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Social Mobility and Productive Inclusion of Low-Income Families

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1. INTRODUCTION

Social mobility is a process that unfolds over time and in multiple dimensions. In its broadest form, it can be understood as the displacement of an individual or group along the social structure, especially in terms of income, education, or occupational position. In this working paper, we articulate two complementary approaches to understanding the trajectories of poor people in Brazil: one that looks at the potential for long-term ascension, and another that captures the recent achievement of productive inclusion.

The first approach, represented by the **Atlas of Social Mobility**[1], estimates, for each municipality, the probability of an individual born between 1983 and 1990 in a family located in the poorest 50% of the income distribution reaching different ranges of income distribution when aging from 25 to 29 years old. It is a measure of relative intergenerational mobility, useful for comparing opportunity structures between territories.

second, developed in the study ***Bolsa Família*: Frist Generations** [2], follows the insertion in the labor market of young people who lived in families benefiting from the program in 2005. By cross-referencing the Unified Registry (*CadÚnico*), the *Bolsa Família* payroll and the Annual Report of Social Information (RAIS), the study observes whether these young people, then aged between 7 and 16 years, obtained formal contracts between 2015 and 2019. The central variable is the formalization rate, understood as the proportion of young people who had formal employment relationships in at least three different years over the period analyzed.

These two lenses, looked at together, allow an exploratory analysis of the ways to overcome poverty. More than describing different realities, this integrated approach seeks to indicate which characteristics of individuals and territories are associated with the transformation of opportunities into real trajectories of social ascension. By doing so, it contributes to the design of more efficient public policies, guided by evidence that take into account territorial inequalities.

The results suggest a positive relationship between mobility and productive inclusion. Municipalities with higher rates of formalization of young people from the Bolsa Família tend to present, on average, higher levels of intergenerational mobility. The municipalities that simultaneously achieve social mobility and productive inclusion are, above all, those with high educational coverage and good conditions in the local labor market.

[1]The Atlas of Social Mobility was developed by a partnership between the Institute for Mobility and Social Development (IMDS) and the Economic Analysis and Research Group (Gappe) of the Federal University of Pernambuco (UFPE) and based on Britto et al. (2024), who reproduce Chetty and Hendren (2018a, 2018b) for Brazil. For more information, visit **https://atlas.imdsbrasil.org/**

[2]The dashboard "*Bolsa Família*: First Generations" was produced by the Institute for Mobility and Social Development (IMDS) and its results were presented in Fassarella et al. (2024). For more information, visit https://imdsbrasil.org/indicador/bolsa-familia-primeiras-geracoes

In addition to the characterization of patterns of productive inclusion and mobility at the territorial level, estimates of the association between educational level and the number of years of permanence in the formal labor market for young people living in families benefiting from the Bolsa Família in 2005 are presented. The results suggest that higher educational levels (at least complete higher education) are associated with up to 0.7 additional years (about 8 and a half months) of formal employment, which corresponds to a 23.7% increase in the length of stay in the formal market compared to individuals who did not complete the 5th year of primary education and accessed the formal labor market between 2015 and 2019.

The rest of this working paper is divided as follows: in section 2 we present databases and show differences in social mobility and productive inclusion between macro-regions. We also characterized the positive relationship between social mobility and productive inclusion among Brazilian municipalities. In section 3, we investigate the characteristics associated with places that simultaneously achieve social mobility and productive inclusion, especially adequate provision of public education services. In section 4, we present evidence of the importance.

2. PRODUCTIVE INCLUSION AND SOCIAL MOBILITY

2.1. The Atlas of Social Mobility

The **Social Mobility Atlas** estimates, for each Brazilian municipality, the probability that an individual born between 1983 and 1990 in a family located in the poorest 50% of the income distribution will reach, between 25 and 29 years of age, different ranges of the income distribution. This approach offers a structured measure of relative intergenerational mobility, allowing comparisons between territories and pointing out where the chances of social ascension are higher or lower. Based on these data, Table 1 presents descriptive statistics for Brazil and by macro-region, with emphasis on two measures of mobility: the probability of reaching the richest 25% (Panel A) and the probability of surpassing the parents' income[3] (Painel B).

The national average for the probability of reaching the richest 25% (Panel A) is 10.8%, and 49.1% for the probability of surpassing the position of parents (Panel B). These values provide a benchmark for comparison between regions.

The average probability of individuals born in the poorest 50% reaching the top quartile of the distribution (Panel A) is significantly higher in the South (18.1%) and Midwest (16.6%), exceeding the national average. The Southeast also shows an above-average performance, with 13.0%. In contrast, the North (7.4%) and Northeast (8.1%) are well below the national standard, revealing that the chances of economic ascension for poor individuals vary according to the territory of origin.

To explain a comparative perspective, we propose a theoretical exercise. Suppose a world with perfect access to opportunities, so that parents' income does not impact the probability of their children's social ascension. In this case, the probability of reaching the richest 25% given that the individual was born in the poorest 50% would be 25%. This scenario is clearly unrealistic, but it suggests a benchmark for analyzing these results.

[3]The probability of exceeding parents' income is defined as the probability of children born in families below the mean income percentile achieving, as adults, a position in the income distribution 10 percentiles higher than that of their parents.

Table 1. Descriptive Statistics of Social Mobility (%)

	Mean	S.D	Min.	Max.
Painel A Prob. of Being in the Richest 25%				
Brazil	10,8	4,8	0,0	47,1
North	7,4	3,1	0,0	25,6
Northeast	8,1	2,1	0,7	22,2
Southeast	13,0	3,9	1,9	42,9
South	18,1	4,6	4,0	47,1
Midwest	16,6	4,0	6,7	37,1
Painel B Prob. of Exceeding Parents' Income				
Brasil	49,1	11,7	9,5	88,0
North	30,5	11,4	9,5	73,8
Northeast	46,2	7,5	14,7	80,1
Southeast	55,2	8,6	22,6	79,3
South	63,4	5,6	38,9	88,0
Midwest	55,6	4,8	28,0	77,1

Notes: The table reports the mean, standard deviation, minimum and maximum of the variables of the Atlas of Social Mobility for Brazil and by macro-region, calculated based on the average probabilities estimated by municipality. Panel A shows the probability of being among the richest 25% as an adult, while panel B shows the probability of exceeding the parents' income. Sample-weighted statistics.

Although the mean values are below this level, it is noteworthy that all regions, with the exception of the Northeast, have municipalities whose maximum probabilities exceed 25%, indicating that, in certain local contexts, there is intergenerational mobility higher than expected in a scenario of neutrality of origin.

The maximum probabilities, observed in the South (47.1%) and Southeast (42.9%), reveal that, in some municipalities, poor young people have almost a 50% chance of reaching the highest strata of the distribution. On the other hand, the minimum probabilities observed in the North (0.0%) and Northeast (0.7%) indicate that the opposite is also true, that is, that social mobility can be extremely unlikely depending on the context.

In Panel B, the mean levels are higher across all regions, as expected, as it is a broader indicator of mobility: it is more likely to earn relatively more than parents, than it is to reach the top of the distribution. Still, inequalities remain. In the North, only 30.5% of children exceed their parents' income, against 63.4% in the South and 55.6% in the Midwest.

The results show the importance of territory in determining the economic opportunities of individuals. The differences in regional averages, combined with the wide variation within each macro-region, suggest that local factors are associated with intergenerational mobility in Brazil.

2.2. Social Mobility of the First Generations of *Bolsa Família*

The study ***Bolsa Família*: First Generations** follows, for more than a decade, a cohort of young people aged 7 to 16 who lived in families benefiting from the *Bolsa Família* Program in 2005. From the crossing between the payroll records of the program, *CadÚnico* and RAIS, the study evaluates the

insertion of these young people in the formal labor market between 2015 and 2019. It is, therefore, a measure of productive inclusion among people from contexts of poverty.

The main indicator used is the formalization rate, defined as the proportion of young people who had formal employment contracts for three or more years over the period of analysis. The criterion seeks to capture not only entry into the formal market, but also some stability in established bonds, removing the influence of short-term or episodic occupations.

The Table 2 presents descriptive statistics of the formalization rate, for Brazil and by macro-region. The national average is 29.4%, serving as a reference for comparison between the territories. The results reveal important disparities: average rates are higher in the South (43.4%), Southeast (38.0%) and Midwest (36.6%), while the North (17.4%) and Northeast (22.9%) register much lower levels. The difference between the regions exceeds 25 percentage points, revealing unequal access to formal job opportunities among young people from Bolsa Família.

Table 2. Descriptive Statistics of the Formalization Rate (%)

	Mean	S.D.	Min.	Max.
Brasil	29,4	10,9	1,3	71,6
North	17,4	7,9	1,3	43,4
Northeast	22,9	5,3	4,9	43,1
Southeast	38,0	7,6	9,4	62,0
South	43,4	6,9	14,9	71,6
Midwest	36,6	5,4	17,1	55,7

Notes: The table reports the mean, standard deviation (S.D.), minimum and maximum of the formalization rate (in percentages) between 2015 and 2019 of dependents of PBF beneficiaries in 2005, for Brazil and by macro-region. Sample-weighted statistics. Municipalities with less than 100 dependents were removed from the analysis.

Despite low average levels observed in some regions, data reveal heterogeneities within each macro-region. Even in more adverse socioeconomic contexts, there are municipalities that have managed to promote more stable trajectories of insertion in the formal labor market. For example, there are municipalities in the North and Northeast regions that have achieved formalization rates of more than 43%, exceeding the national average and even the average performance of more favored regions. These local experiences, although a minority, indicate that the formalization of low-income young people is possible and that public policies can play a relevant role in making it feasible.

The analysis presented in this subsection complements the long-term perspective of the Atlas of Social Mobility by offering a measure of the achievement of productive inclusion trajectories.

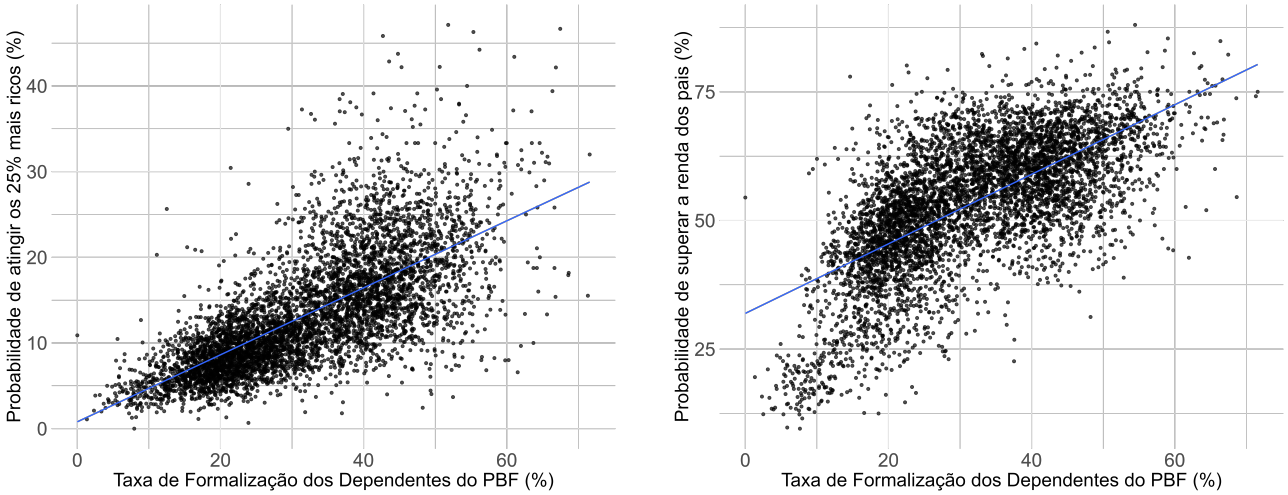
2.3. Social mobility and productive inclusion

The articulation between the data from the *Social Mobility Atlas* e the study *Bolsa Família: First Generations* allows to explore the relationship between the potential for economic mobility in the long term and the effective realization of productive inclusion trajectories in the short and medium term. By combining these two dimensions at the municipal level, it is possible to identify distinct territorial patterns and persistent inequalities.

The analysis was conducted based on the ordering of municipalities according to their *Bolsa Família*

young people formalization rates, allowing us to observe how the indicators of intergenerational mobility behave throughout this distribution. On the one hand, the probability of individuals born among the poorest 50% reaching the richest 25% in adult life is considered (Figure 1a); on the other, the probability of exceeding their parents' income (Figure 1b).

Figure 1. Relationship between Intergenerational Mobility and Productive Inclusion



(a) Probability of reaching the richest 25%

(b) Probability of outperforming parents' income

Notes: The scatterplots show the relationship between the percentile of municipalities, ordered by the formalization rate of young people from the Bolsa Família Program, and the respective average probabilities of intergenerational mobility, as estimated by the Atlas of Social Mobility.

The two panels in Figure 1 suggest a positive relationship between mobility and productive inclusion. Municipalities with higher rates of formalization of young people from Bolsa Família tend to present, on average, higher levels of intergenerational mobility. This association indicates that territories that offer better conditions for insertion in the formal labor market also tend to favor overcoming disadvantages of origin.

However, the dispersion of the points around the trend indicates that this relationship is far from perfect. There are municipalities that, despite presenting relatively high formalization rates, exhibit modest levels of social mobility. The reverse is also true: some territories with high mobility potential, according to the Atlas, have not been able, so far, to translate this potential into effective productive inclusion of vulnerable young people.

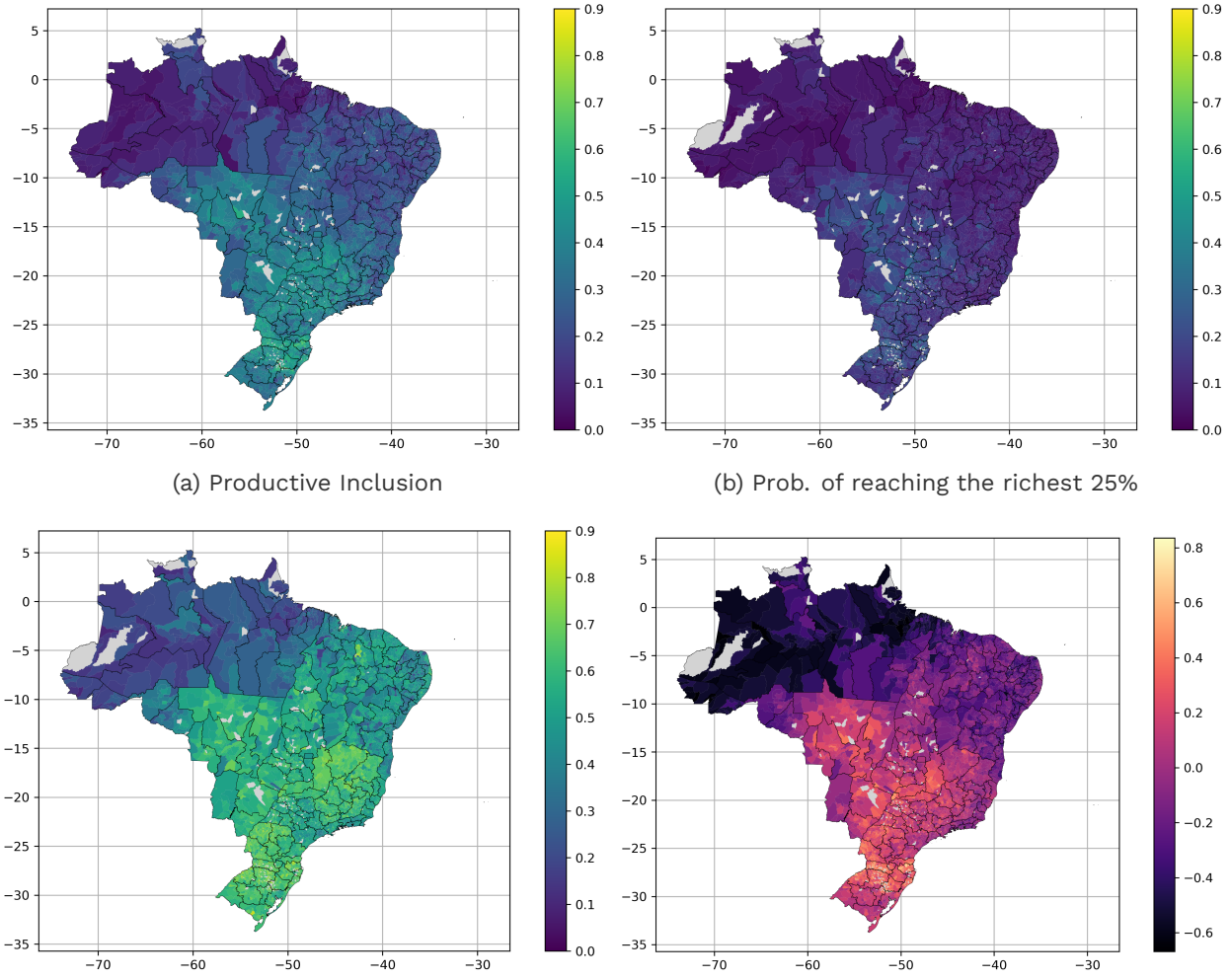
3. IDENTIFICATION OF LOCAL CHARACTERISTICS

The Figure 1 results indicate that there is a positive association between social mobility and productive inclusion in the Brazilian territory as a whole. Below, we show in more detail how this relationship varies throughout space.

Figure 2 shows, by municipality, (i) the formalization rate, (ii) the probability of being among the richest 25% and (iii) the probability of surpassing their parents' income, in panels 2a, 2b, and 2c, respectively. In line with Tables 1 and 2, a pattern can be observed: municipalities in the Center-

South tend to present higher values in all metrics, while the opposite occurs, in general, in the North and Northeast regions.

Figure 2. Spatial Distribution of Intergenerational Mobility and Productive Inclusion



(a) Productive Inclusion

(b) Prob. of reaching the richest 25%

(c) Prob. of surpassing their parents' income

(d) Productive Inclusion and Intergenerational Mobility (PCA)

Notes: The sequence of maps indicates the formalization rates between 2015 and 2019 of the dependents of BFP beneficiaries in 2005, in panel (a), and the probability of a child being among the richest 25% and surpassing the income of their parents, in panels (b) and (c), respectively. This analysis is carried out at the municipal level; However, we removed from the sample municipalities with less than 100 dependents in the selected interval, indicating them on the map in the color gray. The black lines indicate intermediate regions. Panel (d) reports the result of a principal component analysis (1 component) built based on the variables exposed in the other panels, which explains 78% of the joint variance.

The comparison between panels 2b and 2c is also informative as it contrasts social mobility metrics more explicitly than the results shown in Table 1. The figures indicate that there are limits to the intensity with which social mobility for the poorest 50% is carried out, even though this is feasible throughout the territory. This conclusion is evidenced by the low probabilities of reaching an income equivalent to the richest 25% compared to the higher probability of exceeding the parents' income.

In the context of a discussion about the relevance of productive inclusion for social mobility, the results suggest that although productive inclusion is relevant for social mobility, and may increase the probability of exceeding parents' income, it is not reasonable to expect that it will promote, in isolation, changes of a magnitude that enable the poorest 50% to achieve, consistently, income

levels equivalent to the richest 25%.

Panel 2d of Figure 2 shows the variation between municipalities of an index (referred to as PCA) that combines productive inclusion with intergenerational mobility.[4] By construction, municipalities that reach high values in the PCA also reach, simultaneously, high values in the variables used in its elaboration. It is noted that the Center-South region of the country is the one that best combines social mobility with productive inclusion, with particular emphasis on the state of Santa Catarina. The Northeast region reaches intermediate values, while the North region reaches the lowest combination of social mobility and productive inclusion in the national territory.

To understand which characteristics are associated with high values in the Productive Inclusion and Intergenerational Mobility (PCA) indicator, we used data provided by the project **2024 Municipal Elections: Municipal Indicators**, prepared by IMDS, which compiles municipal indicators from 2016 to 2019 on the following topics: education, labor and income, housing and sanitation, health, safety and poverty.[5]

The result of this analysis, reported in Figure 3, suggests that places that simultaneously achieve social mobility and productive inclusion are, above all, those with high educational coverage (correlation 0.60). The correlation remains relevant, although to a lesser extent, for variables indicating good local labor market conditions (0.46) and adequate housing and sanitation infrastructure (0.29). Safety and health, in turn, show only a slightly positive correlation (0.08 and 0.04, respectively), while the correlation with poverty indicators is insignificant (-0.04).[6]

Although only illustrative, these correlations suggest that there are variations in social mobility and productive inclusion in the territory may be related to differences between municipalities in the provision of public services, such as education and employment (qualification of the workforce).[7]

4. EDUCATION AND PRODUCTIVE INCLUSION

As suggested by Figure 3, the educational quality offered by a municipality is strongly correlated with its ability to simultaneously generate social mobility and productive inclusion. That said, a

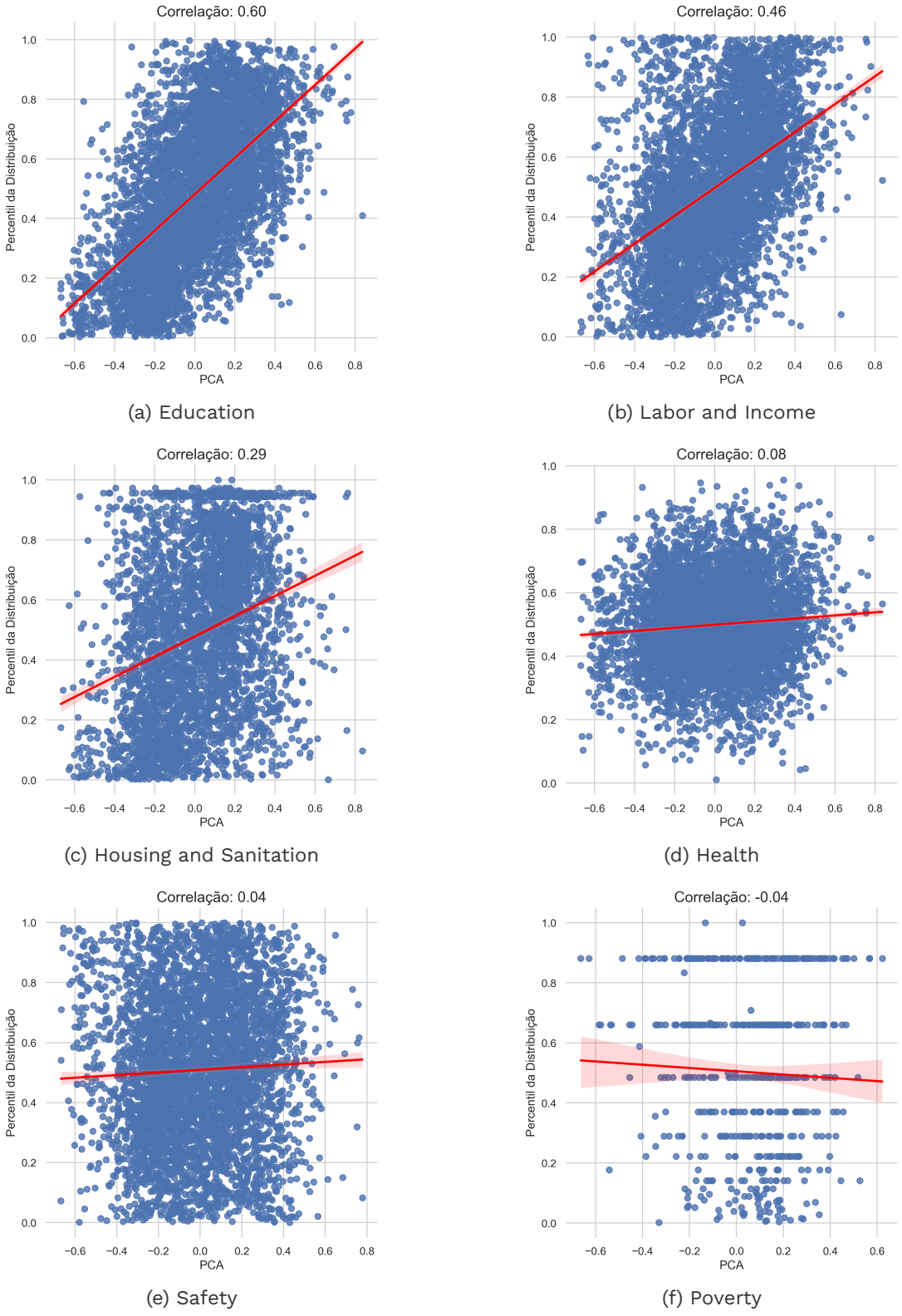
[4] We built the index that combines intergenerational mobility with productive inclusion through a Principal Component Analysis (PCA). PCA is a dimensionality reduction technique that transforms a set of possibly correlated variables into a new set of orthogonal variables called principal components. Each component is a linear combination of the original variables that maximizes the variance explained in a hierarchical fashion (the 1st component explains as much as possible, the 2nd explains the most of what is left, and so on). The result allows you to visualize structures (groups, trends) in a few dimensions, reducing noise and feeding models with fewer variables, but maintaining essential information. In our case, we applied PCA to the variables described in panels 2a, 2b, and 2c of Figure 2. The index is the 1st principal component, which explains 78% of the combined variance of the variables. See Greenacre et al. (2022) for more details on the methodology.

[5] For more information about the project "Municipal Elections 2024: Municipal Indicators", access https://imds-brasil.org/indicador/eleicoes-municipais-2024-indicadores-municipais/. The themes listed in the body text are composed of several variables. For each municipality-variable pair, we calculated its position in the distribution of the variable under analysis and then aggregated the results by municipality-theme by the mean. This methodology is necessary since the raw data of the variables are unbalanced. In addition, we identified the variables that indicate worsening through high values (homicide rates, for example) and extracted the distributions from their symmetries, so that high values (and, consequently, the high position in the distribution) are always associated with desirable characteristics.

[6] The statistical insignificance of the analysis on the theme "Poverty" may be associated with the low number of observations available, unlike the case of the other themes.

[7] The variables that make up the "Education" theme include the following topics: 1) education financing, 2) teaching quality (IDEB in elementary and secondary education, percentage of literate students at the right age), 3) educational flow (age-grade distortion), 4) school dropout, 5) early childhood education offer, and 6) demand for higher education. The variables that make up the theme "Work and Income" include the following topics: 1) employment and remuneration, 2) qualification of the workforce, and 3) youth at work.

Figure 3. Association Between Local Factors and Productive Inclusion with Social Mobility



(a) Education (b) Labor and Income

(c) Housing and Sanitation (d) Health

(e) Safety (f) Poverty

Notes: The set of figures reports on the correlation between the characteristics of the municipalities and the principal component (PCA) generated from the probability of insertion in the formal market and the two measures of social mobility, which explain 78% of the joint variance of the variables. The characteristics, measured for the years between 2016 and 2019, are obtained from data from IMDS project "Municipal Elections 2024: Municipal Indicators". The values reported are the average, by category-municipality, of the percentile in the distribution of the variables. 4.4% of the municipalities were lost due to the impossibility of matching.

more careful analysis of the educational profile of individuals is necessary to verify whether, in fact, individuals who acquire higher education obtain more productive inclusion.

Figure 4 reports, in panel 4a, that young people (dependents) on beneficiaries of Bolsa Família Program in 2005 who accessed the formal labor market between 2015 and 2019, and the distribution of years in RAIS by level of education. The educational levels were coded as follows: 1 - up to 5th grade of incomplete elementary school; 2 - 5th grade of complete elementary school; 3 - up to 9th grade of incomplete junior high school; 4 - 9th grade of complete JHS (up to incomplete high school); 5 - complete high school (up to incomplete higher education); 6 - complete higher education or more. It is notable that the more educated an individual is, the more likely he or she will experience more years formally employed. For example, among young people (dependents) on beneficiaries of Bolsa Família Program in 2005 who accessed the formal labor market between 2015 and 2019, a share of 74.3% of those with complete higher education or more had at least 3 years of formalization. For those with complete high school and complete junior high school (9th grade), these proportions are 68.3% and 61.7%, respectively.

This suggestive evidence from panel 4a motivates a more careful econometric study. Panel 4b reports the result of the association between reaching a certain educational level and prolonged stay in RAIS, taking the first educational level as a reference and controlling the analysis by skin color/race, municipality of residence in 2005, sex and age group.[8] In other words, panel 4b indicates the additional number of years in RAIS associated with reaching a certain educational level, when compared to individuals with up to 5th grade of incomplete elementary school, controlling the analysis for the aforementioned variables.

The results suggest that educational gains are always positive, so that more education is always associated with longer permanence in formal jobs. The magnitude of impacts, in turn, suggests that higher educational levels (at least complete higher education) are associated with up to 0.7 additional years (about 8 and a half months) of formal employment compared to individuals who did not complete the 5th year of elementary school and accessed the formal labor market between 2015 and 2019. This result has economic relevance, amounting to a 23.7% increase in presence in RAIS as compared to the average of the comparison group.

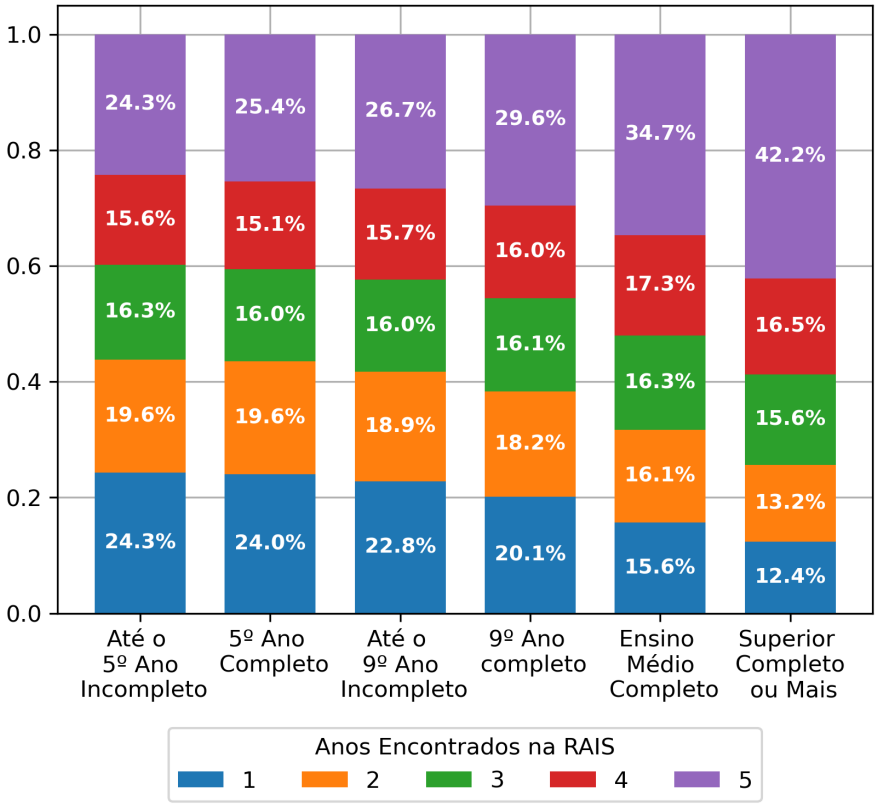
Even if descriptive, the results indicate that productive inclusion policies focused on more educated individuals are more likely to generate persistent gains in beneficiaries, such as prolonged permanence in formal jobs.

5. POLICY RECOMMENDATIONS

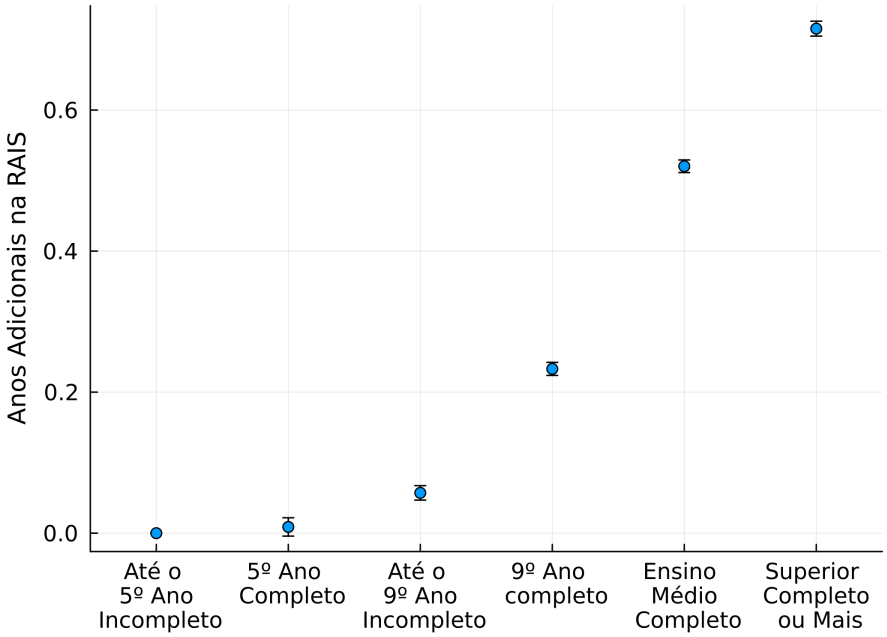
In this article we use two complementary approaches to understand the trajectories of people from poverty in Brazil: one that emphasizes social mobility between different generations of a family and another that addresses productive inclusion through obtaining a formal job.

[8] This association is estimated by multiple linear regression of the form $y_i = \sum_{e=1}^{6} educ_i^e + \gamma^c + \gamma^s + \gamma^f + \gamma^m + \varepsilon_i$, where y_i is the permanence in years in RAIS of individual i, $educ^e$ represents the different levels of schooling and $\gamma^c, \gamma^s, \gamma^f$ and γ^m represent fixed effects of skin color/race, sex, age group and municipality of residence in 2005, respectively. Standard errors are robust to heteroscedasticity by HC3. The educational level "Up to 5th Grade (Incomplete)" of elementary school is removed from the analysis for the identification of the model, so that it becomes the reference for the results.

Figure 4. Relationship between Schooling and Productive Inclusion



(a) Permanence in RAIS by Educational Level



(b) Association between Educational Level and Permanence in RAIS

Notes: The figure reports the relationship between schooling and productive inclusion for young people (dependents) on beneficiaries of Bolsa Família Program in 2005 who accessed the formal labor market between 2015 and 2019. Panel (a) presents the distribution of years of permanence in RAIS by educational level. In panel (b) the coefficients of a regression of the form $y_i = \sum_{e=1}^{6} educ_i^e + \gamma^c + \gamma^s + \gamma^f + \gamma^m + \varepsilon_i$ are presented, where y_i is the permanence in years in RAIS of individual i, $educ^e$ represents the different levels of schooling and $\gamma^c, \gamma^s, \gamma^f$ and γ^m represent fixed effects of skin color/race, sex, age group and municipality of residence in 2005, respectively. The educational level "Up to 5th Grade (Incomplete)" is removed from the analysis for the identification of the model, so that it becomes the reference of the results. Standard errors are robust to heteroscedasticity by HC3 and are reported as the bars in panel (b).

Evidence from the Atlas of Social Mobility and *Bolsa Família*: First Generations study shows that the probabilities of social ascension and of obtaining formal employment vary as a function of the characteristics of individuals and of the territory. In other words, policies that aim to increase intergenerational mobility and productive inclusion should incorporate in their design information about the profile of individuals and the locations in which they live.

In this regard, we make some general recommendations below:[9]

1) **Customize the productive inclusion policy according to the profile of the workers**

   Low-income workers with a higher level of education are more likely to get a formal job. For these workers, labor intermediation services can be particularly effective for productive inclusion. In the case of workers with a lower level of education, professional qualification services may be necessary to complement the intermediation process with companies.

   With the worker's profile described in an efficient platform, it is possible to customize labor intermediation and professional qualification services. In other words, the customization of public policy is essential to treat different workers according to their needs and potential. This way the system can indicate workers who are able to obtain a job and those who have yet to undergo some type of professional qualification.

2) **Use technological tools to customize the productive inclusion policy**

   Proper customization will depend on technological resources, such as the incorporation of Artificial Intelligence and Machine Learning techniques. These tools are also essential for the development of a more efficient intermediation system, allowing for better matching between workers and job openings and expansion of the number of vacancies filled.

   Another important use of technology is to connect the intermediation system and the professional qualification system. With new customization and matching mechanisms, the intermediation system will be able to identify qualification needs for workers. In addition, workers who have completed a professional qualification course have greater chances of employment if the intermediation system is communicated about the new competence acquired and immediately seeks possibility of employment for the newly qualified graduate.

3) **Develop Job Mapping Mechanisms in Each Location**

   Over the years, Brazil has had several professional qualification programs, such as PRONATEC, but evaluations show that, in general, these programs have not been able to increase the employability or salary of their graduates. On the other hand, studies show that PRONATEC-MDIC, an arm of PRONATEC conducted by the Ministry of Development, Industry and Commerce (MDIC), has significantly increased employability.[10]

   The main premise of PRONATEC-MDIC was the mapping of vacancies. The courses were only offered after observing the need for certain professional training in a given region. This demand was mapped through direct contact with companies that reported the type of professional they needed. After this capture of demand, classes were offered, which were only confirmed after enrollment of a sufficient number of students.

[9] More specific proposals for productive inclusion in line with the recommendations of this text are presented in the article Labor intermediation and professional qualification programs for productive inclusion, by Fernando de Holanda Barbosa Filho and Fernando Veloso.

[10] For more details on professional qualification programs in Brazil and a discussion of PRONATEC and PRONATEC-MDIC evaluations, see Barbosa Filho (2022).

In summary, the mapping of vacancies helps to locate the vacancy geographically and provide courses in nearby locations that can meet the captured demand. This, in turn, considerably increases the chance of success of the professional qualification policy.

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