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 cross-sectional data from 88 censuses that span 23 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" (coarse administrative units similar to states in the U.S.) and more than 6,000 "districts" (fine administrative units similar to counties in the U.S.). I document 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 in LAC. I document a declining trend in the mobility gap between urban and rural populations, but I do not find important differences by gender. 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 contrast, geographical variables do not appear to be highly correlated to mobility, and some proxies of economic development at the beginning of the sample period are only correlated to downward mobility.

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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) 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, 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 or wealth.

Recent studies have used household and public opinion surveys with retrospective information about parents' education to document the levels of intergenerational mobility in education in LAC countries. They have found that the intergenerational persistence of education is high (in other words, IGM is low) relative to other regions of the world (for an example, see Hertz et al. (2007), Neidhöfer, Serrano, and Gasparini (2018), and Narayan et al. (2018)).

Previous literature has focused on country-level analysis, 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

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

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 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 88 censuses. The analysis covers 23 countries spanning more than half a century (approximately between 1960 and 2011). I rely on samples of co-residents (i.e., children living with their parents or older relatives), which can generate biased estimates given that co-residence is not random (see for example Emran, Greene, and Shilpi (2018)). 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.

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 do not find significant 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 contrast,

geographical correlates do not appear to be highly correlated to mobility, and some proxies of economic development like the share of employment in manufacture and agriculture at the beginning of the sample period are only correlated to downward mobility.

This paper is related to two strands of the economic literature. First, it adds to the literature about intergenerational mobility in general (see Black and 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 US. Furthermore, it adds to the recent wave of research that looks at intergenerational mobility in education. This set of papers include on one hand those that use household survey data. For example, Hertz et al. (2007) and Narayan et al. (2018) that document IGM for a very large set of countries, and Neidhöfer et al. (2018) that focus only on Latin America. On the other hand and more closely related to this paper, there are recent studies that use administrative data or census data. For instance, Asher, Novosad, and Rafkin (2018) 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; and most closely related to this paper, Alesina, Hohmann, Michalopoulos, and Papaioannou (2020) document patterns of IGM in Africa using Census data and estimate whether regions have a causal effect on mobility.

Second, this paper is also related at the conceptual level to the theoretical literature about the intergenerational transmission of socioeconomic status. Seminal papers in this area of focus include Becker and Tomes (1979), Becker and Tomes (1986), Loury (1981); and, more recently, they also include contributions from Solon (2004), Solon (2014), and Becker (2018).

The paper is organized as follows. In 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

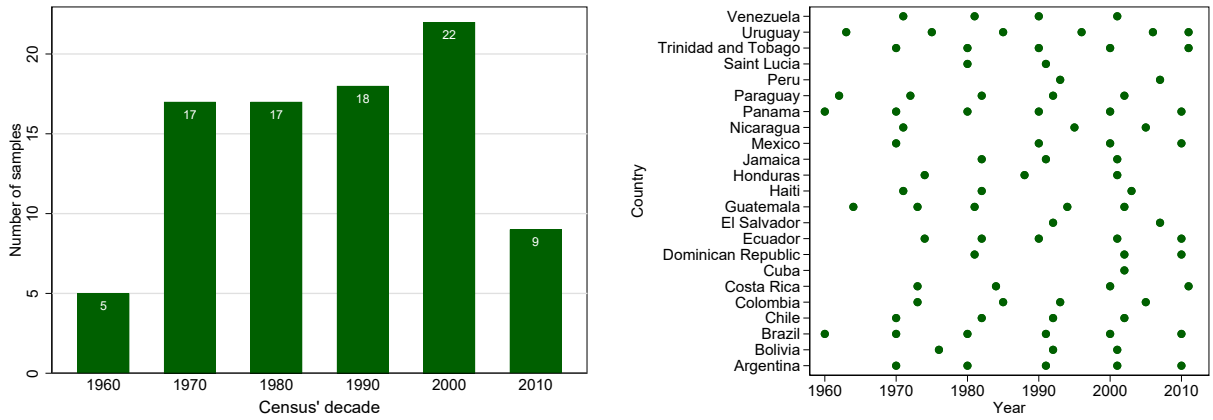
Three sources of data have been typically used to estimate intergenerational mobility. 1) cross-sectional samples of adult populations with retrospective questions about parental education. For example, Narayan et al. (2018) use household survey data that covers the 96% of the world population; 2) panel 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), and Neidhöfer et al. (2018)). Long panel data as well as administrative/registry data that allow the researcher to link generations are rare.

In this paper, I use Census data obtained from IPUMS International. In particular, I use 88 samples of population and housing Censuses, which are run to compute the total population and contain an educational attainment question in their questionnaire.[2] 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 dis-aggregated geographical level. However, the main disadvantage of this data is that does not link all the individuals with their parents, so I need to rely on samples of coresidents as it is explained below.

[2]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.

Figure 1: Coverage over time



(a) Number of samples by decade

(b) Samples by country

I Countries and smaller administrative units

I use individual records, retrieved from 88 national censuses from 23 countries: 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, and Venezuela. I obtain the data from IPUMS (2019) (Integrated Public Use Microdata Series) International, hosted at the University of Minnesota Population Centre, that reports harmonized representative samples, typically 10% of the full micro data set (see Table 4 in the Appendix for the details about the fraction available by census).

These 88 samples span approximately half a century going from 1960 to 2011 in an unbalanced fashion. Figure 1a shows the number of samples by decade, highlighting that they are concentrated between the 1970s and 2000s. Figure 1b shows the coverage by country and year highlighting some heterogeneity in coverage. In terms of frequency and time span, there are countries such as Brazil, Panama, and Uruguay with the highest availability of data (i.e. roughly one census per decade between 1960 and 2010). On the other extreme, Cuba has only one Census in 2002 while El Salvador, Peru, and Saint Lucia have only two

censuses in different decades.

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" (similar to states in the U.S.) and "fine" administrative units (similar to counties in the U.S.). The sample spans 394 provinces (admin-1 units) and 6,689 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 will be available in the Appendix.

II Linking generations and coresidence

The data collection is organized at the household level, so it is possible to link only 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".[3] Table 1 provides the details of the assignment.

Figure 2 shows the unweighted average rate of co-residence by age in the sample pooling all the countries and years. There are rates above 95% for individuals before reaching 18 years old that then start decreasing more rapidly getting close to 60% 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

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

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.

by age for women relative to men (see Figure 15 in the Appendix).

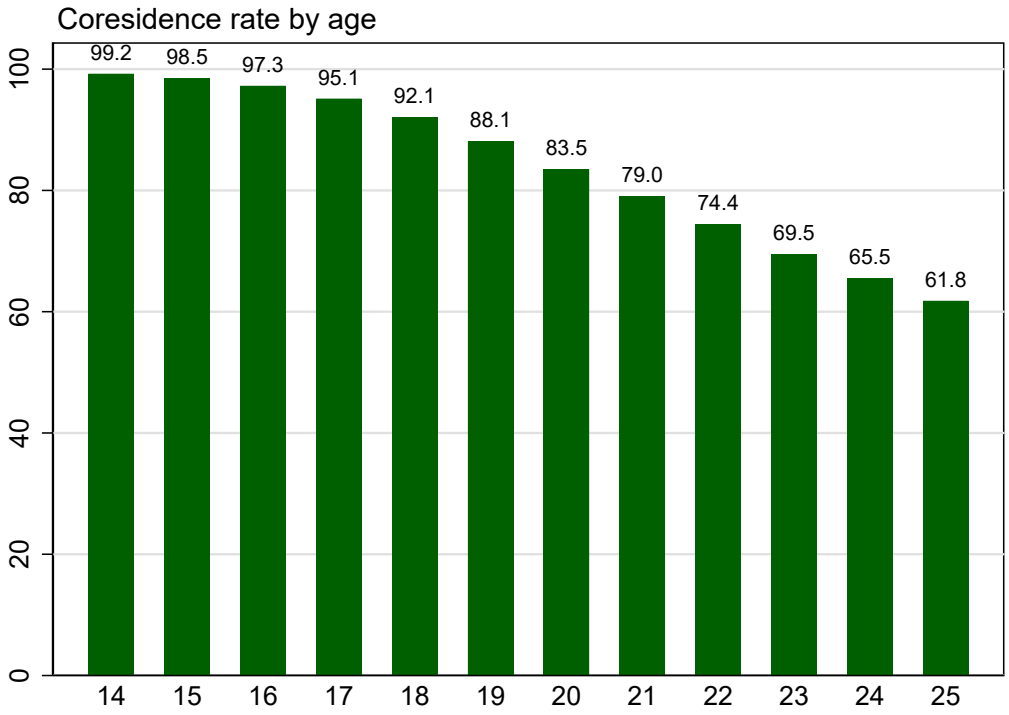
Figure 3 disaggregates the coresidence rate by country displaying some variability in the magnitude of the fall of it with age. This figure also suggest that the fall in coresidence around age 25 is likely driven by Brazil and Mexico, which are the most populated countries in Latin America.

III 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 three key advantages: 1) it contain less measurement error, which can lead to attenuation bias (see

[3] Alesina et al. (2020) uses a similar method to assign individuals with Census data for Africa.

Figure 2: Coresidence rate by age



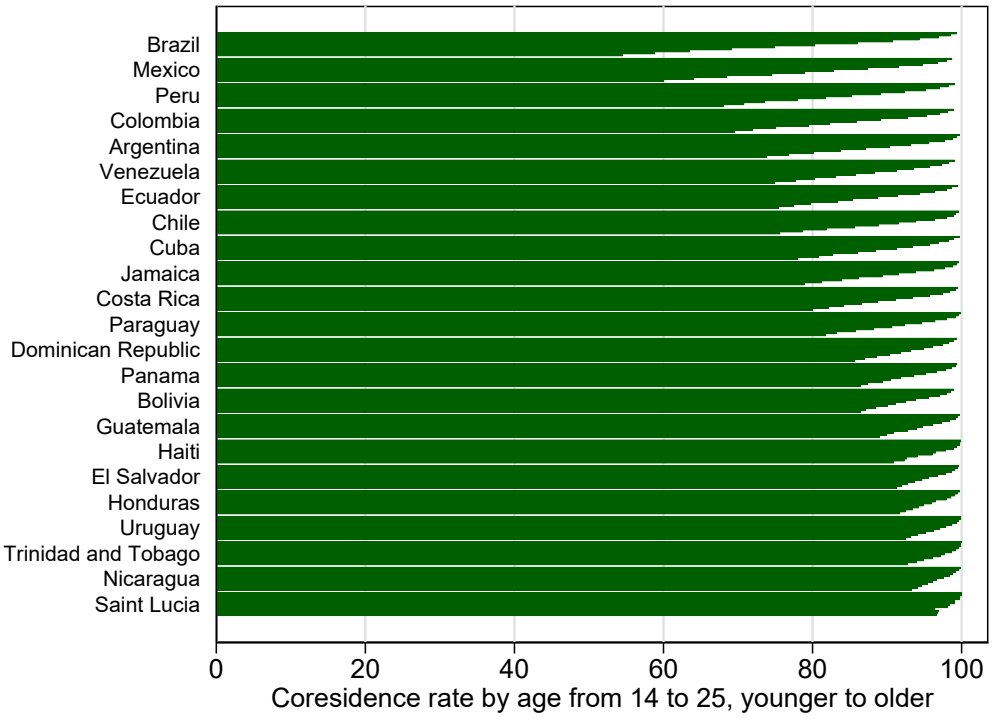
Notes: Coresidence is defined as living with at least one relative one generation older. The data is unweighted.

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 and Solon (2006)). In addition, it 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[4] and contains four categories: 1) Less than primary completed, 2) primary completed, 3) secondary completed, 4)

[4]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.

Figure 3: Coresidence rate by age and country



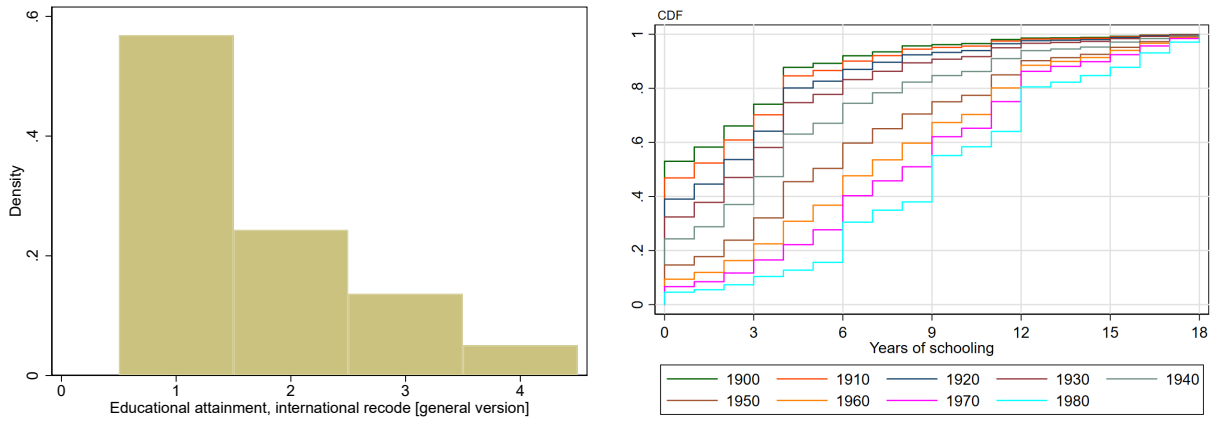
Notes: Coresidence is defined as living with at least one relative one generation older. The data is unweighted.

university completed. In this paper I use the latter variable, which has a lower number of missing values and it is available for more countries than the former.[5] 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 show levels of education that correspond to less than completed secondary (see Figure 4a), which supports the focus on primary completion that I will detail later as most of the action happens at lower levels of completion. In addition, although the level of education in Latin America and the Caribbean has been increasing across cohorts (see Figure 4b), 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.

[5]Years of schooling is not available for Brazil 2010, Cuba 2002, Saint Lucia 1991, Trinidad and Tobago

Figure 4: 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 in five country-year samples. The sample includes only individuals older 25 from decade cohorts 1900 to 1980. The data is unweighted.

Figure 5 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. 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. (2020) 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 are Jamaica and Guatemala[6] (see Figure 6).

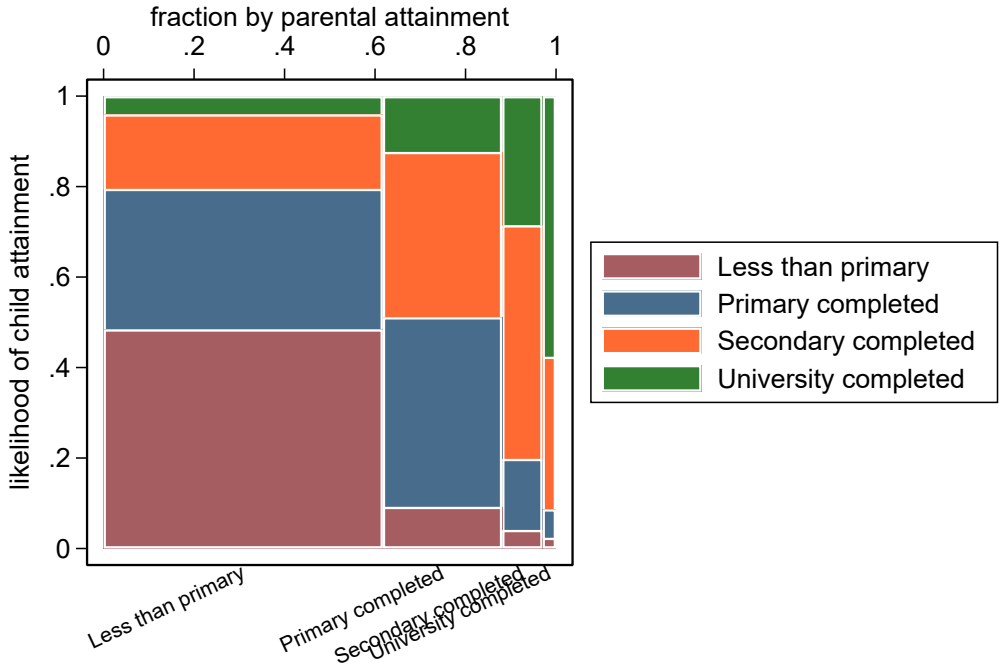
IV Methodology

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 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

1970, and Uruguay 2011.

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

Figure 5: Educational Attainment Transition Matrix



Notes: The sample is constructed with individuals older than 25 and it is unweighted.

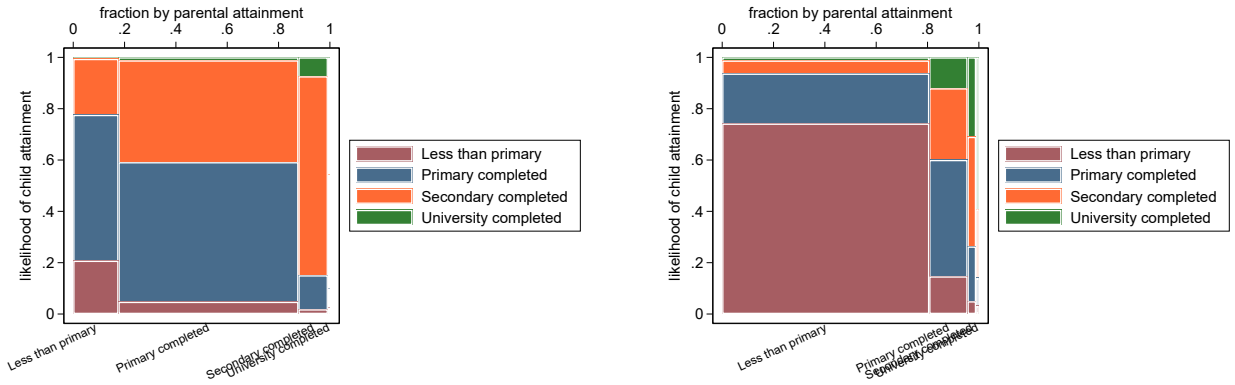
the household (parents and/or extended family members, such as aunts and uncles).

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"

Figure 6: Transition matrix for selected countries



(a) Jamaica **(b)** Guatemala

Notes: The sample is constructed with individuals older than 25 and it is unweighted.

did not complete primary net of cohort and census year effects.

This empirical approach is used in Alesina et al. (2020) 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 do 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 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 completed at least primary education. 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:

$$\begin{aligned} y^{up}_{icroyt} &= \alpha^{up}_{cr} + \gamma^{b}_{o} + \gamma^{b}_{y} + \theta_t + \epsilon_{icroyt} \\ y^{down}_{icroyt} &= \alpha^{down}_{cr} + \gamma^{b}_{o} + \gamma^{b}_{y} + \theta_t + \epsilon_{icroyt} \end{aligned} \tag{3}$$

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 a robustness 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. (2020) 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).[7]

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

III Intergenerational Mobility in Latin America

I 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 is as large as the one documented for African countries by Alesina et al. (2020), although with higher minimum and maximum values. However, the level of upward mobility in countries such as Haiti, Guatemala, and Nicaragua is comparable to the level of mobility seen in Mali, Guinea, and Burkina Faso, although highest than the countries ranked at the bottom in Africa such as Malawi, Ethiopia, Sudan, Mozambique, and South Sudan.

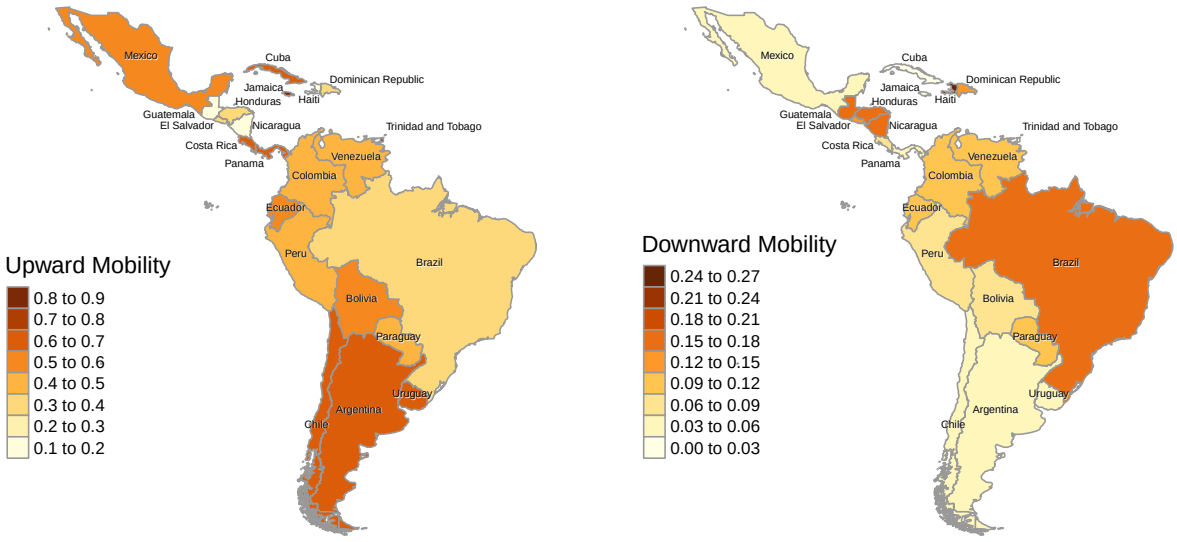
Figure 7 maps the country-level estimates of upward and downward mobility in education. They highlight the heterogeneity found across the continent, show that the patterns of upward mobility are inversely related to downward mobility and that there are combinations of low and high mobility countries in South America, as well as in Central America and the Caribbean. The estimates of upward and downward mobility at the level of country are significantly negatively correlated (see Figure 22 in the Appendix).

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	.871	.869	-.005	.001	40,874	72,601
Trinidad and Tobago	1970,1980,1990,2000,2011	.838	.832	.023	.023	41,253	81,100
Argentina	1970,1980,1991,2001,2010	.761	.789	.036	.034	1,068,471	2,017,618
Cuba	2002	.715	.731	.008	.011	54,746	107,031
Chile	1970,1982,1992,2002	.683	.709	.048	.042	344,149	651,737
Uruguay	1963,1975,1985,1996,2006,2011	.669	.686	.064	.053	108,528	199,653
Panama	1960,1970,1980,1990,2000,2010	.634	.664	.05	.04	86,527	157,906
Costa Rica	1973,1984,2000,2011	.633	.643	.087	.069	107,088	197,018
Bolivia	1976,1992,2001	.608	.633	.081	.067	136,132	230,519
Mexico	1970,1990,2000,2010	.605	.626	.048	.041	2,800,473	4,938,357
Ecuador	1974,1982,1990,2001,2010	.544	.573	.09	.074	373,130	667,055
Venezuela	1971,1981,1990,2001	.534	.589	.097	.08	517,845	940,792
Saint Lucia	1980,1991	.517	.487	.121	.135	2,059	3,635
Peru	1993,2007	.48	.525	.115	.088	357,472	668,806
Paraguay	1962,1972,1982,1992,2002	.433	.464	.112	.094	118,082	207,766
Colombia	1973,1985,1993,2005	.403	.438	.142	.114	886,765	1,605,718
Honduras	1974,1988,2001	.399	.434	.152	.134	109,458	182,786
Dominican Republic	1981,2002,2010	.377	.444	.148	.122	173,340	312,654
Brazil	1960,1970,1980,1991,2000,2010	.365	.42	.171	.129	10,755,302	18,713,412
El Salvador	1992,2007	.342	.374	.164	.139	85,402	150,582
Haiti	1971,1982,2003	.213	.268	.225	.178	104,465	183,588
Nicaragua	1971,1995,2005	.195	.24	.223	.18	93,635	167,740
Guatemala	1964,1973,1981,1994,2002	.183	.214	.155	.125	238,047	402,133
mean / total		.522	.55	.102	.086	18,603,243	32,860,207

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 23 country-estimates.

Figure 7: Intergenerational Mobility in LAC



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

I.1 Urban-rural

Within countries there may be some level of heterogeneity between the mobility of populations living in urban areas versus rural areas. To explore this, I estimate mobility by birth-decade cohort of the children and country.[8] Figure 8 reports the gap between the upward/downward mobility in urban-rural areas over birth cohort. I find a positive gap that has been declining as one moves towards older birth cohorts.

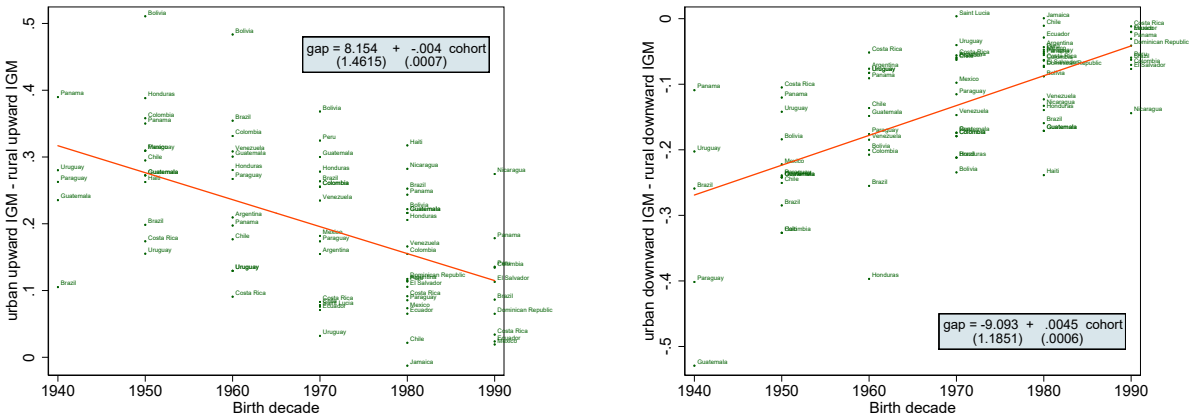
I.2 Gender

Similar to the gaps between urban and rural populations, there may exist heterogeneous levels of mobility by gender. To explore this possibility I estimate mobility by gender and birth-decade cohort.[9] I do not find systematic differences by gender although it appears that

[8]This analysis is done by estimating a modified version of equations 1 and 2 that measure mobility at the country-cohort, i.e. $y^{up}_{icoyt} = \alpha^{up}_{cy} + \epsilon_{icoyt}$ and $y^{down}_{icoyt} = \alpha^{down}_{cy} + \epsilon_{icoyt}$ using samples restricted to urban or rural population.

[9]This analysis is done by estimating a modified version of equations 1 and 2 that measure mobility at the country-cohort, i.e. $y^{up}_{icoyt} = \alpha^{up}_{cy} + \epsilon_{icoyt}$ and $y^{down}_{icoyt} = \alpha^{down}_{cy} + \epsilon_{icoyt}$ using samples restricted to male or female population.

Figure 8: Intergenerational Mobility in LAC - Urban/rural



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

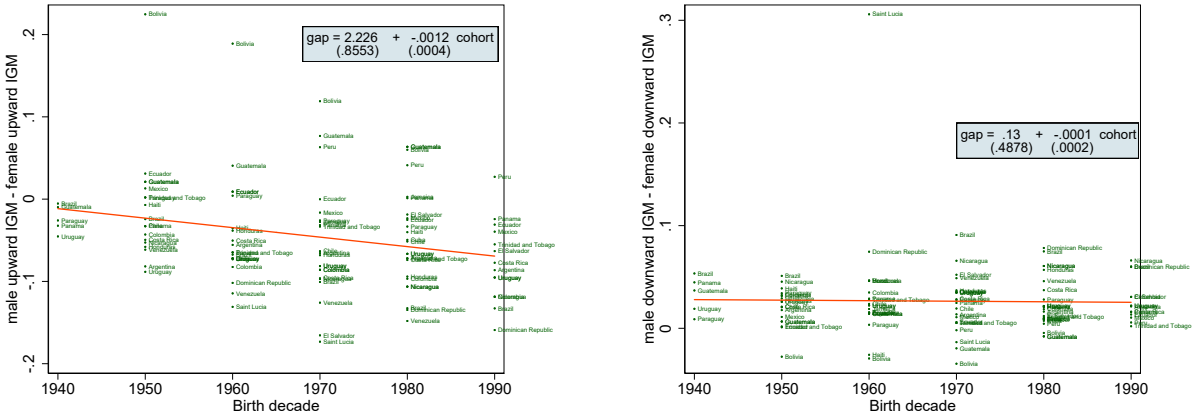
Notes: The estimates are done by birth decade cohort of the children.

there is a trend towards higher upward mobility for women (see Figure 9) while downward mobility appears flat.

I.3 Evolution over time

As Figure 1b made clear, 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 birth cohorts available. Figure 10 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.

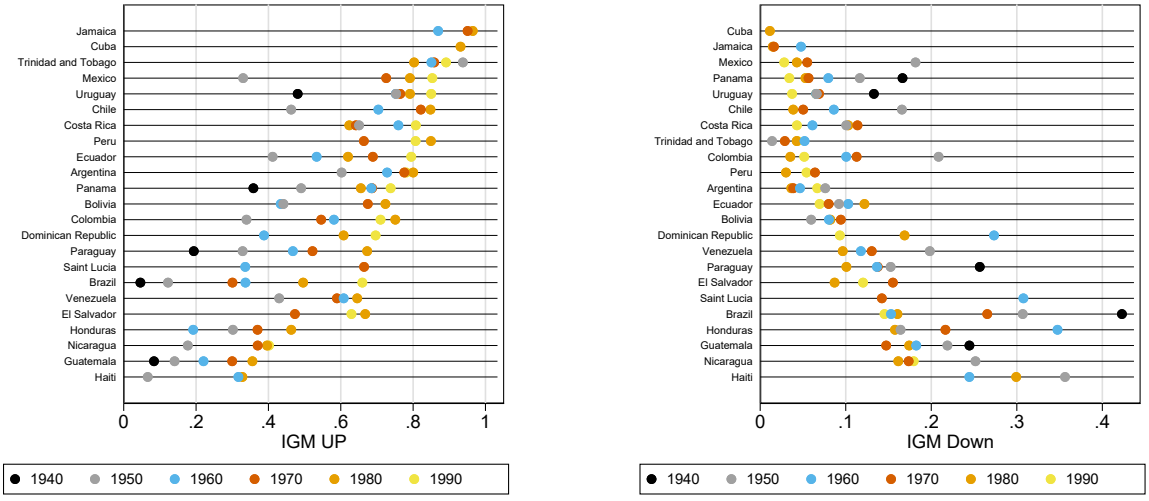
Figure 9: Intergenerational Mobility in LAC - Gender



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

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

Figure 10: Intergenerational Mobility in LAC across cohorts



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

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

II Spatial variation of intergenerational mobility in LAC

Table 9 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.

In the case of downward mobility, the variability is much smaller in level with Paraguay that stands out in terms of the range between the province with the minimum and the maximum level of downward mobility.

Figure 11 and 12 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 9) and maps (see Figure 16 and 17) 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 unitary range.

Table 3: Summary Statistics: Province-Level Estimates of IM

		upward							downward						
country	provinces	mean	median	stdev	min	max	Nmin	Nmean	mean	median	stdev	min	max	Nmin	Nmean
Cuba	15	.93	.927	.037	.854	.976	53	101	.011	.01	.004	.006	.018	494	3563
Jamaica	14	.891	.894	.029	.841	.941	107	307	.027	.026	.006	.018	.042	1107	2613
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	.676	.672	.079	.506	.901	2253	37987	.052	.051	.016	.015	.097	6260	49528
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
Bolivia	9	.576	.566	.118	.39	.765	405	7755	.11	.091	.056	.062	.25	358	7370
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	.471	.472	.046	.427	.515	324	444	.158	.158	.002	.156	.159	75	103
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	394	.585	.603	.203	.099	.976	53	29507	.114	.092	.076	.006	.397	75	17821

Notes: This table shows summary statistics for province level estimates of IGM. "Total" shows the unweighted summary statistics across all provinces. The columns "Nmin" and "Nmean" report respectively the smallest and largest sample size across provinces. Provinces with less than 50 observations are omitted.

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 it is solely descriptive.

I run univariate regressions pooling all the countries linking IGM to geographical and initial conditions that has been discussed in previous studies on mobility outside the continent (for example, see Alesina et al., 2020). This is done estimating the following econometric specification:

$$\alpha_{cr}^{up/down} = \eta_c + \beta Z_{cr} + \epsilon_{cr} \tag{4}$$

where the dependent variable corresponds to the measure of upward or downward intergenerational mobility previously estimated for province/district r in country c, η_c denote

Figure 11: Upward Mobility in LAC

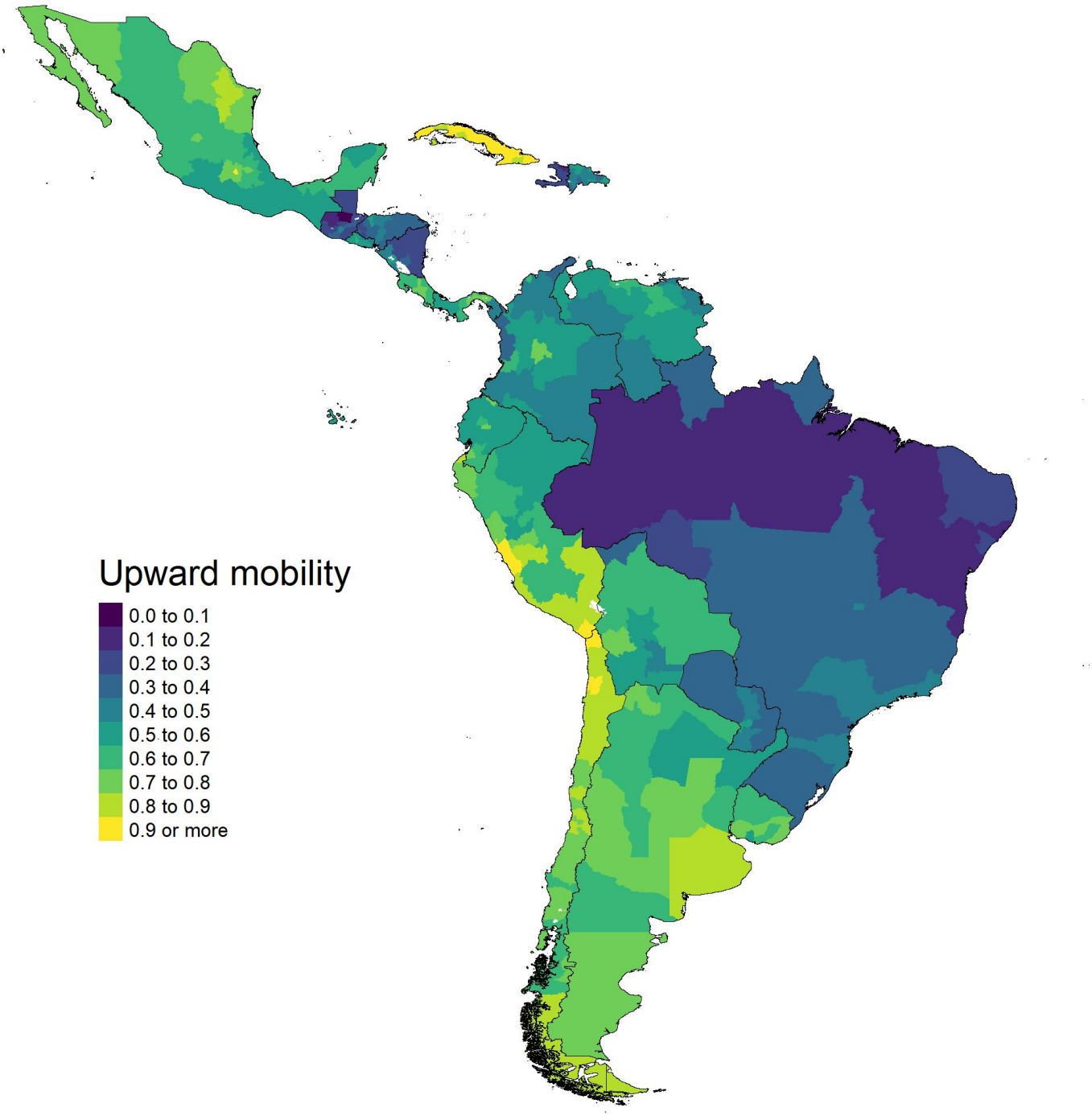
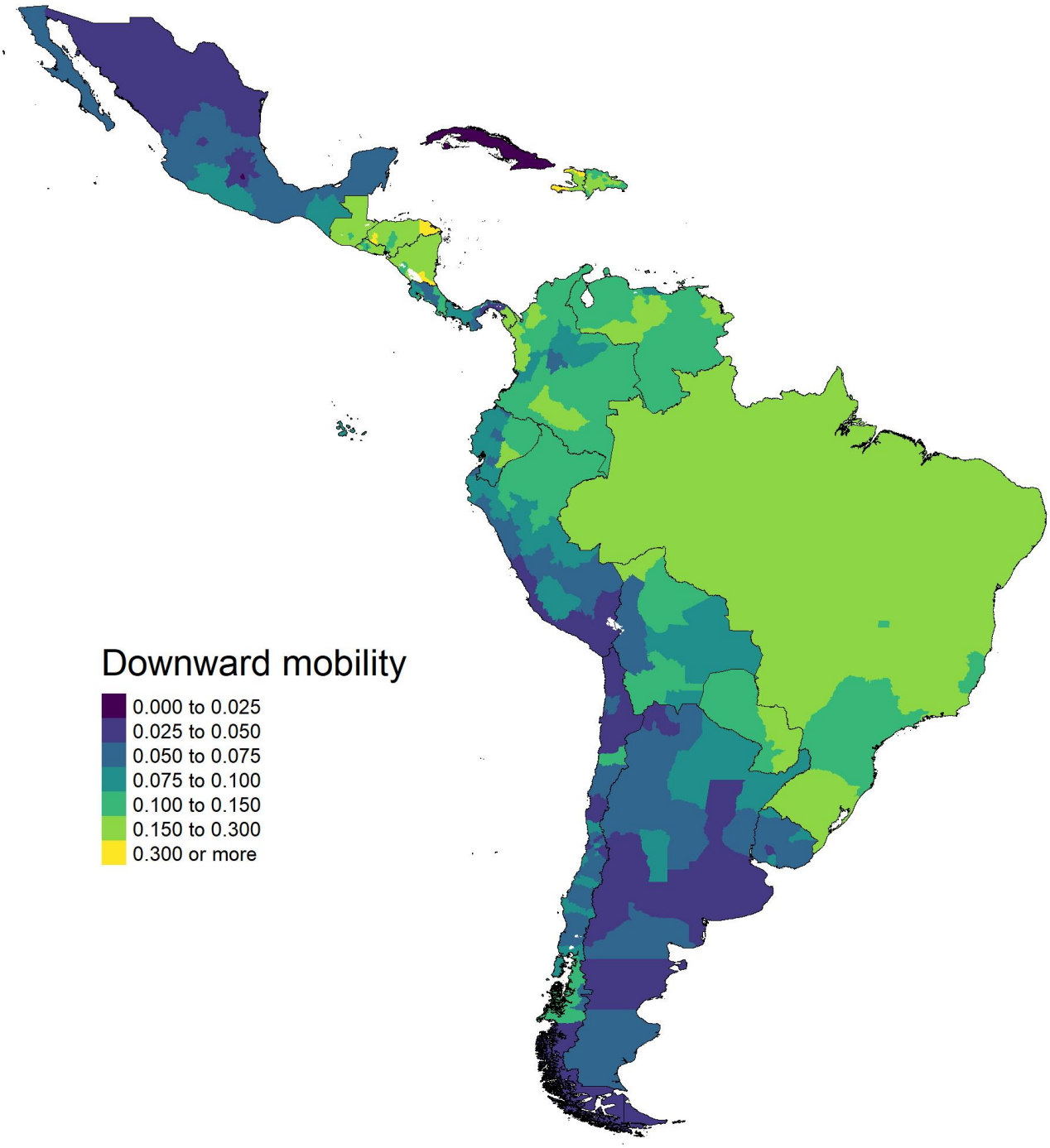


Figure 12: Downward Mobility in LAC



country fixed effects, Z_{cr} and β are respectively the covariate and the coefficient of interest. The latter summarizing the linear association between intergenerational mobility and the covariate.

I Education of the old generation

First I analyze the share of the old generation that was able to complete primary education. Alesina et al. (2020) 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:

$$e_{icroyt} = \delta_{cr} + \gamma_o^b + \gamma_y^b + \theta_t + \epsilon_{icroyt} \tag{5}$$

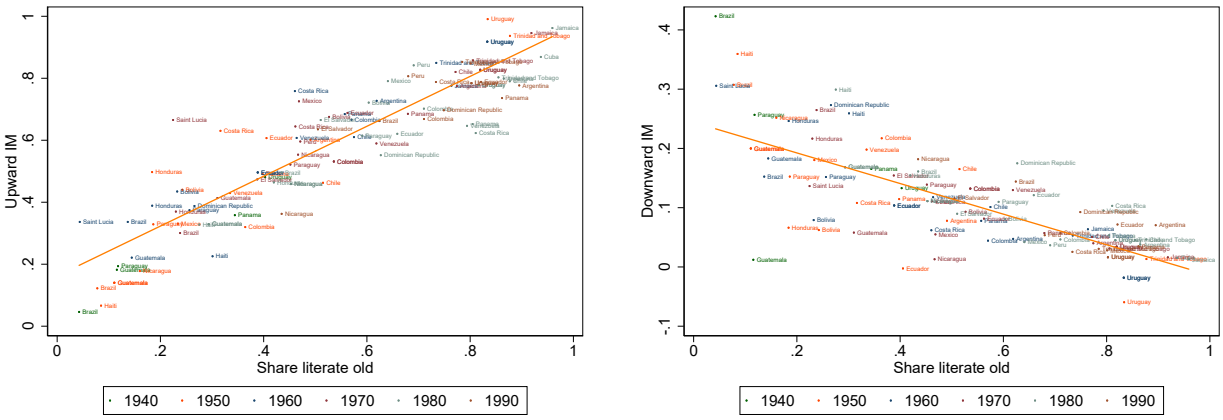
where e_{icroyt} is a dummy variable equal to 1 if the completed educational level of the old generation observed for individual i from country c region r is at least primary. Similar to before, γ_o^b and γ_y^b are birth-decade fixed effects for parents and children, and θ_t a census year fixed effect.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

Figure 13 shows the associated scatter plots, which evidence a strong positive correlation with upward mobility and the opposite in the case of downward mobility. These findings suggest the existence of a high level of inertia confirming the findings of Alesina et al. (2020).

II 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

Figure 13: 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.

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.

Previous literature 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 provinces that are proxies of the level of development at the beginning of the the period of study. These are the urban share of the population, the share of agricultural employment, the share of manufacturing employment, and the share of service employment. These last four covariates are computed restricting the sample to only individuals born before 1960.

The results are reported in Figure 14 for upward and downward mobility respectively. Although upward mobility seems to be correlated with the proxies of development, the correlation becomes insignificant when controlling by education of the old generation in all

Figure 14: 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.

the cases. However, in the case of downward mobility, I find a significant correlation even after controlling for education of the old with the share of employment in manufacture and agriculture, although with opposite signs.

In the case of the geographical correlates, they are not significantly correlated to either measure of mobility. This contrasts to the results that have been documented for Africa, where distance to the coast and to the capital are significantly correlated to the measures of mobility.

Qualitatively similar results are found when the analysis of correlations is done using estimates at the district level (see Figures 23 and 24 in the Appendix).

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 attain-

ment 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 similar to what has been recently documented in Africa, although the least mobile countries in Africa are less mobile than any country in LAC. 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, with countries having 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. However, upward mobility does not appear to be highly correlated with geographical variables and proxies of economic development as previously documented for Africa, whereas downward mobility appears correlated to the shares of employment in manufacturing and agriculture.

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 level.

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Appendix

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

Table 4 reports the Census' samples available and the size of the extract.

Table 5 reports sample size from raw data to samples restricted by age and by availability of information on education.

Table 6 reports the rates of co-residency by country for different ages.

Table 7 reports the rates of co-residency by country-sample for different ages.

Figure 15 displays rates of coresidence by urban/rural population and by gender.

Table 8 summarizes the education level by cohort using data on individuals at least 25 years old.

Table 9 reports district-level estimates of intergenerational mobility.

Figure 16 and 17 displays maps of mobility at the district-level fir LAC.

Figure 22 displays the negative relationship between upward and downward mobility.

Figure 23 and 24 displays the analysis of correlations using district level data.

A1. Sample coverage and construction

Table 4: Census' samples available in IPUMS

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

Table 5: 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.

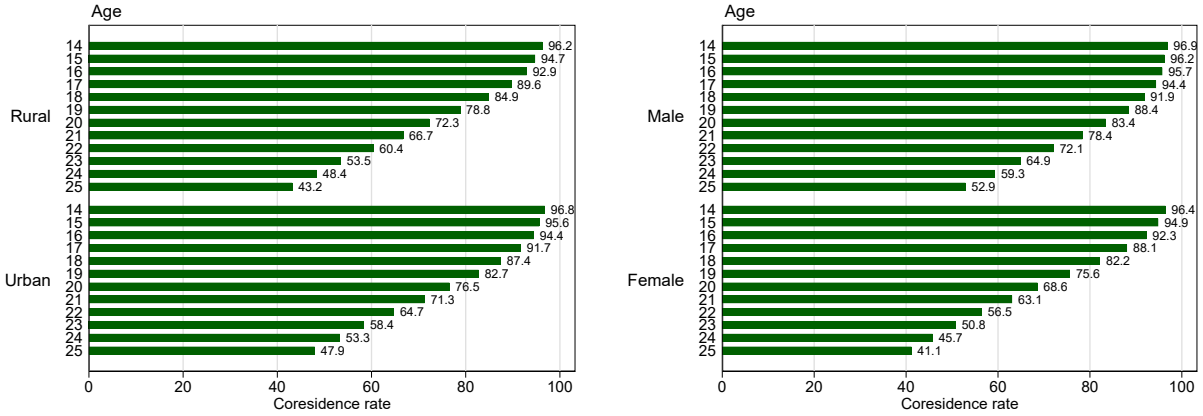
A2. Rates of co-residence

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 6: Co-residence rates

	Rate				Observations (thousands)			
	14-18	18-25	21-25	20-23	14-18	18-25	21-25	20-23
Argentina	98.3	85.2	80.2	85.3	1245	1744	1066	869
Bolivia	97.6	90.3	88.2	90.2	165	223	136	113
Brazil	96.0	71.7	62.4	70.8	10424	13912	8271	6921
Chile	98.5	86.6	82.0	86.9	417	577	356	288
Colombia	96.9	81.5	76.1	81.2	1112	1483	907	732
Costa Rica	98.1	88.0	84.3	87.7	129	182	110	91
Dominican Republic	98.0	90.6	88.0	90.4	263	357	210	177
Ecuador	97.4	84.4	79.9	84.1	462	636	387	319
El Salvador	98.9	94.2	92.5	94.0	110	138	82	68
Guatemala	98.8	93.0	90.8	92.8	286	363	214	180
Haiti	99.5	94.9	92.8	94.8	123	158	88	76
Honduras	99.0	94.6	93.1	94.5	137	170	100	84
Jamaica	98.3	87.6	83.4	87.5	54	72	43	35
Mexico	96.4	78.2	71.4	78.0	5576	7374	4378	3635
Nicaragua	99.2	95.6	94.4	95.5	120	156	93	78
Panama	98.4	91.2	88.7	91.1	109	150	91	74
Paraguay	98.7	89.0	85.5	89.0	136	177	107	89
Peru	96.6	80.1	74.5	79.7	436	604	371	301
Saint Lucia	99.5	97.6	96.8	97.2	1	1	1	1
Trinidad and Tobago	99.7	96.1	94.6	96.2	41	59	36	28
Uruguay	99.6	95.6	94.1	95.6	100	139	85	69
Venezuela	96.9	84.7	80.4	84.4	630	858	518	428

Figure 15: 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 previous generation.

Table 7: 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	99.3	94.7	92.8	94.8	33	48	29	23
Argentina	1980	98.0	84.3	79.5	84.5	204	276	174	138
Argentina	1991	98.1	82.4	76.3	82.4	364	467	280	231
Argentina	2001	98.8	87.2	82.8	87.4	306	464	288	238
Argentina	2010	98.2	85.5	80.6	85.4	338	490	295	240
Bolivia	1976	98.9	92.7	90.7	92.3	39	52	31	26
Bolivia	1992	98.5	91.0	88.6	90.8	52	68	42	34
Bolivia	2001	96.3	88.7	86.7	88.8	74	103	63	52
Brazil	1960	97.1	73.5	64.4	72.7	1386	1824	1069	905
Brazil	1970	96.8	72.1	61.7	70.9	2383	2963	1714	1474
Brazil	1980	95.6	67.0	56.7	65.9	2907	3972	2407	1987
Brazil	1991	95.1	73.8	66.3	73.3	1707	2345	1432	1164
Brazil	2000	95.8	74.9	66.6	74.1	2041	2809	1650	1391
Chile	1960	99.7	95.4	93.5	95.3	6	7	4	4
Chile	1970	98.6	85.0	79.7	85.3	77	91	55	45
Chile	1982	99.3	92.4	89.5	92.5	111	150	91	75
Chile	1992	97.7	83.1	77.6	83.6	107	166	105	82
Chile	2002	98.2	85.4	80.7	85.7	116	163	101	83
Colombia	1964	98.1	86.6	82.8	86.3	26	32	19	15
Colombia	1973	98.3	88.6	84.6	88.1	185	212	122	103
Colombia	1985	98.5	88.6	84.9	88.9	260	370	225	183
Colombia	1993	96.7	77.5	71.2	77.3	282	398	251	197
Colombia	2005	95.0	75.6	69.6	75.0	360	472	290	233
Costa Rica	1963	99.1	94.8	93.1	94.6	7	9	5	4

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Table 7 – continued from previous page

	Year	14-18	18-25	21-25	20-23	14-18	18-25	21-25	20-23
Costa Rica	1973	99.5	96.3	94.9	96.1	20	23	13	11
Costa Rica	1984	98.2	86.3	81.8	85.9	25	38	23	19
Costa Rica	2000	97.8	85.4	81.0	84.9	38	50	30	25
Costa Rica	2011	97.5	87.1	83.8	87.1	39	63	40	32
Dominican Republic	1960	97.8	88.3	86.0	87.8	16	22	13	10
Dominican Republic	1970	97.9	88.8	85.2	88.1	24	28	15	13
Dominican Republic	1981	99.0	95.3	93.7	94.9	54	67	38	33
Dominican Republic	2002	98.2	90.9	88.5	90.8	78	111	68	56
Dominican Republic	2010	97.2	88.7	85.6	88.6	91	129	76	64
Ecuador	1962	98.9	92.4	90.4	92.4	11	15	9	7
Ecuador	1974	98.8	92.4	90.2	92.0	53	68	40	33
Ecuador	1982	98.9	91.8	89.5	91.8	71	94	57	48
Ecuador	1990	97.0	81.9	76.3	81.5	90	122	74	60
Ecuador	2001	96.7	81.3	76.2	81.0	110	159	98	82
Ecuador	2010	96.9	81.3	76.1	80.8	128	178	109	88
El Salvador	1992	99.2	94.0	92.1	93.8	49	61	37	30
El Salvador	2007	98.8	94.3	92.8	94.1	61	77	46	38
Guatemala	1964	99.1	95.1	93.9	95.1	19	23	14	11
Guatemala	1973	98.7	93.8	92.6	93.6	28	38	22	19
Guatemala	1981	99.3	94.9	93.4	94.8	29	40	23	20
Guatemala	1994	98.9	92.7	90.5	92.5	88	104	61	51
Guatemala	2002	98.7	92.1	89.6	92.0	122	159	93	80
Haiti	1971	99.7	95.8	94.0	95.8	37	45	25	21
Haiti	1982	99.3	96.1	94.7	96.1	9	14	8	7
Haiti	2003	99.4	94.3	91.9	94.1	77	99	55	47
Honduras	1961	99.4	96.7	95.6	96.7	2	2	1	1
Honduras	1974	99.3	95.5	94.2	95.2	26	31	18	15
Honduras	1988	99.3	95.3	93.9	95.3	41	48	29	24
Honduras	2001	98.7	93.9	92.1	93.7	69	89	51	45
Jamaica	1982	98.7	88.1	83.6	87.9	18	23	13	11
Jamaica	1991	98.7	88.3	84.2	88.4	19	27	16	13
Jamaica	2001	97.4	86.4	82.3	86.0	17	22	13	11
Mexico	1960	97.1	82.5	77.8	82.1	47	63	37	30
Mexico	1970	99.3	94.6	92.8	94.4	44	51	29	24
Mexico	1990	95.8	73.8	65.0	73.3	958	1191	689	579
Mexico	1995	98.6	86.4	81.8	86.1	33	44	26	22
Mexico	2000	95.1	72.6	64.6	72.2	1078	1438	866	705
Mexico	2005	95.8	75.7	68.5	75.6	1035	1423	858	706
Mexico	2010	97.2	83.0	77.1	82.6	1279	1628	946	798
Mexico	2015	97.6	83.3	78.1	83.1	1102	1536	928	770
Nicaragua	1971	99.5	95.6	94.0	95.5	18	20	12	10
Nicaragua	1995	99.4	96.1	95.0	96.0	46	56	33	28
Nicaragua	2005	99.0	95.3	94.1	95.1	56	80	49	40
Panama	1960	99.0	95.4	94.0	95.6	4	5	3	3
Panama	1970	99.3	95.1	93.6	94.9	12	16	10	8

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Table 7 – continued from previous page

	Year	14-18	18-25	21-25	20-23	14-18	18-25	21-25	20-23
Panama	1980	98.2	95.1	93.9	95.0	19	24	14	12
Panama	1990	99.5	96.4	95.2	96.3	21	30	18	15
Panama	2000	98.0	86.5	82.7	86.5	24	33	21	16
Panama	2010	97.6	86.9	83.5	86.7	29	41	25	20
Paraguay	1962	99.6	96.5	95.4	96.9	6	8	5	4
Paraguay	1972	99.6	96.6	95.4	96.7	20	23	14	11
Paraguay	1982	98.6	88.2	84.6	88.5	27	37	23	19
Paraguay	1992	98.1	84.7	80.6	84.5	32	44	27	22
Paraguay	2002	98.7	88.9	84.7	88.7	51	64	37	32
Peru	1993	97.0	80.4	74.6	80.0	196	267	165	135
Peru	2007	96.2	79.9	74.4	79.5	240	337	206	166
Saint Lucia	1980	99.5	97.6	96.8	97.2	1	1	1	1
Trinidad and Tobago	1980	99.7	97.6	96.6	97.7	12	16	9	8
Trinidad and Tobago	1990	99.8	97.7	96.8	97.6	10	14	9	7
Trinidad and Tobago	2000	99.5	94.0	91.5	93.7	12	15	8	7
Trinidad and Tobago	2011	99.6	95.1	93.4	95.9	8	14	9	7
Uruguay	1963	99.7	95.8	94.2	95.8	16	23	14	11
Uruguay	1975	99.5	95.2	93.3	95.0	19	27	16	13
Uruguay	1985	99.5	95.1	93.8	95.2	19	29	19	15
Uruguay	1996	99.5	95.4	93.9	95.6	23	34	21	17
Uruguay	2006	99.6	96.8	95.4	96.6	21	27	16	13
Venezuela	1971	98.2	89.4	86.3	89.2	97	121	71	60
Venezuela	1981	98.1	89.8	86.7	89.6	144	192	115	96
Venezuela	1990	95.6	80.3	75.1	79.7	168	227	137	112
Venezuela	2001	96.4	82.9	78.3	82.8	221	318	195	160

A.3 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 8: Education by cohort

	cohort	mean years	less primary	primary	secondary	tertiary
Argentina	1950	8.8	19.3	50.8	23.0	6.9
Argentina	1960	9.9	11.5	49.6	30.8	8.1
Argentina	1970	10.7	8.4	45.9	35.9	9.8
Argentina	1980	11.4	7.5	46.3	35.8	10.4
Bolivia	1950	6.0	47.3	30.4	17.4	4.8
Bolivia	1960	7.7	31.5	39.0	23.8	5.7
Bolivia	1970	8.9	22.9	37.8	32.3	7.0
Bolivia	1980					
Brazil	1950	5.3	63.2	16.7	13.8	6.4
Brazil	1960	6.4	49.2	24.4	19.4	7.1
Brazil	1970	6.9	38.8	27.8	25.2	8.2
Brazil	1980		22.5	30.4	36.4	10.7
Chile	1950	9.1	19.3	47.3	28.4	5.0
Chile	1960	10.0	12.2	45.9	37.1	4.8
Chile	1970	11.2	7.0	39.2	46.1	7.7
Chile	1980					
Colombia	1950	6.1	39.2	38.1	17.3	5.3
Colombia	1960	6.8	30.1	41.5	23.8	4.6
Colombia	1970	7.5	27.6	36.3	27.8	8.4
Colombia	1980	8.1	22.3	34.4	35.4	7.9
Costa Rica	1950	7.8	23.4	46.8	18.2	11.5
Costa Rica	1960	8.5	15.0	51.7	19.1	14.1
Costa Rica	1970	8.7	15.4	50.2	17.3	17.2
Costa Rica	1980	9.7	11.5	44.0	20.2	24.3
Cuba	1950		7.4	48.3	31.1	13.2
Cuba	1960		2.6	43.6	41.6	12.3
Cuba	1970		1.8	43.9	44.7	9.7
Cuba	1980					
Dominican Republic	1950	6.3	50.8	28.8	12.4	8.0
Dominican Republic	1960	8.0	33.7	37.0	17.7	11.5
Dominican Republic	1970	8.5	27.7	39.3	22.3	10.8
Dominican Republic	1980	9.6	20.8	33.5	33.5	12.3
Ecuador	1950	7.4	34.4	39.9	17.6	8.1
Ecuador	1960	8.8	22.6	41.6	26.2	9.7
Ecuador	1970	9.4	16.7	42.6	30.9	9.9

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Table 8 – continued from previous page

	cohort	mean years	less primary	primary	secondary	tertiary
Ecuador	1980	10.2	11.3	39.3	37.4	12.0
El Salvador	1950	5.2	55.9	27.4	12.6	4.1
El Salvador	1960	6.4	45.5	31.7	18.0	4.8
El Salvador	1970	7.5	37.4	33.3	22.9	6.3
El Salvador	1980	8.1	31.8	37.3	25.4	5.5
Guatemala	1950	3.5	71.1	18.9	6.5	3.5
Guatemala	1960	4.5	62.1	24.8	9.2	3.9
Guatemala	1970	5.2	55.0	29.2	11.3	4.5
Guatemala	1980					
Haiti	1950	2.6	75.6	16.4	7.2	0.8
Haiti	1960	3.5	66.9	19.0	13.0	1.2
Haiti	1970	5.5	49.3	29.5	19.9	1.3
Haiti	1980					
Honduras	1950	4.5	61.7	25.9	9.7	2.7
Honduras	1960	5.4	50.8	33.2	13.0	3.0
Honduras	1970	6.0	41.7	42.0	13.8	2.5
Honduras	1980					
Jamaica	1950	9.5	7.9	62.2	27.5	2.5
Jamaica	1960	11.0	2.7	48.8	46.4	2.1
Jamaica	1970	12.4	2.2	21.1	74.4	2.4
Jamaica	1980					
Mexico	1950	6.0	44.6	38.6	9.1	7.8
Mexico	1960	7.5	29.2	47.1	14.2	9.5
Mexico	1970	8.4	19.5	54.6	16.0	10.0
Mexico	1980	9.0	15.0	54.1	19.9	11.0
Nicaragua	1950	4.8	60.2	24.2	9.2	6.3
Nicaragua	1960	5.9	48.5	31.4	13.7	6.4
Nicaragua	1970	6.3	43.5	32.7	16.4	7.3
Nicaragua	1980	6.7	39.8	32.5	20.0	7.7
Panama	1950	8.5	21.5	45.7	21.3	11.5
Panama	1960	9.7	12.7	45.2	28.8	13.3
Panama	1970	10.2	11.2	40.9	31.1	16.9
Panama	1980	10.7	8.9	36.9	36.2	18.1
Paraguay	1950	6.2	46.7	39.3	9.8	4.2
Paraguay	1960	7.3	33.9	43.9	17.0	5.2
Paraguay	1970	8.1	25.9	46.2	21.5	6.4
Paraguay	1980					
Peru	1950	7.5	38.2	16.8	33.3	11.8
Peru	1960	8.5	27.4	19.2	42.1	11.3
Peru	1970	9.3	16.5	20.5	48.8	14.2
Peru	1980	9.8	11.4	20.8	56.0	11.9
Saint Lucia	1950	9.4	72.3	3.9	20.9	2.9

Continued on next page

Table 8 – continued from previous page

	cohort	mean years	less primary	primary	secondary	tertiary
Saint Lucia	1960		52.3	8.3	36.4	3.0
Saint Lucia	1970					
Saint Lucia	1980					
Trinidad and Tobago	1950	9.0	16.0	44.8	36.2	3.0
Trinidad and Tobago	1960	10.1	12.3	31.9	52.5	3.2
Trinidad and Tobago	1970	11.4	6.9	20.7	67.7	4.7
Trinidad and Tobago	1980	12.0	5.6	15.9	72.0	6.5
Uruguay	1950	8.6	18.5	54.5	21.7	5.2
Uruguay	1960	8.8	12.3	60.4	20.5	6.8
Uruguay	1970	9.2	11.4	56.3	25.0	7.2
Uruguay	1980	9.5	6.8	55.5	31.0	6.8
Venezuela	1950	7.0	30.3	44.3	23.5	1.9
Venezuela	1960	7.7	22.5	44.7	31.9	0.8
Venezuela	1970	8.5	14.9	42.9	41.9	0.2
Venezuela	1980					

A4. District-level estimates

Table 9: Summary Statistics: District-Level Estimates of IM

		upward							downward						
country	districts	mean	median	stdev	min	max	Nmin	Nmean	mean	median	stdev	min	max	Nmin	Nmean
Cuba	145	.929	.983	.131	-.002	1.027	2	9	.013	.01	.01	-.001	.052	84	352
Uruguay	67	.803	.797	.061	.684	.963	13	133	.046	.043	.022	.003	.098	238	737
Chile	179	.76	.752	.081	.534	.99	17	374	.069	.065	.026	.014	.157	140	1181
Argentina	312	.714	.733	.123	.407	.986	36	751	.066	.054	.035	.013	.194	276	2674
Costa Rica	55	.714	.719	.07	.498	.878	110	627	.075	.072	.027	.033	.156	313	1320
Peru	168	.703	.69	.127	.339	.935	38	852	.097	.081	.053	.016	.342	64	1275
Mexico	2,331	.627	.618	.14	.205	1.322	2	521	.081	.069	.055	-.086	.503	4	680
Ecuador	78	.593	.6	.116	.306	.847	26	1906	.111	.095	.054	.054	.333	12	2878
Panama	35	.588	.593	.153	.253	.803	184	766	.095	.08	.052	.031	.241	152	1706
El Salvador	103	.555	.55	.094	.327	.814	49	455	.178	.173	.069	.043	.383	28	374
Bolivia	79	.546	.567	.158	.196	.903	164	884	.176	.147	.108	.036	.56	33	840
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	.471	.477	.119	.116	.781	12	1110	.16	.144	.07	.039	.508	9	764
Dominican Republic	65	.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	.213	.2	.068	.103	.423	47	495
Honduras	96	.355	.346	.109	.112	.576	211	805	.25	.233	.088	.109	.513	39	336
Guatemala	191	.243	.237	.11	.03	.613	286	961	.291	.264	.122	.088	.784	8	286
Haiti	23	.196	.191	.063	.087	.373	845	3559	.412	.426	.087	.221	.569	91	982
total	6,689	.537	.548	.199	-.043	1.322	2	1239	.137	.115	.096	-.086	.784	4	993

Notes: This table shows summary statistics for district level estimates of IM. "Total" shows the unweighted summary statistics across all districts.

A5. District-level maps of mobility

Figure 16: Upward Mobility in LAC

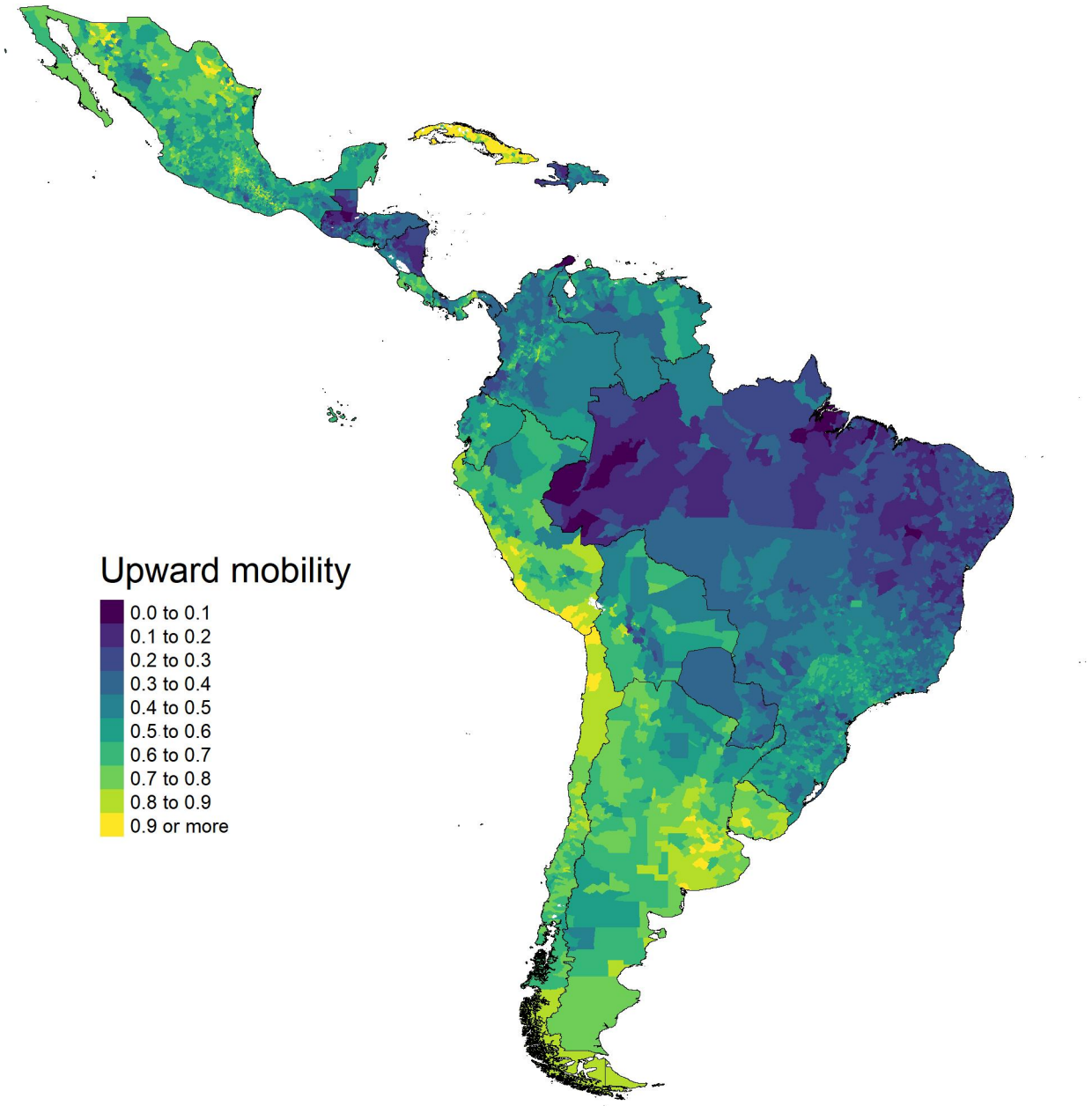
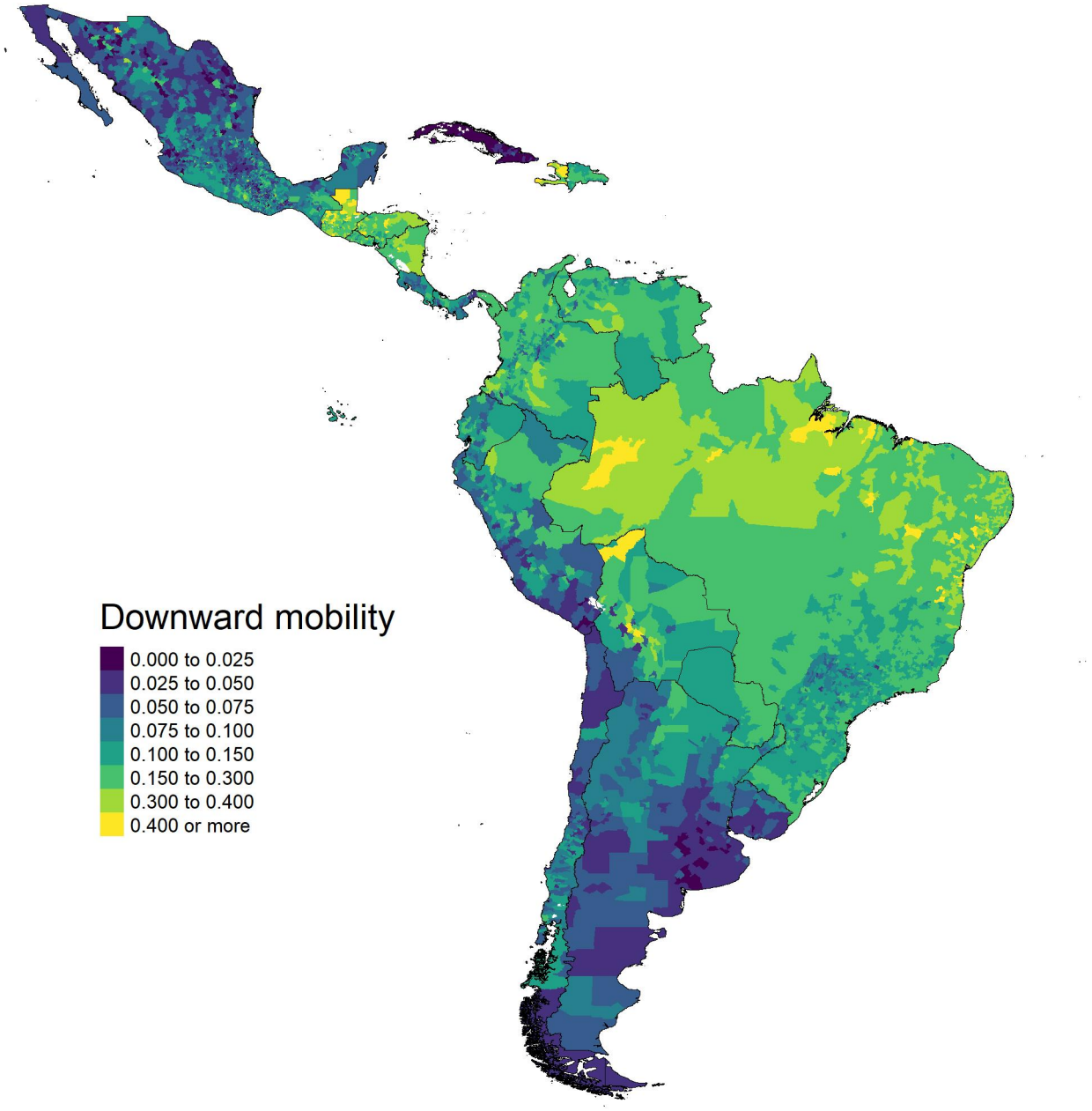
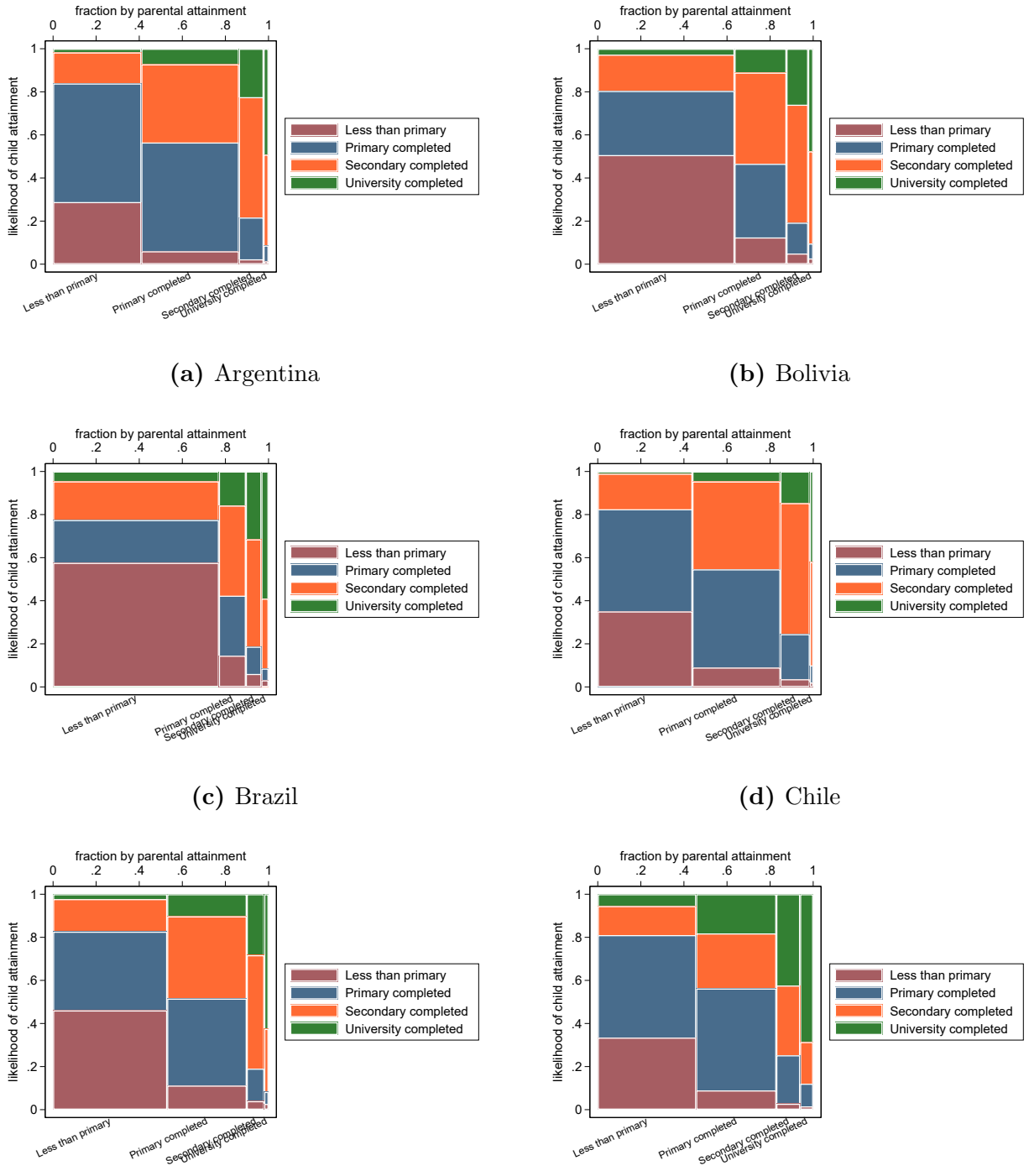


Figure 17: Downward Mobility in LAC



A6. Transition matrix by country

Figure 18: Transition matrix by country



(a) Argentina

(b) Bolivia

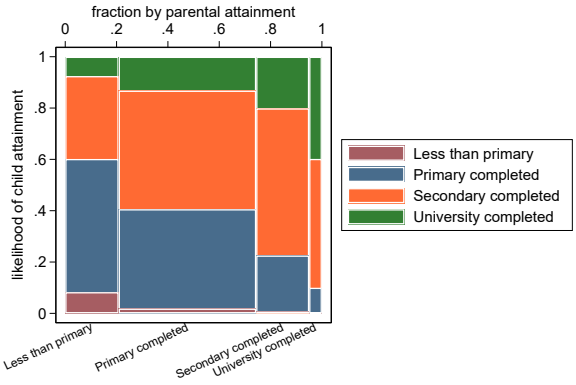
(c) Brazil

(d) Chile

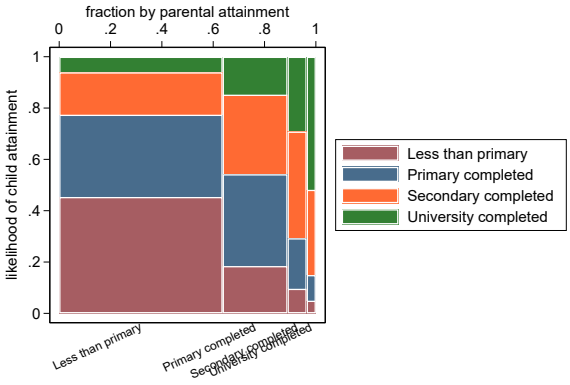
(e) Colombia

(f) Costa Rica

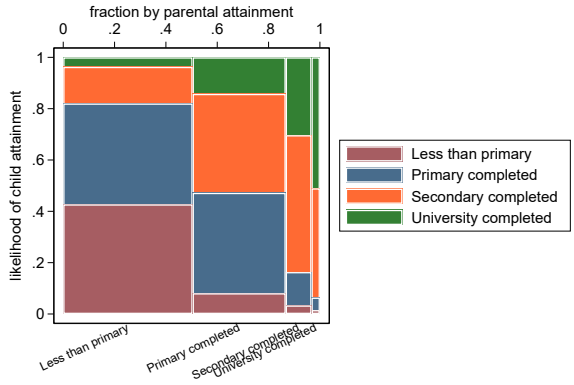
Figure 19: Transition matrix by country



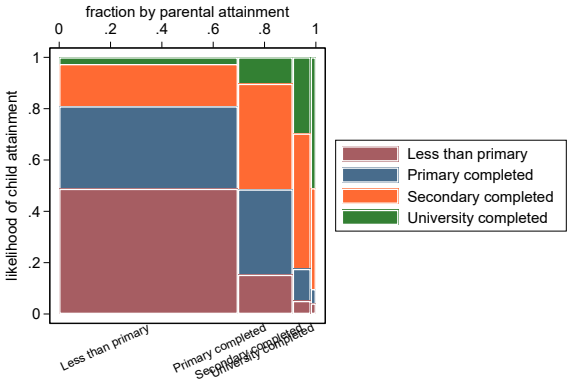
(a) Cuba



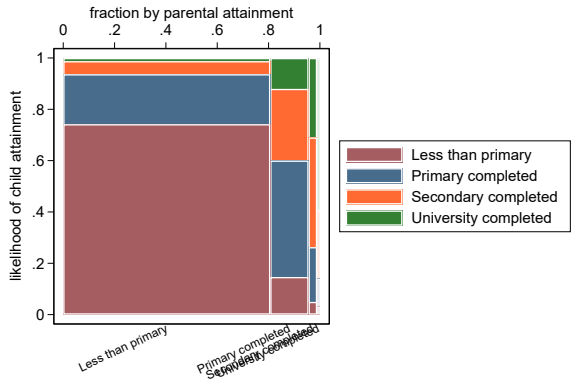
(b) Dominican Republic



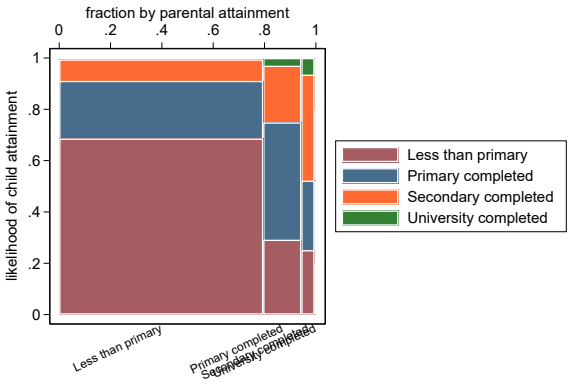
(c) Ecuador



(d) El Salvador

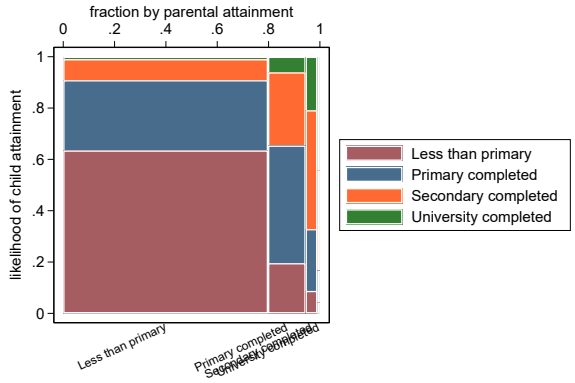


(e) Guatemala

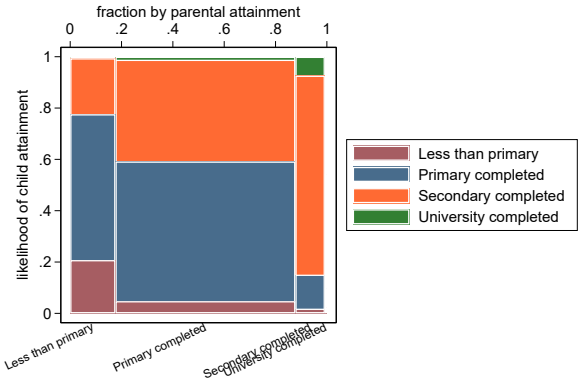


(f) Haiti

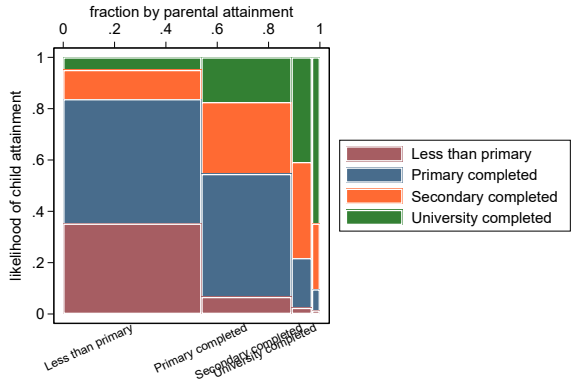
Figure 20: Transition matrix by country



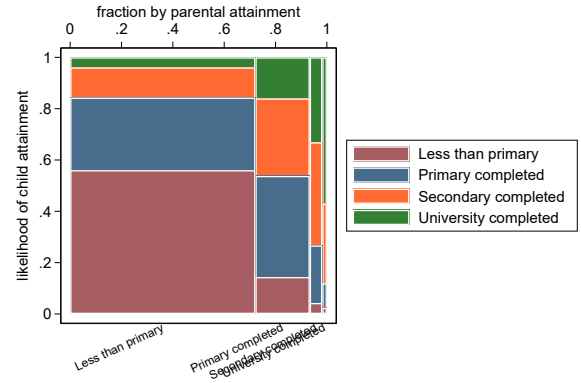
(a) Honduras



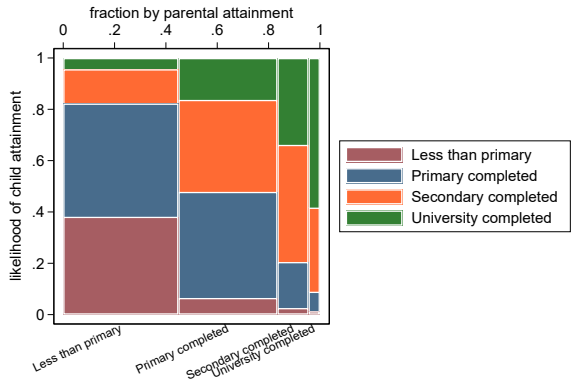
(b) Jamaica



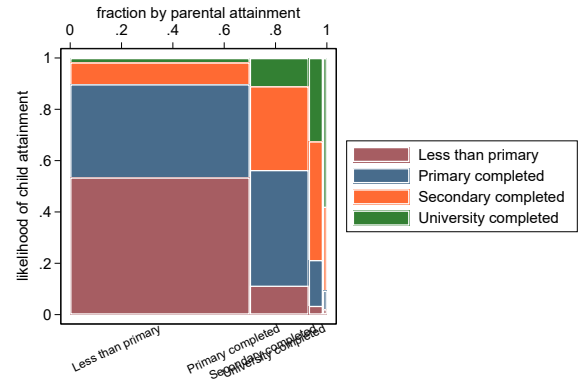
(c) Mexico



(d) Nicaragua

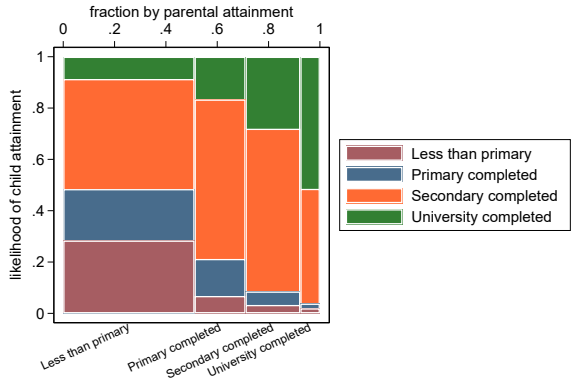


(e) Panama

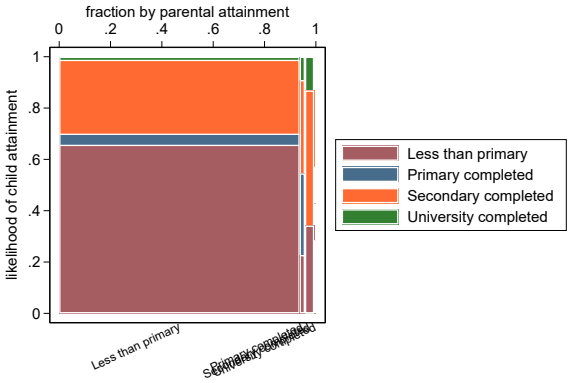


(f) Paraguay

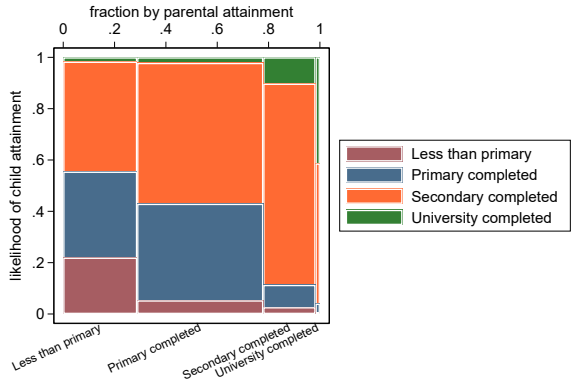
Figure 21: Transition matrix by country



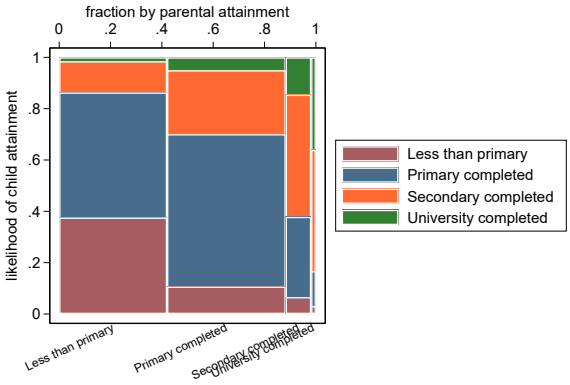
(a) Peru



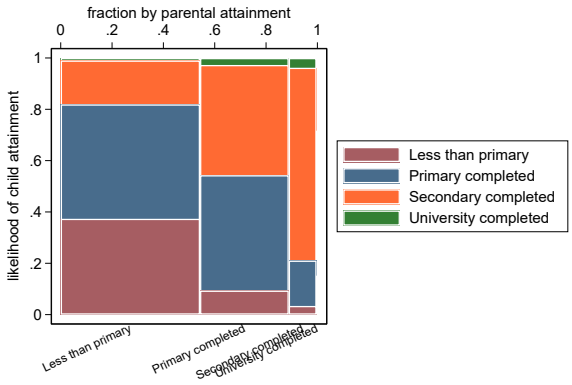
(b) Saint Lucia



(c) Trinidad and Tobago



(d) Uruguay



(e) Panama

Figure 22: Upward and downward mobility are highly negatively correlated

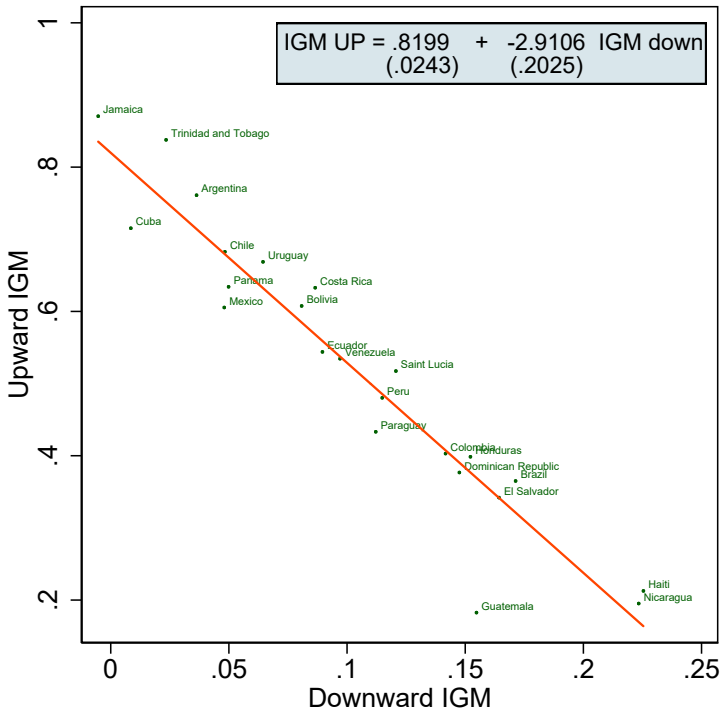


Figure 23: Within-Country correlates of upward mobility

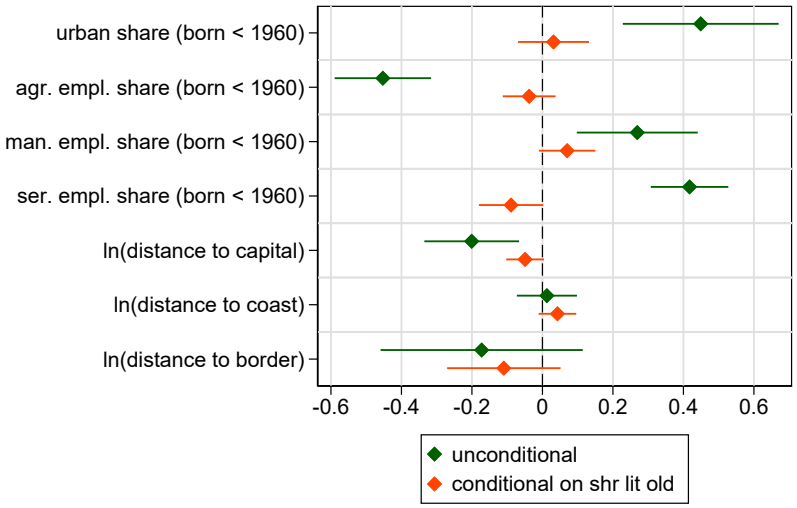


Figure 24: Within-Country correlates of downward mobility