2011	8.8	41,606	116,917
36	Ecuador	2001	10	354,222	1,213,725	82	Uruguay	1963	10	79,403	256,171
37	Ecuador	2010	10	386,944	1,448,233	83	Uruguay	1975	10	95,935	279,994
38	El Salvador	1992	10	125,695	510,760	84	Uruguay	1985	10	105,761	295,915
39	El Salvador	2007	10	172,012	574,364	85	Uruguay	1996	10	118,067	315,920
40	Guatemala	1964	5	40,220	210,411	86	Uruguay	2006	8.4	85,316	256,866
41	Guatemala	1973	5.5	59,622	289,458	87	Uruguay	2011	10	118,498	328,425
42	Guatemala	1981	5	65,555	302,106	88	Venezuela	1971	2	284,336	1,158,527
43	Guatemala	1994	10	160,603	833,139	89	Venezuela	1981	10	323,321	1,441,266
44	Guatemala	2002	10	222,770	1,121,946	90	Venezuela	1990	10	468,808	1,803,953
45	Haiti	1971	10	95,145	434,869	91	Venezuela	2001	10	646,080	2,306,489
46	Haiti	1982	2.5	28,698	128,770						

Table A2: Sample sizes

			All observations		Obs. with education					All observations		Obs. with education	
Country	Year	age: All	age: 14-18	age: 14-25	age: 14-18	age: 14-25	Country	Year	age: All	age: 14-18	age: 14-25	age: 14-18	age: 14-25
Argentina	1970	466,892	42,317	96,744	31,411	59,124	Haiti	2003	838,045	103,088	218,016	72,705	130,436
Argentina	1980	2,700,000	241,353	532,289	193,448	348,232	Honduras	1974	278,348	32,262	64,660	24,018	37,966
Argentina	1991	4,300,000	392,977	844,871	347,074	611,881	Honduras	1988	423,971	47,258	95,944	37,642	62,769
Argentina	2001	3,600,000	321,380	764,630	295,621	596,468	Honduras	2001	608,620	73,272	154,339	62,008	105,745
Argentina	2010	4,000,000	354,910	813,073	323,256	621,385	Jamaica	1982	223,668	27,612	58,456	17,270	28,729
Bolivia	1976	461,699	51,674	109,380	35,230	57,307	Jamaica	1991	232,625	25,145	56,810	17,326	32,498
Bolivia	1992	642,368	69,992	147,085	46,235	75,965	Jamaica	2001	205,179	21,357	47,770	14,349	25,241
Bolivia	2001	827,692	90,786	199,275	63,080	111,001	Mexico	1970	483,405	54,069	111,210	41,915	64,605
Brazil	1960	15,000,000	1,600,000	3,500,000	1,300,000	2,200,000	Mexico	1990	8,100,000	1,000,000	2,100,000	900,739	1,500,000
Brazil	1970	25,000,000	2,800,000	6,000,000	2,300,000	3,700,000	Mexico	2000	10,000,000	1,100,000	2,400,000	963,638	1,700,000
Brazil	1980	29,000,000	3,300,000	7,400,000	2,700,000	4,600,000	Mexico	2010	12,000,000	1,300,000	2,700,000	1,200,000	2,200,000
Brazil	1991	17,000,000	1,800,000	4,000,000	1,600,000	2,800,000	Nicaragua	1971	189,469	22,601	44,957	16,771	26,368
Brazil	2000	20,000,000	2,200,000	4,800,000	1,900,000	3,400,000	Nicaragua	1995	435,728	51,956	107,402	42,619	74,447
Brazil	2010	21,000,000	1,900,000	4,500,000	1,700,000	3,200,000	Nicaragua	2005	515,485	60,691	136,084	50,811	95,961
Chile	1970	890,481	96,432	203,625	73,392	123,911	Panama	1960	53,553	5,481	11,869	3,368	5,498
Chile	1982	1,100,000	130,958	293,439	106,794	197,946	Panama	1970	150,473	15,817	34,219	11,310	18,797
Chile	1992	1,300,000	121,069	290,349	100,838	199,734	Panama	1980	195,577	22,673	47,420	17,725	30,333
Chile	2002	1,500,000	130,506	297,907	110,343	214,019	Panama	1990	232,737	25,536	57,471	19,537	36,604
Colombia	1973	2,000,000	245,355	493,144	172,222	281,047	Panama	2000	284,081	27,438	62,585	21,924	41,171
Colombia	1985	2,600,000	312,063	705,404	245,920	466,142	Panama	2010	341,118	30,266	70,017	26,170	49,837
Colombia	1993	3,200,000	336,233	758,037	263,014	485,909	Paraguay	1962	90,236	10,003	20,431	6,011	10,224
Colombia	2005	4,000,000	399,870	860,151	325,438	579,432	Paraguay	1972	233,669	27,630	54,005	18,806	31,105
Costa Rica	1973	186,762	23,539	46,832	18,809	30,070	Paraguay	1982	301,582	34,248	74,515	25,177	45,971
Costa Rica	1984	241,220	28,005	64,067	23,982	44,198	Paraguay	1992	415,401	41,705	89,839	30,061	52,473
Costa Rica	2000	381,500	40,582	88,091	36,085	63,624	Paraguay	2002	516,083	59,365	125,811	48,042	85,609
Costa Rica	2011	430,082	40,703	98,328	36,805	74,880	Peru	1993	2,200,000	245,196	539,320	183,244	335,766
Cuba	2002	1,100,000	82,556	180,787	69,378	132,152	Peru	2007	2,700,000	280,035	636,955	222,254	419,885
Dominican Republic	1981	475,829	62,387	126,838	49,358	84,310	Saint Lucia	1980	11,451	1,516	2,985	1,076	1,754
Dominican Republic	2002	857,606	85,616	194,479	69,843	128,140	Saint Lucia	1991	13,382	1,455	3,406	1,138	2,154
Dominican Republic	2010	943,784	98,661	221,932	78,426	142,857	Trinidad and Tobago	1970	69,349	8,259	16,684	6,398	10,873
Ecuador	1974	648,678	72,812	162,826	49,142	82,561	Trinidad and Tobago	1980	105,464	13,096	28,713	11,078	20,578
Ecuador	1982	806,834	89,627	194,868	64,889	112,394	Trinidad and Tobago	1990	113,104	10,646	24,520	9,232	18,279
Ecuador	1990	966,234	108,806	237,150	83,171	146,856	Trinidad and Tobago	2000	111,833	12,444	26,458	10,890	20,515
Ecuador	2001	1,200,000	126,354	287,034	100,955	186,327	Trinidad and Tobago	2011	116,917	8,325	22,630	7,288	17,595
Ecuador	2010	1,400,000	145,454	326,549	117,218	212,597	Uruguay	1963	256,171	20,618	47,079	15,749	28,722
El Salvador	1992	510,760	62,794	129,373	44,508	74,325	Uruguay	1975	279,994	24,213	53,152	18,704	33,222
El Salvador	2007	574,364	62,912	131,762	55,338	100,318	Uruguay	1985	295,915	23,728	55,355	18,881	35,368
Guatemala	1964	210,079	22,674	46,804	17,177	27,249	Uruguay	1996	315,920	26,188	60,440	21,870	41,399
Guatemala	1973	289,446	33,148	71,814	24,569	39,263	Uruguay	2006	256,866	21,943	45,451	20,277	36,604
Guatemala	1981	302,106	33,771	72,879	26,958	45,277	Uruguay	2011	328,425	26,825	60,496	23,925	43,382
Guatemala	1994	833,137	97,480	196,310	82,505	135,877	Venezuela	1971	1,200,000	133,044	282,119	87,971	144,465
Guatemala	2002	1,100,000	127,311	269,696	114,181	200,981	Venezuela	1981	1,400,000	166,729	367,032	133,566	238,340
Haiti	1971	434,869	51,096	101,984	35,014	58,427	Venezuela	1990	1,800,000	199,055	445,482	149,752	269,185
Haiti	1982	128,770	15,471	36,494	8,349	15,840	Venezuela	2001	2,300,000	234,403	534,204	204,784	394,511

Notes: This table reports the total sample size by country-year Census, and for restricted population by age and keeping only observations with information of education for children and parents.

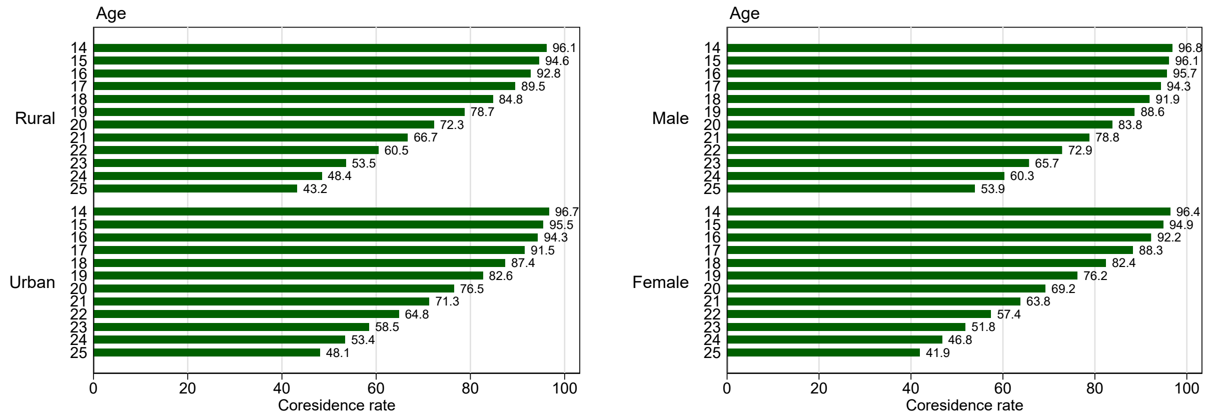
B Rates of co-residence

This table shows the co-residency rate by country for different ages. The co-residence rate is the total number of individuals that co-reside with at least one member of an immediately older generation in the household divided by the total number of individuals in the age group. The sample considers only individuals for whom their own educational attainment and the relationship to household head are observed.

Table A3: Co-residence rates

	Rate				Observations (thousands)			
	14-18	18-25	21-25	20-23	14-18	18-25	21-25	20-23
Argentina	95.7	72.1	63.1	72.2	1246	1746	1067	870
Bolivia	86.7	57.6	48.8	56.4	263	358	218	180
Brazil	93.7	63.0	51.7	62.0	12292	16695	10015	8312
Chile	95.4	72.7	63.8	73.3	410	570	351	285
Colombia	93.4	68.4	59.6	68.2	1086	1451	888	717
Costa Rica	94.5	68.3	58.8	68.0	122	173	105	87
Cuba	91.6	74.6	68.7	74.8	141	217	136	107
Dominican Republic	89.0	63.4	54.1	62.7	222	307	182	153
Ecuador	92.8	64.8	55.2	64.2	451	621	378	311
El Salvador	90.8	66.8	57.8	66.1	110	138	82	68
Guatemala	92.8	63.4	52.8	62.6	286	363	214	180
Haiti	94.4	71.6	60.3	71.1	123	158	88	76
Honduras	91.1	62.3	52.1	60.9	136	168	98	83
Jamaica	90.5	65.2	55.2	64.7	58	76	45	37
Mexico	93.8	69.1	59.4	68.5	3363	4318	2536	2112
Nicaragua	92.4	67.7	59.1	67.2	120	156	93	78
Panama	92.5	66.8	57.7	66.3	108	150	91	74
Paraguay	94.7	67.4	57.4	67.2	136	177	107	89
Peru	93.3	69.8	61.8	69.4	436	604	371	301
Saint Lucia	94.7	66.3	55.7	65.2	2	3	2	2
Suriname	95.7	81.2	75.6	82.2	4	5	3	3
Trinidad and Tobago	96.1	78.1	70.4	78.8	47	66	40	32
Uruguay	95.4	68.9	59.2	68.6	125	175	107	87
Venezuela	92.6	67.7	59.0	67.1	630	858	518	428

Figure A1: Coresidence rate by age for subgroups

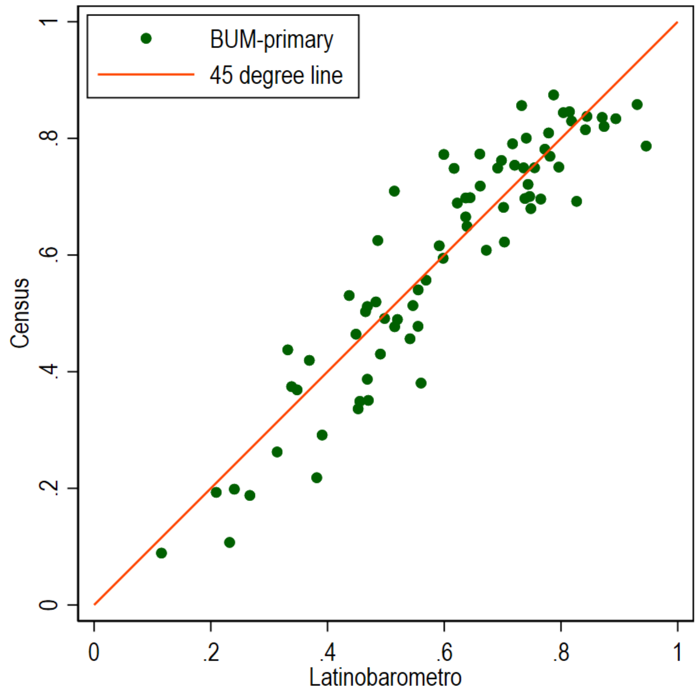


(a) Coresidence rates by urban-rural status

(b) Coresidence rate by gender

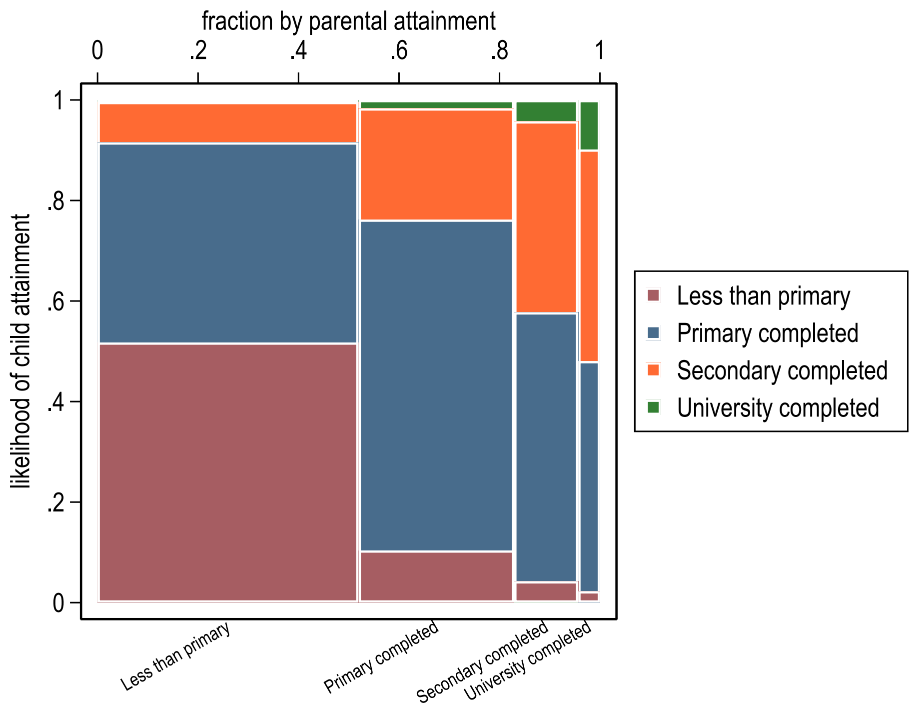
Notes: Coresidence is defined as living with at least one individual of the immediately previous generation. The data in the graph is unweighted.

Figure A2: Comparison of IGM with all versus coresident children



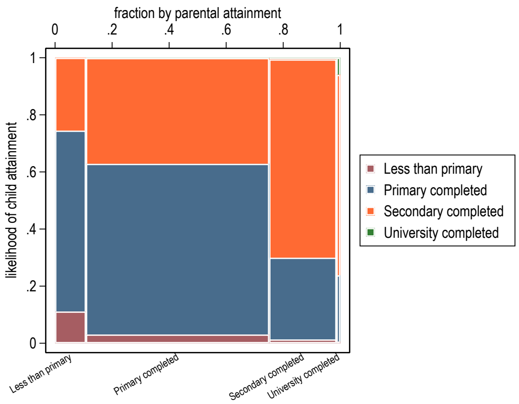
Notes: The source of these estimates is Munoz and Siravegna (2021). It shows the relationship between estimates of the conditional probability of completing at least primary school for individuals whose parents did not complete primary using two data sources. One set of estimates. computed with census data, use individuals aged 21-25 that coreside with at least one parent. The second set of estimates use the equivalent five birth-cohorts of each census sample with data from Latinobarometro where individuals are asked about the educational attainment of their parents. These 72 estimates span 18 countries in Latin America.

Figure A3: Educational Attainment Transition Matrix

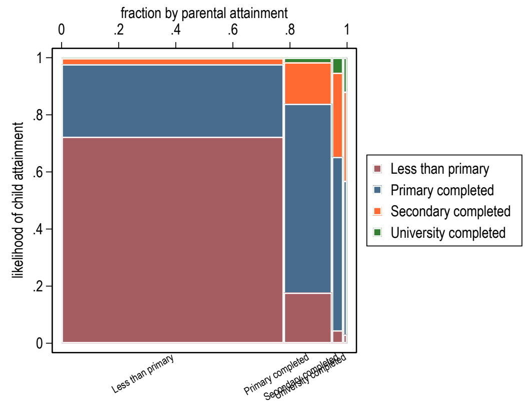


Notes: The sample is constructed with individuals aged 14-25 years that coreside with at least one individual of the generation above. The figure displays the transition matrix between the educational attainment of individuals in the sample and their parents. The horizontal axis is divided according to the share of parents with each level of educational attainment. The height of each rectangle within the figure is the likelihood of child educational attainment conditional on the attainment of their parents.

Figure A4: Transition matrix for selected countries



(a) Jamaica



(b) Guatemala

Notes: The sample is constructed with individuals aged 14-25 years that coreside with at least one individual of the generation above. The figures display the transition matrix between the educational attainment of individuals in the sample and their parents. The horizontal axis is divided according to the share of parents with each level of educational attainment. The height of each rectangle within each figure is the likelihood of child educational attainment conditional on the attainment of their parents.

Table A4: Co-residence rate by sample

		Rate				Observations (thousands)			
	Year	14-18	18-25	21-25	20-23	14-18	18-25	21-25	20-23
Argentina	1970	95.0	69.7	59.3	69.8	33	48	29	24
Argentina	1980	94.6	68.2	58.8	68.6	204	276	174	138
Argentina	1991	95.6	69.4	59.1	69.3	364	468	281	231
Argentina	2001	96.7	76.4	68.7	76.8	306	464	288	238
Argentina	2010	95.5	73.1	64.5	72.9	338	490	295	240
Bolivia	1976	90.8	54.8	43.0	52.8	39	52	31	26
Bolivia	1992	93.1	58.1	46.7	56.9	52	68	42	34
Bolivia	2001	85.9	57.5	49.3	56.6	74	102	62	52
Bolivia	2012	82.3	58.4	51.6	57.4	98	137	83	68
Brazil	1960	94.9	61.3	48.5	60.1	1386	1824	1069	905
Brazil	1970	95.7	62.9	49.4	61.4	2383	2963	1714	1474
Brazil	1980	94.4	59.6	47.1	58.2	2907	3972	2407	1987
Brazil	1991	92.3	63.5	53.3	62.8	1710	2347	1433	1166
Brazil	2000	92.6	65.5	54.8	64.6	2064	2837	1665	1404
Brazil	2010	91.6	66.2	58.0	66.1	1842	2753	1727	1377
Chile	1970	95.8	68.8	58.0	69.1	77	91	55	45
Chile	1982	96.2	74.0	64.5	74.5	111	150	91	75
Chile	1992	94.5	71.2	62.5	72.2	107	166	105	82
Chile	2002	95.1	75.1	67.8	75.6	116	163	101	83
Colombia	1973	93.8	66.2	54.8	64.8	185	212	122	103
Colombia	1985	95.4	73.1	64.5	73.8	260	370	225	183
Colombia	1993	94.3	68.7	60.1	68.6	282	398	251	197
Colombia	2005	91.1	65.5	57.4	64.9	360	472	290	233
Costa Rica	1973	95.5	64.4	50.9	62.4	20	23	13	11
Costa Rica	1984	95.0	66.2	55.3	65.8	25	38	23	19
Costa Rica	2000	94.5	67.5	57.5	66.7	38	50	30	25
Costa Rica	2011	93.7	71.7	64.4	72.3	39	63	40	32
Cuba	2002	91.3	73.5	66.7	73.3	76	103	62	48
Cuba	2012	92.0	75.5	70.4	75.9	65	113	74	59
Dominican Republic	1981	91.7	67.1	56.9	65.7	54	67	38	33
Dominican Republic	2002	90.0	63.8	54.9	63.6	78	111	68	56
Dominican Republic	2010	86.6	61.2	52.0	60.4	91	129	76	64
Ecuador	1974	92.8	62.0	51.2	60.7	53	68	40	33
Ecuador	1982	93.8	64.4	54.1	63.6	71	94	57	48
Ecuador	1990	93.1	65.1	54.8	64.8	90	122	74	60
Ecuador	2001	92.3	65.3	56.2	64.8	110	159	98	82
Ecuador	2010	92.4	65.5	56.6	64.8	128	178	109	88
El Salvador	1992	91.3	61.8	51.0	61.0	49	61	37	30
El Salvador	2007	90.5	70.7	63.2	70.1	61	77	46	38
Guatemala	1964	91.6	56.1	44.8	55.6	19	23	14	11
Guatemala	1973	88.4	50.4	39.8	48.9	28	38	22	19
Guatemala	1981	92.7	59.4	47.9	58.3	29	40	23	20

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Table A4 – continued from previous page

	Year	14-18	18-25	21-25	20-23	14-18	18-25	21-25	20-23
Guatemala	1994	93.5	64.5	53.5	63.5	88	104	61	51
Guatemala	2002	93.5	67.8	57.8	67.2	122	159	93	80
Haiti	1971	94.9	66.9	52.8	66.8	37	45	25	21
Haiti	1982	93.8	67.7	56.3	67.9	9	14	8	7
Haiti	2003	94.3	74.3	64.3	73.6	77	99	55	47
Honduras	1974	92.0	59.4	48.2	58.2	26	31	18	15
Honduras	1988	92.6	64.6	54.7	63.5	41	48	29	24
Honduras	2001	89.9	62.0	52.0	60.5	69	89	51	45
Jamaica	1982	90.9	65.0	53.7	64.2	20	25	14	12
Jamaica	1991	91.7	67.5	57.8	67.6	20	28	17	14
Jamaica	2001	88.5	62.5	53.6	61.6	17	23	14	11
Mexico	1970	94.7	58.2	44.0	56.8	44	51	29	24
Mexico	1990	94.0	66.5	55.3	65.8	958	1191	689	579
Mexico	2000	93.0	66.8	57.4	66.4	1079	1442	869	708
Mexico	2010	94.2	73.3	64.7	72.8	1282	1634	949	801
Nicaragua	1971	93.1	61.8	49.6	60.8	18	20	12	10
Nicaragua	1995	93.5	69.4	60.4	68.8	46	56	33	28
Nicaragua	2005	91.2	68.1	60.5	67.6	56	80	49	40
Panama	1960	91.3	52.8	40.6	52.3	4	5	3	3
Panama	1970	91.7	57.8	46.4	56.5	12	16	10	8
Panama	1980	92.7	65.9	55.1	65.1	19	24	14	12
Panama	1990	93.2	69.9	61.0	69.6	21	30	18	15
Panama	2000	93.3	68.8	60.4	68.4	24	33	21	16
Panama	2010	91.8	68.6	61.0	68.5	29	41	25	20
Paraguay	1962	95.7	63.1	51.9	64.3	6	8	5	4
Paraguay	1972	96.0	66.5	55.3	67.1	20	23	14	11
Paraguay	1982	94.7	67.6	57.9	67.8	27	37	23	19
Paraguay	1992	93.2	61.8	52.0	60.9	32	44	27	22
Paraguay	2002	95.1	72.0	62.5	71.5	51	64	37	32
Peru	1993	94.0	69.5	60.9	69.1	196	267	165	135
Peru	2007	92.7	70.0	62.5	69.6	240	337	206	166
Saint Lucia	1980	95.3	64.5	51.5	63.2	1	1	1	1
Saint Lucia	1991	94.0	67.7	58.6	66.9	1	2	1	1
Suriname	2012	95.7	81.2	75.6	82.2	4	5	3	3
Trinidad and Tobago	1970	97.0	72.1	59.5	72.0	7	8	4	4
Trinidad and Tobago	1980	95.2	73.2	63.2	73.6	12	16	9	8
Trinidad and Tobago	1990	95.8	76.9	69.4	78.0	10	14	9	7
Trinidad and Tobago	2000	96.4	81.4	74.2	81.2	12	15	8	7
Trinidad and Tobago	2011	96.5	84.4	80.1	86.2	8	14	9	7
Uruguay	1963	97.1	70.6	60.0	70.3	16	23	14	11
Uruguay	1975	96.5	67.6	56.0	66.6	19	27	16	13
Uruguay	1985	96.9	67.1	57.5	67.6	19	29	19	15
Uruguay	1996	94.0	69.3	60.5	69.3	23	34	21	17
Uruguay	2006	95.0	74.9	65.7	74.6	21	27	16	13
Uruguay	2011	94.0	65.6	56.5	64.8	25	36	22	18

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Table A4 – continued from previous page

	Year	14-18	18-25	21-25	20-23	14-18	18-25	21-25	20-23
Venezuela	1971	93.7	60.5	48.4	58.8	97	121	71	60
Venezuela	1981	92.8	66.7	57.3	66.1	144	192	115	96
Venezuela	1990	91.7	66.6	57.9	65.8	168	227	137	112
Venezuela	2001	92.7	71.7	64.6	71.7	221	318	195	160

C Schooling by cohort

In this section, I summarize the education level by country and cohort using data on individuals at least 25 years old.

Table A5: Education by cohort

	cohort	mean years	less primary	primary	secondary	tertiary
Argentina	1950	9.1	17.8	50.6	24.1	7.5
Argentina	1960	10.0	11.3	48.9	31.4	8.4
Argentina	1970	10.8	8.1	45.8	36.1	9.9
Argentina	1980	11.4	7.4	46.3	35.9	10.4
Bolivia	1950	6.3	46.1	30.7	17.4	5.9
Bolivia	1960	7.8	31.4	38.5	22.8	7.3
Bolivia	1970	9.2	22.7	37.7	28.7	10.9
Bolivia	1980	10.7	13.7	34.7	35.6	16.1
Brazil	1950	5.7	58.2	18.0	15.7	8.2
Brazil	1960	6.7	44.6	25.4	21.5	8.5
Brazil	1970	7.2	33.8	28.1	27.9	10.2
Brazil	1980		18.9	28.9	39.0	13.2
Chile	1950	9.2	19.0	47.2	28.7	5.1
Chile	1960	10.1	12.0	45.9	37.3	4.8
Chile	1970	11.3	6.8	39.4	46.2	7.6
Chile	1980					
Colombia	1950	6.5	34.9	39.7	18.9	6.5
Colombia	1960	7.5	24.5	42.2	26.6	6.7
Colombia	1970	8.8	18.2	34.6	34.6	12.6
Colombia	1980	9.4	14.1	30.0	43.0	12.9
Costa Rica	1950	7.9	23.1	46.9	18.3	11.7
Costa Rica	1960	8.6	14.7	51.8	19.2	14.3
Costa Rica	1970	8.7	15.1	50.3	17.2	17.4
Costa Rica	1980	9.7	11.4	44.1	20.1	24.3
Cuba	1950	10.4	7.6	46.1	32.6	13.7
Cuba	1960	11.4	2.8	39.7	43.4	14.2
Cuba	1970	11.7	1.9	37.6	46.9	13.6
Cuba	1980	12.3	1.5	24.3	52.1	22.1
Dominican Republic	1950	6.3	50.5	29.0	12.3	8.1
Dominican Republic	1960	8.0	33.5	37.1	17.8	11.7
Dominican Republic	1970	8.6	27.4	39.4	22.3	10.9
Dominican Republic	1980	9.7	19.8	33.6	34.0	12.6
Ecuador	1950	7.4	34.3	39.8	17.7	8.2
Ecuador	1960	8.8	22.4	41.7	26.1	9.8

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Table A5 – continued from previous page

	cohort	mean years	less primary	primary	secondary	tertiary
Ecuador	1970	9.4	16.4	42.7	30.9	10.0
Ecuador	1980	10.2	11.1	39.5	37.2	12.1
El Salvador	1950	5.2	55.6	27.3	12.9	4.2
El Salvador	1960	6.5	45.0	31.7	18.3	5.0
El Salvador	1970	7.5	37.3	33.3	23.0	6.4
El Salvador	1980	8.1	31.5	37.2	25.7	5.6
Guatemala	1950	3.5	71.9	18.5	6.4	3.3
Guatemala	1960	4.5	62.3	24.6	9.1	3.9
Guatemala	1970	5.2	55.2	29.0	11.3	4.5
Guatemala	1980					
Haiti	1950	3.0	71.9	21.3	6.0	0.8
Haiti	1960	3.4	67.7	18.5	12.6	1.2
Haiti	1970	5.2	52.6	28.1	18.2	1.2
Haiti	1980					
Honduras	1950	4.5	61.8	25.8	9.7	2.7
Honduras	1960	5.4	50.7	33.2	13.0	3.0
Honduras	1970	6.0	41.5	42.2	13.9	2.5
Honduras	1980					
Jamaica	1950	9.7	7.4	60.5	29.4	2.7
Jamaica	1960	11.2	2.7	44.7	50.2	2.4
Jamaica	1970	12.4	2.1	20.9	74.5	2.6
Jamaica	1980					
Mexico	1950	6.8	37.4	41.8	11.4	9.5
Mexico	1960	8.3	23.6	47.8	17.3	11.4
Mexico	1970	9.2	13.8	54.0	19.9	12.3
Mexico	1980	10.1	9.8	50.3	24.1	15.8
Nicaragua	1950	4.9	59.7	24.4	9.3	6.5
Nicaragua	1960	6.0	48.1	31.6	13.9	6.5
Nicaragua	1970	6.4	42.9	33.2	16.5	7.4
Nicaragua	1980	6.8	39.3	32.7	20.3	7.7
Panama	1950	8.6	21.2	45.5	21.4	11.8
Panama	1960	9.7	12.4	45.0	29.0	13.6
Panama	1970	10.2	11.0	40.8	31.1	17.2
Panama	1980	10.7	8.8	36.7	36.3	18.2
Paraguay	1950	6.2	46.8	39.2	9.9	4.2
Paraguay	1960	7.3	34.1	43.7	16.9	5.3
Paraguay	1970	8.1	26.3	46.0	21.3	6.5
Paraguay	1980					
Peru	1950	7.5	38.8	16.8	32.9	11.6
Peru	1960	8.4	28.2	19.2	41.4	11.2
Peru	1970	9.3	16.9	20.8	48.3	14.0
Peru	1980	9.7	11.9	21.2	55.2	11.6

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Table A5 – continued from previous page

	cohort	mean years	less primary	primary	secondary	tertiary
Saint Lucia	1950	9.4	72.3	3.9	20.8	3.0
Saint Lucia	1960		52.7	8.8	35.6	2.8
Saint Lucia	1970					
Saint Lucia	1980					
Suriname	1950		11.3	69.8	16.1	2.9
Suriname	1960		7.1	70.9	18.5	3.5
Suriname	1970		6.4	66.3	22.7	4.6
Suriname	1980		4.9	57.9	30.8	6.4
Trinidad and Tobago	1950	9.0	15.8	44.6	36.4	3.1
Trinidad and Tobago	1960	10.1	12.1	31.6	52.9	3.4
Trinidad and Tobago	1970	11.5	6.7	20.6	67.8	4.9
Trinidad and Tobago	1980	12.1	5.4	15.9	72.0	6.8
Uruguay	1950	8.9	17.7	53.0	23.3	5.9
Uruguay	1960	9.2	12.1	57.5	22.6	7.8
Uruguay	1970	9.7	11.8	53.0	26.9	8.3
Uruguay	1980	10.2	6.6	54.0	31.9	7.4
Venezuela	1950	7.4	26.0	46.2	25.5	2.2
Venezuela	1960	8.1	18.7	46.3	34.0	1.1
Venezuela	1970	8.6	14.6	43.0	42.1	0.2
Venezuela	1980					

D District-level estimates

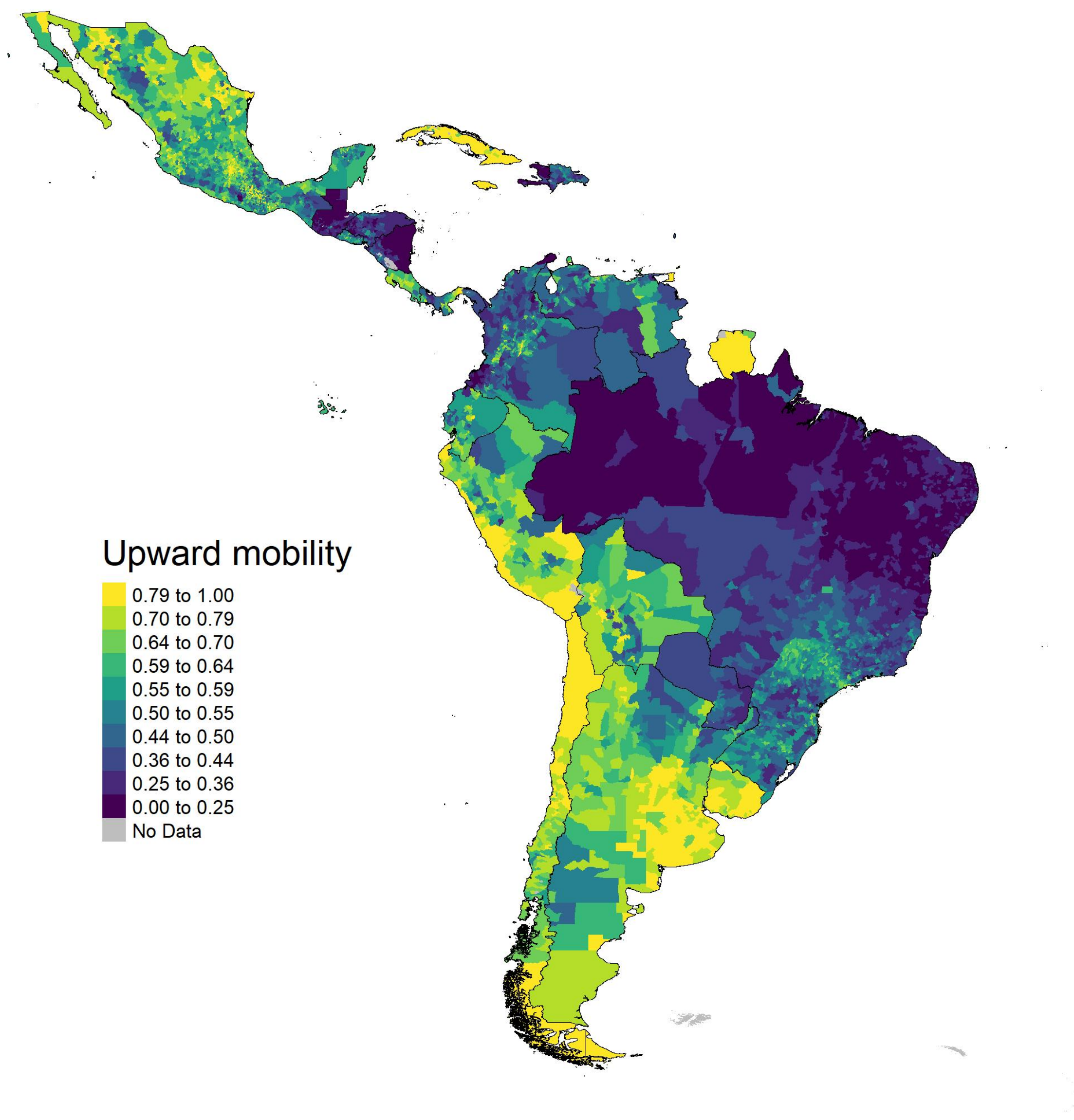
Table A6: Summary Statistics: District-Level Estimates of Educational IGM

		upward							downward						
country	districts	mean	median	stdev	min	max	Nmin	Nmean	mean	median	stdev	min	max	Nmin	Nmean
Cuba	137	.845	.872	.112	.722	.94	50	58	.012	.01	.007	0	.043	178	726
Uruguay	67	.798	.793	.056	.684	.94	50	151	.046	.043	.022	.003	.098	238	737
Chile	179	.758	.752	.079	.534	.969	68	378	.069	.065	.026	.014	.157	140	1181
Costa Rica	55	.714	.719	.07	.498	.878	110	627	.075	.072	.027	.033	.156	313	1320
Argentina	312	.713	.732	.123	.407	.986	56	756	.066	.054	.035	.013	.194	276	2674
Peru	168	.702	.688	.127	.339	.935	111	857	.097	.081	.053	.016	.342	64	1275
Bolivia	80	.627	.642	.13	.345	.948	179	1114	.111	.104	.059	.027	.317	80	1471
Mexico	2,331	.615	.612	.132	.192	1.133	50	551	.083	.071	.055	-.052	.504	50	702
Ecuador	78	.591	.599	.115	.306	.847	180	1930	.109	.095	.047	.054	.291	244	2915
Panama	35	.588	.593	.153	.253	.803	184	766	.095	.08	.052	.031	.241	152	1706
El Salvador	103	.553	.549	.091	.327	.754	92	459	.177	.168	.068	.043	.383	50	381
Venezuela	157	.52	.513	.103	.255	.746	194	1412	.158	.151	.05	.068	.334	135	1886
Colombia	434	.509	.498	.127	-.043	.88	123	967	.151	.145	.065	.037	.371	133	1076
Paraguay	63	.474	.477	.119	.116	.781	208	1146	.152	.143	.051	.039	.259	96	788
Dominican Republic	66	.462	.463	.082	.301	.667	73	770	.154	.147	.036	.082	.273	94	953
Brazil	2,040	.386	.387	.15	.019	.827	366	2514	.203	.184	.087	.046	.602	65	1089
Nicaragua	68	.361	.373	.11	.138	.582	264	882	.214	.2	.069	.103	.423	51	501
Honduras	96	.355	.346	.109	.112	.576	211	805	.24	.224	.08	.109	.44	52	359
Guatemala	191	.243	.237	.11	.03	.613	286	961	.268	.252	.095	.088	.649	50	329
Haiti	23	.196	.191	.063	.087	.373	845	3559	.412	.426	.087	.221	.569	91	982
total	6,683	.523	.539	.187	-.043	1.133	50	1296	.136	.115	.093	-.052	.649	50	1027

Notes: This table shows summary statistics for district-level estimates of IGM. Upward reflects the likelihood that children, aged 14-18, whose parents have not completed primary schooling will manage to complete at least primary education. Downward reflects the likelihood that children, aged 14-18, whose parents have completed primary schooling or higher will not manage to complete primary education. "Total" shows the unweighted summary statistics across all districts. The columns "Nmin" and "Nmean" report respectively the smallest and average sample size across districts. Countries are sorted from the highest to the lowest average level of upward IGM across districts (column "mean"). Districts with less than 50 observations are omitted.

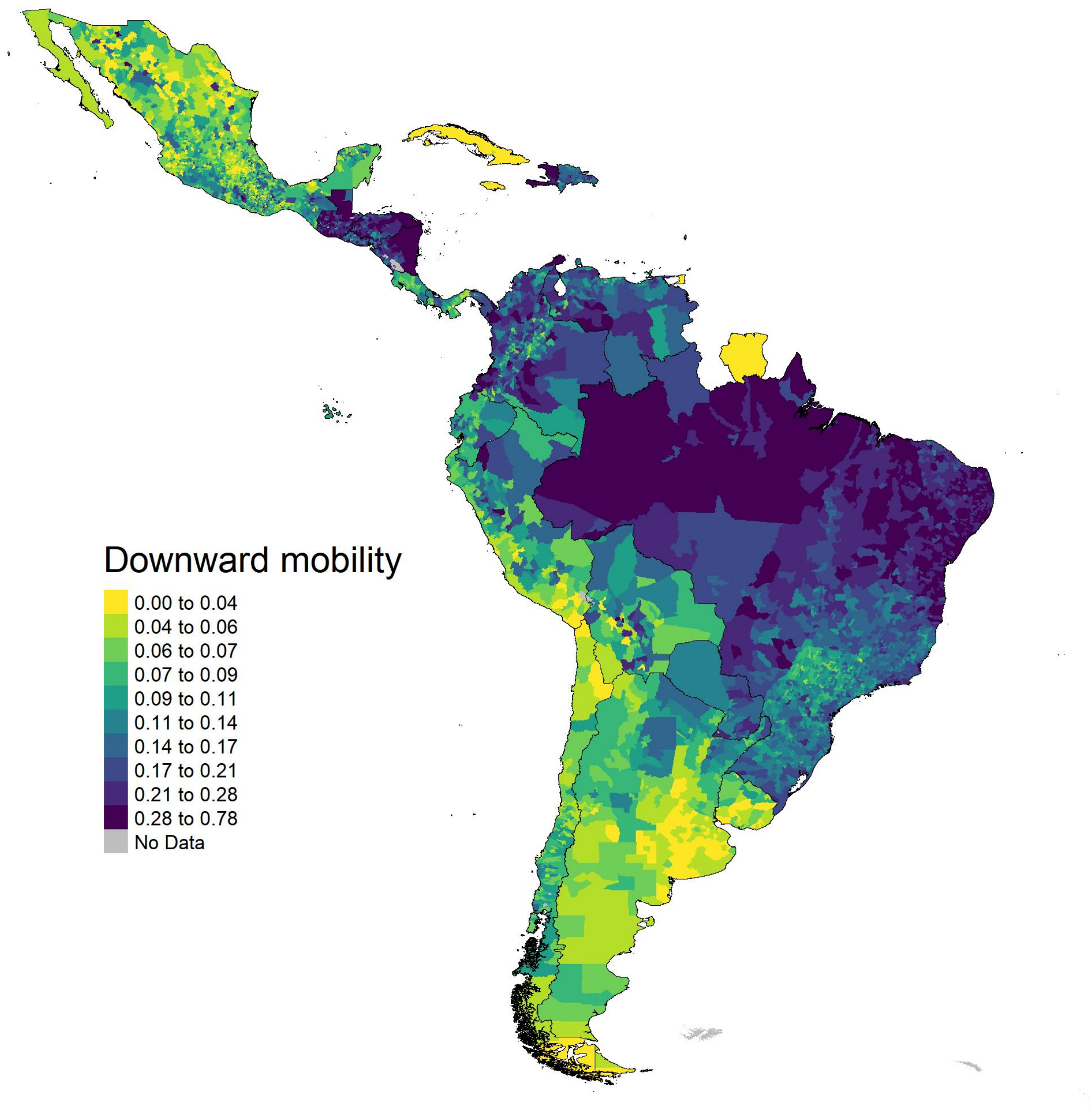
E District-level maps of mobility

Figure A5: Upward Mobility in LAC



Notes: Upward mobility reflects the likelihood that children, aged 14-18, whose parents have not completed primary schooling will manage to complete at least primary education. This graph uses provinces for St. Lucia, Jamaica, Trinidad and Tobago and Suriname that do not have a finer administrative units in the data set.

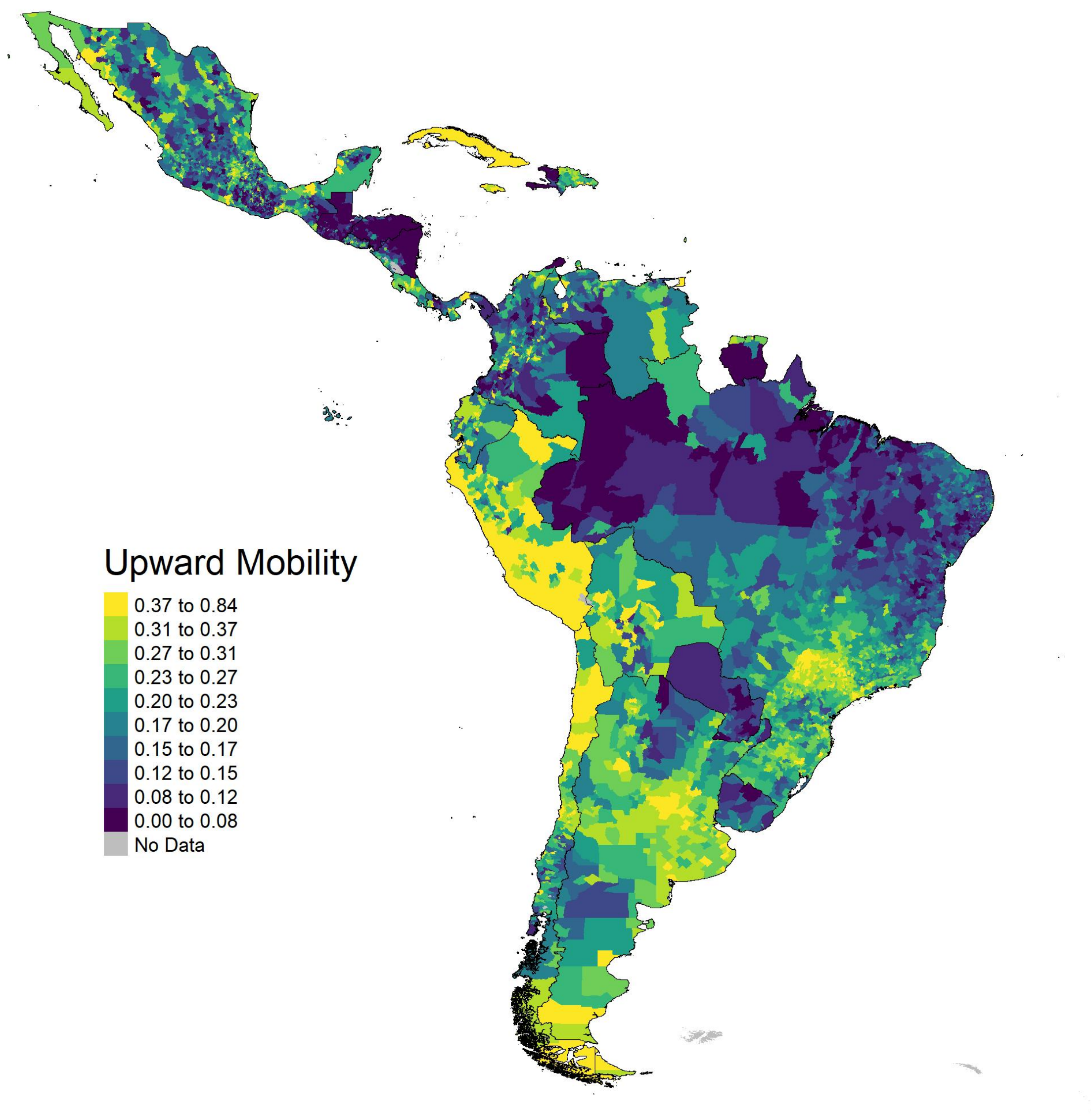
Figure A6: Downward Mobility in LAC



Notes: Downward mobility reflects the likelihood that children, aged 14-18, whose parents completed at least primary schooling will not manage to complete primary education. This graph uses provinces for St. Lucia, Jamaica, Trinidad and Tobago and Suriname that do not have a finer administrative units in the data set.

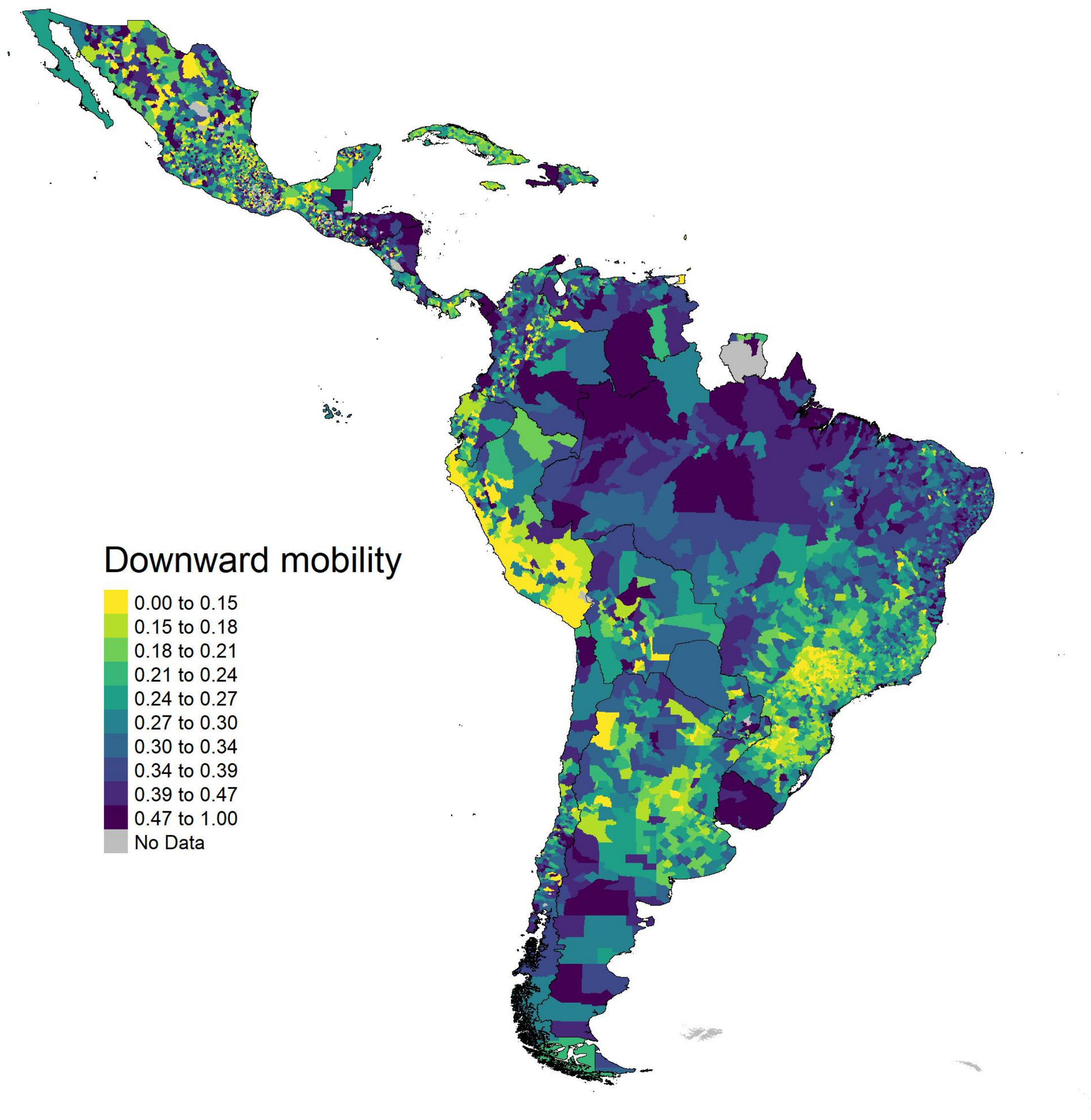
F District-level maps of mobility in secondary

Figure A7: Upward Mobility in LAC



Notes: Upward mobility reflects the likelihood that children, aged 14-18, whose parents have not completed secondary schooling will manage to complete at least secondary education. This graph uses provinces for St. Lucia, Jamaica, Trinidad and Tobago and Suriname that do not have a finer administrative units in the data set.

Figure A8: Downward Mobility in LAC



Notes: Downward mobility reflects the likelihood that children, aged 14-18, whose parents completed at least secondary schooling will not manage to complete secondary education. This graph uses provinces for St. Lucia, Jamaica, Trinidad and Tobago and Suriname that do not have a finer administrative units in the data set.

G Estimates of IGM using secondary education

Table A7: Country-Level Estimates of Educational Intergenerational Mobility

		(1)	(2)	(3)	(4)	(5)	(6)
mobility / N	census years	upward	upward	downward	downward	N	N
age range		19-25	20-25	19-25	20-25	19-25	20-25
Trinidad and Tobago	1970,1980,1990,2000,2011	.58	.579	.077	.072	51,140	21,370
Peru	1993,2007	.493	.504	.059	.049	348,429	220,485
Jamaica	1982,1991,2001	.458	.455	.138	.149	49,411	11,400
Saint Lucia	1980,1991	.42	.408	.084	.139	2,694	168
Cuba	2002,2012	.362	.381	.221	.205	84,252	123,515
Chile	1970,1982,1992,2002	.358	.369	.164	.148	431,534	129,491
Argentina	1970,1980,1991,2001,2010	.344	.358	.213	.198	1,276,838	447,347
Panama	1960,1970,1980,1990,2000,2010	.338	.351	.186	.174	97,802	31,532
Bolivia	1976,1992,2001,2012	.326	.338	.21	.2	211,870	62,971
Venezuela	1971,1981,1990,2001	.292	.297	.236	.233	636,479	130,603
Ecuador	1974,1982,1990,2001,2010	.289	.3	.194	.176	429,008	105,824
Costa Rica	1973,1984,2000,2011	.287	.296	.205	.19	122,731	40,554
Dominican Republic	1981,2002,2010	.257	.278	.243	.216	197,241	54,451
Brazil	1960,1970,1980,1991,2000,2010	.249	.268	.231	.203	12,610,650	1,718,702
Colombia	1973,1985,1993,2005	.242	.255	.2	.171	1,152,288	160,657
Mexico	1970,1990,2000,2010	.24	.252	.226	.202	3,392,481	506,282
Uruguay	1963,1975,1985,1996,2006,2011	.237	.24	.334	.31	130,248	34,931
Paraguay	1962,1972,1982,1992,2002	.206	.218	.143	.12	146,601	15,782
El Salvador	1992,2007	.185	.201	.224	.193	100,588	17,559
Haiti	1971,1982,2003	.157	.162	.425	.398	133,746	10,397
Guatemala	1964,1973,1981,1994,2002	.122	.131	.195	.169	278,412	19,341
Honduras	1974,1988,2001	.093	.096	.383	.371	121,155	11,281
Suriname	2012	.077	.114	.367	.334	4,413	1,318
Nicaragua	1971,1995,2005	.033	.043	.338	.309	118,929	15,611
mean / total		.277	.287	.221	.205	22,128,940	3,891,572

Notes: Columns (1) and (2) give upward-IGM estimates. They reflect the likelihood that children, aged 19-25 and 20-25, whose parents have not completed secondary schooling will manage to complete at least secondary education. Columns (3) and (4) give downward-IGM estimates. They reflect the likelihood that children, aged 19-25 and 20-25, whose parents have completed secondary schooling or higher will not manage to complete secondary education. Columns (5) and (6) give the number of observations used to estimate the country-specific IGM statistics (children whose parental education is reported in the censuses). Countries are sorted from the highest to the lowest level of upward IGM in the 19-25 sample (column (1)). "mean" gives the unweighted average of the 24 country-estimates.

Table A8: Summary Statistics: Province-Level Estimates of Educational IGM

		upward							downward						
country	provinces	mean	median	stdev	min	max	Nmin	Nmean	mean	median	stdev	min	max	Nmin	Nmean
Trinidad and Tobago	4	.62	.619	.121	.494	.746	835	7021	.1	.102	.015	.082	.117	327	2941
Peru	25	.534	.508	.157	.288	.787	441	7603	.114	.1	.049	.043	.249	291	4850
Cuba	14	.504	.501	.026	.472	.574	443	3264	.2	.199	.021	.171	.247	611	4823
Jamaica	14	.394	.398	.055	.322	.505	741	1957	.173	.168	.038	.117	.248	123	459
Bolivia	9	.364	.366	.081	.256	.485	707	12967	.201	.183	.061	.137	.306	154	3841
Saint Lucia	4	.325	.312	.065	.268	.406	262	373	.181	.181		.181	.181	62	62
Chile	44	.321	.314	.079	.154	.477	234	4438	.283	.28	.059	.175	.42	68	1627
Argentina	24	.317	.314	.064	.222	.56	1136	29270	.242	.241	.057	.136	.377	504	10278
Costa Rica	7	.297	.296	.061	.222	.391	4477	9661	.263	.227	.073	.193	.371	864	3186
Dominican Republic	23	.281	.29	.057	.136	.394	733	2938	.264	.234	.077	.176	.518	54	864
Mexico	32	.279	.274	.049	.193	.394	5016	58421	.217	.214	.025	.155	.263	1130	8763
Panama	7	.277	.297	.101	.087	.409	673	7697	.193	.19	.018	.173	.226	300	2912
Suriname	7	.273	.305	.124	.04	.392	62	344	.282	.282	.019	.269	.296	170	316
Ecuador	14	.266	.28	.052	.182	.342	1339	16814	.219	.191	.08	.139	.427	188	4181
Colombia	22	.257	.236	.075	.148	.435	645	28660	.228	.216	.067	.122	.42	132	4020
Venezuela	22	.253	.251	.049	.161	.36	894	15945	.291	.281	.07	.183	.487	153	3279
El Salvador	14	.208	.216	.066	.124	.385	1430	3963	.308	.298	.067	.207	.497	69	742
Uruguay	19	.189	.192	.029	.142	.272	647	3783	.492	.505	.053	.357	.574	109	1013
Brazil	25	.185	.168	.057	.11	.305	6098	280107	.264	.271	.049	.184	.352	1744	38217
Nicaragua	12	.164	.174	.075	.05	.286	918	5457	.298	.3	.048	.219	.391	70	782
Paraguay	14	.148	.13	.082	.08	.373	1844	6227	.275	.273	.05	.151	.345	60	723
Guatemala	22	.083	.076	.04	.03	.214	1967	6973	.305	.284	.064	.214	.426	51	486
Honduras	18	.074	.064	.04	.02	.176	297	3726	.482	.486	.079	.302	.573	65	440
Haiti	4	.059	.051	.021	.044	.09	4577	18354	.698	.707	.112	.553	.827	115	1426
total	400	.274	.267	.14	.02	.787	62	30464	.268	.247	.112	.043	.827	51	5629

Notes: This table shows summary statistics for province-level estimates of upward and downward IGM. Upward reflects the likelihood that children, aged 19-25, whose parents have not completed secondary schooling will manage to complete at least secondary education. Downward reflects the likelihood that children, aged 19-25, whose parents have completed secondary schooling or higher will not manage to complete secondary education. “Total” shows the unweighted summary statistics across all provinces. The columns “Nmin” and “Nmean” report respectively the smallest and average sample size across provinces. Provinces with less than 50 observations are omitted.

Table A9: Summary Statistics: District-Level Estimates of Educational IGM

		upward							downward						
country	districts	mean	median	stdev	min	max	Nmin	Nmean	mean	median	stdev	min	max	Nmin	Nmean
Cuba	137	.496	.493	.052	.373	.632	90	333	.212	.209	.038	.107	.325	66	493
Peru	168	.437	.416	.176	.104	.84	156	1138	.144	.127	.075	.034	.444	50	1024
Chile	179	.318	.311	.123	.088	.82	140	1091	.273	.27	.087	.045	.533	50	513
Costa Rica	55	.316	.317	.071	.155	.488	288	1230	.244	.232	.082	.104	.474	59	412
Argentina	312	.287	.294	.08	.059	.562	192	2252	.25	.243	.067	.106	.532	50	868
Bolivia	80	.281	.267	.114	.102	.592	219	1459	.258	.25	.08	.124	.479	52	784
Dominican Republic	66	.277	.282	.058	.136	.466	111	1040	.26	.241	.073	.158	.518	51	427
Panama	35	.248	.233	.124	.019	.444	356	1539	.214	.198	.063	.075	.344	52	689
Ecuador	78	.237	.217	.081	.096	.423	331	3057	.238	.228	.076	.127	.465	53	952
Uruguay	67	.219	.193	.093	.051	.499	169	572	.471	.485	.121	.173	.71	50	233
Venezuela	157	.216	.211	.07	.067	.404	289	2234	.327	.317	.09	.125	.599	50	634
Brazil	2,040	.213	.208	.09	-.007	.528	365	2373	.273	.261	.096	.055	.659	50	484
El Salvador	103	.212	.188	.106	.03	.516	160	539	.279	.277	.073	.117	.464	51	293
Colombia	434	.21	.189	.098	-.09	.493	185	1453	.261	.249	.092	.077	.629	50	348
Mexico	2,331	.19	.181	.097	-.046	.663	50	813	.244	.234	.076	.059	.54	50	362
Nicaragua	68	.161	.159	.072	.034	.312	228	963	.287	.277	.081	.179	.476	50	323
Paraguay	64	.15	.132	.084	-.049	.374	187	1326	.264	.259	.064	.151	.406	53	377
Guatemala	191	.069	.059	.051	-.006	.268	199	803	.302	.282	.075	.162	.441	55	324
Honduras	96	.059	.052	.042	-.004	.219	195	699	.454	.461	.081	.298	.579	51	376
Haiti	23	.042	.035	.031	.001	.137	753	3192	.708	.717	.09	.52	.83	59	451
total	6,684	.217	.203	.117	-.09	.84	50	1490	.264	.249	.098	.034	.83	50	506

Notes: This table shows summary statistics for district-level estimates of upward and downward IGM. Upward reflects the likelihood that children, aged 19-25, whose parents have not completed secondary schooling will manage to complete at least secondary education. Downward reflects the likelihood that children, aged 19-25, whose parents have completed secondary schooling or higher will not manage to complete secondary education. "Total" shows the unweighted summary statistics across all districts. The columns "Nmin" and "Nmean" report respectively the smallest and average sample size across districts. Districts with less than 50 observations are omitted.

H Estimates of upward IGM using primary-to-secondary education

Table A10: Country-Level Estimates of Upward IGM using primary-to-secondary education

		(1)	(2)
mobility / N	census years	upward	N
age range		19-25	19-25
Trinidad and Tobago	1970,1980,1990,2000,2011	.466	8,506
Peru	1993,2007	.416	131,085
Saint Lucia	1980,1991	.388	1,452
Jamaica	1982,1991,2001	.315	4,304
Bolivia	1976,1992,2001,2012	.237	66,410
Chile	1970,1982,1992,2002	.19	97,017
Brazil	1960,1970,1980,1991,2000,2010	.187	6,142,101
Cuba	2002,2012	.187	4,037
Uruguay	1963,1975,1985,1996,2006,2011	.178	25,192
Argentina	1970,1980,1991,2001,2010	.177	226,100
Dominican Republic	1981,2002,2010	.161	64,387
Panama	1960,1970,1980,1990,2000,2010	.161	23,221
Venezuela	1971,1981,1990,2001	.148	185,993
Costa Rica	1973,1984,2000,2011	.133	28,829
Ecuador	1974,1982,1990,2001,2010	.128	121,410
Colombia	1973,1985,1993,2005	.121	354,007
Mexico	1970,1990,2000,2010	.107	1,008,707
El Salvador	1992,2007	.092	37,462
Paraguay	1962,1972,1982,1992,2002	.085	54,934
Haiti	1971,1982,2003	.073	62,660
Guatemala	1964,1973,1981,1994,2002	.042	125,087
Honduras	1974,1988,2001	.036	52,754
Nicaragua	1971,1995,2005	-.004	47,560
Suriname	2012	-.094	200
mean / total		.164	8,873,415

Notes: Column (1) gives upward-IGM estimates. It reflects the likelihood that children, aged 19-25, whose parents have not completed primary schooling will manage to complete at least secondary education. Column (2) gives the number of observations used to estimate the country-specific IGM statistics (children whose parental education is reported in the censuses). Countries are sorted from the highest to the lowest level of upward IGM (column (1)). "mean" gives the unweighted average of the 24 country-estimates.

Table A11: Province-Level estimates of upward IGM using primary-to-secondary education

		upward						
country	provinces	mean	median	stdev	min	max	Nmin	Nmean
Peru	25	.481	.442	.165	.246	.748	250	5243
Cuba	14	.323	.342	.049	.231	.384	155	309
Bolivia	9	.251	.254	.08	.154	.384	348	7379
Chile	44	.203	.205	.062	.093	.331	114	1694
Dominican Republic	23	.194	.201	.046	.067	.275	588	1795
Costa Rica	7	.166	.167	.042	.12	.244	2051	4118
Argentina	24	.155	.15	.048	.089	.322	219	9421
Mexico	32	.155	.149	.039	.096	.244	2143	31522
Colombia	22	.149	.136	.047	.092	.254	141	16091
El Salvador	14	.148	.145	.044	.097	.27	1209	2676
Venezuela	22	.147	.147	.029	.082	.214	643	8454
Uruguay	19	.144	.139	.027	.094	.191	264	1326
Brazil	25	.14	.128	.05	.074	.249	4716	245684
Ecuador	14	.136	.134	.031	.098	.204	840	8672
Panama	7	.131	.127	.054	.055	.224	457	3317
Nicaragua	12	.107	.114	.051	.04	.19	807	3963
Paraguay	14	.076	.067	.048	.032	.211	1312	4225
Guatemala	22	.049	.047	.021	.012	.106	1614	5686
Haiti	4	.046	.041	.011	.039	.063	4211	15665
Honduras	18	.045	.036	.024	.01	.105	152	2931
total	371	.173	.149	.118	.01	.748	114	23884

Notes: This table shows summary statistics for province-level estimates of upward IGM. Upward reflects the likelihood that children, aged 19-25, whose parents have not completed primary schooling will manage to complete at least secondary education. “Total” shows the unweighted summary statistics across all provinces. The columns “Nmin” and “Nmean” report respectively the smallest and average sample size across provinces. Provinces with less than 50 observations are omitted.

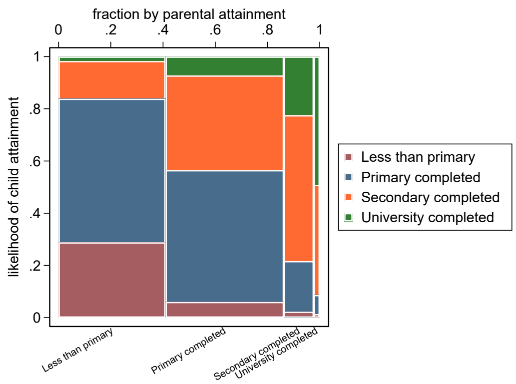
Table A12: District-Level Estimates of Upward IGM using primary-to-secondary education

		upward						
country	districts	mean	median	stdev	min	max	Nmin	Nmean
Peru	168	.395	.365	.175	.084	.807	105	785
Cuba	137	.338	.354	.091	.149	.479	52	81
Bolivia	80	.202	.194	.095	.064	.473	150	830
Chile	179	.2	.192	.082	.04	.478	81	421
Dominican Republic	66	.193	.187	.056	.067	.433	65	635
Costa Rica	55	.179	.181	.06	.057	.304	117	524
Brazil	2,040	.174	.168	.079	-.018	.471	278	1990
El Salvador	103	.155	.139	.076	.023	.381	87	364
Uruguay	67	.15	.144	.065	.024	.355	51	156
Argentina	312	.139	.14	.053	.012	.325	54	727
Colombia	434	.131	.115	.066	-.097	.321	82	816
Venezuela	157	.128	.123	.046	.028	.257	190	1185
Ecuador	78	.126	.115	.049	.026	.241	142	1577
Panama	35	.123	.098	.075	.011	.276	176	663
Nicaragua	68	.11	.101	.054	.017	.232	192	699
Mexico	2,331	.109	.098	.068	-.041	.635	50	452
Paraguay	63	.077	.07	.051	-.067	.211	153	900
Guatemala	191	.043	.039	.03	-.005	.156	172	655
Honduras	96	.037	.032	.028	-.006	.141	152	550
Haiti	23	.034	.033	.024	-.003	.103	664	2724
total	6,683	.144	.127	.093	-.097	.807	50	1042

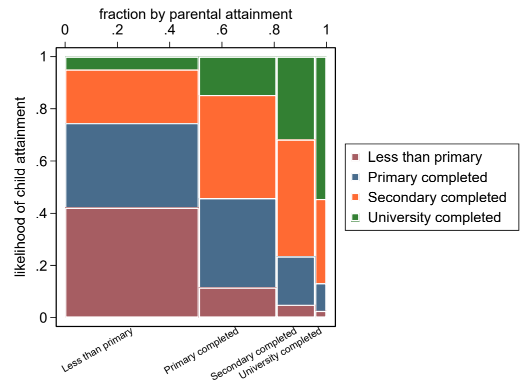
Notes: This table shows summary statistics for district-level estimates of upward IGM. Upward reflects the likelihood that children, aged 19-25, whose parents have not completed primary schooling will manage to complete at least secondary education. "Total" shows the unweighted summary statistics across all districts. The columns "Nmin" and "Nmean" report respectively the smallest and average sample size across districts. Districts with less than 50 observations are omitted.

I Transition matrix by country

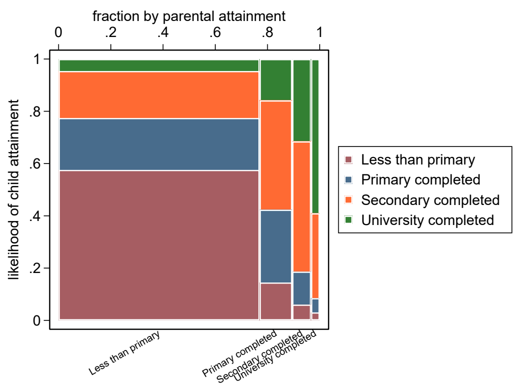
Figure A9: Transition matrix by country



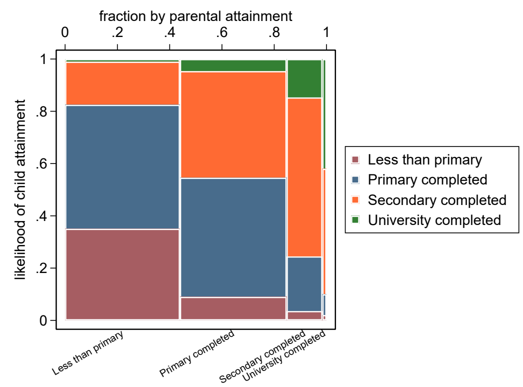
(a) Argentina



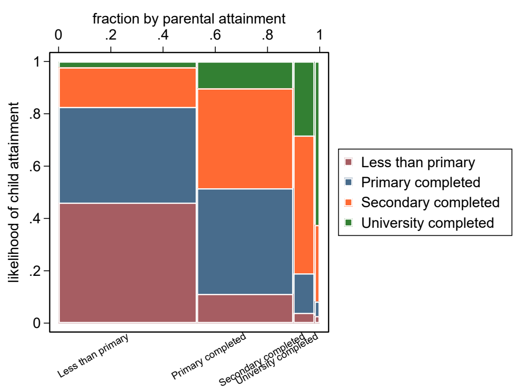
(b) Bolivia



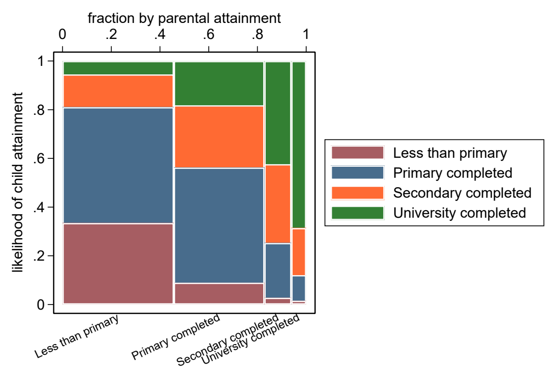
(c) Brazil



(d) Chile

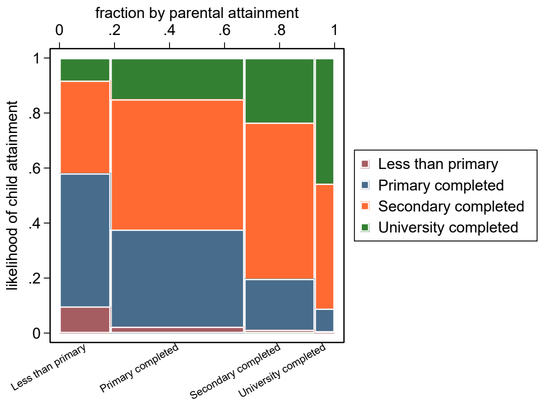


(e) Colombia

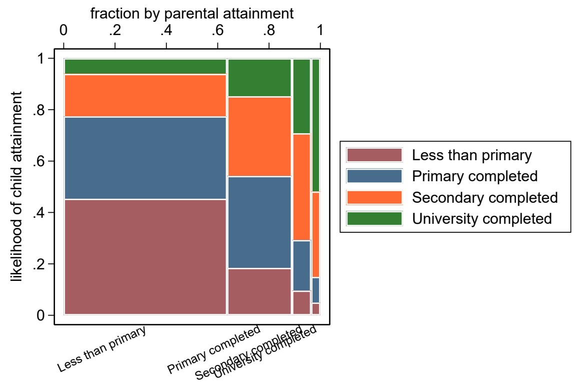


(f) Costa Rica

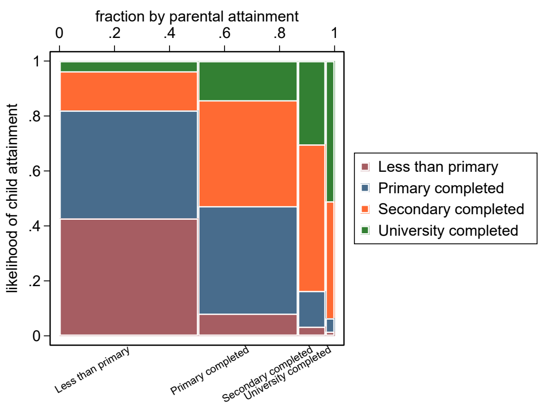
Figure A10: Transition matrix by country



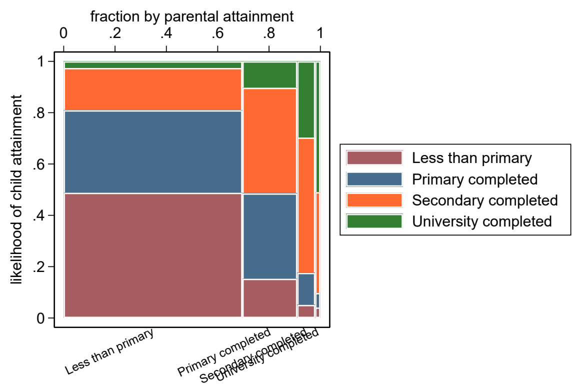
(a) Cuba



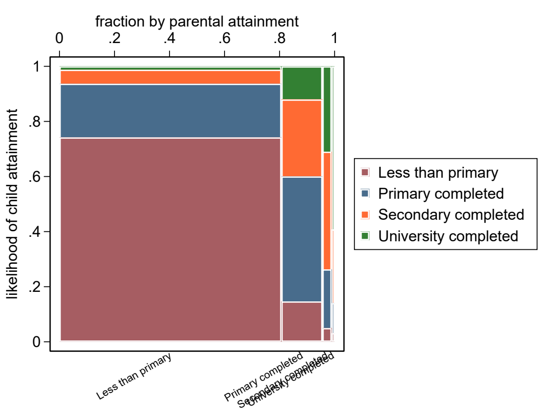
(b) Dominican Republic



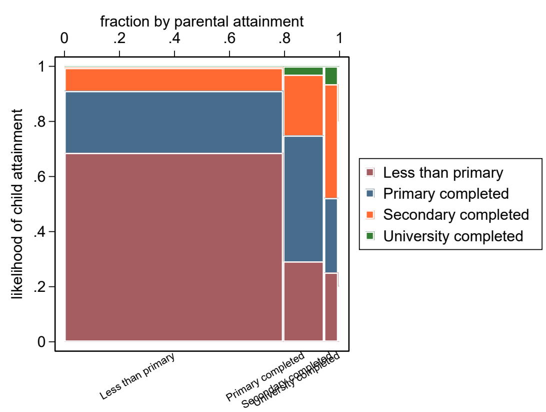
(c) Ecuador



(d) El Salvador

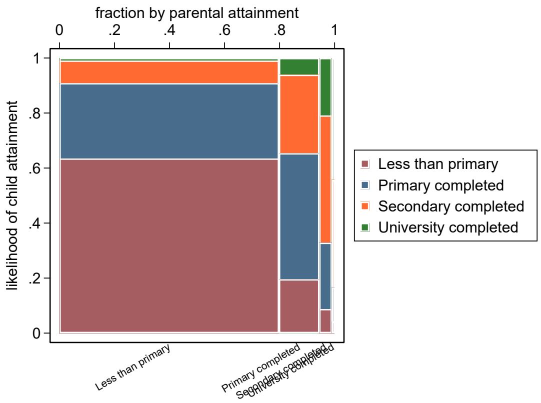


(e) Guatemala

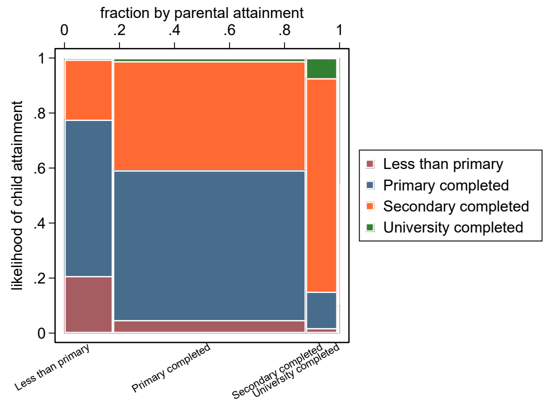


(f) Haiti

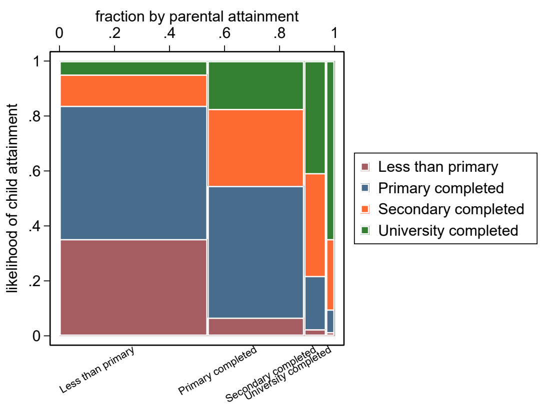
Figure A11: Transition matrix by country



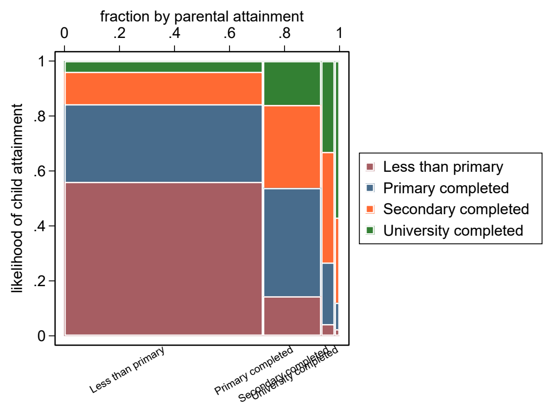
(a) Honduras



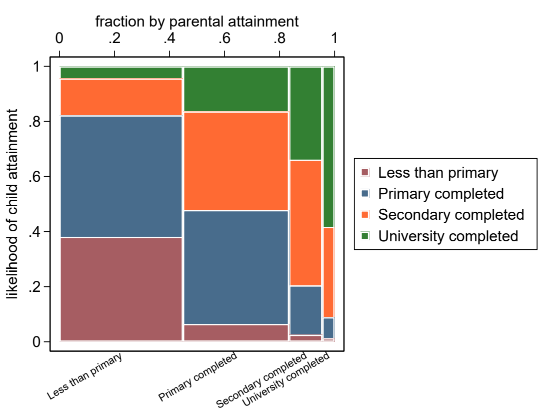
(b) Jamaica



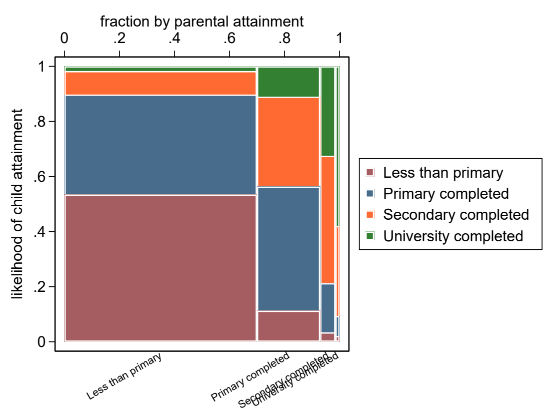
(c) Mexico



(d) Nicaragua

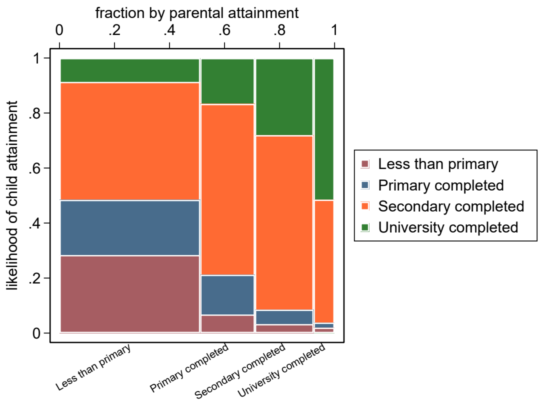


(e) Panama

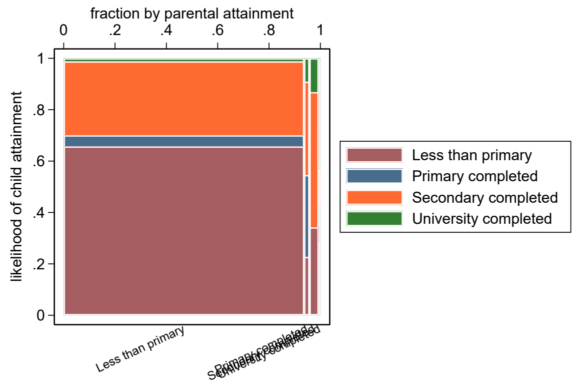


(f) Paraguay

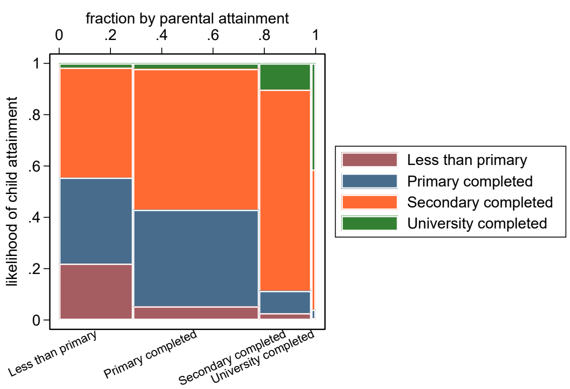
Figure A12: Transition matrix by country



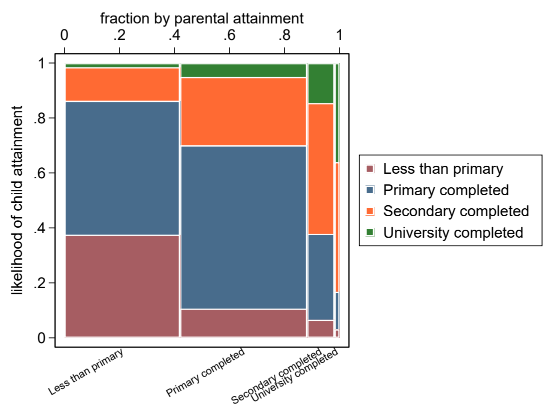
(a) Peru



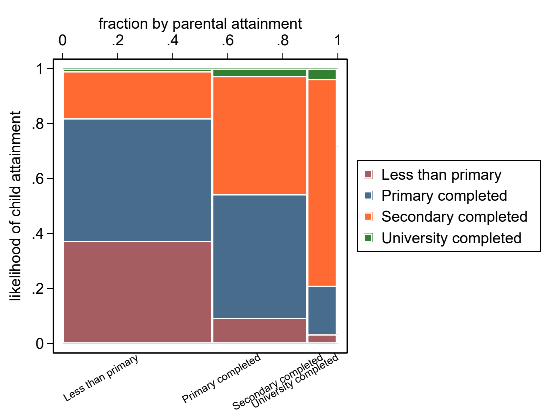
(b) Saint Lucia



(c) Trinidad and Tobago



(d) Uruguay



(e) Panama

Figure A13: Upward and downward mobility are highly negatively correlated

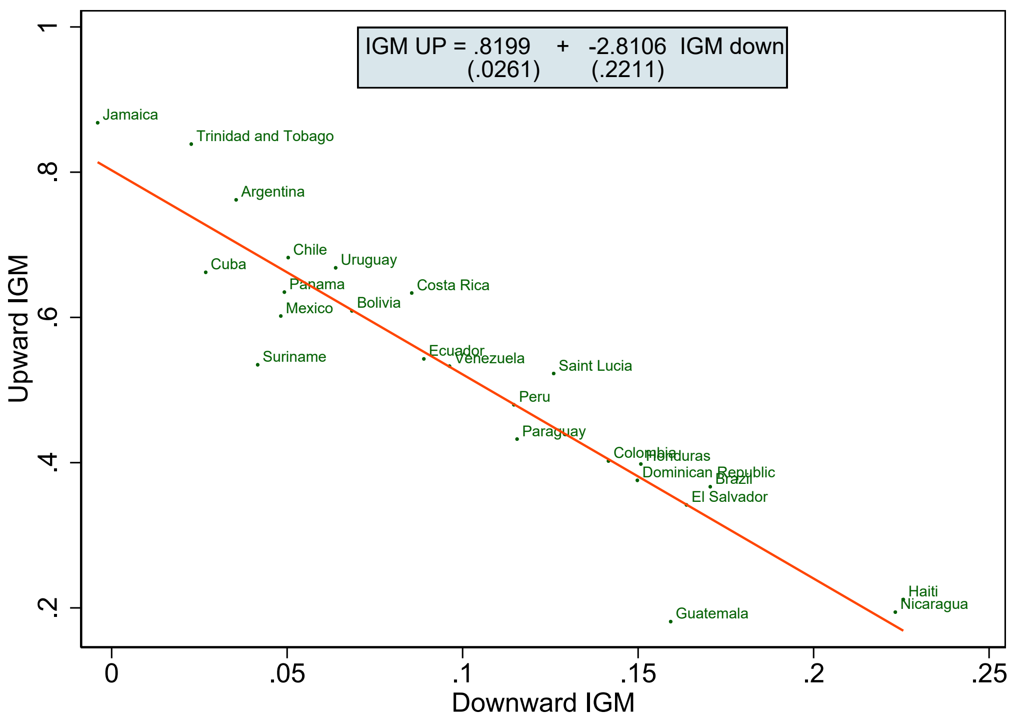


Figure A14: Upward mobility by urban/rural status

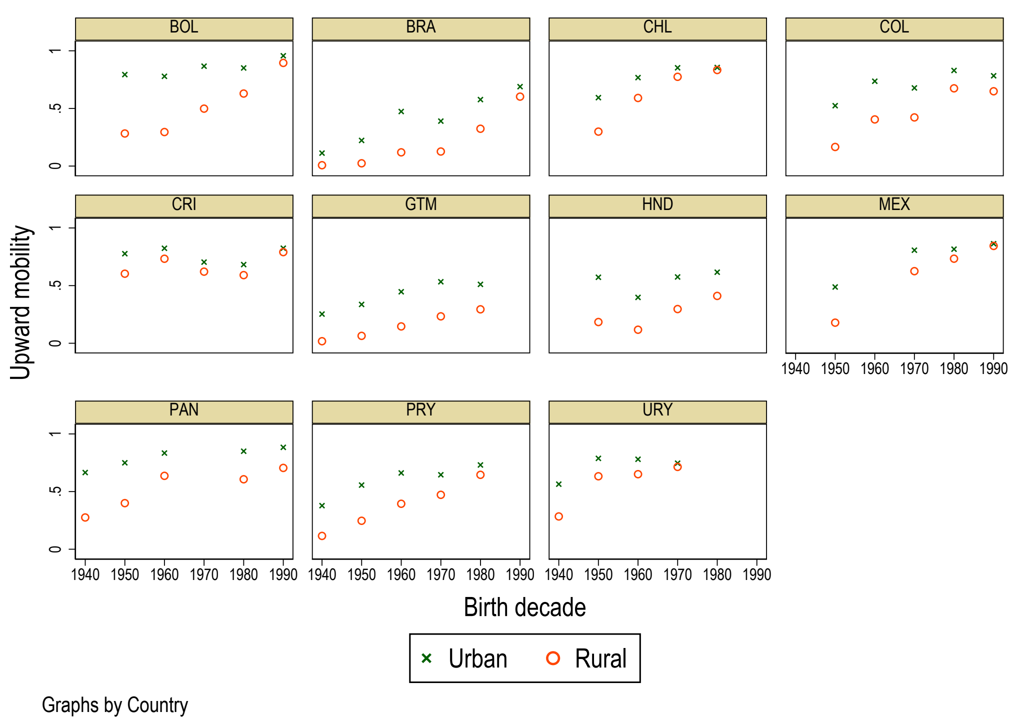


Figure A15: Downward mobility by urban/rural status

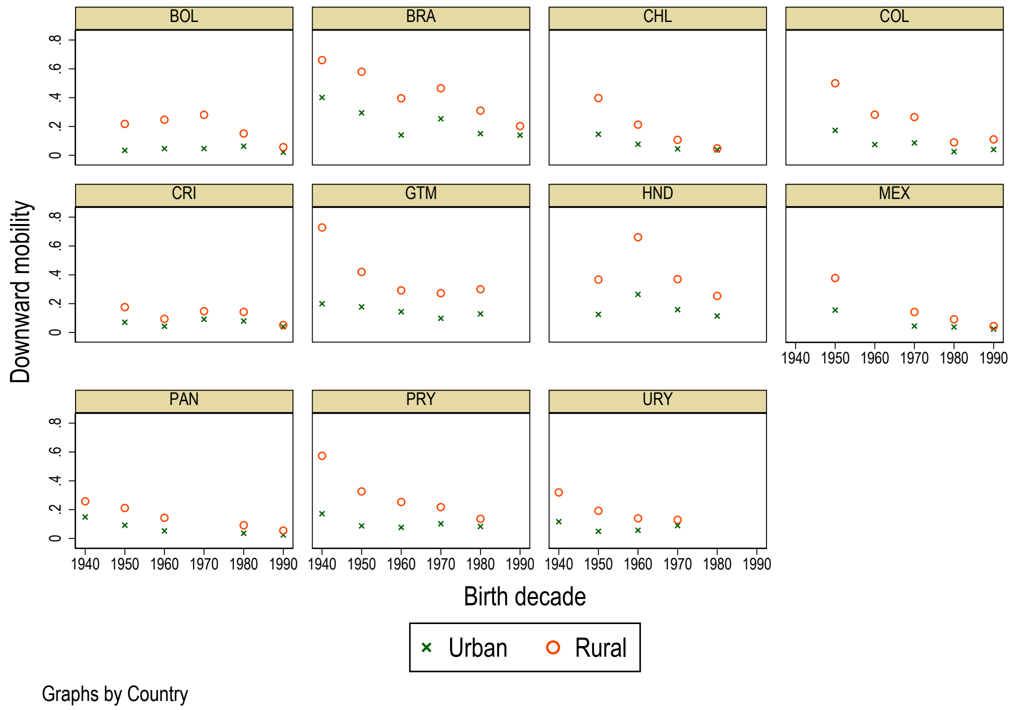


Figure A16: Upward mobility by gender

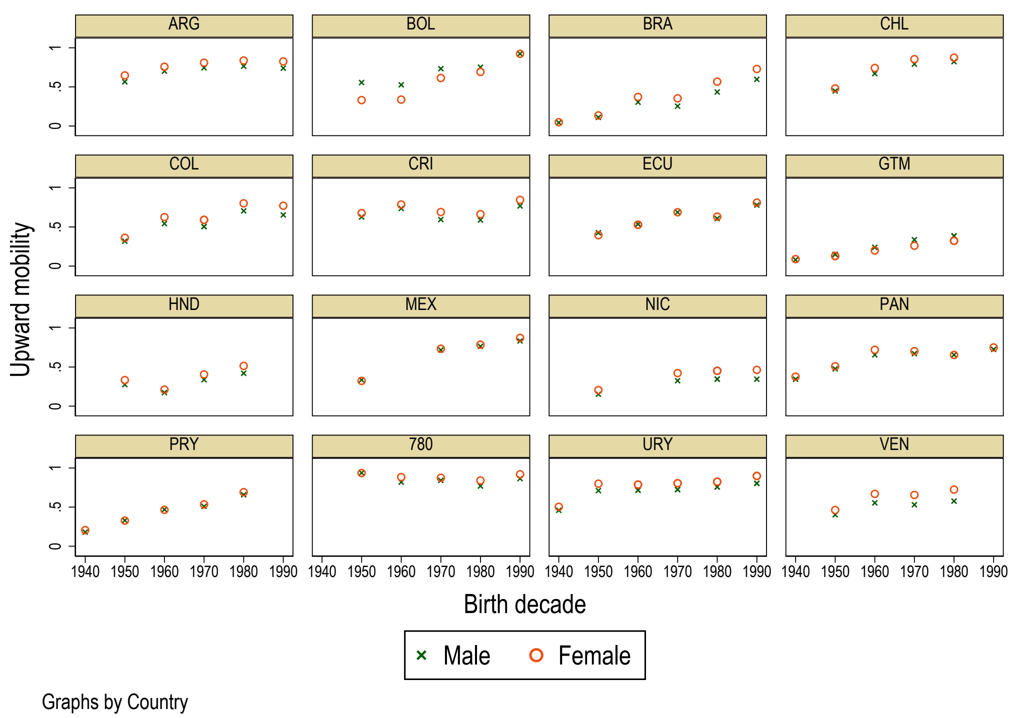


Figure A17: Downward mobility by gender

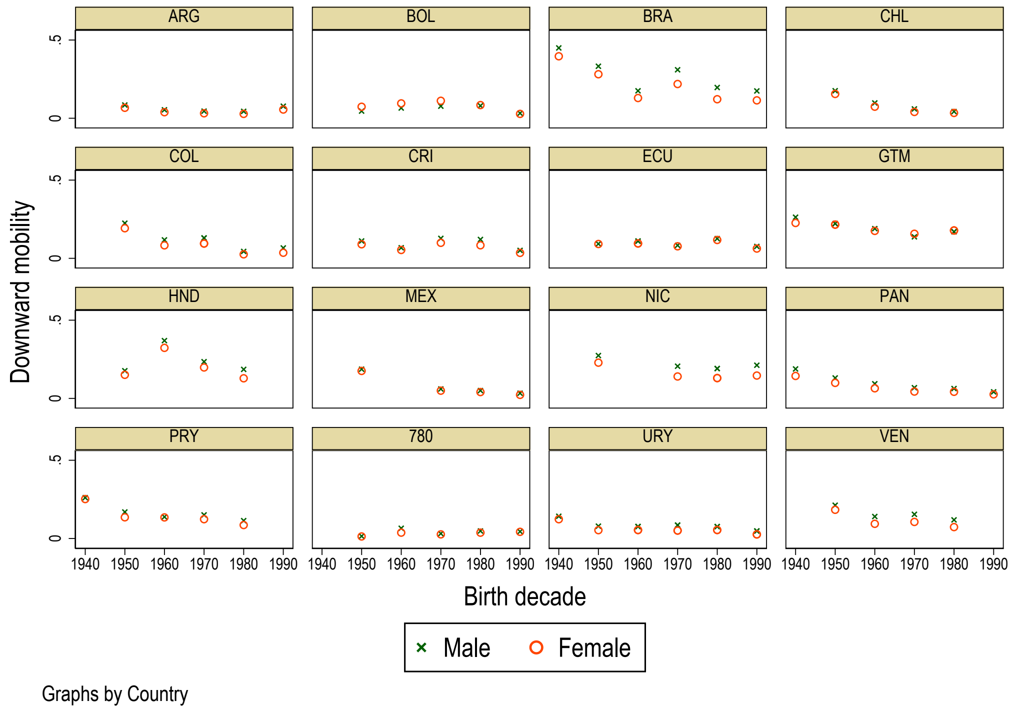
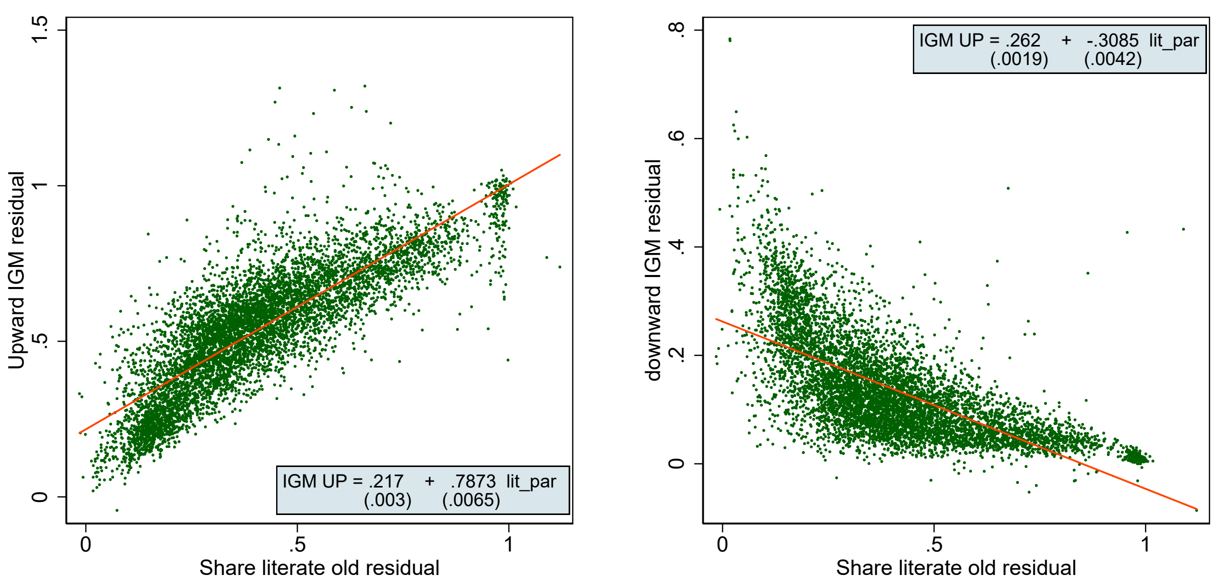


Figure A18: Intergenerational Mobility and Literacy of the Old Generation



(a) Upward mobility

(b) Downward mobility

Notes: This graph uses data at the district-level netting out country fixed effects.