UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Intergenerational Mobility and Education

Evidence from Latin America

ABSTRACT

The main objective of this study is to investigate the extent of social mobility in Latin America. Using educational attainment as a proxy for socioeconomic status in 18 Latin American countries, this study estimates ordinary-least-squared regressions of the persistence of educational attainment across generations. Furthermore, the role of ethnicity and gender is explored more in detail. Drawing on existing evidence, this thesis also elaborates on the potential determinants of social mobility and the implications for public policy. Additionally, the transition into higher education is assessed, using a linear probability model. We find that the correlation coefficient between parents' and children's education is approximately 0.56 and that the estimated beta-coefficient from the regressions is approximately 0.41. Mobility is slightly lower among females and the non-white population respectively. Moreover, there is a high probability that an individual will enrol in higher education, given that the parents have undertaken tertiary education. Increasing the availability of quality education, as well as the social mix within schools and the access to grants/student loans, may improve social mobility. Finally, the implications for public policy are discussed with reference to an illustrative case study, on the Brazilian Conditional Cash Transfer programme Bolsa Família.

KEYWORDS: intergenerational mobility, social mobility, inequality, education, Latin America, gender, ethnicity

Bachelor Thesis in Development Economics 15 ECTS

June 2016

Department of Economics

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ACKNOWLEDGMENTS

We would like to thank our supervisor Ann-Sofie Isaksson for her excellent advice and dedication to our project. We would also like to thank the School of Business, Economics and Law, especially the Department of Economics, for providing us with the necessary tools to make this thesis possible. Furthermore, we would like to thank the Latinobarómetro database, for providing data ready for *Stata*. A great thanks to our families and friends that have supported us during this intensive period. Most of all, we would like to thank each other for a great collaboration and the great fun we have had along the way.

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1. INTRODUCTION

Latin America and the Caribbean is by international comparison the most unequal region in the world[1]. The 2010 Human Development Report from the United Nations Development Programme (UNDP), emphasised that not only is the region unequal, but inequality is persistent and accompanied by low social mobility. Consequently, the Latin American region has fallen into an inequality trap that is difficult to break. Thus, the main objective of this study is to investigate the extent of social mobility in this region. While some factors that influence social mobility cannot easily be targeted by public policy, e.g. inherited abilities, other factors, notably the formation of human capital, are key areas for government action. Since education is an important component of human capital (Causa & Johansson 2009, OECD 2010) and an individual's educational attainment itself is affected by family background (Behrman, Birdsall & Székely 1998), we use education as a proxy for socioeconomic status.

Intergenerational mobility denotes how large a proportion of the parents' socioeconomic status that is transmitted to the offspring. In other words, it captures the degree to which individuals have the possibility to attain a different socioeconomic status than that of their parents (Causa & Johansson 2009, OECD 2010). Previous studies have found that intergenerational mobility is low in the region (see Behrman *et al.* 1998, Andersen 2000, Behrman, Gaviria & Székely 2001, Daude 2011, Daude & Robano 2015). Furthermore, the 2010 Human Development Report also emphasised how inequalities based on group characteristics e.g. ethnicity and gender, hinder human development in Latin America and the Caribbean. For example, poverty rates are higher among the non-white population, notably amidst the indigenous people and afro-descendants. Similarly, females have lower earnings than men, as they tend to be overrepresented in the informal sector of the economy.

Against this background, this thesis aims to answer the following research questions: To which extent does the socioeconomic status of the parents affect the socioeconomic status of the offspring, using education as a proxy, in Latin America? Is social mobility lower for non-whites and females respectively? In addition, we look at the transition into higher education, as well as the potential determinants of social mobility and the public policies that may improve the situation. Using data from 2012 Latinobarómetro public opinion survey, we look at 18 different

[1] Human Development Indices: A statistical update 2015, United Nations Development Programme. See figure 10 in Appendix.

Latin American countries. The self-reported education of the respondent is regressed as our dependent variable, on that of their parents as our independent variable. In order to ensure reliability in our estimates, two measures of education are used: both the number of educational years and the level of education (e.g. primary, secondary and tertiary education).

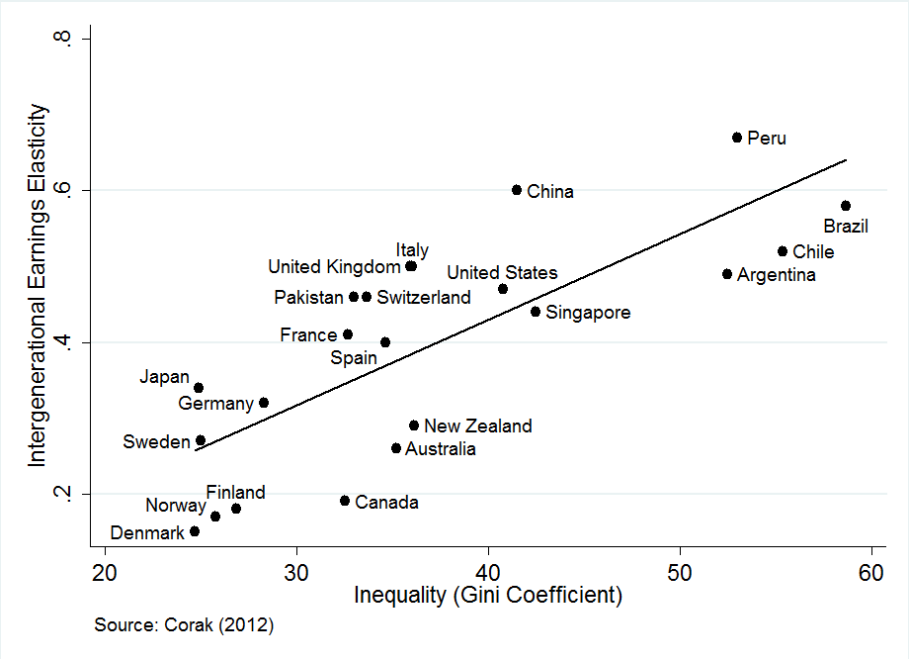
We find that the average correlation between parental and child education is approximately 0.56 for the whole region and that the estimated beta-coefficient is approximately 0.41. El Salvador and Nicaragua stand out as the least mobile countries, while Colombia and Mexico display the highest levels of mobility in the region after Paraguay, which is an outlier. Mobility is slightly lower among females and the non-white population respectively. Moreover, there is a high probability that an individual will enrol in higher education, given that the parents have undertaken tertiary education. Equal access to quality education, increasing the social mix within schools and providing grants and student loans, are policies that may improve mobility, notably in education.

The remainder of this thesis is structured as follows. Section 2 discusses previous literature on intergenerational mobility. Section 3 outlines the theoretical framework elaborated by Becker & Tomes (1979; 1986) and Solon (2004). Section 4 provides the methodology and section 5 presents the results from our regressions. Section 6 analyses the obtained results and their relationship to potential drivers of intergenerational mobility, together with a brief case study on the Brazilian conditional cash transfer (CCT) programme, *Bolsa Família*. Section 7 concludes.

2. LITERATURE REVIEW

When looking at income inequality in the world, the Latin American countries stand out as the most unequal (see Behrman *et al.* 1998, Andersen 2000, Behrman *et al.* 2001, UNDP 2010). According to Andersen (2000), high income inequality is not necessarily destructive *per se*, since combined with high levels of social mobility, it creates incentives for hard work and study. However, if high income inequalities are combined with low levels of social mobility, inequalities are more likely to persist. Corak (2013) discusses the link between income inequality and social mobility, by plotting "The Great Gatsby Curve", presented in a speech by Alan Krueger[2]. It suggests that countries with higher income inequality, measured by the Gini index, also tend to be less mobile. However, when Andersen (2000) studied the Latin American countries specifically, no clear relationship between inequality and social mobility in education could be found. Thus, social mobility seems to be somewhat related to high income inequality, while other key factors may have an important influence.

Figure 1 - The Great Gatsby Curve



Within the literature on intergenerational mobility, socioeconomic characteristics such as earnings, occupation and education are common indicators. While studies for industrialised countries, notably Britain and the US, have been available for a few decades (see Atkinson

[2] Alan Krueger was the Chairman of the Council of Economic Advisers, in the United States. The full conference speech is available here: https://www.whitehouse.gov/sites/default/files/krueger_cap_speech_final_remarks.pdf

1980, Behrman & Taubman 1985, Peters 1992), our knowledge about intergenerational mobility in the developing world is far less extensive. As data on the pairs of parental earnings and the earnings of the offspring are less available for the developing world, using alternative measures to income enables further research within the area of social mobility[3]. In an attempt to cover the nature of intergenerational mobility in both the developed and developing world, Hertz Jayasundera, Piraino, Selcuk, Smith & Verashchagina (2007) estimate 50-year trends in the persistence of educational attainment of parents and children for 42 countries in different regions. In the findings by Hertz *et al.* (2007), the seven Latin American nations in their sample stand out as the least mobile, while the Nordic countries exhibit the highest levels of educational mobility.

Studies concerned with the Latin American region specifically, all point to the same conclusion: that intergenerational mobility is low in the region, and further, it is identified as a key obstacle for overcoming persistence in social and economic inequality (see Behrman *et al.* 1998, Behrman *et al*. 2001, Andersen 2000). Behrman *et al.* (1998) estimate the empirical association between family background and education for children aged 10-21. Using micro data from 28 household surveys in 16 Latin American countries, the authors conclude that increasing resources and educational quality have a positive effect on intergenerational schooling mobility. The authors further argue that countries with the same distributions of income may exhibit higher levels of welfare if there is higher social mobility. In addition, Behrman *et al.* (2001) explore the dimensions of intergenerational mobility in occupation and schooling for four large Latin American countries in comparison to the United States. The United States displays higher levels of intergenerational mobility than the Latin American countries and moving from the lowest classes in society is virtually impossible in the four Latin American countries, while it remains difficult, but not unattainable in the United States. Whether measuring occupational or educational status, the authors suggest that further research around the mechanisms determining social mobility – credit constraints, discrimination and spatial segregation – should be more closely investigated.

Azevedo & Boullion (2009) review the existing evidence on social mobility in the Latin American region, both concerning earnings and educational attainment. In line with the arguments of Behrman *et al.* (2001), they suggest that the determinants of low social mobility

[3] For example, Andrade, Veloso, Madalozzo, & Ferreira (2003) use occupation and education as instruments for earnings in Brazil.

in the region are associated with cultural and economic factors such as social exclusion, low access to higher education and discrimination. More recently, Daude (2011) and Daude & Robano (2015), estimated the effect of parental education on children's education, controlling for circumstances beyond the individual's control, such as gender, ethnicity and other socio-economic factors. Using data from the 2008 Latinobarómetro survey, Daude (2011) finds that low social mobility is upheld by low downward mobility of those at the top, while children from the middle-income sectors face the risk of moving downwards. Furthermore, the most disadvantaged children had very little opportunity of moving beyond primary education. Being white did increase the average level of education, but had no effect on intergenerational mobility. These findings are consistent with the findings of Daude & Robano (2015), since they use the same round of Latinobarómetro survey data. Additionally, they find that females have lower educational attainment than men, but that there is no difference in social mobility between the sexes. Both studies suggest that key determinants of social mobility include access to credit, expenditure on primary education and the level of social inclusion. These findings are very much in line with evidence from the OECD countries (OECD 2010).

Another mechanism through which inequalities persist, is the unequal distribution of educational opportunities. Following John Roemer's (1998) work on equality of opportunity, a growing amount of literature explores the role of unequal opportunities in Latin America (see Bourginon, Ferreira & Menendez 2007, de Barros, Ferreira, Vega & Chanduvi 2009, Gamboa & Waltenberg 2012). Ferreira & Gignoux (2014) use a sample of 57 countries that participated in the 2006 PISA survey and estimate that inequality of opportunity explains around 35% of the differences in educational achievement. Furthermore, they conclude that the effect was even worse in the Latin American countries. Nevertheless, although unequal access to education itself may be an alarming issue, unequal access to the equivalent *quality* in education is another important aspect of schooling immobility. Daude (2011) also uses the 2006 PISA results and estimates the importance of educational quality in relation to social mobility. The author finds that the educational quality a child receives, is associated to the student's socioeconomic background. The lack of social inclusion within private establishments was identified as an important determinant of student performance.

Others have discussed the potential problems that lie within the interpretation of the intergenerational mobility estimates, such as unobserved transmitted abilities and characteristics (Sacerdote 2002, Plug 2004, Björklund, Jäntti & Solon 2007). Björklund *et al.*

(2007) investigate the concept of "nature versus nurture" more in depth, which refers to the distinction between inherited abilities from the parents and the abilities stemming from the environment in which the child is brought up. However, fairly recent evidence (OECD 2008, cited in Daude 2011) shows that the inherited abilities only have limited influence when it comes to intergenerational mobility. Furthermore, when studying cross-country variation in intergenerational mobility, the differences across countries are more related to environmental circumstances rather than inherited abilities.

Against this background, this thesis contributes to the already existing literature by estimating social mobility with a more recent dataset and explores its relationship to potential determinants of intergenerational mobility. Moreover, a second contribution is to investigate the role played by ethnicity and gender on social mobility. Finally, a third contribution is to explore the transition from secondary to tertiary education more in detail.

3. THEORETICAL FRAMEWORK

This section presents the theoretical background drawing on influential work by Becker & Tomes (1979; 1986) and modifications by Solon (2004). According to Becker & Tomes (1979), the child's income rises when parents invest in the child's human or physical capital. The transmission of human capital between generations is therefore dependent on parents' investment choice in the human capital of the offspring.

3.1 A Simple Model

Within the literature on intergenerational mobility, the standard strategy is to estimate a simple model between the earnings of parents and those of children. An individual is assumed to live for two periods: first as a child, and then as an adult. Each family consists of one parent and one child. The relationship is represented by:

$$y_t = a + by_{t-1} + \varepsilon_t \qquad (1)$$

where y denotes earnings, t the time period (thus y_{t-1} designates the earnings of the previous generation, i.e. the parents), a is a constant and b captures the degree of inheritability of parental income. If the parameter b grows over time, it implies that inequality also continues to grow. ε_t is an error term, capturing characteristics that influence children's earnings independently from parental earnings (Becker & Tomes 1986). The same model can be applied analogously to measures of education in order to estimate the persistence of parental background on future life conditions of their children. This is the type of model we estimate empirically for our sample.

Becker & Tomes (1979) also pointed out that there is *more* than parental earnings that could influence children's future earnings. In particular, aspects difficult to measure such as culture, ambition and networks also influence the child's economic outcomes. Becker & Tomes (1979; 1986) do not distinguish between inherited characteristics linked to biology (e.g. cognitive skills) and environmental influences (e.g. level of ambition). For more on this, see Björklud *et al.* (2007). Instead, all such characteristics are denoted as endowments, which can be passed on from one generation to another. By replacing y with E, we get:

$$E_{i,t} = a_t + bE_{i,t-1} + v_{i,t} \qquad (2)$$

where E is the endowment, i the family and t the time period. a is a constant and b is the degree of inheritability of endowments. v accounts for other influences on children's endowments, such as luck. It is further assumed that parents cannot invest in their children's endowments (Becker & Tomes 1986). Nevertheless, endowments play an important role in determining the future human capital of children, together with investments by parents and governments. The relationship can be represented as:

$$h_{i,t} = \Psi(G_{i,t-1}, I_{i,t-1}, E_{i,t}) \quad (3)$$

where h is human capital, G is government policy and I is the parents' investment in human capital. Ψ measures the degree to which these characteristics influence human capital. Thinking of human capital as education, equation (3) provides interesting insights. If assumed that parents can neither affect the endowments ($E_{i,t}$), nor public policy ($G_{i,t-1}$), the first step in determining how educational attainment is passed on from one generation to another, is to investigate how parents decide how much to invest in their children's education.

3.2 Parents' Investment Choice

Solon (2004) develops the Becker-Tomes model by rationalizing a log-linear income regression. In a first step, the children's earnings will depend on their human capital and its returns, similar to the Mincer equation[4]. The level of human capital is, as represented by equation (3), dependent on government expenditure and investment, however endowments are now assumed to be exogenous. Parents can choose to invest either in their children's human capital or to consume. According to Solon (2004), this choice will depend upon the parents' preference for human capital over consumption (summarised in an altruism parameter) and the returns to human capital investment. Government policy can affect this choice by higher public investment or by changes in the tax rate. Solon's (2004) model[5] implies that while high-earning parents invest more in their children's human capital, this effect could be offset by increasing the availability of funds, either by higher public investment or access to credit. Furthermore, the more altruistic the parents are, the more they will invest in their children's human capital. Lastly, the higher the return on human capital investment, the higher is the propensity to invest. These aspects will be discussed in the light of our findings in section 6.

[4] $\log y_{i,t} = \mu + \rho h_{i,t}$, where μ is a constant, ρ denotes the returns to human capital and $h_{i,t}$ the level of human capital.
[5] For a mathematically detailed derivation of the model, see Solon 2004.

4. METHODOLOGY AND DATA

This section presents the methodology and data of this thesis. Recalling our theoretical framework, earnings and human capital are closely related. Thus, by using education as an indicator of an individual's human capital, we obtain a proxy for a person's socioeconomic status. Consequently, we estimate intergenerational mobility as the persistence of parental educational attainment on the educational attainment of the offspring. There are several practical advantages with using education instead of earnings. First, while income data is scarce and volatile for the developing world, most household surveys nowadays include questions about the respondent's education. Second, as education is easier to compute than earnings, the risk of measurement error is reduced (Daude & Robano 2015). Third, as an individual's educational level is fixed after a certain age, while income varies over an individual's lifetime (Haider & Solon 2006), it is easier to obtain estimates that are more likely to be stable in a long term perspective.

Two main approaches are used to estimate the relationship between parents' and children's education. First, we estimate simple correlations between parental and child education, providing a rough indication of intergenerational mobility, however it does not control for unobserved characteristics that may influence the outcomes. Second, regressions are run with measures of educational attainment in the whole Latin American region, controlling for characteristics such as age, gender, ethnicity, marital status and urban/rural environment. We further examine this effect in more detail for each country in our sample. In order to ensure reliability and avoid bias, by only using the number of schooling years as an indicator of attainment, we also run the same regressions using educational levels (e.g. primary, secondary and tertiary schooling). In other words, we estimate our main model with two dependent and two independent variables: the parents' education and the respondent's education, both in terms of schooling years and the level of education.

Moreover, in order to detect the transition from secondary to tertiary education, we regress a dummy variable for if the respondent has started university as the dependent variable, on a dummy variable for if the parents have started higher education as the independent variable. Using this linear probability model, we obtain the probability that the respondent has started university given that their parents have undertaken higher education. As in our main model, we run regressions using both the number of schooling years and the educational level as indicators.

Hence, we estimate this second model (i.e. the linear probability model) with two dependent and two independent variables, see tables 10 and 11 in Appendix for overall variable definitions.

4.1 Data Sources and Description

Data for the regression analysis is collected from the 2012 Latinobarómetro public opinion survey, providing country representative samples of around 1000 observations for each country. This gives us a total of 20 204 interviews obtained from 18 Latin American countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. The Latinobarómetro Corporation is a non-profit NGO that conducts surveys in the region every year and represents over 600 million inhabitants[6]. We chose to exclude all observations that were under the age of 18, in order to avoid individuals that are currently studying from biasing our sample[7]. The number of observations excluded were 125.

When estimating intergenerational mobility based on educational years, we excluded those individuals who had responded "no answer" on their own and their parents' education. The available alternatives to this question included: "without education", "educational years ranging from 1-12 years of education", "incomplete university", "completed university", "high school/academies/incomplete technical", "high school/academies/complete technical". The alternatives take a numeric value ranging from 1-17, where 1 stands for "without education" and 17 stands for "high school/academies/complete technical". As the two last alternatives: "high school/academies/incomplete technical" and "high school/academies/complete technical", are difficult to place on a scale of educational attainment, these were excluded from the sample. Consequently, the numeric value ranges from 1-15, where 15 denotes "completed university". In total, 2 915 observations concerning parental education and 1 658 observations on the respondent's education were excluded. A problem with the given alternatives, is that the answers "incomplete university" and the "complete university" are assigned the numeric values of 14 and 15, which do not necessarily correspond to 14 or 15 years of education. This is another motive behind investigating the movement from secondary to tertiary school in more detail.

[6] See more at www.latinobarometro.org

[7] Naturally, some over the age of 18 could still be studying, however as the individuals have reached adulthood, it could also be assumed that they have completed the most fundamental parts of education. Furthermore, the transition into higher education is explored more closely in section 4.3.2.

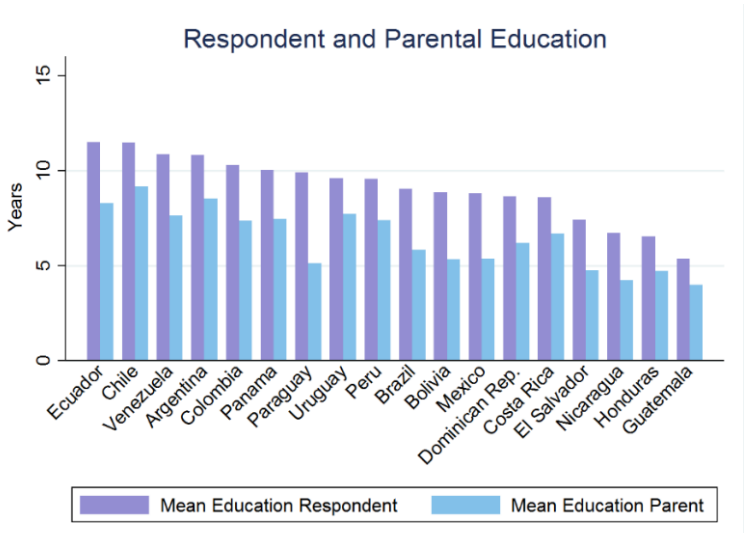
In order to ensure further reliability in our estimates, additional regressions were run using the educational level as an alternative indicator of educational attainment. Available answer alternatives included: “illiterate”, “primary incomplete”, “primary complete”, “secondary, intermediate, vocational incomplete”, “secondary, intermediate, vocational complete”, “higher incomplete” and “higher complete”. The levels take a numeric value ranging from 1-7, where 1 denotes “illiterate” and 7 “higher complete”. In total, 2 272 observations concerning parental education and 3 observations on the respondent’s education were excluded, as these provided “no answer” or “no data”.

All in all, when estimating on the basis of educational years, 14 792-15 980 potential observations were left for the whole Latin American region. For educational levels, the sample became slightly larger with 16 633-17 931 potential observations. Estimates within each country were conducted with 483-1 127 observations based on educational years and 733-1 158 observations based on educational levels. Descriptive statistics over the data, after the exclusion of observations outlined in this section, are found in section 4.1.1.

4.1.1 Descriptive Statistics

The current generation is on average more educated than their parents and this pattern is consistent when using the educational level attained as an alternative indicator.

Figure 2 - Descriptive Figure by Country: Years of Education



This is the case in all countries, notably in Paraguay, which experiences the greatest jump in the average education of children compared to that of parents. Ecuador, Chile and Argentina all display high levels of education, both in terms of parents and the current generation. Venezuela seems to have experienced an increase in education from parents to children. Guatemala and Honduras show a low educational attainment both for respondents and parents. Table 1 displays descriptive statistics for all countries in our sample, using the number of years in education as our indicator. Table 2 also displays the descriptive statistics for all countries in our sample, but uses the educational level attained as the indicator (see table note).

Table 1 - Descriptive Statistics by Country (Years of Education)

	Respondent Education						Parent Education					
Country	**Mean**	**25th pctl.**	**Median**	**75th pctl.**	**Std Dev.**	**Sample Size**	**Mean**	**25th pctl.**	**Median**	**75th pctl.**	**Std Dev.**	**Sample Size**
Argentina	10.83	8	12	13	2.97	1 076	8.52	7	8	13	3.62	1 047
Bolivia	8.86	5	9	13	4.70	1 098	5.33	1	4	8	4.70	985
Brazil	9.03	5	9	13	4.34	1 183	5.84	2	5	9	4.33	1170
Chile	11.48	10	13	13	3.07	1 053	9.15	7	9	13	4.21	982
Colombia	10.31	8	10	14	3.78	674	7.36	5	9	9	4.22	889
Costa Rica	8.59	6	7	12	3.85	975	6.69	1	7	10	4.44	823
Dominican Rep.	8.63	5	5	13	4.53	979	6.21	1	5	12	5.29	739
Ecuador	11.49	9	13	14	3.32	1155	8.29	7	7	13	4.07	1087
El Salvador	7.41	3	7	12	4.61	991	4.77	1	3	7	4.53	857
Guatemala	5.37	1	5	7	4.24	970	3.97	1	1	7	3.94	909
Honduras	6.53	3	7	7	4.12	993	4.72	1	4	7	4.05	897
Mexico	8.81	7	10	12	3.97	1 113	5.36	1	4	7	4.34	1 082
Nicaragua	6.71	2	7	10	4.35	991	4.24	1	1	7	4.29	865
Panama	10.04	7	12	13	4.10	969	7.44	1	7	13	4.96	773
Paraguay	9.91	7	10	13	3.33	1 142	5.11	3	6	7	2.65	1 060
Peru	9.58	7	12	12	4.36	984	7.40	3	7	12	4.57	1 009
Uruguay	9.59	7	10	13	3.19	1 107	7.73	7	7	10	3.39	1 033
Venezuela	10.84	9	12	12	3.07	1 093	7.64	7	7	12	4.07	1 082
Total	9.15	7	10	13	4.25	18 546	6.47	1	7	10	4.48	17 289

Note: 1 = “without education”, 2-13 = “1-12 years of education”, 14 = “incomplete university” and 15 = “completed university”.

Table 2 - Descriptive Statistics by Country (Level of Education)

	Respondent Education						Parent Education					
Country	**Mean**	**25th pctl.**	**Median**	**75th pctl.**	**Std Dev.**	**Sample Size**	**Mean**	**25th pctl.**	**Median**	**75th pctl.**	**Std Dev.**	**Sample Size**
Argentina	4.51	3	5	5	1.44	1 200	3.48	2	3	5	1.54	1 085
Bolivia	3.81	2	4	5	1.96	1 200	2.55	1	2	4	1.85	1 030
Brazil	3.68	2	3	5	1.79	1 204	2.55	2	2	3	1.57	1 182
Chile	4.59	4	5	5	1.49	1 197	3.62	2	4	5	1.69	1 014
Colombia	4.35	3	5	5	1.52	1 200	3.15	2	3	4	1.69	1 089
Costa Rica	3.70	2	3	5	1.67	1 000	3.05	1	3	4	1.78	833
Dominican Rep.	3.43	2	2	5	1.79	1 000	2.70	1	2	4	1.98	755
Ecuador	4.87	4	5	6	1.48	1 200	3.53	3	3	5	1.57	1 098
El Salvador	2.83	2	2	4	1.69	1 000	2.08	1	2	2	1.53	858
Guatemala	2.55	1	2	4	1.53	1 000	2.04	1	1	3	1.41	922
Honduras	2.89	2	3	3	1.49	1 000	2.28	1	2	3	1.46	901
Mexico	4.17	3	5	5	1.69	1 200	2.81	1	2	5	1.88	1 136
Nicaragua	3.01	2	3	4	1.66	1 000	2.19	1	1	3	1.63	871
Panama	4.19	3	4	5	1.65	1 000	3.30	1	3	5	1.90	786
Paraguay	3.70	2	4	5	1.67	1 200	1.87	2	2	2	0.61	1 062
Peru	4.59	3	5	6	1.88	1 200	3.57	2	3	5	1.98	1 098
Uruguay	4.12	3	4	5	1.40	1 200	3.50	3	3	4	1.47	1 109
Venezuela	4.85	4	5	6	1.45	1 200	3.44	3	3	5	1.66	1 103
Total	3.92	2	4	5	1.77	20 201	2.90	1	3	4	1.74	17 932

Note: 1 = “illiterate”, 2 = “primary incomplete”, 3 = “primary complete”, 4 = “secondary, intermediate, vocational incomplete”, 5 = “secondary, intermediate, vocational complete”, 6 = “higher incomplete” and 7 = “higher complete”.

As seen in table 2, Guatemala’s educational level for the current generation displays the value 2.55, which implies that the average respondent has only undertaken primary education, either complete or incomplete. By contrast, the average Ecuadorian has almost completed secondary education or the equivalent. When looking at the previous generation, Latin Americans have moved from primary education to secondary education (although not completed), and

experienced an average increase of 2.68 years[8]. These numbers are not considerably different from the statistics reported by Daude (2011), in which data from 2008 was used.

4.2 Simple Correlations

The first method used to estimate social mobility is through a simple correlation coefficient between parents' and children's education. A higher correlation coefficient implies higher immobility. However, the correlation coefficient is only intended to provide a rough indication of intergenerational mobility in the region, since estimating causal effects requires more precision and the correlation coefficient does not account for other factors that could influence the estimate. We estimate the correlation between parents' education and children's education both according to the number of educational years attained and their educational level.

4.3 Econometric Model

The second approach is to estimate the transmission of the parents' socioeconomic status, proxied with educational attainment, on that of the offspring. The advantage with using this approach is that it allows us to control for aspects that may influence educational achievement. The baseline regression[9] estimates the respondent's educational attainment as dependent on parental educational attainment:

$$RE_{i,c} = \delta_0 + \beta PE_{i,c} + \varepsilon_{i,c} \qquad (1)$$

where i denotes individual, c stands for country, $RE_{i,c}$ indicates the respondent's own educational attainment and $PE_{i,c}$ the educational attainment of the parents. δ_0 is a constant and $\varepsilon_{i,c}$ captures unobserved characteristics. A higher beta-coefficient indicates higher educational immobility between the generations, as the parents' own education has more impact on the education of their child. One more year of parental education therefore results in β more years of education for its offspring.

[8] Calculated as the differences between the mean education of the respondent and the mean education of the parents, in table 1.

[9] $PE_{i,c}$ replaces y_{t-1} in equation (1) in the theoretical framework, section 3. Since we use cross-sectional data and not time series data, the subscript $t-1$ is not used. However, it is still intended to denote the educational attainment of the previous generation.

4.3.1 Control Variables and Interaction Terms

Controls for individual characteristics that may influence a person's educational attainment were added. First we controlled for age, since education is assumed to increase with age. However, since the effect is most likely non-linear, an age^2 term was also controlled for. As there are large differences in educational attainment between urban and rural areas in Latin America (UNDP 2010), we defined the dummy variable *small city*, which takes the value 1 if the respondent lives in a city with 20 000 inhabitants or less and 0 if it is more than 20 000 inhabitants. In order to investigate if there are any differences due to gender, we defined the dummy variable *female*, which takes the value 1 if the respondent is a woman and 0 if the respondent is male.

Based on the fact that poverty rates are higher among the non-white population (Ferreira, Messina, Rigolini, López-Calva, Lugo & Vakis 2013), ethnicity was controlled for when running the regressions. Hence, the dummy variable *white* was defined, taking the value 1 if the respondent is white and 0 if the respondent is from any other ethnic group (in our sample these are classified as: black, mulatto, mestizo and indigenous). A problem with this approach, is that the dummy variable only provides an indication of the differences in educational attainment between the white and non-white population, serving as an overall measure of racial discrimination. However, it does not document potential differences between different non-white ethnic groups, e.g. if indigenous face more obstacles than mestizos.

Furthermore, Daude (2011) found that married individuals exhibited higher levels of education, which is why marital status is also controlled for. *Married* is thus a dummy for marital status, given the value 1 if the respondent is married and 0 if the respondent is divorced or single. Finally, θ_c was included, as a control for country-fixed effects. This was done in order to account for differences attributed to country-specific characteristics, given disparities in average educational attainment across countries in our sample. The estimated regression, including controls, is as follows:

$$RE_{i,c} = \delta_0 + \beta PE_{i,c} + \alpha_1 age_{i,c} + \alpha_2 age_{i,c}^2 + \alpha_3 small\ city_{i,c} + \alpha_4 female_{i,c} + \alpha_5 white_{i,c} + \alpha_6 married_{i,c} + \alpha_7 \theta_c + \varepsilon_{i,c} \quad (2)$$

Additionally, according to Crenshaw (1989) it matters whether an individual is both female and from an ethnically marginalized group in the society. Thus as an additional control, we included the interaction term $female_{i,c} \times white_{i,c}$ accounting for the joint effect of ethnicity and gender. Moreover, in order to investigate how gender and ethnicity affect social mobility, the interaction terms $PE_{i,c} \times white_{i,c}$ and $PE_{i,c} \times female_{i,c}$ were included. The estimated regression, including interaction terms, is as follows:

$$RE_{i,c} = \delta_0 + \beta PE_{i,c} + \alpha_1 age_{i,c} + \alpha_2 age_{i,c}^2 + \alpha_3 small\ city_{i,c} + \alpha_4 female_{i,c} + \alpha_5 white_{i,c} + \alpha_6 married_{i,c} + \alpha_7 \theta_c + \alpha_8 female_{i,c} \times white_{i,c} + \alpha_9 PE_{i,c} \times white_{i,c} + \alpha_{10} PE_{i,c} \times female_{i,c} + \varepsilon_{i,c} \quad (3)$$

For the purpose of answering our main research questions, the coefficient of interest is β, which measures the degree of intergenerational mobility in education. A large coefficient indicates a high persistence of parental education on that of the offspring, whereas a small coefficient indicates high mobility. We expect β to be positive and quite sizeable, given previous studies for Latin America (see Behrman *et al.* 2001, Daude 2011, Daude & Robano 2015). Additionally, we expect the coefficient on the interaction term between parental education and being white to be negative, as whites are likely to experience higher mobility. Furthermore, we expect the coefficient on the interaction term between parental education and gender to be positive, as females may experience lower mobility.

4.3.2 Transition into Higher Education

The last step is to create a separate regression to detect the movement from secondary to tertiary education. This is done as a robustness check, since higher education was assigned the number 14 (for incomplete university) and 15 (for complete university) which is not entirely representative (as higher education usually last more than two years). The transition into higher education is also interesting to investigate, as the movement into tertiary education has mostly been explored for developed countries. This effect was estimated by a linear probability model[10], using a dummy variable as the dependent variable and a dummy variable as the independent variable, while running an OLS-regression. The estimated regression is as follows:

[10] Non-linear alternatives to the linear probability model include probit and logit regressions. In this case, the linear probability model was used as it eases the interpretation of the probabilities.

$$RU_{i,c} = \delta_0 + \beta PU_{i,c} + \alpha_1 age_{i,c} + \alpha_2 age_{i,c}^2 + \alpha_3 small\ city_{i,c} + \alpha_4 female_{i,c} + \alpha_5 white_{i,c} + \alpha_6 married_{i,c} + \alpha_7 \theta_c + \varepsilon_{i,c} \quad (4)$$

where $RU_{i,c}$ stands for "respondent university" and is a dummy variable taking the value 1 if the respondent has either incomplete or complete university education and 0 if the respondent did not attend university. $PU_{i,c}$ stands for "parent university" and is a dummy variable taking the value 1 if the parents have either incomplete or complete university education and 0 if the parents have no higher education. Two separate regressions were run, one using the number of schooling years and one using educational level attained. Interaction terms were not included as this would render the beta-coefficients for each country more difficult to interpret.

4.4 The Validity of the Model

The main objective of this study is to investigate the extent to which the socioeconomic status of the parents affects the socioeconomic status of the offspring. As socioeconomic status is proxied with education, it is important to interpret the estimates as an indication of the transmission of socioeconomic status across generations, i.e. not the pure effect of parental education on the individual's education *per se*. There are most likely endogeneity problems present in the model, since the exogeneity assumption could be "broken" by, for example: omitted variable bias, measurement error and reversed causality.

Omitted variable bias is not our main concern as the objective of this study is not to estimate the pure causal effect of parental education on the offspring's education. If this would have been the purpose of our research question, it would have required us to control for other socioeconomic characteristics included in the error term, correlated with the explanatory variable: parental education. However, since we use education as a proxy for socioeconomic status, we intend our estimated beta-coefficient to capture the effect of characteristics such as earnings, occupation and even cultural traits. Aspects such as ambition and the interaction between family members, close friends and an individual's network, also determine the educational attainment of children (UNDP 2010). Thus, by including too many control variables, part of the effect we wish to capture by using education as a proxy would be "controlled away".

Measurement error, however, is of greater concern since we use a proxy variable, which naturally does not measure an individual's socioeconomic status entirely. Nevertheless, as pointed out in the beginning of section 4, using education as a proxy is still more reliable than other options, such as earnings. Another concern is that some countries provided relatively small number of observations and that the samples risk to be not entirely representative of the whole population. For example, Paraguay shows the highest increase between the parents' and the child's average number of schooling years, without any clear explanation (see figure 2, in section 4.1.1). Such an increase is not consistent with previous findings by Daude (2011) and Daude & Robano (2015). Furthermore, as discussed by Ferreira & Gignoux (2014), there might be a problem concerning the fact that the different levels of educational attainment may not be comparable, due to disparities in the quality of schooling. For example, is one year of schooling in Brazil worth as much as one year of schooling in Sweden? Nevertheless, since samples from only one region are used, and despite a few differences in the educational quality and quantity among the Latin American countries, the region itself is quite homogeneous and therefore the problem might not be of great concern.

Lastly, reversed causality arises when intending to estimate the effect of an independent variable on a dependent variable, but in fact, the coefficient also captures causality in the opposite direction, i.e. the effect that the dependent variable has on the independent variable. For example, when assessing the link between education on economic development, education is usually believed to have a positive effect on the gross domestic product (GDP) of a country. However, higher GDP is also likely to have a positive effect on education, as governments can spend more on schooling. Thus, the coefficient will overestimate the effect of education on GDP. Nevertheless, in our case, it is not likely that reversed causality is a problem, since the educational level of the children is implausible to affect the educational level of the parents (who have in most cases, already completed schooling).

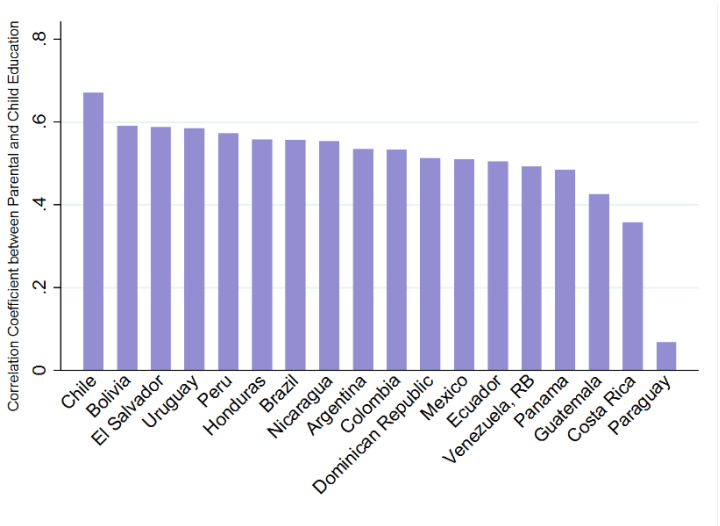
5. MAIN RESULTS

This section provides estimates of intergenerational mobility, using parental education as an independent variable to predict the educational attainment of their offspring. First we provide the reader with the results from some simple correlations between the respondent's and the parents' education. Second, we present our ordinary-least-squared baseline estimation and two supplementary estimations with additional controls. Third, the results for each country in the sample are shown. As a final robustness check, we regress a dummy variable for if the respondent has started university as our dependent variable, on a dummy variable for if the parents have attended university. This linear probability model enables us to detect the transition from secondary to tertiary education.

5.1 Simple Correlations

In order to gain a first overview of the persistence of parental education and that of children, a simple correlation was conducted for every country between the respondent's and parents' education, shown in figure 3.

Figure 3 - Descriptive Graph by Country: Correlation Coefficient



Note: Correlation coefficient obtained using years of education as the indicator.

Chile shows the strongest relationship between the education of parents and children. Paraguay is an outlier with a correlation coefficient well below the regional average. Costa Rica and Guatemala display comparably lower correlation coefficients than the other countries. Overall, the average correlation coefficient for the whole region is around 0.56, which is above the global average of 0.43, estimated by Hertz *et al*. (2007). As a first approximation, the Latin American

region seems to exhibit a strong relationship between the educational attainment of the current and past generation.

5.2 Empirical Results for Latin America

Starting with the OLS estimates for the whole Latin American region, we first conducted the baseline estimation and thereafter added controls in order to detect which underlying factors that may influence the education of the current generation.

5.2.1 Baseline Estimation

Table 3 displays the results from the baseline regression.

Table 3 - OLS Estimates - Baseline Regression Results

	(1)	(2)
Dependent Variable:		
Respondent Education	**Years of Education**	**Level of Education**
Parent education	0.53 *** [0.01]	0.54 *** [0.01]
Constant	5.84 *** [0.05]	2.41 *** [0.02]
Observations	15 980	17 931
R-squared	0.31	0.29

Note: *** = significant at 1%, ** = significant at 5%, * = significant at 10%. Robust standard errors reported in brackets.

As shown in table 3, the beta-coefficient for the variable measuring parents' educational attainment, using educational years, is 0.53 and 0.54 when using the educational level attained. Both coefficients are significant at 1%. This indicates that irrespective of indicator, our results point in the same direction, namely that there is a high persistence in the educational transmission across generations. When using years of education as our measure, a beta-coefficient of 0.53 demonstrates that if the respondent's parents have one more year of education, the respondent will have 0.53 more years of education. Likewise, using the educational level attained as our indicator, a beta-coefficient of 0.54 demonstrates that one additional level of schooling, e.g. "primary complete" for the parents, will translate into 0.54 additional levels of schooling for their offspring. In this case, the respondents may be on their

way to start secondary education. In line with the approximation from the simple correlations, the beta-coefficients suggest a strong relationship between parents' education and that of their children.

5.2.2 Additional Controls

In a second step, regressions are run controlling for age, size of city, gender, ethnicity, marital status and country fixed effects. These controls serve to identify to what extent the parameter measuring parental education is driven by other factors. Furthermore, in order to detect differences in mobility attributed to ethnicity and gender, interaction terms, presented in section 4.3.1, were added.

In regressions (3) – (4) we included additional controls for age, place of residence, gender and ethnicity and country characteristics. As described in section 4.3.1, these variables control for other factors that may influence an individual's educational attainment. Even though the coefficient of interest decreased from 0.53 to 0.40 (for years) and from 0.54 to 0.42 (for educational level attained) and thus showing a lower result than previous estimates from Daude (2011) and Daude & Robano (2015), it is still sizeable[11]. This provides a weak indication of an improvement in social mobility in recent years. We find that the variable for small city is highly significant and indicates a lower educational attainment compared to residents of a large city. Females and non-whites are less educated than the males and whites respectively. Moreover, given that there may be differences in education attributed to both gender and ethnicity combined, the interaction term $female_{i,c} \times white_{i,c}$ was added in regressions (5) - (6). Its coefficient was positive and only significant when using the educational level attained. The fact that there is a small increase in educational levels for white females could be driven by the relatively larger importance of ethnicity over gender in this region.

[11] Their studies showed a beta-coefficient that was around 0.6, including controls very similar to ours, using data from the 2008 Latinobarómetro survey.

Table 4 - OLS Estimates: Additional Controls

	(3)	(4)	(5)	(6)
Dependent Variable:				
Respondent Education	**Years**	**Level**	**Years**	**Level**
Parent education	0.40 ***	0.42 ***	0.40 ***	0.41 ***
	[0.01]	[0.01]	[0.01]	[0.01]
Age	0.05 ***	0.04 ***	0.05 ***	0.04 ***
	[0.01]	[0.00]	[0.01]	[0.00]
Age squared	-0.00 ***	-0.00 ***	-0.00 ***	-0.00 ***
	[0.00]	[0.00]	[0.00]	[0.00]
Small city	-0.65 ***	-0.27 ***	-0.65 ***	-0.27 ***
	[0.08]	[0.03]	[0.08]	[0.03]
Female	-0.12 **	-0.03	-0.33 ***	-0.16 ***
	[0.05]	[0.02]	[0.11]	[0.05]
White	0.17 ***	0.06 **	0.31 **	0.03
	[0.06]	[0.03]	[0.14]	[0.05]
Married	-0.12 **	-0.07 ***	-0.13 **	-0.07 ***
	[0.06]	[0.02]	[0.06]	[0.02]
Female x White			0.02	0.11 **
			[0.11]	[0.05]
Parent education x White			-0.03 ***	-0.12
			[0.01]	[0.01]
Parent education x Female			0.02 **	0.03 ***
			[0.01]	[0.01]
Country Dummies	Yes	Yes	Yes	Yes
Constant	7.91 ***	1.77 ***	7.94 ***	1.82 ***
	[0.25]	[0.09]	[0.03]	[0.10]
Observations	14 920	16 773	14 920	16 773
R-squared	0.42	0.38	0.42	0.38

Note: *** = significant at 1%, ** = significant at 5%, * = significant at 10%. Robust standard errors reported in brackets.

In order to detect differences across groups in terms of social mobility, we estimated regressions (5) - (6), including interaction terms between parental education and gender, as well as between parental education and ethnicity. We note that the interaction term between parental education and the dummy variable white is -0.03 and significant at the 1% level. This suggests that being

white decreases the beta coefficient with -0.03 years, given one additional year of parental education. The result implies that there is a slightly smaller persistence in the transmission of educational attainment of parents among their children, i.e. a higher degree of social mobility. Respectively, being female increases the beta-coefficient with 0.02, given one more year of parental education, which results in lower social mobility. These estimates are significant, regardless of educational indicator, with the exception of $PE_{i,c} \times white_{i,c}$. Here, the significance disappears when using educational levels attained, but the effect is larger and still points in the same direction. The above results imply that females face somewhat lower mobility than males and that mobility is slightly higher among the white population. However, the effects are small and should be interpreted with caution, as there may be important underlying cross country-variation. In the following sections, we explore these aspects further.

5.3 By Country Regressions

The estimated coefficient 0.4 in regression (2), implies a high persistence of educational attainment between the past and the current generation in Latin America. In order to identify which underlying country specific differences that could be related to social and economic patterns, we ran separate regressions for each country in our sample. The regressions were run controlling for gender, ethnicity, place of residence, age and age squared. Table 5 and Table 6 display the results.

Table 5 - OLS Estimates: Additional Controls by Country (Years of Education)

Dependent Variable:

Respondent Education

Country Name	Parent Education	Female	White	Small city	Constant	Obs.	R-squared
Argentina	0.41 *** [0.03]	0.34 ** [0.16]	0.19 [0.93]	0.29 [0.38]	7.20 *** [0.59]	884	0.33
Bolivia	0.47 *** [0.03]	-1.47 *** [0.24]	0.04 [1.09]	-0.54 ** [0.27]	9.08 *** [0.81]	835	0.47
Brazil	0.41 *** [0.03]	0.30 [0.21]	0.95*** [0.21]	- 0.59 * [0.31]	7.29 *** [0.73]	1 074	0.43
Chile	0.38 *** [0.02]	-0.24 [0.15]	-0.01 [0.15]	-0.38 [0.25]	7.28 *** [0.60]	787	0.49
Colombia	0.29 *** [0.03]	0.26 [0.27]	-0.01 [0.29]	-1.80 *** [0.32]	10.63 *** [1.16]	487	0.41
Costa Rica	0.31 *** [0.03]	0.11 [0.26]	0.08 [0.27]	-0.15 [0.57]	5.47 *** [0.95]	760	0.13
Dominican Rep.	0.37 *** [0.03]	0.20 [0.30]	-1.00 ** [0.45]	-0.75 [0.49]	6.73 *** [1.00]	703	0.30
Ecuador	0.37 *** [0.02]	-0.43 *** [0.17]	-0.08 [0.35]	-2.26 *** [0.73]	6.60 *** [0.65]	1 037	0.32
El Salvador	0.52 *** [0.03]	-0.64 ** [0.27]	0.79 *** [0.27]	-0.85 *** [0.29]	6.70 *** [0.97]	772	0.38
Guatemala	0.34 *** [0.04]	-0.66 ** [0.27]	0.15 [0.28]	0.04 [0.31]	6.62 *** [0.91]	802	0.20
Honduras	0.48 *** [0.03]	0.32 [0.24]	-0.57 * [0.34]	-2.12 *** [0.31]	5.01 *** [0.85]	809	0.35
Mexico	0.30 *** [0.03]	-0.60 *** [0.20]	-0.78 ** [0.33]	-0.95 *** [0.33]	9.48 *** [0.74]	849	0.42
Nicaragua	0.51 *** [0.51]	0.48 * [0.26]	-0.38 [0.46]	-0.61 * [0.36]	4.70 *** [0.89]	776	0.33
Panama	0.42 *** [0.03]	0.17 [0.27]	0.28 [0.31]	0.25 [0.30]	3.12 *** [1.08]	705	0.27
Paraguay	0.06 * [0.04]	-0.28 [0.19]	-0.00 [0.20]	-0.85 *** [0.20]	12.39 *** [0.71]	961	0.18
Peru	0.46 *** [0.03]	-1.10 *** [0.25]	-0.14 [0.41]	-0.30 [0.35]	5.87 *** [0.88]	771	0.35
Uruguay	0.49 *** [0.03]	0.21 [0.16]	0.50 *** [0.19]	-0.33 * [0.17]	4.83 *** [0.72]	926	0.38
Venezuela	0.32 *** [0.03]	0.43 *** [0.17]	0.43 ** [0.17]	0.31 [0.36]	5.59 *** [0.68]	982	0.30

Note: Table only showing the main results from the by country regression, not showing the additional control variables included in the regressions: age, age squared and married. *** = significant at 1%, ** = significant at 5%, * = significant at 10%. Robust standard errors reported in brackets.

Figure 4 - Descriptive Graph by Country: Beta-Coefficient on Parents' Education (Educational Years Attained)

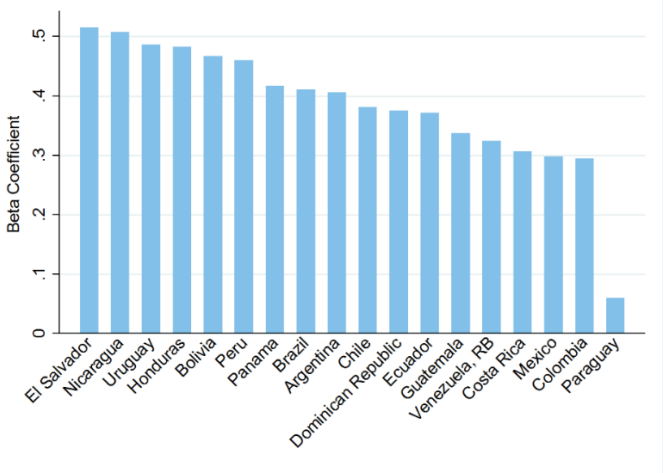


Table 6 - OLS Estimates: Additional Controls by Country (Level of Education)

Dependent Variable:

Respondent Education

Country Name	Parent Education	Female	White	Small city	Constant	Obs.	R-squared
Argentina	0.44 *** [0.03]	0.18 ** [0.08]	0.05 [0.09]	-0.00 [0.19]	2.35 *** [0.27]	1 026	0.28
Bolivia	0.50 *** [0.03]	-0.46 *** [0.10]	0.02 [0.33]	-0.22 * [0.12]	2.87 *** [0.34]	953	0.39
Brazil	0.45 *** [0.03]	0.20 ** [0.09]	0.46*** [0.09]	-0.34 *** [0.13]	2.59 *** [0.33]	1 100	0.35
Chile	0.44 *** [0.03]	-0.07 [0.07]	-0.02 [0.07]	-0.09 [0.12]	2.58 *** [0.29]	933	0.40
Colombia	0.38 *** [0.03]	-0.04 [0.08]	-0.09 [0.09]	-0.52 *** [0.09]	2.81 *** [0.29]	1 019	0.40
Costa Rica	0.34 *** [0.03]	0.04 [0.12]	-0.01 [0.12]	-0.02 [0.26]	2.06 *** [0.41]	791	0.13
Dominican Rep.	0.42 *** [0.03]	-0.02 [0.11]	-0.40 *** [0.16]	-0.28 [0.19]	2.19 *** [0.37]	737	0.30
Ecuador	0.42 *** [0.03]	-0.21 *** [0.07]	-0.15 [0.15]	-1.32 *** [0.19]	2.36 *** [0.30]	1 086	0.29
El Salvador	0.54 *** [0.04]	-0.18 * [0.10]	0.24 ** [0.11]	-0.26 ** [0.11]	2.38 *** [0.39]	781	0.32
Guatemala	0.40 *** [0.05]	-0.25 ** [0.10]	-0.05 [0.10]	0.01 [0.11]	2.28 *** [0.33]	836	0.21
Honduras	0.50 *** [0.04]	0.11 [0.09]	-0.15 [0.13]	-0.71 *** [0.11]	1.87 *** [0.32]	819	0.34
Mexico	0.31 *** [0.02]	-0.22 ** [0.09]	-0.41 *** [0.14]	-0.47 *** [0.14]	3.75*** [0.31]	960	0.37
Nicaragua	0.52 *** [0.04]	0.20 ** [0.10]	-0.09 [0.17]	-0.23 * [0.13]	1.79 *** [0.35]	789	0.33
Panama	0.43 *** [0.03]	0.11 [0.11]	0.09 [0.13]	0.11 [0.12]	0.92 *** [0.44]	742	0.25
Paraguay	-0.08 [0.08]	-0.15 [0.10]	-0.12 [0.10]	-0.52 *** [0.10]	5.08 *** [0.37]	1 017	0.13
Peru	0.45 *** [0.03]	-0.37 *** [0.10]	0.07 [0.15]	-0.04 [0.14]	1.91 *** [0.33]	1 016	0.31
Uruguay	0.43 *** [0.03]	0.19 *** [0.07]	0.37 *** [0.08]	-0.18 ** [0.08]	2.13 *** [0.29]	1 078	0.27
Venezuela	0.36 *** [0.03]	0.17 ** [0.07]	0.22 *** [0.07]	0.02 [0.16]	1.83 *** [0.29]	1 090	0.28

Note: Table only showing the main results from the by country regression, not showing the additional control variables: age, age squared and married. *** = significant at 1%, ** = significant at 5%, * = significant at 10%. Robust standard errors reported in brackets.

As seen figure 4 and in table 5, El Salvador has the highest beta-coefficient in the region, with a value of 0.52, significant at 1%. When looking at educational levels attained as our indicator instead (table 6), the beta-coefficient is now 0.54 and still significant at 1%. Irrespective of indicator, the coefficient of interest indicates a high persistence in the transmission of educational attainment of parents among their children. Other countries with a beta-coefficient around 0.5 include Honduras, Nicaragua and Uruguay, implying lower levels of mobility than we observed in regressions (3) – (6), for the Latin American region. Countries with higher mobility than Latin America as a whole, include Colombia, Costa Rica, Mexico and Venezuela, with coefficients around 0.3. Paraguay is an outlier, with the lowest beta-coefficient, 0.06, in the region. As mentioned in section 4.4, the sub-sample for Paraguay may be unrepresentative of the whole population. Furthermore, the beta-coefficient for Paraguay is no longer significant

when using educational level attained instead of educational years as the indicator. Comparing our results with those of Daude & Robano (2015), Paraguay ranks in the middle in terms of mobility, with a beta-coefficient of 0.55. We find it unlikely that Paraguay has changed so drastically from 2008 to 2012.

The regressions including interaction terms are presented in table 7 and table 8.

Table 7 - OLS Estimates: Interaction Terms (Years of Education)

Dependent Variable:
Respondent Education

Country	Parent Education	Parent × White	Parent × Female	Obs.	R-squared
Argentina	0.49 *** [0.05]	-0.11 ** [0.05]	-0.01 [0.05]	884	0.33
Bolivia	0.39 *** [0.04]	0.23 [0.20]	0.14*** [0.04]	835	0.50
Brazil	0.41*** [0.04]	-0.02 [0.04]	0.02 [0.04]	1 074	0.44
Chile	0.34 *** [0.04]	0.02 [0.04]	0.05 [0.04]	787	0.49
Colombia	0.32 *** [0.04]	-0.00 [0.06]	-0.03 [0.05]	487	0.41
Costa Rica	0.34 *** [0.05]	-0.00 [0.06]	-0.07 [0.06]	760	0.14
Dominican Rep.	0.37 *** [0.04]	0.13 [0.09]	-0.02 [0.05]	703	0.30
Ecuador	0.36 *** [0.03]	0.04 [0.08]	0.02 [0.04]	1 037	0.32
El Salvador	0.53 *** [0.05]	-0.04 [0.06]	0.03 [0.05]	772	0.39
Guatemala	0.34 *** [0.06]	-0.14 * [0.08]	0.11 [0.08]	802	0.21
Honduras	0.46 *** [0.05]	0.16 ** [0.08]	0.00 [0.06]	809	0.35
Mexico	0.29 *** [0.03]	0.02 [0.07]	0.01 [0.05]	849	0.42
Nicaragua	0.50 *** [0.05]	0.09 [0.09]	-0.01 [0.06]	776	0.33
Panama	0.46 *** [0.04]	-0.21 *** [0.07]	-0.03 [0.06]	705	0.28
Paraguay	0.04 [0.06]	-0.11 [0.07]	0.11 [0.07]	961	0.18
Peru	0.40 *** [0.04]	-0.06 [0.08]	0.14 *** [0.05]	771	0.36
Uruguay	0.45 *** [0.05]	0.06 [0.05]	-0.02 ** [0.05]	926	0.38
Venezuela	0.38 *** [0.03]	-0.05 [0.05]	-0.08 * [0.04]	982	0.30

Note: Table only showing the main results from the by country regressions including the interaction terms, not showing the additional control variables: age, age squared, small city, female, white and married. *** = significant at 1%, ** = significant at 5%, * = significant at 10%. Robust standard errors reported in brackets.

Table 8 - OLS Estimates: Interaction Terms (Level of Education)

Dependent Variable:
Respondent Education

Country	Parent Education	Parent × White	Parent × Female	Obs.	R-squared
Argentina	0.49 *** [0.06]	-0.05 [0.06]	0.00 [0.06]	1 026	0.28
Bolivia	0.42 *** [0.04]	0.16 [0.13]	0.15 *** [0.05]	953	0.39
Brazil	0.43 *** [0.05]	0.00 [0.05]	0.04 [0.05]	1 100	0.35
Chile	0.35 *** [0.05]	0.12 ** [0.05]	0.02 [0.05]	933	0.40
Colombia	0.36 *** [0.04]	-0.03 [0.05]	0.06 [0.04]	1 019	0.37
Costa Rica	0.36 *** [0.06]	-0.00 [0.03]	-0.05 [0.07]	781	0.12
Dominican Rep.	0.40 *** [0.05]	0.07 [0.08]	0.00 [0.06]	737	0.30
Ecuador	0.42 *** [0.03]	0.22 *** [0.07]	-0.01 [0.05]	1 086	0.29
El Salvador	0.55 *** [0.07]	0.01 [0.08]	-0.04 [0.07]	781	0.32
Guatemala	0.44 *** [0.07]	-0.16 * [0.09]	0.07 [0.09]	836	0.22
Honduras	0.46 *** [0.05]	0.21 ** [0.08]	0.02 [0.07]	819	0.35
Mexico	0.28 *** [0.03]	-0.02 [0.07]	0.08 * [0.04]	960	0.37
Nicaragua	0.51 *** [0.05]	0.03 [0.10]	0.2 [0.07]	789	0.33
Panama	0.46 *** [0.04]	-0.17 ** [0.07]	0.01 [0.06]	742	0.26
Paraguay	-0.34 ** [0.13]	0.24 [0.16]	0.28 * [0.15]	1 017	0.13
Peru	0.40 *** [0.03]	-0.12 [0.07]	0.14 *** [0.05]	1 016	0.32
Uruguay	0.30 *** [0.06]	0.13 ** [0.06]	0.03 [0.05]	1 078	0.27
Venezuela	0.43 *** [0.03]	-0.06 [0.05]	-0.09 * [0.05]	1 090	0.29

Note: Table only showing the main results from the by country regressions including the interaction terms, not showing the additional control variables: age, age squared, small city, female, white and married. *** = significant at 1%, ** = significant at 5%, * = significant at 10%. Robust standard errors reported in brackets.

A majority of the interaction term coefficients were very small or insignificant. Nevertheless, a few countries stand out. In Peru, the interaction between parental education and female was significant at the 1% level, with a coefficient of 0.14. This suggests that females face lower social mobility than men in Peru. The opposite case was present in Venezuela, where females face a slightly higher social mobility, with the coefficients -0.08 (educational years) and -0.09 (educational levels), significant at 10%. The interaction term between parental education and the white dummy variable was significant in Panama (at 1%), Honduras (at 5%) and Guatemala (at 10%). In Panama and Guatemala, the coefficients were negative, indicating higher social

mobility for the white population, while they were positive in Honduras, indicating the opposite. The coefficients ranged between ±0.14-0.22 irrespective of which indicator was used.

5.4 Linear Probability Model Estimates

In order to detect the transition into higher education, we estimated a linear probability model, described in section 4.3.2. The results from the regressions are displayed in table 9.

Table 9 - OLS Estimates: Dummy Variable as Dependent and Independent

Dependent Variable:
Respondent University

Country Name	Parent University (Years of Education)	Obs.	R- squared	Parent University (Level of Education)	Obs.	R- squared
Argentina	0.49 *** [0.07]	884	0.12	0.39 *** [0.05]	1 026	0.10
Bolivia	0.52 *** [0.07]	835	0.15	0.50 *** [0.05]	953	0.17
Brazil	0.48 *** [0.08]	1 074	0.13	0.48 *** [0.07]	1 100	0.13
Chile	0.55 *** [0.06]	787	0.20	0.51 *** [0.05]	933	0.18
Colombia	0.64 *** [0.05]	487	0.38	0.55 *** [0.05]	1 019	0.19
Costa Rica	0.47 *** [0.06]	760	0.13	0.42 *** [0.06]	791	0.11
Dominican Rep.	0.46 *** [0.06]	703	0.18	0.42 *** [0.06]	737	0.15
Ecuador	0.41 *** [0.05]	1 037	0.09	0.42 *** [0.04]	1 086	0.10
El Salvador	0.50 *** [0.08]	772	0.16	0.47 *** [0.08]	781	0.15
Guatemala	0.44 *** [0.10]	802	0.12	0.40 *** [0.10]	836	0.10
Honduras	0.31 *** [0.09]	809	0.07	0.31 *** [0.09]	819	0.07
Mexico	0.41 *** [0.07]	849	0.15	0.33 *** [0.05]	960	0.11
Nicaragua	0.38 *** [0.09]	776	0.10	0.34 *** [0.08]	789	0.09
Panama	0.44 *** [0.05]	705	0.12	0.42 *** [0.05]	742	0.12
Paraguay	0.42 [0.33]	961	0.06	0.39 [0.24]	1 017	0.06
Peru	0.52 *** [0.06]	771	0.18	0.40 *** [0.04]	1 016	0.13
Uruguay	0.49 *** [0.07]	926	0.16	0.27 *** [0.05]	1 078	0.08
Venezuela	0.47 *** [0.07]	982	0.11	0.37 *** [0.06]	1 090	0.09

Note: Table only showing the main results from the by country regressions, not showing the additional control variables: age, age squared, small city, female, white and married. *** = significant at 1%, ** = significant at 5%, * = significant at 10%. Robust standard errors reported in brackets.

All countries except for one, Paraguay is insignificant, display a beta-coefficient significant at 1%. The results show the probability that the respondent will start university, given that the parents have started university. For example, in the case of Argentina which has a beta-coefficient of 0.49 (for years of education), it should be interpreted in the following way: in comparison to the individuals whose parents have not attended university, the individuals with parents having a university education, have a 49 percentage points larger probability that they themselves will attend university. Interesting to note is that even though Colombia was one of the most mobile countries in our sample, it displays the highest probability that the respondent will start university, given that the parents have started university. This may suggest that mobility is lower at the higher levels of education in Colombia.

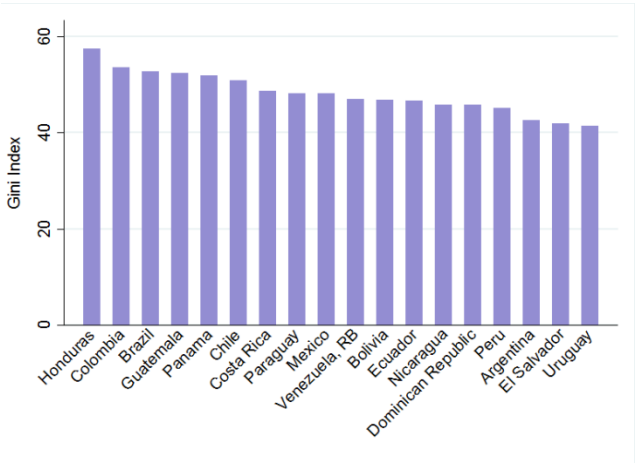
6. DISCUSSION AND POLICY IMPLICATIONS

This section discusses the potential drivers of intergenerational mobility and the policy implications in the light of our findings. Rather than presenting causal relationships between factors affecting mobility and our estimates, they are analysed against conclusions from previous research, e.g. by plotting our beta-coefficient against country-level statistics. Furthermore, an illustrative case study on the Brazilian CCT programme *Bolsa Família* is provided, as similar programmes have become an important part of social policy all over Latin America, aiming to build human capital and create equal opportunities.

6.1 Inequality and Social Mobility

As seen in figure 5, all countries in Latin America are highly unequal, since even the least unequal countries in the region have a high Gini coefficient of around 0.40. A Gini coefficient of 1 represents perfect inequality and a Gini coefficient of 0 means perfect equality. To place the Gini coefficients of the Latin American countries in a context, egalitarian countries such as Sweden had a coefficient of approximately 0.26 in the time period 2005-2013[12]. Furthermore, our estimated beta-coefficients suggest that although the region is more mobile now than when using data from 2008 (see Daude 2011, Daude & Robano 2015), social mobility is still low in international comparison. Consequently, plotting our estimates against the Gini index (see figure 6) may not provide any clear indication of a relationship between inequality and mobility.

Figure 5 - Bar Chart: Gini Coefficient for each Country in the Region

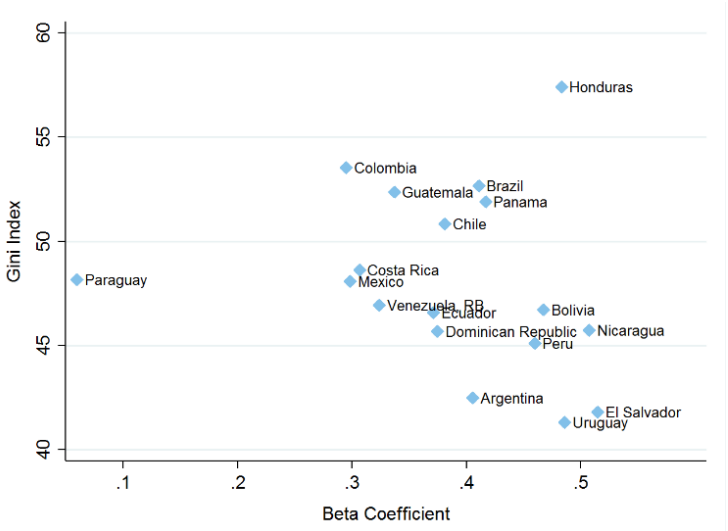


Source: World Bank Indicators, latest available data.[13]

[12] Available from: http://data.un.org/DocumentData.aspx?q=inequality+adjusted+hdi&id=379

[13] Year 2012 for Argentina, Bolivia, Brazil, Colombia, Costa Rica Dominican Republic, Ecuador, El Salvador, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay. Year 2011 for Chile and Guatemala, 2009 for Nicaragua and 2006 for Venezuela.

Figure 6 - Scatter plot of the Gini Index and the Estimated Beta-Coefficient on Parents' Education

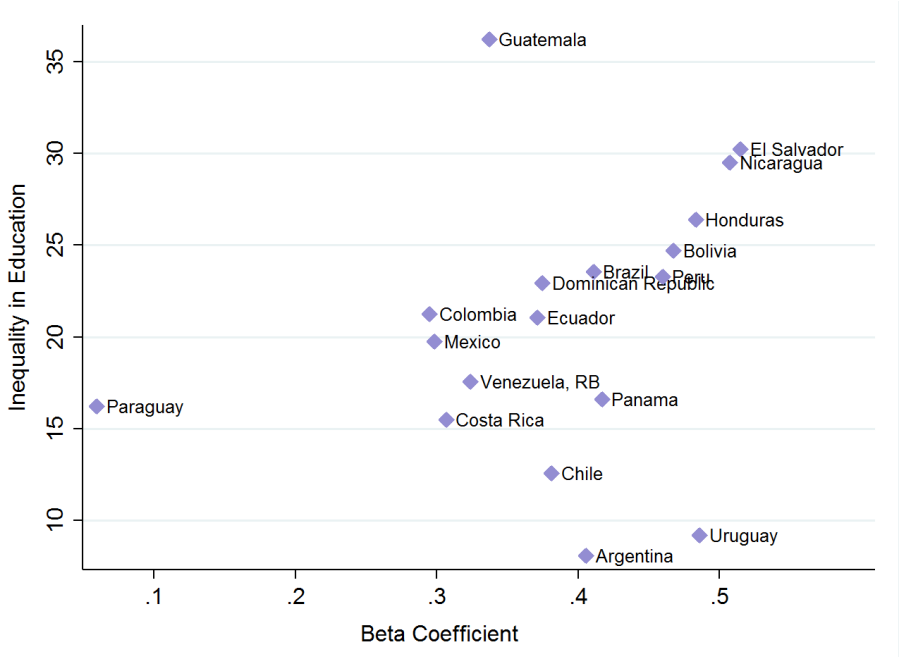


Source: World Bank Indicators and the authors' own calculations

As seen in figure 6, there was no conclusive pattern between inequality and mobility, confirming our above reasoning. This is also in line with results from Andersen (2000), where using data only for the Latin American region did not provide a clear indication of the link between income inequality and mobility. Honduras exhibits both high immobility as well as high inequality and Paraguay is clearly an outlier, with a Gini coefficient on par with the regional average, while the estimated mobility is unusually high. However, excluding Honduras and Paraguay from the interpretation of the figure, there may be a counter-intuitive pattern, suggesting that a higher beta-coefficient is associated with less income inequality. A speculation on the potential reasons for this, could be that social policies in unequal countries have started to increase mobility, while the effected has not yet translated into less inequality. El Salvador is also an interesting case, as it was estimated as the most immobile country in our sample, while its Gini coefficient is among the lower ones in the region. Argentina and Uruguay are also more immobile than expected given their income distribution. By contrast, Colombia is one of the most unequal countries in our sample, whereas its estimated mobility was high in regional comparison. Using data from industrialised countries, however, evidence suggests that immobility and inequality are somewhat associated (see Andrews & Leigh 2009, Corak 2013).

As discussed in section 2, the distribution and accessibility of education may also influence social mobility. Plotting inequality in education against our estimates, figure 7 shows that there is a weak positive relationship between the distribution of education and intergenerational mobility.

Figure 7 - Scatter plot over Inequality in Education[14] and the Estimated Beta-Coefficient on Parents' Education



Source: Human Development Indices: A statistical update 2015, United Nations Development Programme and the authors' own calculations

As figure 7 displays, Paraguay, Guatemala, Argentina and Uruguay are outliers. However, it is interesting to note that the two most immobile countries, El Salvador and Nicaragua, also exhibit high levels of inequality in education. By contrast, Colombia and Mexico, have a much lower level of inequality in education. Thus, while income inequality itself may not have the most important impact on social mobility in the region, an unequal distribution of education seems more associated to the persistence of economic outcomes across generations. Against this background, an area of priority for public policy in Latin America, should arguably be to equalise educational opportunity across groups in society.

6.1.1 Inequality between Groups

Inequalities between groups, e.g. racial and gendered inequalities, may also influence intergenerational mobility. In particular, an unequal distribution of education might create obstacles for marginalised groups to climb up the socioeconomic ladder. In our sample, Venezuela and Uruguay stand out as the only countries with a statistically significant positive

[14] Measured as the inequality in years of schooling, based on data from household surveys, estimated by the Atkinson inequality index. Data available from: http://data.un.org/DocumentData.aspx?q=inequality+adjusted+hdi&id=379

effect (at 10% and 5% respectively)[15] of being female on social mobility[16], even though the effects were very weak. Findings by Andersen (2000) for teenage girls, point in the same direction, as girls showed to be more mobile in Venezuela. On the other hand, being female in Bolivia and Peru displayed the largest negative effect on both educational attainment and social mobility. According to Ferreira *et al.* (2013), ethnic minority households also tend to be at the bottom of the income distribution and therefore may face more unequal opportunities. Furthermore, they find that children from ethnic minorities in three Latin American countries: Brazil, Ecuador and Guatemala, perform worse in school. This may imply that it is more difficult for non-white children to move on from one educational level to another. Therefore, in terms of ethnicity, it may not be surprising that non-whites generally experience greater persistence of parental background on their economic outcomes. As displayed in our results, non-whites experienced lower social mobility than whites, as well as a lower educational attainment.

Overall, our results in section 5 imply that there is a slightly smaller persistence in the transmission of educational attainment for the white population, while the opposite holds for females. These conclusions are not the same as those drawn by Daude & Robano (2015), using similar data for 2008. Their estimates were only significant at 10% for the interaction term parental education and white, and insignificant for parental education and female. By contrast, our interaction terms are statistically significant at 1% and 5% respectively[17]. This may imply that the situation for non-whites and females have slightly worsened over the last four years (2008-2012), nevertheless the estimates are so small that they may not be *economically* significant. Consequently, the only conclusion to be drawn from our estimates is that the situation has not improved, despite the Millennium Development Goal to eliminate gender inequality[18]. This insight might build on the fact that educational attainment is unequally distributed between groups.

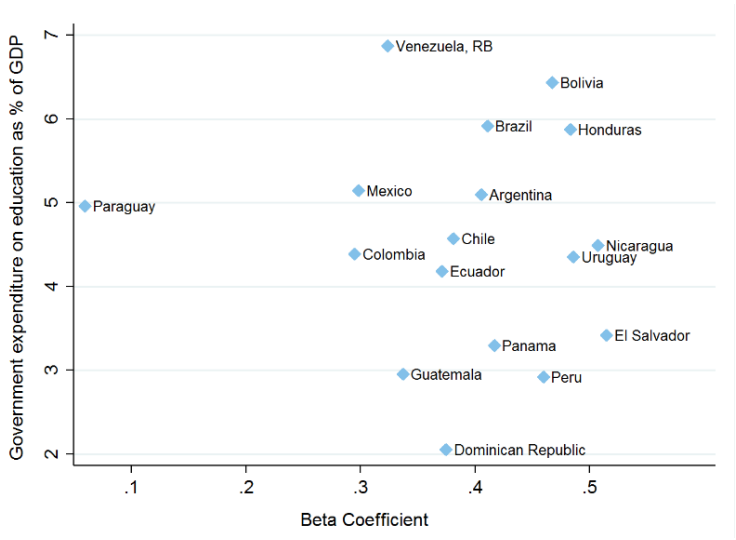
6.2 Educational Polices

Educational policies have a great possibility to influence intergenerational mobility and equalising opportunity for disadvantaged groups in society. Daude & Robano (2015) show a

[15] Estimated as years of schooling, see table 7.
[16] With regards to the interaction term: $PE_{i,c} \times female_{i,c}$
[17] For educational years.
[18] See more at http://www.un.org/millenniumgoals/gender.shtml

negative relationship between public expenditure on education per student, relative to GDP per capita and intergenerational mobility. Andersen (2000) points out that a free education system would enable students to choose their education irrespective of family background. Thus, as a first intuition, government policy could affect mobility by spending more to make education accessible for all.

Figure 8 - Scatter plot of Government Expenditure on Education and the Estimated Beta-Coefficient on Parents' Education



Source: World Bank Indicators and the authors' own calculations

Note: Data for Costa Rica is missing. Data reflects the latest available year[19].

Figure 8 displays the relationship between government expenditure on education and our estimated beta-coefficient. While there is no clear pattern, we note that many countries stay immobile despite high levels of spending on education, e.g. Venezuela, Bolivia and Honduras. Daude (2011) points out that most countries in Latin America, with the exception of Costa Rica and El Salvador, are inefficient in generating mobility through educational spending. Thus, the explanation may lie in where educational spending is targeted. Is it targeted towards basic or tertiary education? Is it directed towards raising the quality or the quantity of education? These questions are the main focus of the following sub-sections.

[19] Year 2012 for Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guatemala, Paraguay, Peru. 2013 for Honduras, 2011 for El Salvador, Mexico, Panama, Uruguay. 2010 for Nicaragua, 2009 for Venezuela, 2007 for Dominican Republic.

6.2.1 Spending on Basic Education

Recalling the previous discussion about equalising opportunity, research has pointed to the importance of early childhood education as a tool for bridging gaps between disadvantaged and privileged groups in the developing world, notably in Latin America and the Caribbean (Vegas & Santibáñez 2010). Furthermore, public expenditure on basic education is shown to have a positive impact on educational mobility. Higher enrolment rates in early childhood education lowers the influence of parental background on students' cognitive skills and educational performance in secondary education (Causa & Johansson 2009, OECD 2010). On the other hand, high expenditure on tertiary education may actually reinforce the importance of family background (Behrman *et al.* 1998). Behrman *et al.* (2001) emphasise that a significant proportion of educational spending should be targeted towards the students with the lowest prospects for completing schooling. Since students from relatively privileged backgrounds tend to be overrepresented in higher education, resources are not directed where they could be the most efficient in generating mobility (Corak 2013).

6.2.2 The Quality of Education and the Social Mix in Schools

As noted in figure 8, numerous countries seem to have a high spending on education without generating more mobility. As mentioned above, this may lie in where educational spending is targeted. The quality of education has been stressed to be just as important as the quantity of education (see OECD 2010, Daude 2011) and even though educational coverage has been expanded across the region (Azevedo & Bouillon 2009), there are still large differences in the educational quality between private and public schools (Daude 2011). Notably, the low quality in public education and the opportunity cost for completing secondary school, results in high dropout rates (Azevedo & Bouillon 2009). According to Andersen (2000) one way of reducing schooling gaps is to ensure that the benefits of schooling are sufficiently high. This could be done by improving the classroom environment as well as the quality of teachers. Furthermore, there is a large disparity between which groups in society that receive public versus private schooling. The most privileged students attend private schools and the students from the middle class or the poor social strata, go to public schools (Daude 2011). The lack of diversity and mixing of students from different socioeconomic backgrounds hinders mobility. According to Daude (2011), limiting schools from picking students from similar backgrounds would promote greater diversity. Evidence from the OECD countries, suggests that a higher social mix of students increases performance without lowering overall achievement (see Causa & Johansson 2009, OECD 2010).

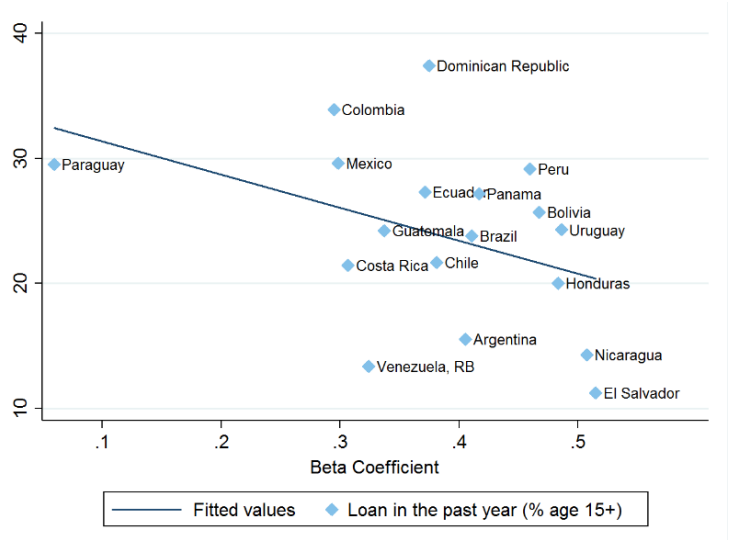
6.2.3 Returns to Education

According to findings by Daude (2011), there is a positive correlation between returns to education and the level of immobility. In the Latin American region, returns to education are above the average rates for the OECD countries. As described in our theoretical framework, Solon (2004) shows that the parents' investment in human capital depends upon, among other things, the returns to human capital. This implies that the higher the returns to education, the more incentives there are for richer families to invest in their children's human capital. Since returns to education are particularly high in Latin America, this enlarges the gap between the different socioeconomic groups and thus, consolidate the persistence of intergenerational immobility.

6.3 Credit Constraints and the Transition into Higher Education

Recalling our theoretical framework from section 3, parents' investments in children depend upon the trade-off between investment and consumption (Solon 2004). Thus, poor households have less possibility to invest in their children compared to rich parents, who have already satisfied their basic needs through consumption. Furthermore, poor parents cannot borrow against their offspring's income, in order to finance human capital accumulation (Aiyagari, Greenwood & Seshadri 2002). Consequently, access to credit markets is a key determinant of intergenerational mobility, as it ensures that opportunities can be ceased regardless of parental background (Daude 2011). A key area for public policy is therefore to remove the constraints holding families back from pursuing further study (Behrman *et al.* 2001).

Figure 9 - Loan in the Past Year and the Estimated Beta-Coefficient on Parents' Education



Source: World Bank Indicators 2011 and the authors' own calculations

Figure 9 plots our beta-coefficient against the percentage of individuals over 15 years old, who had taken a loan in the past year for our sample countries. This is used as an indicator of access to credit, however it is not unproblematic, since it does not measure the accessibility of credit in itself. Nevertheless, as a rough approximation, we note a weak negative relationship between our measure of intergenerational mobility and our indicator of credit access. In our sample's most immobile country, El Salvador, individuals seem to have taken almost no loans. By contrast, relatively mobile countries such as Colombia and Mexico, exhibit higher degrees of borrowing. Venezuela is an exception, which exhibits higher levels of mobility than expected given the propensity to borrow. Thus, we observe that individuals tend to borrow more in countries with higher mobility, although no conclusion around the nature of borrowing can be established.

Against this background, access to credit may play an important role in generating intergenerational mobility, if used for human capital accumulation. In high-income countries, government-supported loan systems for tertiary education are shown to decrease obstacles for students from disadvantaged backgrounds (Causa & Johansson 2009, OECD 2010). For example, Oliveira Martins, Boarini, Strauss, de la Maisonneuve & Saadi (2007) find that lower financial constraints are associated with higher graduation rates in tertiary education. However, lack of credit is not the main hindrance for moving from secondary to tertiary education, since not all of the students from lower socioeconomic background have sufficient qualifications to enter a higher education (Carneiro & Heckman 2003). Thus, the most able students are also more likely to be financially constrained in acquiring higher education. Once more, the main problem lies within the fact that the average quality of the education is lower in public schools, and leaves students without the necessary abilities to enter higher education.

Although the main priority for Latin America should be to ease the transition from primary to secondary education, access to credit is a necessity in order to increase the presence of students from disadvantaged backgrounds in tertiary education. Evidence from Denmark, Finland, Italy and Luxemburg shows that a son whose father has undergone higher education is 30 percentage points more likely to complete higher education, compared to someone whose father had only completed upper secondary education (OECD 2010). As our estimates from table 7 suggest, there is a similar, if not worse, effect in Latin America. Thus, in addition to equipping students with necessary skills for entering university, student loans and grants could serve as a facilitator for wider accessibility of higher education (Daude 2011).

6.4 Illustrative Case Study: The Brazilian CCT Programme *Bolsa Família*

The objective of this case study is to provide an example of a social policy that addresses the different causes of intergenerational immobility discussed in this section. Conditional cash transfer (CCT) programmes aim to reduce the cost of education by providing transfers to poor families, conditional on having their children enrolled in school. These programmes have become a central component of social policy in Latin America, e.g. Mexico's *Oportunidades*, *Familias en Acción* in Colombia and the *Bolsa Família* in Brazil (Soares, Ribas & Osório 2010). Here, we take a closer look at the potential implications of *Bolsa Família* in the light of our previous findings. *Bolsa Família* is a CCT programme introduced in 2003, which provides monthly transfers to poor families with incomes under R$ 140 (US$ 59). Families receive R$ 32 (or US$ 14) per month, for a maximum of five children under 15 years old. For a maximum of two adolescents between 16 and 17 years old, the family receives R$38 (US$16) per month (Bohn, Veiga, Dalt, Brandão & Gouvêa 2014). Benefits are also given to breastfeeding/pregnant women and all payments are given out directly to the woman's bank card, on the basis that women are shown to invest more in their family (Glewwe & Kassouf 2012). In order to receive benefits, children under 6 years old must be immunized, the woman must provide proof of having undergone prenatal and postnatal medical care and children must attend school at least 85% of the time (Bohn *et al.* 2014).

Recalling our previous estimates, the beta- and the correlation coefficient for Brazil suggested a high persistence in parental education on that of the offspring. However, these levels were intermediate in relation to the other Latin American countries (see figures 3 and 4). Nevertheless, the combined level of inequality and immobility was among the highest in our sample (see figure 6). Ethnicity displayed a significant effect on educational attainment, while the interaction term between parental education and the dummy variable for white was insignificant. Whereas non-whites have less education than whites, no conclusion regarding the effect of ethnicity on social mobility could be reached based on our estimates. However, Ribeiro (2010) show that in Brazil, social class has a stronger influence at lower educational levels, while ethnicity starts having a real impact at higher levels. Drawing on historical evidence, Marió & Woolcock, with von Bulow (2008) suggest that non-whites face more difficulties in converting their human capital into monetary returns.

As described in our theoretical framework, parents' investment choice in human capital are important for generating social mobility. A very unique feature of *Bolsa Família* is its focus on

the accumulation of human capital by education and health (Handa & Davis 2006), as well as targeting of children up to 17 years old. Solon (2004), pointed out that expenditure on early education promotes mobility, since benefits reach the worst off, rather than those from more privileged backgrounds who tend to be overrepresented in tertiary education. Glewwe & Kassouf (2012) estimated *Bolsa Família* to have risen enrolment rates with about 5.5%-6.5% in grades 1-8, with a stronger impact on girls and non-whites.

Another important aspect is the increased opportunity cost for undertaking other activities than schooling, which decreases the likelihood of students dropping out of school. Evidence has shown an overall decrease in dropout rates for children participating in *Bolsa Família* (Oliveira, Andrade, Resende, Rodrigues, Rodrigues & Ribas 2007, Glewwe & Kassouf 2012). For example, in grades 1-8, dropout rates decreased by 0.4-0.5 percentage points, particularly among the non-white students (Glewwe & Kassouf 2012). Decreasing dropout rates is essential in order to ensure transition from one educational level to another, which enables children to reach an education beyond that of their parents.

CCT programmes may also have implications beyond raising the average education of the poor. For example, Soares, Soares, Medeiros & Osório (2006) estimated *Bolsa Família* to explain 21% of the fall in the Gini index in 1995-2004. Another important aspect is that the supplementary funds reduce the necessity for constrained families to sacrifice consumption for human capital investment. One potential obstacle for the success of *Bolsa Família*, is that schools with a high amount of children participating in the programme, also tend to have less resources, e.g. fewer computers and well-educated teachers (Glewwe & Kassouf 2012). The high concentration of students from poorer backgrounds in the same school may actually reduce some of the programme's efficiency. Daude (2011) shows that Brazilian students in private schools outperform those in public schools with approximately 100 points in the 2006 PISA survey, meaning that a student from a private school has approximately three years more of education, measured in cognitive skills. Thus, the programme could be even more efficient if its students were more widely spread across the schools. Another frequently discussed disadvantage with CCT programmes is whether or not the benefits exceed the cost (see Handa & Davis 2006). Glewwe & Kassouf (2012) point out that the long-run effect of *Bolsa Família* may only prove profitable if successfully targeted to students who would otherwise not have attended school.

7. CONCLUSION

The aim of this thesis was to explore the extent of social mobility in Latin America, the most unequal region in the world. Using educational attainment as a proxy for socioeconomic status, we find that the average correlation between parental and child education is approximately 0.56 for the whole Latin American region, which is higher than the global average correlation of 0.43 estimated by Hertz *et al.* (2007). With regards to our beta-coefficient, its average level of 0.40 suggests that Latin America is still highly immobile, although it is lower than previous estimates from Daude (2011) and Daude & Robano (2015). Countries with the highest level of immobility included El Salvador, Nicaragua, and Uruguay, whereas countries with relatively higher mobility included Colombia, Mexico and Costa Rica. Paraguay was an outlier throughout all estimations.

With regards to our second research question, we find with statistical significance that females and non-whites face lower mobility than whites and males respectively. As expected, being female slightly decreases intergenerational mobility, as the beta-coefficient increases with approximately 0.02. On the other hand, being white slightly increases mobility as the beta-coefficient decreases with approximately -0.03[20]. Previous literature had been inconclusive in this regard. While the coefficients are small, it provides an indication that could be further explored. Here, looking into differences in mobility attributed to gender and ethnicity using both education, occupation and income could provide a more comprehensive overview of the situation. As was mentioned in the literature, non-whites face lower returns to education than whites, which could imply that while differences in educational mobility may be smaller, mobility in terms of earnings and occupation are likely to be larger.

Throughout our study, the majority of estimates were consistent whether education was measured as the number of years or the educational level. Furthermore, we explored the transition from secondary to tertiary education more closely, something which has attracted more attention for industrialised countries. We find a high probability that the respondent will attend university, given that the parents have higher education, compared to individuals whose parents have not attended university. This effect is stronger for our sample countries, than for the developed countries.

[20] Measured by educational years as an indicator. When using the level of education as our indicator, the significance of $PE_{i,c} \times white_{i,c}$ disappears but the effect is larger and still points in the same direction.

In an attempt to evaluate the potential drivers of intergenerational mobility and the implications for public policy, we discussed our results in the light of previous research. However, further research on this area is encouraged, in order to establish causal relationships between intergenerational mobility and its determinants. Intergenerational mobility seems to be associated with income inequality to a certain extent, however, the distribution of education itself shows a clearer relationship. To improve mobility across the generations, educational policies should seemingly seek to improve the quality of education, notably in the public system. Since most of the disadvantaged students are gathered in the public schools this would equalise the opportunities to undertake higher studies. Good examples of policies that target the most disadvantaged are the conditional cash transfer programmes, such as *Bolsa Família* in Brazil. However, in order to prevent the cost of the programmes to exceed the benefits, it is important to improve efficiency, by reaching households where students would not have attended school in absence of the cash transfers. Furthermore, credit access and in particular, grants/student loans could ease the transition to tertiary education.

To conclude, although social mobility seems somewhat improved in the region compared to previous studies, much is still left to be done at the governmental level. Expanding opportunities to the most disadvantaged groups, notably to non-whites and females, could break the inequality trap by which inequalities are reproduced across generations. This is essential in order to offer individuals the freedom to choose their own economic and social outcomes, regardless of birthplace. This would, in spite of high levels of economic inequality in the region, bridge the gap between different groups and create a more cohesive society. Only when social mobility is at the core of the political agenda, the transmission of inequality will be broken.

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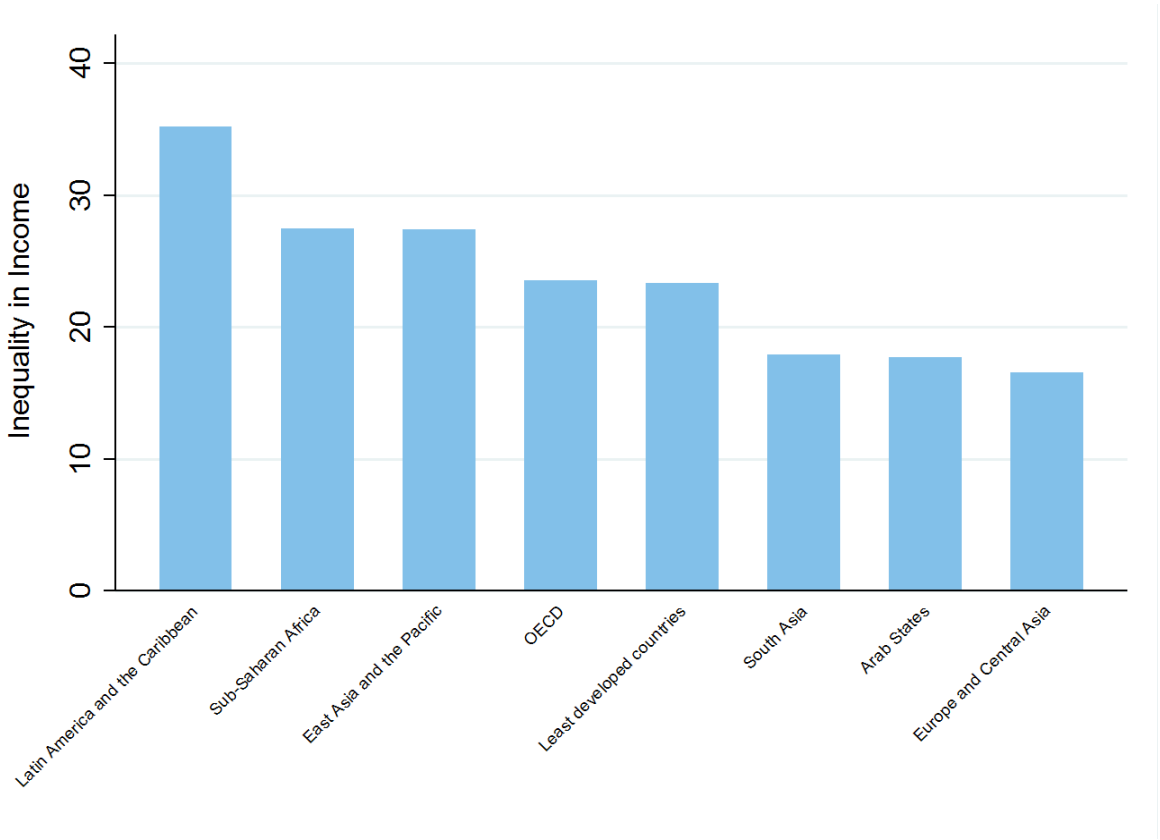
9. APPENDIX

Figure 10 - Inequality in Income by Regions



Source: Human Development Indices: A statistical update 2015, United Nations Development Programme[21]

[21] Available from: http://data.un.org/DocumentData.aspx?q=inequality+adjusted+hdi&id=379

Table 10: Dependent Variables

Dependent Variable	Definition
RE: Respondent Education (Years of Education)	The respondent's education measured as the number of schooling years. Each year takes a numeric value, where: 1 denotes "without education", 14 denotes "incomplete university" and 15 "completed university"
RE: Respondent Education (Level of Education)	The respondent's education measured as the highest level attained from 1-7, where: 1 denotes "illiterate", 2 "primary incomplete", 3 "primary complete", 4 "secondary/vocational/intermediate incomplete", 5 "secondary/vocational/intermediate complete", 6 "higher incomplete" and 7 "higher complete"
RU: Parent University (Years of Education)	Dummy variable. 1 if the respondent has either incomplete or complete university education, denoted as 14 or 15 0 if the respondent has no university education, taking all values under 14
RU: Parent University (Level of Education)	Dummy variable. 1 if the respondent has either incomplete or complete university education, denoted as 5 or 7 0 if the respondent has no university education, taking all values under 5

Table 11: Independent Variables

Independent Variable	Definition
PE: Parent Education (Years of education)	The parents' education measured as the number of schooling years, reported by the respondent. Each year takes a numeric value from 1-15, where: 1 denotes "without education", 14 denotes "incomplete university" and 15 "completed university"
PE: Parent Education (Level of education)	The parents' education measured as the highest level attained, from 1-7, where: 1 denotes "illiterate", 2 "primary incomplete", 3 "primary complete", 4 "secondary/vocational/intermediate incomplete", 5 "secondary/vocational/intermediate complete" 6 "higher incomplete" and 7 "higher complete"
PU: Parent University (Years of education)	Dummy variable. 1 if the parents' have either incomplete or complete university education, corresponding to the values 14 or 15. 0 if the parents have no university education, taking all values under 14.
PU: Parent University (Level of education)	Dummy variable. 1 if the parents' have either incomplete or complete university education, corresponding to the values 6 or 7. 0 if the parents' have no university education, corresponding to all values under 6.
Age	Years, from 18-99
Age squared	The number of years squared
Small City	Dummy variable. 1: If the respondent lives in a city with 20 000 inhabitants or less. 0 If the respondent lives in a city with more than 20 000 inhabitants.
Female	Dummy variable. 1: If the respondent is female. 0 If the respondent is male
White	Dummy variable. 1 If the respondent is white. 0 if the respondent is black, indigenous, mestizo or mulatto.
Married	Dummy variable. 1 if the respondent is married. 0 if the respondent is single or divorced
θ	Country-fixed effects, controlling for disparities in average achievement in education across countries