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# Intergenerational mobility in education and occupation and the effect of schooling on youth's earnings in Brazil

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ABSTRACT

This study uses data from the International Labor Organization's 2013 school-to-work transition survey (SWTS) to measure intergenerational educational and occupational mobility in Brazil. The SWTS database contains information on youths from 15 to 29 years old as well as on family's socioeconomic characteristics, both current and retrospective. This data set permits the measurement of intergenerational mobility. The results obtained show great intergenerational educational mobility, especially when parents had lower levels of education, and slightly less occupational mobility. To analyze the returns to education, earnings equations were estimated using the Heckman selection model. The education of youths and their parents had a great impact on youths' earnings, mainly on females. Young women with higher education more than double their earnings compared to those without high school.



## 1. Introduction

Income distribution is one of many indicators of the populations' quality of life, many times associated with poverty, hampering improvements in health and education, and elevating crime rates. Also, according to Behrman et al. (2001), society is viewed as being less fair if inequality is largely a reflection of the absence of opportunities for those with poor family backgrounds. In Brazil, income distribution, access to health care facilities, and educational opportunities, are historically characterized by great regional heterogeneity. Data from the Brazilian National Household Sample Survey (PNAD, *Instituto Brasileiro de Geografia e Estatística*, IBGE, 2014) show that in economically more developed regions of the country (South and Southeast), monthly family income is twice that found in the country's North and Northeast regions and that the illiteracy rate of individuals over 15 years of age in some states of the Northeast region, such as Maranhão and Alagoas, is more than 17 times higher than in the southeastern state of Santa Catarina, 50% and 2.9%, respectively.

Despite the disparities noted above, Brazil underwent significant economic and social transformations between 2003 and 2014 that raised more than 37 million people out of poverty (Hoffmann, 2007). Between 2002 and 2012, average income growth in Brazil was 3.5% in real terms, while the incomes of the bottom 40% of the population grew 6.1% on average. However, the fall in poverty and inequality appears to have ended in 2014. GDP growth in Brazil was 4.5% between 2006 and

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2010 but decreased to 2.1% between 2011 and 2014 and fell to 0.1% in 2014. Even with the triumphs in poverty reduction over the last decade, inequality still remains at a relatively high level for a middle income country (World Bank, 2015).

The Gini index, which varies from 0 (complete equality) to 1 (complete inequality), is 0.53 in Brazil in 2014. In Argentina, Mexico, and China, other middle-income countries, it is 0.43, 0.48 and 0.42, respectively. Other evidence of the challenges that need to be overcome to promote more equitable income distribution among the Brazilian population are the facts that about 25% of the population receives less than half a minimum wage (R$ 724.00 in 2014), 50% of the population accounts for only 17% of the country's income, and the top 1% account for 11% of total income (IBGE, 2014).

Persistent economic inequality in Brazil has multiple causes, including historical and cultural factors. Youths unequal educational opportunities result in higher levels of income and work environment disparity. Although educational inequality may be the reason of disparity among regional educational systems, it may also be attributed to: (i) differences in youths characteristics, or (ii) differences in family backgrounds (since a better family background can lead to better opportunities for young people).

Several international studies have focused on young people's transition from school to work. Ryan (2001) conducted an integrated analysis of this transitional process in seven countries and found that social disadvantage created significant obstacles to youth employment and that unemployment and inactivity among young workers is a cause of concern. The works by Huitfeldt and Kabbani (2007) evaluating Syrian data and Egel and Salehi-Isfahani (2010) evaluating Iranian data identify a series of particularities hindering young people's integration into the working population.

Chetty et al. (2014) estimated the intergenerational elasticity of income in the United States. Their study addressed five factors considered to be correlated with variations between children and parents' incomes: countrywide income inequality, residential segregation, social capital, school quality, and family structure. More recently, Chetty et al. (2020) studied sources of racial income disparity from an intergenerational perspective using longitudinal data from the United States between 1989 and 2015. The authors cite that areas with low poverty, little racism, and high paternal presence rates had fewer racially correlated income disparities. Thus, policies aimed at replicating such environmental characteristics can help reduce the income gap between blacks and whites.

A review of Brazilian literature shows that many studies on intergenerational mobility have been conducted using data from the Brazilian National Household Sample Survey (PNAD) and the Demographic Census and they all confirm the important role of parents' education in explaining their children's achievement. These studies include Barros and Lam (1993); Barros et al. (2001); Pastore (1979); Pastore and Valle Silva (2000); Pero and Szerman (2008); Reis and Ramos (2011); Ferreira and Veloso (2003 & 2006), and Mahlmeister et al. (2019). We highlight the two studies by Ferreira and Veloso (2003 & 2006) and the study by Mahlmeister et al. (2019).

The first study by Ferreira and Veloso (2003) identifies intergenerational mobility of education in Brazil, while the second (2006) estimates the coefficient of wage elasticity using data from the 1996 PNAD social mobility supplement. Applying methodology originally proposed by Ferreira and Veloso (2003) and using data from the 2014 PNAD social mobility supplement, Mahlmeister et al. (2019) also confirm that there has been intergenerational mobility of education in Brazil. Their study found that there was an increase in the educational level of children whose parents had little schooling and that educational level of children whose parents had more than 11 years of schooling was stable.

This present study presents the results of intergenerational mobility in Brazil, addressing family characteristics that significantly influence social inequality: education and occupation. Specifically, the study uses SWTS data to analyze the transmission of educational and occupational characteristics of parents to their 15–29 years-old offspring (the intergenerational mobility of these characteristics). As earnings are a key determinant of inequality, the study also investigated the causes of earnings differentials among Brazilian youths, analyzing the impact of education, for the youths and their parents', on earnings. As a way to capture potential regional and gender differences, the analyses are stratified by sex and geographic regions. From our knowledge, this is the first time a study use the School-to-Work Transition Survey (ILO) to examine the Brazilian intergenerational educational and occupational mobility.

After this introduction, the paper follows with three additional sections: Methodology, Results, and Conclusions.

## 2. Methodology

This study contains two complementary analyses. One analysis addresses the intergenerational mobility in education and occupational characteristics, while the other estimates the effect of years of schooling on earnings.

Black and Devereux (2010) examined relatively recent developments in intergenerational mobility, arguing that the literature has placed increased emphasis on the causal mechanisms that underlie the relationship between parents' characteristics and their children's outcomes in addition to focusing on obtaining precise estimates of correlations and elasticities. The most common empirical characterization of mobility is given by a model relating the socioeconomic indicator $Y_{i,t-1}$ of parents in period $t$ - 1 to that of their children in period $t$, such as

$$\log\left(Y_{i,t}\right) = \alpha + \beta \log\left(Y_{i,t-1}\right) + \varepsilon_{i,t} \tag{1}$$

where $\alpha$ and $\beta$ are parameters to be estimated and $\varepsilon$ is the error term for individual $i$ in time $t$, whose distribution is assumed to be normal ($\varepsilon \sim N\left(0, \sigma^2\right)$). If $Y$ is defined in relation to the mean of its distribution, parameter $\beta$ is the intergenerational elasticity and $(1 - \beta)$ is a measure of intergenerational mobility (Black and Devereux, 2010). More specifically, coefficient $\beta$

in a log-log model represents intergenerational elasticity by measuring the percentage change of $Y$ in period $t$ with respect to a percentage change of $Y$ in period $t-1$.

Intergenerational mobility is defined as any change in the social position of family members that takes place from one generation to the next. Unschooled immigrants who have children graduating from college and grandchildren becoming teachers are examples of intergenerational mobility. Therefore, if coefficient $\beta$ in Eq. (1) – a regression of mothers' and fathers' education on their children's education - is close to zero, the schooling outcome is not closely related across generations and the intergenerational mobility is very high $(1-\beta)$.

To study the transmission of schooling from parents to children, we estimate Eq. (1) with $Y$ representing the logarithm of mothers' and fathers' levels of education, separately. Estimates of $\beta$ that are close to unity suggest very narrow intergenerational mobility, while estimates of $\beta$ close to zero suggest that schooling outcomes are not closely related across generations. Overall, $\beta$ will be interpreted as a measure of the effect family background has on socioeconomic outcome, which in our case is years of schooling, and as an implied measure of inequality of opportunity.

Another approach widely used in the literature to characterize intergenerational mobility is the intergenerational correlation $(\rho)$[1] : The correlation between the log of socioeconomic indicator of parents and children equals the elasticity, provided that the standard deviation of log socioeconomic indicator $(\sigma)$ is the same for both generations.

The method of obtaining intergenerational mobility through correlation has attractive properties when compared to the elasticity method. The correlation method eliminates dispersion from the data type (cross-section), whereas the elasticity in the elasticity method may differ from one generation to another simply because variances are different between generations.

The correlation between generations is defined as

$$\rho = \left(\sigma_{it}/\sigma_{it-1}\right)\beta. \tag{2}$$

In order to measure intergenerational transmission of education we can consider educational attainment as a continuous variable and calculate the parent-child correlation, or we can consider educational attainment as a discrete variable and use transition matrices where parental education is on one axis and child education on the other. Using two different indices, Chevalier et al. (2009) measured different kinds of mobility across boundaries from one generation to the next.

In a similar manner, we constructed matrices distinguishing sectors of employment to analyze occupational mobility. Behrman et al. (2001) divided employment into white collar and blue-collar occupations to compare occupational mobility among countries.

In terms of estimation, education has advantages over earnings, given that measurement problems related to education are much less challenging. The reasons education has this advantage is that the completion of school generally occurs earlier in life (mid-twenties), whereas earnings change over time, unemployment is not an issue, and measurement error is likely to be much smaller since individuals tend to know their educational achievement and inform it without restrictions, contrary to earnings.

Another important item that needs to be examined is the returns to schooling on earnings. If they are high, we might expect that large differences in schooling result in large differences in earnings. The youth's earnings equations will be estimated using the Heckman selection model described below. This approach has advantages as it controls for selectivity bias due to a large number out of the labour market.

Consider the following model, called the selection equation.[2] Let $Z_i^*$ be an unobserved variable representing the probability that person $i$ works given other observable characteristics $\mathbf{W}_i$. The relation between $Z_i^*$ and $\mathbf{W}_i$ is described as

$$Z_i^* = \boldsymbol{\gamma}'\mathbf{W}_i + u_i \tag{3}$$

Variable $Z_i^*$ is not observed because it is related to the reservation wage, with the reservation wage being the minimum wage at which a person will accept employment. However, it is possible to observe a variable $Z$ that assumes value 0 if the person does not participate in the labor market and value 1 if that person participates. Consider than the following equation:

$$Z_i = \begin{cases} 1, \text{ if } Z_i^* > 0 \\ 0, \text{ otherwise} \end{cases}. \tag{4}$$

We want to estimate the earnings equation as,

$$Y_i = \boldsymbol{\beta}'\mathbf{X}_i + \varepsilon_i, \tag{5}$$

where $Y_i$ is the earnings of individual $i$, $\boldsymbol{\beta}$ is the parameter vector to be estimated, $\mathbf{X}_i$ is the matrix with the observable characteristics of the individual and $\varepsilon$ the error term. $Y_i$ is observed only if $Z_i{}^*$ is greater than zero, i.e., we observe the wage rates only for those working.

[1] Examples of studies that used this approach: Dahan and Gaviria (2001), Behrman et al. (2000) and Behrman et al. (2001).
[2] To more details see Refs. Greene (2003), Heckman (1979).

Assuming that the errors $\varepsilon_i$ and $u_i$ are bivariate normally distributed with mean 0 and correlation $\rho$, we have

$$\begin{aligned} &\mathrm{E}\left(Y_i|Y_i \text{ is observed}\right) = \mathrm{E}\left(Y_i|Z_i^* > 0\right) = \mathrm{E}\left(Y_i|u_i > -\boldsymbol{\gamma}'\mathbf{W}_i\right) \\ &= \boldsymbol{\beta}'\mathbf{X}_i + \mathrm{E}\left(\varepsilon_i|u_i > -\boldsymbol{\gamma}'\mathbf{W}_i\right) = \boldsymbol{\beta}'\mathbf{X}_i + \rho\sigma_\varepsilon \frac{\phi(\alpha_u)}{\Phi(\alpha_u)} = \boldsymbol{\beta}'\mathbf{X}_i + \beta_\lambda \lambda_i(\alpha_u) \end{aligned} \tag{6}$$

where $\phi$ is the probability density function of standardized normal and $\Phi$ is its cumulative distribution function, with

$$\alpha_u = \frac{-\boldsymbol{\gamma}'\mathbf{W}_i}{\sigma_u}, \tag{7}$$

then,

$$Y_i \left| Z_i^* \right\rangle 0 = \mathrm{E}\left(Y_i|Z_i^* > 0\right) + v_i = \boldsymbol{\beta}'\mathbf{X}_i + \beta_\lambda \lambda_i(\alpha_u) + v_i. \tag{8}$$

Therefore, if we estimate Eq. (3) using least squares method only for individuals where $Y$ is observed, the estimated coefficients $\beta$ will be biased and inconsistent since we are not considering the term $\lambda$ in (4) that is correlated with the error term $v$.

Sample selection bias arises because the unobservable characteristic affecting the work decision (reservation wage) is correlated with the unobservable characteristics affecting the wage.

To obtain consistent estimates we use a maximum likelihood Heckman selection model. The first step estimates the probability that a youth is employed and the second the earnings equation for those working taking into account $\lambda$. See Vella (1998) for the comparison of different selection models.

If the youths' decision whether to work or not is random, we would not have a problem estimating the earnings equation only for those working by least squares; however, it is more likely that individuals will not work if they are poorly remunerated. Usually people choose not to work when their personal reservation wage is greater than the wage offered by employers. To circumvent this problem, we will use variables that greatly improve the chance of working (low reservation wage) but not the outcome under study (the wage offer). Such a variable might be the number of children the youth has or the youth's wealth. A woman with a baby will have higher reservation wage than a young woman just finishing college, but the fact that a woman has a baby will not change an employer's wage offer.

## 3. Results

The following analyzes are based on microdata from the ILO school-to-work transition survey (SWTS). The SWTS survey was the result of the Ẅork4Youthp̈roject, a project created through a partnership between the ILO and the MasterCard Foundation. The survey was conducted among youths from 15 to 29 years old in 28 countries and was intended to aid in the development of public policies, activities, and strategies to ease young people's transition from school to work.[3]

These data are statistically representative of the universe of Brazilian's in this age group, with a sample composed of 3288 interviews, distributed among 160 municipalities, and covering 25 Brazilian States. The municipalities are also stratified by the population density and by size (small, medium, and large municipalities).

We analyze educational mobility between parents and children by gender and geographic regions. Subsequently, earnings equations considering returns to schooling were estimated. Sampling weights were used in the calculations. All analyses were focused on individuals that had completed their studies or dropped out of school. The goal of this restriction was to eliminate youths that had not completed their schooling to avoid having a censored variable.[4]

Table 1 shows that there were 1976 (924 + 1052) youths between 15 and 29 years of age not currently studying, which represents 60% of the Brazilian sample. The average age of those youths not currently studying was 23.

### 3.1. Educational mobility

Table 2 shows the average number of years of Brazilian parents' and youths' schooling.

While mothers and fathers have a mean of less than six years of formal education, their sons and daughters have mean of 10 years of schooling, nearly twice as much as their parents. These numbers show that the amount of formal education has significantly increased from one generation to the next. Observe that women have a larger educational mean than men in Brazil, although the difference is small.

[3] Asia pacific: Bangladesh, Cambodia, Nepal, Samoa, Vietnam; • Eastern Europe and Central Asia: Former Yugoslav Republic of Macedonia, Armenia, Russian Federation, Kyrgyzstan, Republic of Moldova, Ukraine; • Latin America and the Caribbean: Brazil, Colombia, El Salvador, Jamaica, Peru; • Middle East and North Africa: Egypt, Jordan, Occupied Palestinian Territories, Tunisia; • Sub-Saharan Africa: Benin, Liberia, Madagascar, Malawi, United Republic of Tanzania, Togo, Uganda, Zambia.

[4] In the 15 to 29 age range many individuals are still studying and so it is not known how many years of education they will complete. Due to the fact that years of education are not observed throughout the sample, this variable is called the censored variable. When using the censored variables and not taking it into account, may introduce bias in the estimates.

**Table 1**
Number and percentage of youths from 15 to 29 years according to schooling situation.[9]

| Youth situation | Frequency | % |
|---|---|---|
| Currently studying | 1306 | 39.76 |
| Have already completed the studies | 924 | 28.13 |
| Have dropped out of school | 1052 | 32.02 |
| Did not answer | 3 | 0.09 |
| Total | 3285 | 100 |

Source: School-to-work transition survey, ILO.

**Table 2**
Mean of Brazilian parents and youths (from 15 to 29 years old) schooling in years.

| Education* | Frequency | Mean |
|---|---|---|
| Youth schooling | 1972** | 10.25 |
| Male youth | 992 | 10.10 |
| Female youth | 980 | 10.40 |
| Mother schooling | 1858 | 5.87 |
| Father schooling | 1600 | 5.67 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.
** Years-of-schooling values for four ex-student youths were missing; these youths were not included in the table's data.

**Table 3**
Measure of intergenerational educational mobility for male and female youths by region.

| Region | Intergenerational schooling mobility (1- β) | | | | | |
|---|---|---|---|---|---|---|
| | All youths* | | Female youths | | Male youths | |
| | Father's education | Mother's education | Father's education | Mother's education | Father's education | Mother's education |
| Brazil | 0.9617 | 0.9588 | 0.9626 | 0.9609 | 0.9610 | 0.9572 |
| North | 0.9856 ns | 0.9601 | 0.9774 ns | 0.9617 | 0.9933 ns | 0.9600 |
| Midwest | 0.9416 | 0.9454 | 0.9383 | 0.9574 | 0.9432 | 0.9301 |
| Northeast | 0.9638 | 0.9641 | 0.9695 | 0.9624 | 0.9608 | 0.9666 |
| South | 0.9513 | 0.9579 | 0.9533 | 0.9639 | 0.9484 | 0.9508 |
| Southeast | 0.9648 | 0.9619 | 0.9605 | 0.9620 | 0.9691 | 0.9619 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.; ns: not significant.

To characterize intergenerational educational mobility, we first use Eq. (1) to estimate the relationship between parents and children education segregated by father, mother, Brazilian region and the child's gender. Table 3 shows these estimated intergenerational mobility values $(1-\beta)$.

When the coefficient $\beta$ in Eq. (1) — a regression of mothers' and fathers' education on a youths' education — is close to zero, then the schooling outcome is not closely related across generations and the intergenerational educational mobility is very high $(1-\beta)$. The result observed for Brazil is a small $\beta$ coefficient (close to 0.04), indicating large intergenerational mobility.

The range of results shown in Table 3 goes from 0.93 for the effect of a mother's education on male youths in the Midwest region of Brazil to 0.97 for the effect a father's education has on male youths in Southeast region of Brazil. Therefore, we observe high intergenerational educational mobility in general. The estimated coefficients of education from fathers in the North region were not statistically significant at the 10% level, possibly due to the small number of observations in this region and the fact that more than 80% of the parents of the sample had low levels of schooling (primary or lower) and did not have sufficient variability. Although the North region's father's education coefficient is not significant at the 10% level, it is at the 11% level.

Table 4 shows the intergenerational correlation ($\rho$) as an alternative to elasticity (Eq. (2)). The intergenerational correlation ($\rho$) is presented separately by gender, education of the father and mother, as well as for the different geographical regions.

The range of results shown in Table 4 goes from 0.09 for the effect of the father's education on female youth in Brazil's Midwest region to 0.14 for the effect of the mother's education on female youth in the Southeast region. The low values of the correlation coefficients show that, even considering the dispersion of the cross-section data, we did not observe results of schooling that are notably related among the generations (similar to the results obtained through the estimated $\beta$ coefficients).

The analyses presented in Tables 3 and 4 indicated that intergenerational mobility is linear, but this need not be the case. According Behrman et al. (2001), "intergenerational ties tend to be stronger at the end of the distribution or asymmetric in that they are stronger in one direction than in another." To account for these possibilities, we created three educational

**Table 4**
Measure of intergenerational schooling correlation for male and female youths by region.

| Region | Correlation between the educational level by generations ($\rho$) | | | | | |
|---|---|---|---|---|---|---|
| | All youths* | | Female youths | | Male youths | |
| | Father's education | Mother's education | Father's education | Mother's education | Father's education | Mother's education |
| Brazil | 0.1146 | 0.1230 | 0.1121 | 0.1221 | 0.1167 | 0.1235 |
| North | 0.1191[ns] | 0.1244 | 0.1115 [ns] | 0.1302 | 0.1260 [ns] | 0.1212 |
| Midwest | 0.1037 | 0.1206 | 0.0895 | 0.1008 | 0.1147 | 0.1382 |
| Northeast | 0.1131 | 0.1178 | 0.1156 | 0.1175 | 0.1113 | 0.1174 |
| South | 0.1239 | 0.1197 | 0.1043 | 0.1074 | 0.1480 | 0.1313 |
| Southeast | 0.1150 | 0.1362 | 0.1131 | 0.1424 | 0.1170 | 0.1308 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.

**Table 5**
Number and percentage of youths* and fathers and mothers of youths according to their level of schooling.

| Schooling level | Father | | Mother | | Male youths | | Female youths | |
|---|---|---|---|---|---|---|---|---|
| | Freq | % | Freq | % | Freq | % | Freq | % |
| Primary school or less | 1876 | 68.72 | 2119 | 67.87 | 356 | 35.58 | 336 | 34.29 |
| High school | 648 | 23.74 | 760 | 24.34 | 571 | 57.56 | 571 | 58.27 |
| College or more | 206 | 7.54 | 243 | 7.78 | 68 | 6.85 | 73 | 7.45 |
| Total | 2730 | 100 | 3122 | 100 | 992 | 100 | 980 | 100 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.

**Table 6**
School mobility matrices between fathers and youths* (%).

| Father's education | Youth primary or less | Youth high school | Youth college or more |
|---|---|---|---|
| Primary school or less | 38.27 | 57.07 | 4.66 |
| High school | 10.97 | 76.77 | 12.26 |
| College or more | 3.13 | 37.5 | 59.38 |
| Total | 31.56 | 60.11 | 8.33 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.

**Table 7**
School mobility matrices between mothers and youths* (%).

| Mother's education | Youth primary or less | Youth high school | Youth college or more |
|---|---|---|---|
| Primary school or less | 40.55 | 56.09 | 3.36 |
| High school | 13.2 | 73.02 | 13.78 |
| College or more | 5.88 | 42.35 | 51.76 |
| Total | 33.93 | 58.58 | 7.5 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.

categories: (1) primary schooling or less, including all individuals with no more than eight years of formal education; (2) high school completed or not, consisting of individuals with nine to eleven years of education; and (3) college or more, completed or not. Table 5 has the percentage of fathers, mothers and youths in each category. Most parents are in the first group, having a primary education or less, while the majority of young people are in the second educational category: high school completed or not.

Tables 6 and 7 display the probability that a youth is in a particular educational category given his/her father's and mother's level of education, respectively.

Table 6 shows that close to 57% of the youths whose fathers had at most a primary school education went to high school and nearly 5% went to college or graduate school, while 38% remained at the same primary school educational level as their fathers. Of the youths whose fathers at least attended college, 60% also at least attended college; but 41% moved in the opposite direction, and 3% of these only made it as far as primary school. Similar results were observed when analyzing a mother's education effect on their children's education, as shown in Table 7.

From these analyses we conclude that there is a correlation between youth educational attainment and parental educational attainment. However, the results also reflect some asymmetries between parents' and children's years of schooling with the proportion of upwardly mobile youths coming from the bottom of the educational distribution being greater than the proportion of downwardly mobile youths from the top of the educational distribution. Behrman et al. (2001) observed

**Table 8**
Measure of educational mobility between generations by gender considering two educational groups*.[10]

| | Female youths | Male youths |
|---|---|---|
| Father's education < = 8 years | 0.96 | 0.96 |
| Father's education > 8 years | 0.30 | 0.66 |
| Mother's education < = 8 years | 0.96 | 0.96 |
| Mother's education > 8 years | 0.47 | 0.65 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.

**Table 9**
Generational occupational mobility between fathers and youths.

| Father's occupation | Occupation of youths (%)* | | | |
|---|---|---|---|---|
| | Highly skilled, non-manual labor | Semi-skilled, non-manual labor | Semi-skilled, manual labor | Unskilled |
| Highly skilled, non-manual | 35.51 | 31.94 | 25.84 | 6.7 |
| Semi-skilled, non-manual | 20.61 | 35.38 | 35.59 | 8.42 |
| Semi-skilled, manual | 20.84 | 19.7 | 44.16 | 15.29 |
| Unskilled | 17.22 | 16.65 | 40.98 | 25.15 |
| Total of entire sample population | 24.29 | 29.59 | 34.94 | 11.18 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed or dropped out of school.

that in Colombia, 24% of children whose parents had no more than an elementary school education completed at least one year of high school and 23% of the youths whose parents at least attended college moved down the educational ladder.

Table 8 shows educational mobility between generations (1-β) by gender considering two distinct parental schooling groups: the low group, comprised of parents with eight years or less years of schooling; and the high group, comprised of parents with more than eight years of schooling.

Data in the table indicates that there is a significant difference in educational mobility between the groups. For the parents in the low schooling group, educational mobility between generations is very high; for parents in the high schooling group, mobility is much lower. When fathers have more than eight years of schooling, the mobility estimate for young females is 0.3; but when fathers have eight years of schooling or less, the mobility estimate for young females is 0.96. Similarly, when mothers have more than eight years of schooling, the mobility estimate for young females is 0.47; but when mothers have eight years of schooling or less, the mobility estimate for young females is 0.96. Analysis of mobility between parents and their young male offspring led to analogous but less differentiated results than that for females.

Jiménez and Jiménez (2019) studied intergenerational educational mobility in Latin American countries between 2003 and 2015 using the equal opportunity (EOP) approach and *Latinobarómetro* survey data. Their main results show a significant increase in mean intergenerational educational mobility over the study's period. A study of intergenerational mobility in Brazil by Mahlmeister et al. (2019) found that there has been an increase in the educational level of youths whose parents had low schooling, which is similar to our results of our results.

### 3.2. Occupational mobility

This segment examines the intergenerational mobility of occupational status: if the parents are manual laborers, will their children also be manual laborers? One may argue that education or income does not entirely explain a person's socioeconomic status; might this status also be transmitted from parents to children? Youths of parents employed as semi-skilled workers that are employed as highly skilled professionals, even if educational levels and the wages have been the same over generations, shows occupational and social mobility. To compare occupational status across generations, four major categories were created. The categories, loosely based on the International Classification of Occupations (ISCO) are: (i) highly skilled non-manual labor; (ii) semi-skilled non-manual labor; (iii) semi-skilled manual labor; and (iv) unskilled labor.

The occupational mobility matrices for fathers and mothers are presented in Tables 9 and 10, respectively. Each cell shows the percentage of sons and daughters in the occupational category for that column conditional on their father's or mother's category for that row.

Data in both Tables 9 and 10 show that the largest percentage of the entire sample population of youths work as semi-skilled manual laborers, independent of their father's or mother's occupation and that there is some intergenerational occupation mobility, more notably between unskilled fathers and their offspring.

Table 9 indicates that the offspring of fathers with higher status occupations are more likely to have higher status occupations than the offspring of fathers with lower status occupations, showing an intergenerational relation of occupational status. The table shows that 17.2% of the youths whose fathers work in unskilled labor activities work in highly skilled, non-manual labor activities, while 25.2% work as unskilled laborers. On the other hand, only 6.7% of the youths whose fathers work in a highly skilled, non-manual labor activities work in unskilled activities. Youths whose fathers have a highly skilled,

**Table 10**
Generational occupational mobility between mothers and youths.

| Mother's occupation** | Occupation of young people (%)* | | | |
|---|---|---|---|---|
| | Highly skilled, non-manual | Semi-skilled, non-manual | Semi-skilled, manual | Unskilled |
| Semi-skilled, non-manual | 26.96 | 30.19 | 33.66 | 9.2 |
| Semi-skilled, manual | 16.21 | 28.15 | 39.81 | 15.82 |
| Unskilled | 9.77 | 23.96 | 41.14 | 25.13 |
| Total of entire sample population | 16.52 | 27.27 | 38.89 | 17.32 |

Source: School-to-work transition survey, ILO.
* Only youths that have completed school or dropped out of school.
** There were no mothers in the category highly skilled, non-manual at the sample.

non-manual occupation are twice as likely to have highly skilled, non-manual labor occupations as those youths whose fathers have unskilled occupations.

Results shown in Table 10 show that the relationship between a mother's occupation and their offspring's occupation is similar to the relationship between a father's occupation and his offspring's occupation shown in Table 9; although, more skewed toward the lower status occupations. For youths that are out of school, there is no mother in the category highly skilled non-manual.

When comparing occupational mobility levels between the United States and Latin American countries, Behrman et al. (2001) found that the United States had higher inter-generational occupational mobility, followed by Colombia, Brazil, Peru and Mexico in that order. According to the authors, Brazil has relatively high mobility in terms of occupational status, but relatively low mobility in terms of years of schooling (Behrman et al., 2001). We obtained an opposite result, but it is worth mentioning that our analysis is based on a group of young people, possibly in an early career stage while Behrman et al. used 23–69 years old group.

### 3.3. Returns to education

The youth earnings equations were estimated taking into account the sample's selectivity bias (using a Heckman selection model), a bias that may result from the fact that earnings are only observed for those who participate in the labor market, making the sample non-random. From the initial sample of 1489 men, 902 work; and from the initial sample of 1535 women, 547 work. Based on that, approximately 61% of male youths and 36% of female youths in the initial sample are employed. Some of the working sample individuals do not receive payments. From the number of working individuals, 72% of the males (644 out of 902) and 66% of the females (359 out of 547) are paid.

The Heckman selection model consists of estimating the earnings equations and the labor force participation equations (probit model) by maximum likelihood. [5] The probit model's dependent variable, which is the selection equation, takes the value of 1 if the individual participates in the labor market and 0 if the individual does not. The dependent variable of the earnings equation is the logarithm of hourly earnings for only those receiving earnings. The data are weighted by the sample expansion factor. Variables social class, marital status, and number of children were included in labor force participation equations and excluded from earnings equations. Table 11 contains a description of the variables used in the analyses.

Table 12 shows the results of the logarithm of hourly earnings for male and for female youths 15–29 years old in the whole initial sample (completed school and still in school) and for those who are out of school but have a completed number of years of education. Region variables (excluding Brazil's Southeast) were included to control for regional differences. The race variables control for ethnical and cultural divergence. In the race category, the variable assumes value 1 for whites and Asians, and value 0 for blacks, mulattos, and indigenous peoples.[6] Results from the Heckman selection model are in Appendix Table A1.

The first four columns of Table 12 show the coefficients using the whole sample, individuals currently studying as well as out of school. The last four columns display the coefficients only for youths that are out of school, either because they completed school or because they dropped out of school. The coefficients of the log earnings equations[7] showed that the youths' education and age (work experience), have a positive effect on earnings. The more education and experience the youths have, the higher their earnings.

The mother's education had a positive effect only on male youth earnings, while the father's education also had a positive effect for males but only for the whole initial sample (column 1). Those residing in urban areas had higher earnings than those residing in rural areas. The coefficients of the regional variables indicated that residents of Brazil's poorer areas (North

[5] This Heckman procedure consists of first estimating the labor force participation equation (probit model) by maximum likelihood, where the dependent variable takes values 1 or 0 whether the individual participates or not in the job market. Then, the inverse of Mill's ratio (lambda) is obtained based on the estimated coefficients from the probit model and used as an exogenous variable in the logarithm of hourly earnings equations only for those receiving earnings. Although consistent, this estimator is not fully efficient according to Greene (2003), and therefore a maximum likelihood Heckman procedure was chosen.
[6] It proceeded in this way due to the low number of observations in some of the races.
[7] Because it is a log-linear model, the interpretation of the model is not direct. For more details, see Ref. Greene (2003).

**Table 11**
Descriptive statistics for the variables used in the earnings equation for male and female.

| Variable | Description | Female youth | | Male youth | |
|---|---|---|---|---|---|
| | | Mean | Std. Dev. | Mean | Std. Dev. |
| Ln_earnings/hour | Log of earnings per hour | 1.67 | 0.67 | 1.82 | 0.69 |
| Elementary | 1 if the youth has completed elementary education, 0 otherwise | 0.21 | 0.41 | 0.29 | 0.45 |
| Highschool | 1 if the young person has completed high school, 0 otherwise. | 0.57 | 0.50 | 0.59 | 0.49 |
| Higher education | 1 if the young person has completed university or post-graduate education, 0 otherwise. | 0.22 | 0.41 | 0.13 | 0.33 |
| educ_moth | Years of mother's schooling. | 6.81 | 4.59 | 6.65 | 4.81 |
| educ_fath | Years of father's schooling. | 6.42 | 4.71 | 6.41 | 4.72 |
| Age | Youths' age in years | 23.37 | 3.94 | 23.11 | 3.91 |
| Experience | Years of work experience | 5.09 | 4.11 | 5.75 | 4.17 |
| Labor union | 1 if participate at labor union, 0 otherwise | 0.20 | 0.40 | 0.24 | 0.43 |
| Student | 1 if currently studying, 0 otherwise | 0.29 | 0.45 | 0.22 | 0.42 |
| Race | 1 if white or Asian, 0 otherwise | 0.40 | 0.49 | 0.35 | 0.48 |
| Urban | 1 if urban, 0 otherwise | 0.88 | 0.33 | 0.85 | 0.36 |
| Poor | 1 if the individual declares himself poor, 0 otherwise | 0.61 | 0.49 | 0.63 | 0.48 |
| Married | 1 if married, 0 otherwise | 0.42 | 0.49 | 0.35 | 0.48 |
| Numberof children | Youths' number of children | 0.76 | 1.06 | 0.45 | 0.82 |
| North | 1 if residing in North region of Brazil, 0 otherwise | 0.11 | 0.31 | 0.10 | 0.30 |
| Midwest | 1 if residing in Midwest region of Brazil, 0 otherwise | 0.04 | 0.20 | 0.06 | 0.24 |
| Northeast | 1 if residing in Northeast region of Brazil, 0 otherwise | 0.26 | 0.44 | 0.26 | 0.44 |
| South | 1 if residing in South region of Brazil, 0 otherwise | 0.14 | 0.35 | 0.14 | 0.34 |
| Southeast | 1 if residing in Southeast region of Brazil, 0 otherwise | 0.45 | 0.50 | 0.44 | 0.50 |

Source: School-to-work transition survey, ILO. Only youths included at the selection equation.

and Northeast) and the Midwest had relatively lower earnings than those residing in the country's wealthier Southeast (omitted variable) and South regions.

When we include youths that are still in school (columns 1–4) the results are smaller than the results for a sample of youths that had completed their education or had dropped out of school (columns 5–8). We also excluded the mother's and father's education when running the earnings equations to see how much the parent's education affects the youth's education. The youths' education coefficients increased when the parents' education variables are omitted. Lam and Schoeni (1993) investigated whether the omission of family background variables led to high returns to schooling in Brazil and concluded that the bias was modest.

It is possible that when parents are low educated and fall into lower income strata, their children need to diligently apply themselves in school and take advantage of whatever educational opportunities are available and thereby open avenues to higher paying jobs. On the other hand, when parents are well educated and have reached a higher economic stratum, they often have elite occupations and can help their children find good jobs, even if the children did not reach higher educational levels.

The impact of schooling for a sample of youths that had completed their education or had dropped out of school (columns 5–8) was not significant for young men with parental control. For women, upon completing high school, their salary would increase 51% compared to girls who had not completed high school. Upon completing higher education, their earnings more than double the value (147%) compared to young women who had not completed high school.

The coefficients in the equations not including parental control were statistically significant for both boys and girls. The results without and with parental control are practically the same for girls. For young males, upon completing high school, there is a 12.5% increase in earnings compared to young men without high school. Upon completing higher education, the salary is 53.2% higher than those who have not completed high school. It is clear that young women have a higher impact of education on earnings with respect to young men. From Table 11 we can observe that women are more educated and receive lower wages compared to men, which may indicate that there is more room for improvements.

The variable age squared in the earnings regressions shows, along with age, a parabolic curve with concavity down. The age coefficient is expected to be positive, but the age squared variable is expected to be negative. This indicates that as a person ages and gains more work experience, his or her salary increases. However, after a certain point, there is a decrease in human capital and returns begin to decline. By including the age squared variable it was observed that its coefficient is not significant in most cases since our sample contains only individuals from 15 to 29 years of age, there is still no parabolic curve formed.

The following analyses show the results of the labor participation equation (probit model). There are also working youths that do not receive wages; in this case, the dependent variable takes value 0.[8] Results from the probit model are shown in Table 13.

[8] The same analyzes were performed considering whether or not young people were employed, regardless of whether they received income. The results were very similar to those obtained in Table 14. However, parental schooling was not statistically significant at the 10% level, except for the total sample of young males, where the father's education was negative and significant at 1%.

**Table 12**
Coefficients of the earnings equations (log earnings/hour) estimated using the Heckman selection model by maximum likelihood for male and female youths from 15 to 29 years old for the whole sample and for only those that were out of school.

| Variable | ln earnings/hour | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | | | Out of school | | | |
| | Male youths | | Female youths | | Male youths | | Female youths | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| High school | 0.0231 | 0.0978 | 0.3343*** | 0.3268*** | 0.0400 | 0.1185* | 0.4119*** | 0.3976*** |
| | (0.072) | (0.062) | (0.116) | (0.102) | (0.078) | (0.066) | (0.146) | (0.114) |
| Higher | 0.1600 | 0.3248*** | 0.7428*** | 0.8422*** | 0.1988 | 0.4268*** | 0.9046*** | 0.9646*** |
| | (0.116) | (0.098) | (0.150) | (0.134) | (0.129) | (0.111) | (0.193) | (0.148) |
| educ_moth | 0.0134* | – | 0.0141 | – | 0.0195** | – | 0.0110 | – |
| | (0.008) | – | (0.009) | – | (0.009) | – | (0.015) | – |
| educ_fath | 0.0153** | – | −0.0023 | – | 0.0081 | – | 0.0010 | – |
| | (0.008) | – | (0.009) | – | (0.009) | – | (0.013) | – |
| Youth Age | 0.2642*** | 0.2369*** | −0.0068 | −0.0654 | 0.1804 | 0.1612 | −0.2157 | −0.2515 |
| | (0.095) | (0.091) | (0.132) | (0.122) | (0.137) | (0.128) | (0.235) | (0.164) |
| Youth Age$\hat{2}$ | −0.0047** | −0.0041** | 0.0008 | 0.0020 | −0.0031 | −0.0027 | 0.0051 | 0.0057 |
| | (0.002) | (0.002) | (0.003) | (0.003) | (0.003) | (0.003) | (0.005) | (0.003) |
| Experience | 0.0070 | 0.0048 | −0.0038 | −0.0007 | 0.0075 | 0.0083 | −0.0049 | −0.0007 |
| | (0.009) | (0.009) | (0.011) | (0.010) | (0.010) | (0.009) | (0.015) | (0.012) |
| Labor union | 0.0370 | 0.0507 | 0.1811* | 0.1911** | 0.0391 | 0.0549 | 0.1172 | 0.1826* |
| | (0.085) | (0.070) | (0.100) | (0.094) | (0.095) | (0.075) | (0.180) | (0.106) |
| Student | 0.0182 | 0.0936 | −0.1290 | −0.1857* | – | – | – | – |
| | (0.090) | (0.084) | (0.093) | (0.097) | – | – | – | – |
| Race | 0.0314 | 0.0737 | −0.0181 | 0.0207 | 0.0854 | 0.1137* | −0.0766 | −0.0145 |
| | (0.060) | (0.056) | (0.074) | (0.071) | (0.072) | (0.065) | (0.089) | (0.083) |
| Urban | 0.1290 | 0.1229 | 0.3498*** | 0.3655*** | 0.0688 | 0.0729 | 0.3590** | 0.3506** |
| | (0.091) | (0.091) | (0.122) | (0.120) | (0.101) | (0.104) | (0.142) | (0.143) |
| North | −0.2528** | −0.1506 | −0.1465 | −0.2207 | −0.1083 | 0.0119 | −0.1934 | −0.1998 |
| | (0.117) | (0.111) | (0.160) | (0.153) | (0.139) | (0.127) | (0.238) | (0.198) |
| Midwest | 0.0416 | 0.0792 | −0.0314 | 0.0184 | 0.0972 | 0.1550 | −0.0684 | −0.0387 |
| | (0.101) | (0.084) | (0.129) | (0.132) | (0.130) | (0.100) | (0.162) | (0.137) |
| Northeast | −0.1857** | −0.1729** | −0.2925*** | −0.3116*** | −0.1226 | −0.1356 | −0.2535** | −0.2924*** |
| | (0.088) | (0.077) | (0.091) | (0.091) | (0.105) | (0.087) | (0.105) | (0.102) |
| South | 0.1144 | 0.1188* | 0.0915 | 0.1060 | 0.1121 | 0.1253* | 0.1534 | 0.1722* |
| | (0.073) | (0.066) | (0.090) | (0.086) | (0.081) | (0.074) | (0.149) | (0.101) |
| Constant | −2.0429* | −1.6347 | 0.5082 | 1.2677 | −0.9791 | −0.6937 | 2.9827 | 3.4959* |
| | (1.094) | (1.034) | (1.489) | (1.387) | (1.611) | (1.485) | (2.777) | (1.871) |
| N. of obs | 666 | 830 | 427 | 504 | 504 | 644 | 298 | 359 |
| Wald Test | 126.71* | 121.70* | 89.49* | 99.30* | 58.70* | 74.80* | 68.84* | 74.65* |

Source: School-to-work transition survey, OIT. Standard deviations are in parentheses.
* Denotes significance at the 1% level.
** Denotes significance at the 5% level.
*** Denotes significance at the10% level.

Columns (1) and (3) of Table 13 present the marginal effects for male and female individuals currently studying and those out of school. Columns (2) and (4) also show the marginal effects by gender, but only for out of school youths, whether they graduated from school or dropped out.

We observe that youth schooling has positive effect on the probability of working, indicating that more years of schooling should lead to a higher probability of employment. When all males are included in the analysis, high school increases the likelihood of working by 7.7 percentage points. If only those who attended high school (completed or dropped out) are considered, the likelihood increases by 12.3 percentage points. The respective values for young females are not statistically significant. The coefficient for mother's and father's schooling were significant and negative in most of the cases. It is expected that the highest the level of mother's and father's education, the more they will value their children's education with respect to working.

Similar to these results, Peek (1978) observed that in the urban area of Khartoum, the capital of Sudan, the mother's education variable had one of the highest influences on their daughters' activities. The author concluded that in families where the mother is relatively well educated, the daughter is more likely to attend school instead of doing housework or working as a paid child laborer. Kassouf (2002) found that both mothers' and fathers' educations had negative and significant effects on the probability of youth employment in Brazil.

[9] The three omitted observations refer to missing values.
[10] Unlike Tables 6 and 7, the analysis on Table 8 considers only two groups: the low group and the high group.

**Table 13**
Marginal effects of the probit model considering the whole sample by gender for youth whether out of school or still studying and only for youths that are out of school (graduated or dropped out).

| Variable | Marginal effect–probit model | | | |
|---|---|---|---|---|
| | Male youths | | Female youths | |
| | Total | Out of school | Total | Out of school |
| Highschool | 0.0771** | 0.1239*** | 0.0488 | 0.0694 |
| | (0.038) | (0.045) | (0.062) | (0.071) |
| Higher education | 0.0954 | 0.0587 | 0.0744 | 0.0608 |
| | (0.059) | (0.071) | (0.084) | (0.108) |
| educ_moth | −0.0087** | −0.0089* | 0.0091 | 0.0200** |
| | (0.004) | (0.005) | (0.006) | (0.008) |
| educ_fath | 0.0011 | −0.0036 | −0.0063 | −0.0141* |
| | (0.004) | (0.005) | (0.006) | (0.008) |
| Youth age | −0.0516 | −0.0488 | 0.0973 | 0.1959* |
| | (0.055) | (0.083) | (0.068) | (0.107) |
| Youth age$\hat{2}$ | 0.0009 | 0.0007 | −0.0023 | −0.0044** |
| | (0.001) | (0.002) | (0.001) | (0.002) |
| Experience | −0.0042 | −0.0032 | −0.0069 | −0.0069 |
| | (0.004) | (0.005) | (0.007) | (0.007) |
| Labor union | 0.2846*** | 0.2939*** | 0.2512*** | 0.2384*** |
| | (0.042) | (0.048) | (0.052) | (0.063) |
| Student | −0.0151 | – | −0.0589 | – |
| | (0.050) | – | (0.063) | – |
| Race | 0.0120 | −0.0084 | −0.0327 | −0.0303 |
| | (0.036) | (0.043) | (0.051) | (0.060) |
| Urban | 0.0861* | 0.0533 | 0.0874 | 0.0656 |
| | (0.048) | (0.055) | (0.072) | (0.094) |
| Married | 0.0156 | −0.0067 | −0.1409*** | −0.1652*** |
| | (0.039) | (0.043) | (0.051) | (0.056) |
| Number of children | −0.0308 | −0.0249 | −0.0310 | −0.0278 |
| | (0.023) | (0.024) | (0.026) | (0.029) |
| Poor | −0.0222 | −0.0226 | 0.1267*** | 0.1287** |
| | (0.036) | (0.041) | (0.047) | (0.058) |
| North | −0.0154 | −0.0759 | −0.0916 | −0.0622 |
| | (0.057) | (0.068) | (0.083) | (0.099) |
| Midwest | −0.1550* | −0.1803* | 0.0452 | −0.0518 |
| | (0.082) | (0.097) | (0.101) | (0.114) |
| Northeast | −0.1426*** | −0.1928*** | −0.0929 | −0.0827 |
| | (0.043) | (0.052) | (0.059) | (0.071) |
| South | 0.0077 | 0.0238 | 0.1058 | 0.1780** |
| | (0.055) | (0.064) | (0.068) | (0.086) |
| Number of obs | 666 | 504 | 427 | 298 |
| Wald test | 78.42* | 68.91* | 83.84* | 69.49* |
| Pseudo R2 | 0.1644 | 0.1938 | 0.1522 | 0.1974 |

Source: School-to-work transition survey, OIT. Standard deviations are in parentheses.
* Denotes significance at the 1% level.
** Denotes significance at the 5% level.
*** Denotes significance at the10% level.

The marginal effect of age is positive and significant only in column (4). Each additional year of age increases the probability of for women getting a job by 19 percentage points. This may be a reflection of the fact that as youth grows older, they become more experienced, mature and responsible, which, as expected, has a positive effect on the likelihood of employment. According to Jensen and Nielsen (1997), since age is associated with maturity, experience, and greater human capital, older youths should have more job opportunities and potentially receive a higher wage than younger job seekers. Barros and Mendonça (1991) analyzed the job participation of youths in three metropolitan Brazilian areas using data from 1987. Their model included only income, region, gender, and age as variables. They also observed that age had a very strong positive effect on labor force participation.

The race coefficient (whites and Asians) was not statistically significant at a 10% level or less. The SWTS survey data show that 33.5% of black, mulatto and indigenous youths are working, while close to 37% of white and Asian youths work.

The probability of working was also found to be higher for Brazilian youths living in the country's urban areas and wealthier regions (South and Southeast) then it is for youths living in its rural areas and poorer regions, such as the North and Northeast. The analyzed survey shows that 36% of the youths living in urban areas work, whereas only 26% of youths living in rural areas work. The South and Southeast regions have the largest percentage of youths working, and the Northeast and Midwest regions have the smallest percentage of youths working. Table 14 shows the percentage of working youths broken-down by Brazilian region.

**Table 14**
Percentage of youths from 15 to 29 years old working, by region.

| Region | Youths working (%) |
|---|---|
| Midwest | 25.2 |
| Northeast | 25.2 |
| North | 35.1 |
| South | 39.3 |
| Southeast | 41.7 |

Source: School-to-work transition survey, ILO.

The results also show that self-declaring poor female are more likely to participate in the labor market, approximately 13 percentage points compared to those who are not poor. The necessity of income increases the probability of entering in the job market. However, according to Barros and Mendonça (1991) the decision of young persons to work and not study is also affected by labor market conditions, not solely by their own economic situation. The authors also point out that the quality of public schools in poorer areas is not high enough to entice youth attendance, and therefore they opt to work.

Finally, the presence of a spouse reduces the likelihood of a young female's employment by 14–16 percentage points. Young women having support from their husband may be able to study or stay home caring for their children and their household.

## 4. Conclusions

The extreme stratification of Brazilian society has resulted in an unequal and unfair distribution of the opportunities for educational and career advancement among the country's population, with those on the lower rungs of Brazil's socioeconomic stratum having very limited educational and employment opportunities. Our study of intergenerational educational mobility produced results that indicate that young people reared in this socioeconomic stratum are acting responsibly and will improve their condition.

Over recent decades, the Brazilian Federal Government has gone through major political change and launched many social programs designed to improve family income and childhood education, especially for the most disadvantage members of society. For example, in 1996 the Federal Government launched the Child Labor Eradication Program (PETI) with the specific objective of eradicating child labor and improving schooling in Brazil. In 2001, to encourage all children to complete eight years of schooling, Brazil launched Bolsa Escola, a conditional cash transfer program that was expanded and renamed Bolsa Familia in October 2003. As of 2020, about 14 million families (or 56 million people, more than a quarter of the Brazilian population) received payments from Bolsa Família. That year the program awarded R$41 per child 15 years of age or less monthly to families living in extreme poverty if the child attended school, with a limit of five children per family. Studies have shown that these programs had significantly increased childhood education and reduced income inequality and poverty in Brazil (Bourguignon et al., 2003; Glewwe and Kassouf, 2012; Barros et al., 2006).

The results show that there is high educational mobility between generations, especially when a youth's parents had lower levels of education. About 57% of the youths in our sample whose parents had at most a primary school education had a high school education, and 5% had undergraduate or graduate degrees. Although we observed some occupational mobility, the educational mobility was much higher. About 17% of the youths whose parents worked in unskilled activities were employed in skilled activities, while 25% worked in the same category as their parents.

Results from the earnings equations showed that the higher a youth's educational level and experience (years of work), the higher his or her hourly earnings. For women, upon completing high school, have an increase in earnings by 51% when compared to young women who had not completed high school. When completing higher education, their earnings more than double (147%) with respect to those that did not even complete high school. For young males, upon completing high school, there is a 12.5% increase in earnings, compared to young males without high school and upon completing higher education, their earnings are 53.2% compared to not having complete high school. It is clear that young women have a much higher impact of education on earnings than young men.

Knowing the importance of education as a mechanism to facilitate social mobility and improve the quality of life for those at the bottom of the income distribution curve, Brazilian policy makers need to focus on improving access to quality education in the country, especially for its most disadvantaged citizens.

## Appendix

**Table A1**
Results from the selection model of the earnings equations.

| Selection model | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | Male youths | | Female youths | | Male youths | | Female youths | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Highschool | 0.2827** | 0.1139 | 0.1679 | 0.2605 | 0.4385*** | 0.1833 | 0.2402 | 0.2858 |
| | (0.141) | (0.116) | (0.195) | (0.168) | (0.160) | (0.128) | (0.223) | (0.180) |
| Higher | 0.4081 | 0.1653 | 0.2130 | 0.3521 | 0.2327 | −0.1318 | 0.1404 | 0.3921 |
| | (0.254) | (0.224) | (0.280) | (0.248) | (0.292) | (0.263) | (0.357) | (0.300) |
| educ_moth | −0.0327** | – | 0.0287 | – | −0.0330* | – | 0.0645** | – |
| | (0.016) | – | (0.020) | – | (0.019) | – | (0.026) | – |
| educ_fath | 0.0041 | – | −0.0213 | – | −0.0132 | – | −0.0496 | – |
| | (0.017) | – | (0.019) | – | (0.020) | – | (0.031) | – |
| Age | −0.1878 | 0.0371 | 0.2343 | 0.1347 | −0.1684 | 0.0815 | 0.5341 | 0.1198 |
| | (0.206) | (0.178) | (0.242) | (0.215) | (0.313) | (0.254) | (0.461) | (0.331) |
| Age$\hat{2}$ | 0.0032 | −0.0013 | −0.0055 | −0.0035 | 0.0023 | −0.0026 | −0.0122 | −0.0035 |
| | (0.004) | (0.004) | (0.005) | (0.005) | (0.007) | (0.005) | (0.010) | (0.007) |
| Experience | −0.0160 | −0.0289* | −0.0186 | −0.0064 | −0.0122 | −0.0305* | −0.0203 | −0.0028 |
| | (0.017) | (0.015) | (0.021) | (0.019) | (0.018) | (0.016) | (0.023) | (0.021) |
| Labor union | 1.5740*** | 1.5293*** | 1.0577*** | 1.1636*** | 1.5566*** | 1.5922*** | 1.0022*** | 1.0473*** |
| | (0.232) | (0.193) | (0.226) | (0.210) | (0.254) | (0.218) | (0.262) | (0.228) |
| Sudent | −0.0598 | −0.0364 | −0.1914 | −0.1410 | – | – | – | – |
| | (0.186) | (0.168) | (0.205) | (0.199) | – | – | – | – |
| Race | 0.0368 | 0.0019 | −0.1091 | −0.0746 | −0.0359 | −0.0734 | −0.1042 | −0.1227 |
| | (0.141) | (0.120) | (0.157) | (0.143) | (0.162) | (0.138) | (0.188) | (0.166) |
| Urban | 0.2980* | 0.1323 | 0.2272 | 0.2698 | 0.1941 | 0.0077 | 0.1925 | 0.2924 |
| | (0.164) | (0.149) | (0.218) | (0.200) | (0.197) | (0.172) | (0.288) | (0.254) |
| North | −0.0611 | −0.0367 | −0.1415 | −0.2331 | −0.2621 | −0.1507 | −0.0355 | −0.1971 |
| | (0.209) | (0.187) | (0.277) | (0.245) | (0.232) | (0.208) | (0.421) | (0.298) |
| Midwest | −0.4878* | −0.3214 | 0.1119 | 0.1893 | −0.5523* | −0.3502 | −0.2060 | −0.1431 |
| | (0.260) | (0.225) | (0.336) | (0.295) | (0.301) | (0.249) | (0.397) | (0.322) |
| Northeast | −0.4757*** | −0.4830*** | −0.3259* | −0.4568*** | −0.6256*** | −0.5193*** | −0.3181 | −0.5027** |
| | (0.150) | (0.127) | (0.177) | (0.160) | (0.175) | (0.146) | (0.275) | (0.198) |
| South | 0.0416 | 0.0344 | 0.2555 | 0.2090 | 0.1021 | 0.1023 | 0.5729 | 0.3693 |
| | (0.215) | (0.182) | (0.260) | (0.227) | (0.255) | (0.215) | (0.540) | (0.318) |
| Married | 0.0576 | 0.1458 | −0.4774*** | −0.4428*** | −0.0291 | 0.1125 | −0.5499** | −0.5213*** |
| | (0.149) | (0.134) | (0.155) | (0.140) | (0.161) | (0.144) | (0.219) | (0.168) |
| Number of children | −0.1162 | −0.0968 | −0.1116 | −0.1014 | −0.0918 | −0.0916 | −0.0982 | −0.1222* |
| | (0.085) | (0.079) | (0.078) | (0.069) | (0.089) | (0.084) | (0.093) | (0.074) |
| Poor | −0.0977 | −0.1026 | 0.3987*** | 0.3344*** | −0.0914 | −0.0965 | 0.4108** | 0.3310** |
| | (0.148) | (0.129) | (0.147) | (0.123) | (0.160) | (0.139) | (0.198) | (0.145) |
| Constant | 3.1572 | 0.5043 | −2.0096 | −0.9476 | 3.4116 | 0.3099 | −5.3510 | −0.5482 |
| | (2.347) | (2.025) | (2.771) | (2.434) | (3.698) | (2.976) | (5.405) | (3.845) |
| Observations | 666 | 830 | 427 | 504 | 504 | 644 | 298 | 359 |

* Denotes significance at the 1% level.
** Denotes significance at the 5% level.
*** Denotes significance at the 10% level.

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