

Teenagers' Education and Migration in Brazil.

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Migration studies have paid attention to education in several ways. First, it has been argued migrants are likely to be selected among the sending population, education being one of the variables differentiating them. Both migrants' higher and lower than the average education level have been analyzed. Second, the effect of parents' migration on children's education has been studied. Third, the educational achievement of the second generation has been considered. Most of the studies have focused on international migration. The effect of internal migration on children and teenagers' education has been less analyzed. This is the topic this study focuses on. Specifically, the extent to which internal migration in Brazil affects teenagers' educational achievement is analyzed, using 2000 census data.

The motivation for this study comes from hearing the opinion of both researchers and policy makers in Brazil, regarding the way internal migration delay the children's school progress. After reaching universal coverage for primary schooling, one of the main problems currently faced by Brazilian education is the age-grade distortion (*defasagem idade serie*), this is to say, the low proportion of students who finish an education cycle in the time they are expected to. Repetition and drop-out are behind this problem. And internal migration is viewed by some Brazilian researchers and policy makers as one of the reasons why students repeat a grade or abandon school in the middle of the academic year, though they may return to school next year. Large proportions of adult Brazilians moving from one locality to another in search of a temporary job would hinder many students' chances to remain on-time, assuming their children either go with them or join them afterwards. In this case, children have to leave the school they started the academic year enrolled in, and they may not find a vacancy in the place they arrive into. Internal migration may also delay school progress if the teenagers are themselves who engage in labor activities, moving as they look for a temporary

job. The problem, as João Batista de Oliveira¹ stated it in a personal interview, would be that *o povo se mixe demais*.

This paper is organized as follows. Section I presents a brief literature review about studies on education and migration. Section II states the research questions. Section III details the methodology employed in order to approach these questions. Section IV presents descriptive statistics about young Brazilian migration and educational variables, as well as the results of the models proposed for answering the research questions. Finally, section V highlights the main findings and discusses conclusive remarks.

I. Literature Review.

Previous Research.

When studying the relationship between migration and education, one area that has produced a large amount of research is that of migrants' selectivity. It has been argued that migrants are different from non-migrants in many areas, education being one of them. Migrants can be positively selected in terms of education, inasmuch as those with a higher attainment can have a stake in looking for a labor market which better returns their human capital. For international migration, some studies have argued that all immigrants are positively selected (Portes and Rumbaut 1996; Treiman et al. 1986), and others have claimed that migrants may be positively or negatively selected (Lee 1966). Borjas explains this difference by arguing immigrants are positively selected when the income distribution in the sending society is egalitarian. When the home-country income distribution is unequal, as compared to the receiving society, immigrants tend to be negatively selected, because those with a lower human capital are more likely to migrate, since they are better rewarded in the receiving labor market.

¹ João Batista de Oliveira is a former World Bank consultant in Education, who has specialized in Brazilian education during the last years.

Borjas found support for this hypothesis using the Mexican case (Borjas 1987, 1991, 1992, 1996) and others have too (Massey and España 1987; Taylor 1986, 1987). Notwithstanding, there are other studies indicating positive education selectivity for Mexican immigrants (Chiquiar and Hanson 2005). Recently, analyzing the 32 major sending countries to the US, Feliciano found evidence of positive selection in education for all immigrants, but Puerto Ricans. She also found the degree of positive selectivity varies considerably by country of origin. Immigrants from Asia tend to be more positively selected than those from Latin America or the Caribbean (Feliciano 2005). Regarding internal migration, most of the studies of education selectivity have been conducted for the US case, finding internal migrants are more likely to be better educated than those who do not migrate (Lieberson 1980; Shryock and Nam 1965; Suval and Hamilton 1965; Tolnay 1998; Long 1973).

Another area of research in the relationship about migration and education is that of the impact of parents' migration on the children who are left behind. Again, most of the studies have focused on international migration to the US. Theoretically, these studies have stressed that having a migrant parent has an unclear effect on children's educational attainment. On the one hand, the remittances migrants send increase the household income, allowing parents to assign more money to their children's education and diminishing the need of child labor. On the other hand, migration alters the family dynamics, generating intra-familial stress. The absence of a disciplinarian figure can disturb children, leading them to poor school performance or dropping out. It can also motivate imitative behaviors in children, who would be tempted to migrate and enter the labor market themselves. Within this framework, Kandel used event history analysis to study how international and internal migration within households affects the likelihood children leave school in Mexico. He found U.S. migration by a sibling increases the likelihood of leaving school, while internal migration

by a sibling reduces it. He also found no significant effect for recent parents' trips on child's education, but a significant effect for accumulated head of the household trips, which he interpreted as a sign of wealth migrants accumulate. Such wealth would be behind the lower chances of a child leaving school (Kandel 2003). Hanson, also studying educational attainment in Mexico and household migration, but observing just international migration to the US, found that children living in households with migrants members complete more years of education than children living in families not experiencing migration, which supports the idea that migrants families have more resources than non-migrants, this is to say, migration would relax a household credit constrains on the financing of education (Hanson and Woodruff 2003). Finally, Cox and Ureta, studying the effect of remittances on Salvadorian children's school attendance, found remittances to have a large, significant and positive effect on school attendance (Edwards and Ureta 2003).

A third, similar area of research regarding the effect of migration on children's education is the study of the immigrants' second generation educational achievement. Portes and Hao analyzed academic attainment and the likelihood of graduating vs. dropping out of high school among immigrant second generation in the US. Provided the group they studied, rather than looking at the consequences of the act of migration on education, they looked at the effect of ethnic composition, both of classes and of schools, on the probability of graduation and on level of educational attainment. They found that length of stay in the US reduce academic performance among the second generation, but also that the ethnic group children belong to impacts their education differently. Basically, different ethnic communities tend to perpetuate their original advantages or disadvantages, supporting the idea different communities have distinctive modes of incorporation (Portes and Hao, 2004).

As clear from above, most of this research has dealt with international migration to the US. This study points to a different problem, inasmuch as is interested in internal migration within Brazil. There is one study that comes closer to the problem of internal migration's impact on children education in a developing context. Curran, Chung, Cadge and Varangrat (2004) analyzed boys and girls differentials in education opportunities in one rural district in Thailand, considering migration as one of the determinants. They noted the social and economic context influence the migration decisions a family makes. So, in the context of rapid labor market expansion in urban areas, which was the case for Thailand during the interval they analyzed (1984-1994), rural residents may see urban migration and wage factory jobs as a competing alternative to schooling. Their findings do not point to critical effects of migration on educational impoverishment. Rather, other factors, such as birth cohort, family size, and land ownership, were more important to explain poor educational achievements. Thought, migration had a significant effect in reducing the gap between boys and girls education achievement, under some circumstances. They found that living in a house with some migrants (either remitting or not) increased girls' secondary schooling opportunities, and for those girls who made the transition to secondary school, having a female remitting migrant increased the chances of continuing schooling (Curran, Chung, Cadge and Varangrat 2004).

Curran et al's study approaches the topic this study focus on, but, as others, it looked at the consequences of other family members' migration on teenagers' education. Most of the studies found evidence of a positive effect of migration on children and teenagers' education. It seems there no much research looking at the way the teenagers' own migration experience impacts their educational achievement. The effect in this case could be detrimental, as some people believe in Brazil, if migrating hinders the children chances to progress in school.

Before going empirically to this question, a brief review of the Brazilian context is presented below.

The Brazilian Educational Context.

Mass education is a relatively recent phenomenon in Brazil. The system is organized in a fundamental cycle (grades 1 to 8), which is compulsory and free of charge in public schools, and a middle cycle (9 to 11), which is also free of charge in public schools, but is not compulsory. Universal coverage for the fundamental level was reached during President Cardoso administration (1996-2002). Middle education coverage is not universal yet. Indeed, the delay is quite important at this level, repetition being one of the reasons behind, as noted by Schwartzman, "many students are not at the level they should be, and there are too many adults occupying the places of young drop-outs...most youngsters between the ages of 15 and 17 are not in secondary education, as they should be, but are lagging behind. Because of repetition, there are about 7 million students in fundamental education that are older than the reference group...In secondary education, about half of the students are 18 years and older, and should have already left school" (Schwartzman, 2004:9-10). Temporary drop out is one of the reasons listed for explaining this delay, "there is an excessive numbers of students leaving schools during the academic year too return next years; admission of over-age students in primary schools, due to lack of targeting for FUNDEF and policies limiting entry age" (Oliveira, 2004: 44). Though, permanent drop out is also behind this problem, increasing as the children grow up, "in 2001, by age 16, 19% of the Brazilian youngsters were already out of school; by age 18, 43%" (Schwartzman, 2004: 11). It has been argued that entering into the labor market is not competing alternative to school, inasmuch as students can combine middle education and work, "when they reach 14, students-mostly the poorer- begin to become active in the labor market. One-third of the 15 year-olds and almost two-thirds of the 17 year olds

are working or looking for jobs. The majority of these youngsters remain in schools. Schools in Brazil are part time and more than 50% of secondary schools are evening schools. However, they enter the labor market with less years of education" (Oliveira, 2004: 54).

Brazil is an extremely diverse country, the North and Northeast being less developed than the South and Southwest. Therefore, is reasonable to expect differential educational attainment by regions, as well as in urban and rural areas. Spatial variables affect education achievement. Several other factors affect the youngster's educational achievement as well. At the household level, a fundamental factor is parents' education and attitudes. The household socioeconomic status and family structure (whether or not both parents are present, which has been conceptualized as intact/non intact families), as well as the number of siblings, have also been found to be significant determinants of school achievement. At the individual level, the student's gender, race/ethnicity and age, as well as his or her school performance and academic aspirations, have been consistently highlighted as significant determinants of educational achievement.

For the Brazilian case, recent results from Paes de Barro have highlighted mothers' education as a key determinant of school progress (Paes de Barro 2001), and results from Marteleto have pointed to a significant relationship between the family size (this is, number of siblings) as well as cohort size (younger cohorts are smaller, as a result of the fertility decline) in determining educational achievements, after controlling for socioeconomic characteristics. Coming from smaller families and cohorts benefits children's school enrolment and attainment (Marteleto 2001).

From this literature review, it is clear that there is a big chance teenagers are not progressing on-time in their schooling, but also that internal migration has not been considered as one of the possible determinants of the delay in previous research, even though

that is the intuition some researchers and policy makers have in mind in Brazil. To what extent internal migration hinders the teenagers' school progress is finally an empirical question, because previous research, even though not pointing specifically to the youngsters' own migration experience, has tend to find a beneficial relationship between children's educational achievement and migration, either because having migrants in the family increases the household income, through remittances, relaxing the financial constrains that could take children out of school, or because migrants are themselves a self-selected group, which tends to advance further in educational terms than non-migrants.

II. Research Questions.

This study will consider educational achievement of Brazilian youngsters, aged 15 to 20 years old. Ideally, this group should either be completing their middle education (grades 9 to 11), between ages 15 and 18, or would have already graduated from school, and would be either coursing post-secondary studies or entering the labor market. This ideal situation, though, does not consider repetition and drop out, which have been stressed as frequent problems in the Brazilian literature. Therefore, it is probable to find people aged 20 who are still in the middle education level, as well as people age 15 who are still in the fundamental education level. For sure, it is also likely to find youths who abandoned school.

Therefore, school attendance and educational attainment will be observed, trying to find out:

- Whether or not migrants' chances of making the transition to middle education differ from those of non-migrants.
- Once the transition has been made, whether or not migrants' chances of remaining in school are different from those of non-migrants.
- How different is the educational attainment of migrants and non-migrants, this is to say, how much of an educational delay sets them apart

The next section details the data and methods used to answer these questions.

III. Data and Methods.

Data from this study comes from a 10% sample of the 2000 Brazilian census. The number of people aged 15-20 was 1,400,022.

In order to model educational attendance and attainment, three dependant variables were used: the probability of making the transition to the middle level vs. not making it (i.e., reaching primary complete or less); the probability of remaining in school once the transition to the middle level was made (vs. dropping out before completing the middle level); and the probability of being delayed vs. being on-time².

On basis of the literature on determinants of educational achievement and the variables available in the census, a number of covariates were included, pertaining the respondent's him or herself, him or her family³, and the space he or she lives in. They are detailed bellow. In each case, the hypothesized sign of their relationship with the educational outcomes is specified.

- Migration status: a dummy indicating whether or not, during the last three years, the respondent has moved from one state to another or from one municipality to another within the same state, those who have not moved being the reference category. Recent migrant are hypothesized to show worse educational outcomes than non-migrants.

² The probability of making the middle level transition was defined as positive for those who were either attending the middle level or who have already completed it; and as negative for those attending the fundamental level, those who abandoned school before completing the fundamental level and those who never attended school. The probability of remaining in school was restricted to those who made the transition, and defined as positive for those attending the middle level, or not attending, but who already completed it; and as negative for those who are not attending the middle level, and have not completed it. Finally the probability of being on-time again considers the whole sample, and was defined using the respondent's age and years of schooling. At each age, people were considered as being on-time if they had the expected years of schooling, assuming they started school at age 7. One year less of the expected was also considered as on-time, provided birthday restrictions. People with more years of schooling than expected, were also considered as on-time, since that reflect they started school at earlier ages. Cases in which people appeared as starting school before age 5 were deleted, as they were assumed to be errors.

³ The unit of reference is the family and not the household.

- Age: a set of dummies for the 15-20 age interval, 15 being the reference. The older the teenager, the less likely he or she will be to enter to the middle level, to remain in it and to advance on-time.
- Gender: a dummy variable, where male is the reference category. It is expected women have less chances of showing positive educational outcomes than men.
- Race: a dummy differentiating White from Non-Whites (*preto, pardo, amarelo, indigena*), with Non-Whites as the reference category. Whites are expected to be more likely to show positive educational outcomes.
- Employment status: a set of dummies indicating whether or not the youngster is working, unemployed or inactive, the last being the reference category. Inactive youths are expected to show better educational outcomes than working or unemployed youths.
- Relationship with the head of the family: a set of dummies indicating the position of the respondent within the family, namely, the head of the family; the head's spouse or partner; children living with both parents; children living with just one parent; other relatives; or other people, not related to the head of the family. Children living with both parents are the reference group, hypothesizing they will be more likely to make the transition to the middle level, to remain in there and to be on-time.
- Family income: measured by a set of dummy variables specifying quartiles of monthly per-capita family income. The lower quartile is the reference category. The higher the income, the more likely teenagers have positive education outcomes.
- Head of the family's gender: a dummy variable indicating whether the family is headed by a men or a woman. Male is the reference category, hypothesizing female-headed families are more vulnerable and, therefore, teenagers living in them will be less likely to enter to the middle level, to complete it and to progress properly.

- Region of the country: a set of dummies indicating where the respondent lived: Southeast, South, Central West, North or Northeast, the first one being the reference category. Teenagers living in the Southeast are expected to have an educational advantage over their peers living in other areas.
- Urban status: a dummy variable indicating whether or not the respondent lived in an urban or rural locality, the former one being the reference group. Rural teenagers are expected to be less likely to make the transition to middle education, to remain in school and to progress in the proper time-line.

Using all the above covariates, a set of logistic regressions were run. Model 1 refers to the probability of making the transition to middle level, Model 2 to the probability of remaining in school provided the transition was made, and Model 3 to the probability of advancing on-time in the educational ladder. A separated set of models were estimated, but they are not analyzed, because the results did not change by much the impact of migration, which is the core variable this study is interested in. The first set includes separated models for people aged 15-17 and 18-20, and for men and women, using the same models' specification. The second set of regressions was estimated for those youngsters whose relationship with the head of the household was that of being children (77.38% of the sample). In this case, mother's education can be added as a control variable. At the same time, the set of dummies for relationship with the head of the family changes to belonging to bi or mono-parental family. Mother's education is an important determinant of educational achievement, but including it in the model restricted the sample to those who were children within the family. The excluded probably were not a random sub-sample, but youths who had started their own family at early ages, in many cases because of teenage fertility. Therefore, it was decided not to

exclude them, and to estimate the models for the whole sample, at the cost of losing the mothers' education variable. Results for all these models can be found in the Appendix.

The next section presents descriptive statistics about education and recent migration, as well as the rest of the covariates, and the models estimates.

IV. Results.

Descriptive Statistics.

Socio-demographics.

Table 1 indicates about 10% of the people aged 15-20 are recent migrants, meaning they changed their place of residence during the last three years. Most of them lived in a different municipality, within the same state. Just a small percentage migrated from other country.

Table 1: Migration status according to previous residence during the last three years

Non-migrant	90.33
Migrant, same state (different municipality)	5.89
Migrant, different state	3.70
Migrant, abroad	0.08
Total	100 (n=1,393,205)

Adding together those who are migrants, as different from non-migrants, table 2 summarizes the covariates differences between these two groups.

Table 2: 15-20 years old Brazilians Characteristics by Migration Status.

	Migrant	Non-migrant	Total
Age			
15	14.35%	16.57%	16.35%
16	15.22%	17.08%	16.89%
17	16.53%	17.61%	17.51%
18	17.75%	17.42%	17.45%
19	17.53%	15.73%	15.92%
20	18.62%	15.58%	15.89%
Gender			
Male	45.04%	51.36%	50.72%
Female	54.96%	48.64%	49.28%
Race			
White	51.24%	49.88%	50.02%
Black	5.49%	6.35%	6.26%
Indigenous	0.44%	0.42%	0.42%
Asian	0.31%	0.37%	0.36%
Brown (Brazil)	41.83%	42.24%	42.2%
Unknown	0.69%	0.75%	0.74%
Employment status			
Working	40.05%	36.26%	36.64%
Unemployed	15.82%	16.53%	16.46%
Inactive	44.13%	47.21%	46.9%
Relationship with head of the family			
Head or spouse	25.21%	11.84%	13.18%
Child both parents	39.49%	63%	60.64%
Child one parent	12.58%	17.23%	16.76%
Other relative	17.11%	7.03%	8.04%
Other non relative	5.62%	0.9%	1.37%
Head of the family's gender			
Male	75.96%	75.24%	75.31%
Female	24.04%	24.76%	24.69%
Family income per capita (mean)	317.5	287.5	295
Urban status			
Rural	16.79%	21%	20.58%
Urban	83.21%	79%	79.42%
Region			
North	10.18%	8.38%	8.56%
Northeast	25.82%	31.87%	31.26%
Southeast	37.96%	40.1%	39.89%
South	15.09%	13.26%	13.45%
Midwest	10.95%	6.38%	6.84%

In terms of age, migration increases as teenagers approach adulthood, even though the differences are small. Women are more likely to migrate than men (54.96% of women are recent migrants, vs. 45.04% of men). There seems to be not important differences in terms of race, the majority being White or Brown (*pardos*). Migrants are more likely to be working and

less likely to be inactive, which at the target age-interval includes students and housewives. One area of interesting differences is family structure. According to their relationship with the head of the family, recent migrants are more likely to have initiated their own family, in so far as their position within the family is being the head or the head's spouse or partner themselves. They are also more likely to be relatives, other than children, or a non-relative living with the family. The family structure of 15-20 years old non-migrants appears as much more traditional, since more than 60% are children living in a bi-parental family. About one quarter of the families are headed by women, the same for migrants and non-migrants. Migrants appear to be in a better position than non-migrants in terms of income, since their per-capita median family income is higher. There is slightly more urban-settlers among migrants than non-migrants. Finally, migrants are more likely to live in the more developed Southeast and less likely to live in the poorer Northeast region of the country.

Education.

Table 3 gives initial information about educational achievement among 15-20 years old Brazilians. It shows current school attendance differences, indicating migrants are less likely to be attending school than non-migrants.

Table 3: Education Attendance by Migration Status.

School Attendance	Migration Status		Total
	Migrant	Non-migrant	
Currently attending	50.95	64.85	63.45
No, attended in the past	47.14	33.12	34.53
No, never attended	1.91	2.03	2.02
Total	100	100	100

The former numbers, though, hide differences in school attendance according to age.

Table 4 portrays that information, showing, as expectable, school attendance diminishes as people get older.

Table 4: Education Attendance by age.

Age	School Attendance			Total
	Currently attending	No, attended in the past	No, never attended	
15	79.85	18.44	1.7	100
16	75.82	22.4	1.78	100
17	69.81	28.36	1.83	100
18	59.35	38.57	2.09	100
19	51.06	46.79	2.15	100
20	43.36	54.04	2.6	100
Total	63.45	34.53	2.02	100

Figure 1 shows the number of years of schooling completed by the whole sample, at different ages. It has two peaks, at grade 8th and 11th, which correspond to complete primary and secondary, respectively.

Figure 1: Years of Schooling by age

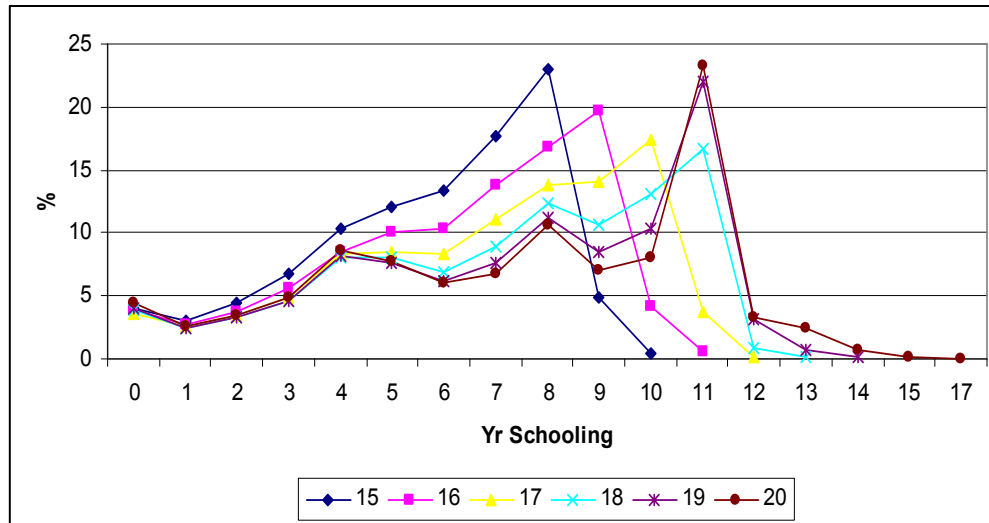


Figure 2 shows the years of schooling attained by migrants and non-migrants, indicating migrants are above the curve of non-migrants during the first 8 years of schooling, and below them afterwards, this is to say, they attain less education.

Figure 2: Years of Schooling by Migration Status

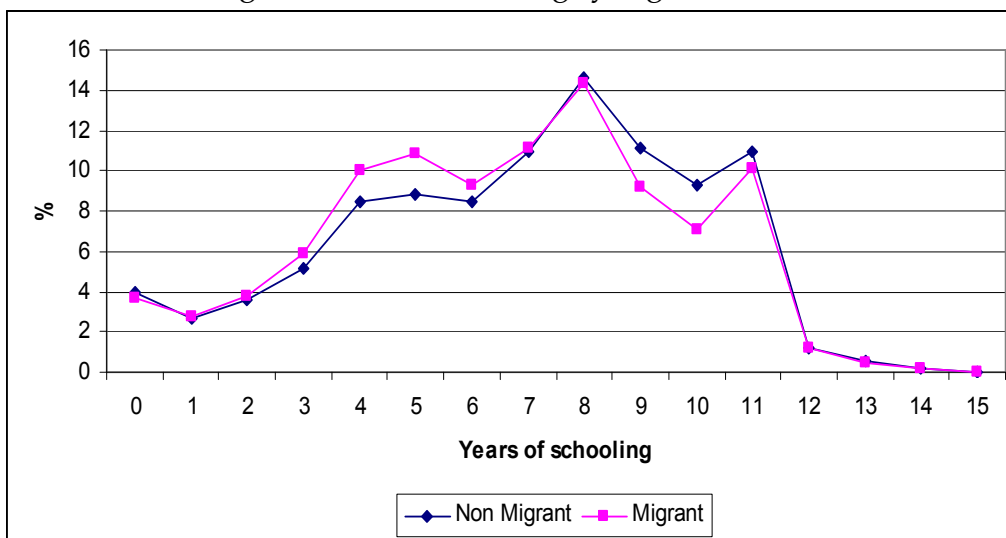


Table 5 summarizes the three educational outcomes this study inquires about, indicating migrants are less likely to make the transition to middle education, to remain in there provided they made the transition, and to be on-time in terms of school progress. The table also shows that, regardless of their migration status, not many Brazilians make the transition to middle education (41.16%), and most of them are not progressing in the ideal schedule (just 30.74% are on-time). Interestingly, the percentage that remains in school, provided they started middle education, is quite high (92.79%). This finding suggests that main problem for the extension of secondary schooling in Brazil is making the transition to the middle level, and not an increasing risk of dropping out as children grow up.

Table 5: Education Outputs by Migration Status.

	Migrant	Non-migrant	Total
Made the transition to the middle level	35.49	41.79	41.16
Remained in the middle level	88.86	93.16	92.79
On time	25.52	31.32	30.74

Models Estimates.

Odds ratios for the three educational outcomes estimated models are presented in

Table 6.

Table 6: Estimated Odd Ratios from Logistic Models Predicting Likelihood Positive Educational Outcomes.

	Model 1.		Model 2		Model 3	
	Transits to middle		Remains in middle		Advances on time	
Recent migrant	0.760***	(0.005)	0.735***	(0.012)	0.787***	(0.006)
16 years old	1.563***	(0.011)	0.342***	(0.011)	0.587***	(0.004)
17 years old	1.994***	(0.014)	0.253***	(0.008)	0.403***	(0.003)
18 years old	2.377***	(0.017)	0.280***	(0.009)	0.289***	(0.002)
19 years old	2.597***	(0.019)	0.294***	(0.009)	0.229***	(0.002)
20 years old	2.739***	(0.021)	0.304***	(0.010)	0.307***	(0.002)
Female	1.603***	(0.007)	1.063***	(0.012)	1.701***	(0.008)
White	1.574***	(0.007)	1.136***	(0.014)	1.686***	(0.008)
Working	0.851***	(0.004)	0.778***	(0.010)	0.877***	(0.005)
Unemployed	1.109***	(0.007)	0.950**	(0.015)	1.019**	(0.007)
Head or spouse	0.400***	(0.003)	0.244***	(0.004)	0.501***	(0.004)
Child, one parent	0.825***	(0.007)	0.735***	(0.016)	0.879***	(0.008)
Other relative	0.622***	(0.005)	0.745***	(0.017)	0.629***	(0.006)
Other non relative	0.352***	(0.007)	0.686***	(0.036)	0.328***	(0.008)
Female-headed family	1.155***	(0.008)	1.223***	(0.023)	1.112***	(0.009)
2 nd income quartile	1.484***	(0.009)	0.931***	(0.017)	1.535***	(0.012)
3 rd income quartile	2.484***	(0.016)	1.078***	(0.020)	2.722***	(0.020)
4 th income quartile	5.854***	(0.039)	1.936***	(0.038)	6.829***	(0.053)
North	0.657***	(0.005)	1.552***	(0.039)	0.548***	(0.005)
Northeast	0.660***	(0.003)	1.902***	(0.031)	0.573***	(0.003)
South	1.118***	(0.007)	1.009	(0.015)	1.068***	(0.007)
Midwest	0.793***	(0.006)	1.246***	(0.027)	0.748***	(0.007)
Rural	0.444***	(0.002)	0.958***	(0.016)	0.484***	(0.003)
Number of observations	1384910		531844		1324710	
χ^2	249857.160		21222.910		230056.420	
<i>df</i>	23		23		23	
<i>Pseudo R2</i>	0.1814		0.0753		0.2007	

* $p < .05$. ** $p < .01$. *** $p < .001$.

Standard errors in parenthesis

The net effect of recent migration is significant and goes in the expected direction, worsening the achievement of 15-20 years old Brazilians. According to Model 1, recent migrants are 24% less likely to make the transition to middle education than non-migrants. Similarly, migrants who accede to the middle level are 26.5% less likely to remain in school than non-migrants, as seen in Model 2. Finally, migrants are 21.3% less likely to be on-time in terms of school progress, as seen in Model 3.

The rest of the covariates were significant (with the exemption of the dummy for Urban/Rural status in Model 2, predicting the likelihood of remaining in school). Regarding the individual-related variables, and according to Model 1, age increases the likelihood of making the transition to the middle level, as 20 years old youths are 2.7 times more likely to have entered to *ensino médio* than 15 years old teenagers. This makes sense, considering the delay among Brazilian students, so as time goes by, they have more chances to catch up the attainment they should have. Though, age does not have the same effect in the other two models. In Model 2, age first decreases the likelihood of remaining in school, as 16 and 17 years old youths are 65.8% and 74.7 % less likely to remain in school than 15 years old teenagers. But at older ages the likelihood slightly increases again, as 18, 19 and 20 years old youngsters are about 70% less likely than 15 years old teenagers of remaining in school. According to Model 3, age appears to reduce the probability of being on-time in terms of school progress, as the odds ratios decrease with each additional year, making 20 years old people 69.3% less likely to be on time than 15 year old teenagers.

The net effect of gender goes on the contrary of hypothesized direction. Women are 60.3% more likely than men to enter the middle level and 70.1% more likely to be on-time, and there are no substantial differences in the chances of remaining in school. White youngsters, as compared to other races, are 57.4% more likely to make the transition to the

middle level, 13.6% more likely to remain in there, given they made the transition, and 68.6% more likely advance in the proper schedule in school. In terms of employment status, working reduces the chances of making the transition to middle education, of remaining in there and of being on-time. Unemployed youths have slightly higher chances to enter to middle education and to progress on-time, but slightly lower chances of maintaining in school. The net of effect of unemployment, though statistically significant, is not practically important, since its odds ratios in the three models are very close to 1.

Regarding the family-related variables, in all the three models the set of dummy variables detailing position within the family behaved as expected, showing children living with both parents (the reference category) are more likely to make the transition to middle education, to remain in there and to progress on-time. Those teens who have formed their own family at early ages, this is to say, who are the head of the family, or the head's spouse or partner, are 60% less likely to enter to *ensino medio*, 75.6% less likely to remain in that level, and 50% less likely to be on-time than children living with both parents. Another category which seems to be especially vulnerable is that of other non relatives living with the family. They are 64.8% less likely to enter to middle education and 67.2% less likely to be on-time than children living with both parents.

Contrary to expected, living in a female-headed family has a small, but positive effect on educational achievement. Youngsters who live in this type of families are 15.5% more likely to enter to *ensino medio*, 22.3 % more likely to remain in school and 11.2% more likely to advance on the proper schedule than teenagers living in male-headed families.

The effect of income, as measured by quartiles, goes in the expected direction. Youngsters living in families with higher income are more likely to show positive educational outcomes. In the extreme, those who belong to the last quartile (the richer) are 5.6 times more

likely to make the transition to the middle level, almost twice as likely to remain in school, and 6.8 times more likely to progress on-time. One interesting point to stress is that the net effect of income seems to be more striking for making the middle education transition and for progressing on-time, whereas the impact on remaining in school is lower in magnitude, though still considerable.

Regarding the spatial-related variables, and as seen in Model 1 and Model 3, in general, living in a region of the country other than the Southeast decreases the chances of making the transition to middle level and of being on-time. The exception is the South, which odds ratio is about one, indicating no difference between the teenagers living in the South and the Southeast. This makes sense, since these two are the more developed regions of Brazil. Model 2, instead, indicates that living in a region of the country other than the Southeast increases the chances of remaining in school, once teenagers accede to *ensino médio*. Interestingly, looking at the odds ratio for the poorer region of Brazil, Northeastern youths are 90.2% more likely than Southeastern youths to remain in school. This effect can be carrying some region-specific characteristics related to drop-out, such as policies designed to avoid it. Again, the odds ratio for the South was not substantially different than the Southeast reference.

Finally, living in a rural area decreases the probability of reaching the middle level and of advancing on the proper schedule, by 55.6% and 51.6%, as compared with living in urban areas. Living in rural areas has not significant effect in the probability of remaining in school.

As stated before, separated models were estimated for ages 15-17 and 18-20, for men and women, and for children, adding, in the latter case, mother's education as a control variable. Since the effect of recent migration is about the same, they are not included in here, but can be found in the Appendix.

V. Discussion.

This paper used data from the 2000 Brazilian census to inquire about the effect of migration on teenagers' educational achievements, finding recent migrants were more likely to show worse achievements than non-migrants. Net of relevant individual, familial and geographic characteristics, recent migrants were 24% less likely to make the transition to middle education, 26.5% less likely to remain in school and 21.3% less likely to progress in the proper time-line than non-migrants. The results support the intuition which motivated this paper, namely, that migration would obstruct educational achievement among young Brazilians. Though, blaming migration for all the delay does not seem to be fair. Differences in the three educational outcomes considered in this paper between migrant and non-migrants never reached 10%, as seen in Table 5. Even though migration had a detrimental effect on teenagers' education, other factors certainly play a fundamental role when explaining why just about 40% of 15-20 year old Brazilian made the transition to middle education and 30% progressed in the proper schedule in the educational ladder.

In this vein, this study's findings support previous research regarding the effect of several determinants of educational achievement, such as family income, race, urban/rural status and region of the country. Two core demographic areas which call the attention are age and gender. There are studies finding women are more likely to go further in the academic arena than men in developing countries, especially once they surpass the frontier of secondary education. The results of this study point to that direction, as women were more likely to accede to middle education, to remain in there, and to advance on-time. Similarly, teens living in female-headed households faced a more optimistic panorama than those living in male-headed households. Rather than suggesting that female-headed families are less vulnerable, this funding suggests women may be more concerned about improving the educational

attainment of their children, so when the decision-making power relies on their hands they may be more prone to favor the permanence of children in school than men. A similar intuition was behind the design of the well-known cash transfer program Brazil has implemented for improving school attendance, *Bolsa Escola*, which grants families a determined amount of money for each children aged 6-15 years who attends school. Rather than the head of the household, who can be man or woman, the recipient of the *bolsa* is the child's mother or female tutor, as they are thought to be more likely to invest the money in education or children-related expenses.

In terms of age, the results are more intriguing. One thing that is clear is that as the youngsters reach adulthood their chances of being on-time in terms of school progress reduce. The idea of age accounting for an accumulated delay is consistent with the higher probability of making the transition to middle level education as teenagers get older. The mixed sign of age on the probability of remaining in school, recalling that age first has a negative and then a positive effect on it, may be accounting for temporary abandonment. Overall, this is an area in which further research is needed.

Besides the age issue, several questions to be further explored open from these findings. First, analyzing the interactions between migration and several of the covariates included in this study, such as gender, age, employment status and region of the country, will probably add interesting information about the way migration impacts the youth educational achievement. Second, analyzing the spatial dynamics of migration can help to better understand the problem. Whether urban-rural and rural-rural migrants, or migrants coming from certain localities and going to particular destinations, differ or not in educational achievement is certainly an area of research which should be further pursued. Third, using more recent data, such as the PNAD survey (*Pesquisa Nacional por Amostra de Domicílios*), which

is available for 2004, can incorporate recent changes in the Brazilian context and validate the patterns found here.

Finally, it is worthy to highlight the low proportion of both migrants and non-migrants who abandon the middle level education provided they started it. Migrants are some more vulnerable than non-migrants in this realm, but the key finding here is that once the transition to *ensino médio* has been made, youngsters are not outstandingly prone to abandon school, contrary to the common sense expectation, and suggesting the problem for the expansion of middle education in Brazil lies mainly in making students enter the middle level. In terms of policies, making middle education compulsory by law is one of the first steps required for expanding enrollment in middle education.

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APPENDIX.

Table 1: Estimated Odd Ratios from Logistic Models Predicting
Likelihood Positive Educational Outcomes, 15-17 years old sub-sample.

	Model 1	Model 2	Model 3
Recent migrant	0.754*** (0.005)	0.736*** (0.012)	0.809*** (0.006)
16 years old	0.809*** (0.004)	0.994 (0.017)	1.362*** (0.008)
17 years old	1.006 (0.005)	0.750*** (0.010)	0.975*** (0.006)
Female	1.594*** (0.007)	1.057*** (0.012)	1.656*** (0.008)
White	1.570*** (0.007)	1.139*** (0.014)	1.632*** (0.008)
Working	1.033*** (0.005)	0.688*** (0.008)	0.666*** (0.003)
Unemployed	1.287*** (0.007)	0.855*** (0.013)	0.817*** (0.005)
Head or spouse	0.505*** (0.003)	0.216*** (0.003)	0.369*** (0.003)
Child, one parent	0.852*** (0.007)	0.720*** (0.016)	0.850*** (0.007)
Other relative	0.651*** (0.005)	0.719*** (0.016)	0.612*** (0.005)
Other non relative	0.374*** (0.007)	0.654*** (0.034)	0.323*** (0.007)
Female-headed family	1.148*** (0.008)	1.225*** (0.023)	1.113*** (0.008)
2 nd income quartile	1.487*** (0.009)	0.928** (0.017)	1.505*** (0.011)
3 rd income quartile	2.507*** (0.016)	1.065*** (0.020)	2.546*** (0.019)
4 th income quartile	6.017*** (0.040)	1.881*** (0.037)	5.791*** (0.044)
North	0.665*** (0.005)	1.528*** (0.038)	0.558*** (0.005)
Northeast	0.677*** (0.003)	1.863*** (0.031)	0.570*** (0.003)
South	1.091*** (0.007)	1.028 (0.015)	1.100*** (0.007)
Midwest	0.788*** (0.006)	1.246*** (0.027)	0.767*** (0.007)
Rural	0.446*** (0.002)	0.963*** (0.016)	0.506*** (0.003)
Number of observations	1384910	531844	1324710
χ^2	240768.560	20842.630	209643.300
<i>df</i>	20	20	20
<i>Pseudo R2</i>	0.1685	0.0672	0.174

* $p < .05$. ** $p < .01$. *** $p < .001$.

Standard errors in parenthesis

Table 2: Estimated Odd Ratios from Logistic Models Predicting Likelihood Positive Educational Outcomes, 18-20 years old sub-sample.

	Model 1		Model 2		Model 3	
Recent migrant	0.756***	(0.005)	0.737***	(0.012)	0.802***	(0.006)
19 years old	1.495***	(0.008)	0.935***	(0.013)	0.474***	(0.003)
20 years old	1.559***	(0.009)	0.977	(0.014)	0.645***	(0.004)
Female	1.601***	(0.007)	1.055***	(0.012)	1.669***	(0.008)
White	1.572***	(0.007)	1.138***	(0.014)	1.645***	(0.008)
Working	0.956***	(0.004)	0.707***	(0.009)	0.737***	(0.004)
Unemployed	1.226***	(0.007)	0.869***	(0.014)	0.872***	(0.006)
Head or spouse	0.443***	(0.003)	0.227***	(0.004)	0.423***	(0.004)
Child, one parent	0.839***	(0.007)	0.724***	(0.016)	0.864***	(0.007)
Other relative	0.639***	(0.005)	0.724***	(0.017)	0.621***	(0.006)
Other non relative	0.364***	(0.007)	0.666***	(0.035)	0.326***	(0.008)
Female-headed family	1.149***	(0.008)	1.224***	(0.023)	1.112***	(0.009)
2 nd income quartile	1.479***	(0.009)	0.931***	(0.017)	1.512***	(0.011)
3 rd income quartile	2.473***	(0.015)	1.073***	(0.020)	2.600***	(0.019)
4 th income quartile	5.865***	(0.039)	1.910***	(0.038)	6.136***	(0.047)
North	0.662***	(0.005)	1.535***	(0.039)	0.557***	(0.005)
Northeast	0.670***	(0.003)	1.877***	(0.031)	0.574***	(0.003)
South	1.105***	(0.007)	1.022	(0.015)	1.085***	(0.007)
Midwest	0.791***	(0.006)	1.247***	(0.027)	0.761***	(0.007)
Rural	0.446***	(0.002)	0.962***	(0.016)	0.500***	(0.003)
Number of observations	1384910		531844		1324710	
χ^2	244072.180		20394.650		216568.010	
<i>df</i>	20		20		20	
<i>Pseudo R2</i>	0.1724		0.0657		0.1816	

* $p < .05$. ** $p < .01$. *** $p < .001$.

Standard errors in parenthesis

Table 3: Estimated Odd Ratios from Logistic Models Predicting Likelihood Positive Educational Outcomes, Men sub-sample.

	Model 1		Model 2		Model 3	
Recent migrant	0.795***	(0.008)	0.721***	(0.019)	0.842***	(0.010)
16 years old	1.552***	(0.016)	0.367***	(0.019)	0.581***	(0.006)
17 years old	1.980***	(0.020)	0.259***	(0.013)	0.388***	(0.004)
18 years old	2.337***	(0.024)	0.254***	(0.012)	0.274***	(0.003)
19 years old	2.496***	(0.027)	0.255***	(0.013)	0.212***	(0.003)
20 years old	2.613***	(0.028)	0.258***	(0.013)	0.282***	(0.003)
White	1.585***	(0.010)	1.124***	(0.020)	1.724***	(0.012)
Working	0.670***	(0.005)	0.547***	(0.011)	0.690***	(0.005)
Unemployed	0.927***	(0.008)	0.759***	(0.020)	0.849***	(0.008)
Head or spouse	0.723***	(0.010)	0.355***	(0.010)	0.975	(0.018)
Child, one parent	0.877***	(0.010)	0.906**	(0.031)	0.939***	(0.012)
Other relative	0.646***	(0.007)	0.832***	(0.028)	0.665***	(0.009)
Other non relative	0.504***	(0.017)	0.616***	(0.051)	0.571***	(0.024)
Female-headed family	1.031**	(0.010)	0.968***	(0.030)	0.985	(0.011)
2 nd income quartile	1.518***	(0.014)	0.932**	(0.028)	1.561***	(0.018)
3 rd income quartile	2.538***	(0.023)	1.048	(0.031)	2.754***	(0.031)
4 th income quartile	5.941***	(0.057)	1.697***	(0.052)	7.039***	(0.081)
North	0.644***	(0.007)	1.317***	(0.048)	0.542***	(0.008)
Northeast	0.640***	(0.005)	1.829***	(0.047)	0.559***	(0.005)
South	1.102***	(0.009)	0.964	(0.021)	1.041***	(0.009)
Midwest	0.756***	(0.009)	1.232***	(0.041)	0.725***	(0.009)
Rural	0.475***	(0.004)	1.065***	(0.027)	0.518***	(0.005)
Number of observations	710156		246348		676087	
χ^2	118687.260		6966.980		109310.710	
<i>df</i>	22		22		22	
<i>Pseudo R2</i>	0.1678		0.0598		0.1932	

* $p < .05$. ** $p < .01$. *** $p < .001$.

Standard errors in parenthesis

Table 4: Estimated Odd Ratios from Logistic Models Predicting Likelihood Positive Educational Outcomes, Women sub-sample.

	Model 1		Model 2		Model 3	
Recent migrant	0.730***	(0.007)	0.736***	(0.016)	0.745***	(0.008)
16 years old	1.601***	(0.016)	0.334***	(0.014)	0.601***	(0.006)
17 years old	2.072***	(0.021)	0.259***	(0.011)	0.424***	(0.004)
18 years old	2.520***	(0.026)	0.320***	(0.013)	0.308***	(0.003)
19 years old	2.818***	(0.030)	0.350***	(0.015)	0.248***	(0.003)
20 years old	2.948***	(0.032)	0.363***	(0.015)	0.331***	(0.004)
White	1.557***	(0.009)	1.143***	(0.018)	1.648***	(0.011)
Working	1.030***	(0.007)	0.941**	(0.016)	1.063***	(0.008)
Unemployed	1.254***	(0.010)	1.029	(0.021)	1.155***	(0.010)
Head or spouse	0.338***	(0.003)	0.209***	(0.004)	0.435***	(0.004)
Child, one parent	0.782***	(0.009)	0.637***	(0.019)	0.834***	(0.010)
Other relative	0.596***	(0.007)	0.689***	(0.022)	0.598***	(0.008)
Other non relative	0.273***	(0.006)	0.656***	(0.045)	0.249***	(0.007)
Female-headed family	1.290***	(0.012)	1.421***	(0.033)	1.230***	(0.013)
2 nd income quartile	1.493**	(0.013)	0.944***	(0.023)	1.534***	(0.016)
3 rd income quartile	2.552***	(0.022)	1.136***	(0.027)	2.768***	(0.028)
4 th income quartile	6.044***	(0.057)	2.227***	(0.059)	6.842***	(0.072)
North	0.674***	(0.008)	1.749***	(0.060)	0.558***	(0.007)
Northeast	0.680***	(0.005)	1.945***	(0.042)	0.587***	(0.005)
South	1.138***	(0.010)	1.049**	(0.021)	1.097***	(0.010)
Midwest	0.838***	(0.010)	1.258***	(0.037)	0.775***	(0.010)
Rural	0.433***	(0.003)	0.911***	(0.020)	0.472***	(0.004)
Number of observations	674754		285496		648623	
χ^2	130056.200		14607.300		119834.300	
<i>df</i>	22		22		22	
<i>Pseudo R2</i>	0.1932		0.0956		0.2029	

* $p < .05$. ** $p < .01$. *** $p < .001$.

Standard errors in parenthesis

Table 5: Estimated Odd Ratios from Logistic Models Predicting Likelihood Positive Educational Outcomes, Children sub-sample.

	Model 1		Model 2		Model 3	
Recent migrant	0.728***	(0.007)	0.696***	(0.017)	0.720***	(0.007)
16 years old	1.585***	(0.012)	0.327***	(0.011)	0.574***	(0.004)
17 years old	2.052***	(0.016)	0.255***	(0.009)	0.389***	(0.003)
18 years old	2.450***	(0.020)	0.288***	(0.010)	0.272***	(0.002)
19 years old	2.655***	(0.022)	0.307***	(0.011)	0.204***	(0.002)
20 years old	2.806***	(0.025)	0.313***	(0.011)	0.275***	(0.003)
Female	1.710***	(0.008)	1.116***	(0.014)	1.803***	(0.009)
White	1.482***	(0.007)	1.099***	(0.016)	1.575***	(0.008)
Working	0.857***	(0.005)	0.709***	(0.011)	0.919***	(0.005)
Unemployed	1.111***	(0.007)	0.892***	(0.017)	1.048***	(0.008)
Child, one parent	0.828***	(0.008)	0.808***	(0.028)	0.877***	(0.009)
Female-headed family	1.056***	(0.010)	1.028	(0.035)	1.013	(0.010)
2 nd income quartile	1.530***	(0.011)	0.901***	(0.022)	1.571***	(0.014)
3 rd income quartile	2.512***	(0.018)	1.009	(0.024)	2.706***	(0.023)
4 th income quartile	5.266***	(0.041)	1.697***	(0.044)	6.036***	(0.054)
North	0.563***	(0.005)	1.392***	(0.045)	0.483***	(0.005)
Northeast	0.597***	(0.004)	1.704***	(0.034)	0.521***	(0.003)
South	1.146***	(0.008)	1.045**	(0.019)	1.090***	(0.008)
Midwest	0.747***	(0.007)	1.245***	(0.035)	0.710***	(0.007)
Rural	0.506***	(0.003)	1.067**	(0.021)	0.543***	(0.004)
Mother's education fundamental or less ^a	0.558***	(0.005)	0.577***	(0.015)	0.543***	(0.005)
Mother's education middle complete or incomplete ^a	1.404***	(0.014)	0.836***	(0.024)	1.281***	(0.013)
Number of observations	1078035		444930		1033211	
χ^2	211548.360		7046.320		198898.670	
<i>df</i>	22		22		22	
<i>Pseudo R2</i>	0.2033		0.0411		0.2169	

* $p < .05$. ** $p < .01$. *** $p < .001$.

Standard errors in parenthesis

^a The reference category for mother's education is some post-middle education