

Chronic and transitory poverty in Brazil: an analysis using Continuous PNAD¹

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Resumo: A partir da década de 1980, a literatura sobre o conceito e a mensuração da pobreza passou a abordar a dimensão temporal e a duração do fenômeno, por meio das abordagens de dinâmica da pobreza. O objetivo deste artigo é analisar a dinâmica e os ciclos de pobreza das famílias brasileiras, entre 2012 e 2019, incluindo o período de aprofundamento da crise econômica no país, utilizando os microdados longitudinais da PNADC (IBGE). Aplicamos a categorização da pobreza crônica e transitória proposta por Hulme e Shepherd (2003). A abordagem econométrica é baseada no modelo de logit multinomial e estimamos a probabilidade relativa de uma família pertencer a uma categoria de pobreza, com o objetivo de analisar as características associadas a uma maior duração e permanência nesta situação. Os resultados deste artigo permitem verificar que as famílias que vivem em regiões rurais e nas regiões nordeste e norte do Brasil têm maior probabilidade de estar em uma situação de pobreza crônica ou transitória. Outras características relevantes associadas a esta situação são: o maior número de crianças na família, a presença de membros com menos escolaridade, uma menor porcentagem de indivíduos economicamente ativos e a presença de chefes não brancos, desempregados, informais, solteiros e idosos.

Palavras-chave: PNAD Contínua, dinâmica da pobreza, pobreza crônica, pobreza transitória.

Abstract: From the 1980s, the international literature on the concept and measurement of poverty began to address the temporal dimension and the duration of the phenomenon, starting the field on poverty dynamics. The aim of this paper is to analyze the dynamic characteristics and the cycles of poverty of Brazilian families, between 2012 and 2019, a period that includes the period of the economic crisis deepening in the country, using the longitudinal microdata of PNADC (IBGE). We apply the categorization of chronic and transitory poverty proposed by Hulme and Shepherd (2003). The econometric approach is based on the multinomial logit model, and we estimate the relative probability of belonging to a category of poverty and odds-ratios, aiming to analyze the characteristics associated with a higher duration and permanency on poverty. The results of this article allow us to verify that families that live in rural regions and in the northeast and north Brazilian regions are more likely to be in a situation of deprivation whether transitory or, especially, chronic. Other relevant characteristics associated with this situation are: the greater number of children, the presence of less educated members, a lower percentage of economically active individuals, and the presence of non-white, unemployed, informal, single and older heads.

Keywords: Continuous PNAD, poverty dynamics, chronic poverty, transitory poverty.

Área 12 - Economia Social e Demografia Econômica

JEL Classification: I32; I31; R20

¹ We are grateful for the financial support for this research by the São Paulo Research Foundation (FAPESP).

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1. Introduction

In the last decades, the reduction in poverty and income inequality has become a central agenda and concern for governments and civil society groups, as well as public and private, national, international, and multilateral institutions. All of them seek to understand the determinants and direct efforts to alleviate the situation of deprivation and increase the well-being of families. With the increasing importance of this research agenda, the theoretical and empirical literature that supports the understanding and resolution of the issue has also expanded.

Despite a certain consensus on the multidimensional and dynamic nature of the phenomenon, multiple ways exist to classify a family as poor or extremely poor. From the 1980s, the international literature on the concept and measurement of poverty began to address the temporal dimension and the duration of the phenomenon, starting the field on poverty dynamics. The dynamics of poverty originate from the movement of entry and exit from deprivation, and such mobility originates from income shocks, cycles of poverty, and vulnerability. This literature treats the time as a substantial dimension for understanding deprivation and defines poverty as a volatile phenomenon in the short-and long-term, and, based on this classification, it seeks to demonstrate that economic cycles can influence, directly or indirectly, the socioeconomic status of families.

Since the emergence and development of these studies, the view that static analyses on poverty have limited explanatory power and can bias the understanding of the problem has spread. In this context, Addison et. al. (2008) argue that the temporal dimension is important for four main reasons: i) families and individuals who remain in poverty for longer need more government attention to exit the situation; ii) countries with similar numbers of poor may have different structures and determinants, while one country may have a greater number of transitory poor, another country may have a higher incidence of chronic poor, and, therefore, will need different public policies; iii) the severity of poverty is related to the length of periods in which a family remains below the poverty line, and the lower the ownership of assets, the longer the duration of poverty; and iv) the duration of poverty implies a constant reworking of individual and family strategies to deal with the situation.

The absence of longitudinal databases or variables in available panels, mainly in developing countries, leads to the development and application of alternative methods to obtain the repetition of research units over a certain period. An example of this type of empirical strategy is the article by Perez (2015), which, in the absence of longitudinal data, uses a pseudo-panel⁴ econometric approach with cross-sectional data to analyze events that induced the entry or exit of families from poverty in Mexico between 1992 and 2012. In this context, it is precisely the limitation of longitudinal data that makes the literature on the dynamics of poverty recent and, therefore, narrow in Brazil.

In the last two decades, greater economic growth and job creation scenario that lasted until 2013—linked to the growth policies of income transfer, such as Programa Bolsa Família⁵ (PBF) and the Benefício de Prestação Continuada⁶ (BPC), and the policy of real appreciation of the minimum wage—led to a sharp drop in the proportion of poor and severity

⁴ Pseudopanel is a method not based on the observations of the individuals' variables, as in the panel data, but on the observed variables from repeated sectional cohorts (MARTINI; HERMETO; JAYME JR; 2014).

⁵The Programa Bolsa Família (PBF), created by the federal government in October 2003, is a conditional cash transfer program and emerged through the unification of five federal cash transfer programs, reaching 13.9 million beneficiary families in 2020 For more details, see <http://www.caixa.gov.br/programas-sociais/bolsa-familia/>.

⁶ The Benefício de Prestação Continuada (BPC) of the Organic Social Assistance Law (LOAS) guarantees people over 65 or disabled people unable to remain alone, a monthly minimum wage, without the beneficiaries having to contribute to the INSS to receive it. For more details, see <https://www.inss.gov.br/tag/bpc/>

of poverty. Rocha (2013) shows that the period from 2003 to 2011 is marked by an average gross domestic product growth of 4.2% per year, and can be considered the most effective in terms of poverty reduction, with a drop from 22.6% to 10.1% in the percentage of poor in the total population. The author links this increase in well-being to the dynamic behavior of the labor market, the creation of approximately 1.6 million new jobs per year, and to the minimum wage appreciation policy, which achieved a real increase of 50% in the period. In addition, she reports the importance of the Bolsa Familia Program, created in 2003, and the expansion of its coverage and the real value of the benefit over the period.

Another study by Osorio et. al. (2012) investigates the characteristics and living conditions of extremely poor, poor, vulnerable to poverty and non-poor families for the period between 2004 and 2009. The authors verify that the income growth of extremely poor families occurs due to the increase in the share of income transfers in the income of these families, which rises from 15% in 2004 to 39% in 2009. In addition, they conclude that the reduction in poverty and improved well-being are mainly due to better income distribution, which is related to the labor market access and the creation of formal jobs, better remuneration, and increases in the minimum wage during the period.

Despite the reduction in poverty in recent decades, income shocks due to unemployment increase and the economic crisis that began in Brazil in mid-2014 negatively affect poverty indicators. Neri (2018) points out that from the end of 2014 to the end of 2017 the growth of poverty was 33%, equivalent to an increase of 6.27 million families, to a total of 23.3 million families. The author highlights that the fall in average income and the increase in poverty and income inequality originated mainly through the increase in unemployment, which reached double digits during the economic crisis, deteriorating the well-being of families. In this context, the most affected were those with incomplete high school, youngsters aged between 15 and 19 years, and family heads, suffering declines of 11.65%, 20.06%, and 10.38% in average income, respectively, as well as workers from the northeast and north of the country.

Thus, the aim of this paper is to analyze the dynamic characteristics and the cycles of poverty of Brazilian families, between 2012 and 2019, a period that includes the period of the economic crisis deepening in the country, using the longitudinal microdata of the Continuous National Household Sample Survey (PNADC) of the Brazilian Institute of Geography and Statistics (IBGE). The PNADC is a longitudinal database that provides rich individual information about labor market transitions and the characteristics of individuals and households, and it allows us to investigate the workers in both the formal and informal labor markets. We use the panel data of PNADC to apply the categorization of chronic and transitory poverty proposed by Hulme and Shepherd (2003). The econometric approach is based on the multinomial logit model, and we estimate the relative probability of belonging to a category of poverty and odds-ratios, aiming to analyze the characteristics associated with a higher duration and permanency on poverty. This poverty dynamics study seeks to understand (i) what are the household and head characteristics related to the poverty situation; (ii) what are the main differences between families with chronic and transitory poverty; (iii) how the chronic and transitory poverty evolve in the analyzed period; iv) what are the factors associated to a higher chance of belonging to a category of poverty dynamics.

We collaborate to the scarce literature of poverty dynamics that focus in Brazil, and to the best of our knowledge, our paper is the first applying Hulme and Shepherd's (2003) categorization and estimating the probability of belonging to a chronic or transitory poverty household using data from PNADC.

The results of this article allow us to verify that families that live in rural regions and in the northeast and north Brazilian regions are more likely to be in a situation of deprivation whether transitory or, especially, chronic. Other relevant characteristics associated with this

situation are: the greater number of children, the presence of less educated members, a lower percentage of economically active individuals, and the presence of non-white, unemployed, informal, single and older heads.

This paper has five sections in addition to this introduction. Section 2 is a brief literature review on the dynamic aspect of poverty and the chronic and transitory categorizations, while Section 3 describes the empirical strategy of this paper. Sections 4 and 5 shows, respectively, the descriptive and estimation results. Finally, Section 6 summarizes the main conclusions of the paper.

2. Literature review: the dynamic aspect of poverty and the chronic and transitory categorizations

One of the pioneering works on the dynamics of poverty is the study by Bane and Ellwood (1983), which recognizes the need to distinguish, in a temporal analysis, the chronic poor from the transitory poor. The authors analyze the factors related to the cycles of poverty in the United States between 1970 and 1981 and calculate the probabilities of exit from the situation of deprivation. The study demonstrates the long-term nature of poverty, because, at any point in the time, a large portion of the poor is chronically poor.

Another pioneering study is by Ravallion (1988), which seeks to analyze changes in the aggregate risk of families in rural areas of India and the expected value of poverty through the decomposition of poverty in categories based on the temporal dimension and taking into account the depth of deprivation at the beginning of the poverty cycle. The author finds that families with chronic poverty may experience more severe deprivation in the context of negative shocks to their income, in comparison with families under short-term poverty.

Two other studies that seek to analyze the determinants of the cycles and dynamics of poverty are those by Baulch and Hoddinott (2000) and McKernan and Ratcliffe (2002). In the former study, the authors argue that families allocate their assets and labor to maximize their earnings. However, they are subject to shocks, which can be aggregated or covariant—if related to the location in which they live, such as generalized droughts, earthquakes, and landslides—or idiosyncratic, if they reach only one family or individual, such as serious illnesses. Negative or positive shocks determine that the family relocates the assets and works to rebalance the current situation and plan the future. Finally, the authors suggest that the transitory poor have less capacity to smooth consumption, and therefore, greater difficulty in managing negative shocks, while the chronic poor have less ability to accumulate assets and to turn them into income, staying longer in a situation of deprivation.

The latter study is an empirical investigation of the events and characteristics that determine poverty dynamics in the United States during the 1980s and the 1990s. Regarding the probability of entering deprivation, black and Hispanic individuals, children, and female-headed households are more likely to fall below the poverty line. Further, despite the probability of leaving, individuals aged 65 and over, and households headed by women and blacks are less likely to leave the situation, while white individuals and those with higher education were more likely to leave the context of poverty. In addition, of the families that fall into poverty, 40% suffer job losses of a family member, while, of the families that emerge out of poverty, 47% have higher incomes through someone in the family obtaining employment.

As presented in the article introduction, the limitation of longitudinal data determines that the literature on poverty dynamics is recent, and therefore, narrow in Brazil. The first study that seeks to estimate the probability of future entry of Brazilian families into poverty, under a vulnerability to poverty approach, is by Ribas (2007). The author uses data from the Consumer Expenditure Survey (POF) of the Brazilian Institute of Geography and Statistics

(IBGE) for the years 2002 to 2003 and a methodology based on the estimation of a consumption function, and finds that 33% of Brazilian families are considered very vulnerable to poverty—that is, they have a high chance of entering poverty in the future. Individuals who are most vulnerable to poverty are, for the most part, unemployed or in rural or domestic jobs. In addition, the vulnerability to poverty for families with young members and in the northeast region is greater.

The second study for the Brazilian case is by Ribas et. al. (2011) who use data from the National Household Sample Survey (PNAD) of the IBGE and decompose poverty based on time, in which the chronic poor differ from the transitory for the time they remain in poverty. The authors emphasize that, in general, race and education are the determining factors for the permanence of individuals in poverty. Poverty found among female heads, on the other hand, predominantly has a transitory character. The authors also find that informal, non-white household heads, with low education and residents in the northeast, are more likely to suffer from chronic poverty, facing greater complexity in exiting the situation.

The third study with a dynamic approach to poverty in the Brazilian context is by Gonçalves and Machado (2015) for the 2002 to 2011 period. The authors use longitudinal data from the Monthly Employment Survey (PME) of the IBGE and the categorization of chronic and transitory poverty proposed by Hulme and Shepherd (2003), to highlight the socioeconomic and demographic heterogeneity of poor families. Through this study, it is possible to verify that the proportion of children is higher in chronically poor families, while the proportion of elderly and working-age members is higher in the transitory poor and never poor families. Besides, family heads with secondary and higher education are highly predominant among the transitory poor, while a large proportion of female and non-white heads are among the chronically poor families. The authors also emphasize the high incidence of chronic poor families in the metropolitan regions of the northeast (Recife and Salvador).

Finally, using the same panel dataset for the same period (2002-2011), Gonçalves (2015) investigates the vulnerability to poverty, that is, the probability of entering poverty in the future, and finds that 77% of vulnerable families are chronic poor if only labor income is considered to calculate the probability of entering poverty. Furthermore, vulnerability is significantly more pervasive in female-headed households as well as individuals with low education, and those who are employed in the informal sectors of the labor market.

3. Empirical strategy

3.1. Database and sample

This study uses quarterly longitudinal microdata from the National Continuous Household Sample Survey (PNADC) of the IBGE for the period between 2012 and 2019, which coincides with the period before and during the economic crisis and its adverse effects on employment, per capita income, and well-being. The survey comprises a panel in which each household is interviewed in a single month of a quarter, remains out of the sample in the next two months, and is then interviewed in the next quarter survey. The process is then repeated until five interviews are conducted for the family, that is, a household can be interviewed for five quarters, once every quarter. The geographic scope of the database is the entire national territory, excluding areas with special characteristics as classified by the IBGE.

To reduce problems of identification and declaration of information in the PNADC of the IBGE, the following were excluded in the construction of the sample: the households that did not carry out the five interviews, the members of the families that present duplicate identifier code at the same time point due to identification problems, and families with heads aged under 16. It is worth mentioning that the PNADC sample, excluding only individuals

with problems in the identifier code, presents 14,085,378 observations, which is the total number of individuals in the database multiplied by the number of interviews in which the individual participates, for the 2012–2019 period. With other exclusions, the final sample obtained shows 7,965,833 observations. The main exclusion occurs for households that did not carry out the five interviews, which leads to the exclusion of 43% of the observations.

3.2. Hulme and Shepherd’s (2003) categorization

Families are classified and grouped by applying the specific and aggregated categorizations presented in the study by Hulme and Shepherd (2003) in an adaptation to the work of Jalan and Ravallion (2000). For the first categorization, the authors define five groups, called specific categories, by locating the punctual indicator and the average poverty indicator in relation to the established poverty line. In this study, the per capita household income in each quarter is the punctual indicator and the average per capita household income in the five quarters is the average poverty indicator.

The poverty line used in this study is the administrative line used as the eligibility criterion in the Bolsa Familia Program, which is readjusted during the study period, as this threshold changes periodically. In addition, to calculate the per capita household income in each quarter and the average per capita income, that is, the average per capita income between the five interviews, the usual monthly income from all jobs for people aged 14 or over was used (only for people who received cash, products, or merchandise in any job). We only consider the household labor income, considering that besides being the main income of individuals in Brazil, it is important to follow the changes triggered by the economic crisis on the variables of the labor market and the consequent heterogeneous variations between the different strata of the poor in different dimensions of the labor market, such as unemployment, duration of unemployment, and informality. Thus, the categories developed are summarized in the following table:

Table 1: Hulme and Shepherd’s (2003) aggregated and specific categories

Aggregate categories	Specific categories	Punctual indicator	Average indicator
Chronic poor	Always poor	Always below the poverty line	Below the poverty line
	Usually poor	Four quarters below the poverty line	Below the poverty line
Transitory poor	Churning or occasionally poor	Three, two or one quarter below the poverty line	Below the poverty line
Non-poor	Never poor	Always above the poverty line	Above the poverty line

Source: Own elaboration.

This categorization was previously applied in Gonçalves and Machado (2015) for the data from the PME (IBGE) for 2002–2011, only for the metropolitan regions. In the present study, this categorization by Hulme and Shepherd (2003) is applied to the most recent period, 2012–2019, with the use of the recently released PNADC (IBGE) microdata, which covers about 3,500 municipalities and allows wider regional analysis.

3.3. Econometric estimation: multinomial logit

We use the multinomial logit model for the econometric estimations in this study. Estimations are made based on the pooled data from the PNADC (IBGE) sample for the

period between 2012 and 2019. Such a model is appropriate when there is a categorical dependent variable.

The model estimates the relative probabilities of belonging to one of the Hulme and Shepherd's (2003) categories, which are nominal, and therefore, have no defined order. The estimation of relative probabilities via multinomial logit requires the definition of a base category. From the four categories defined for the classification of families—always poor, usually poor, churning or occasionally poor, and never poor—we choose the base category as never poor.

Thus, the dependent variable (symbolized by j) receives a value of 1 if the family is always poor, 2 if usually poor, 3 if churning or occasionally poor, and 4 if never poor. Therefore, we have:

$$Pr(y = j) = \frac{\exp(X\beta_j)}{\sum_{k=1}^3 \exp(X\beta_k) + 1}$$

where X is the vector of the family and head variables and β_j and is the estimated coefficient for each group, where $j = 1, 2, 3$ or 4. Furthermore, \exp represents the exponential of each coefficient and as never poor is the base category chosen, $\beta_4 = 0$. Thus, the other β 's estimate the probabilities related to β_4 for each of the other three categories of poor. Hence, the relative risk (or relative probability) can be calculated, for instance, by assuming $j = 1$ in relation to the base category, as follows:

$$\exp(X\beta_1) = \frac{Pr(y = 1)}{Pr(y = 4)}$$

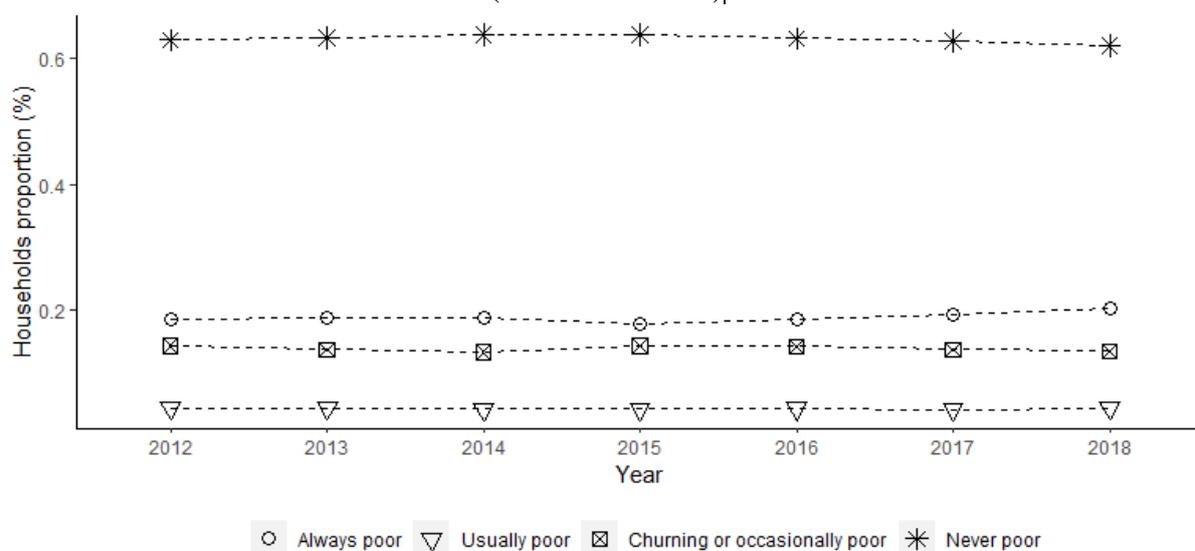
The explanatory variables included in the model are from the family and the household head. The household variables chosen are the number of members in the household, rural region, metropolitan region, presence of children aged below six, and macro-region in which the household lives. For the heads, the variables are age, male, white, marital status, schooling (completed secondary school and college), unemployed, inactive, and informal heads. Categorical explanatory variables necessitate choosing a base category to be omitted so that the others can be estimated. For the macro-region variable, the midwest region was omitted. For the education variable, the category of heads that had only completed elementary education was omitted, and finally, for the labor market variable, the employed heads were omitted.

The estimates made through this multinomial logit have the sole objective of finding statistically significant correlations between the dependent variable (the category of poverty to which a household belongs) and its observable characteristics. Finding causal relationships requires greater econometric sophistication and is not the aim of this article.

4. Descriptive analyses of chronic and transitory poor families in the sample

The descriptive statistics in this section explicit and illustrate the relationship between the situation of privation of the family (chronic, transitory, and never poor) and the characteristics of the heads and other family members. These analyses demonstrate the heterogeneity that exists among families that have different trajectories and movements in and out of poverty.

Chart 1: Proportion of families in the specific categories of chronic and transitory poverty (2012-2018/2019)



Source: Own elaboration based on PNADC (IBGE) 2012-2019.

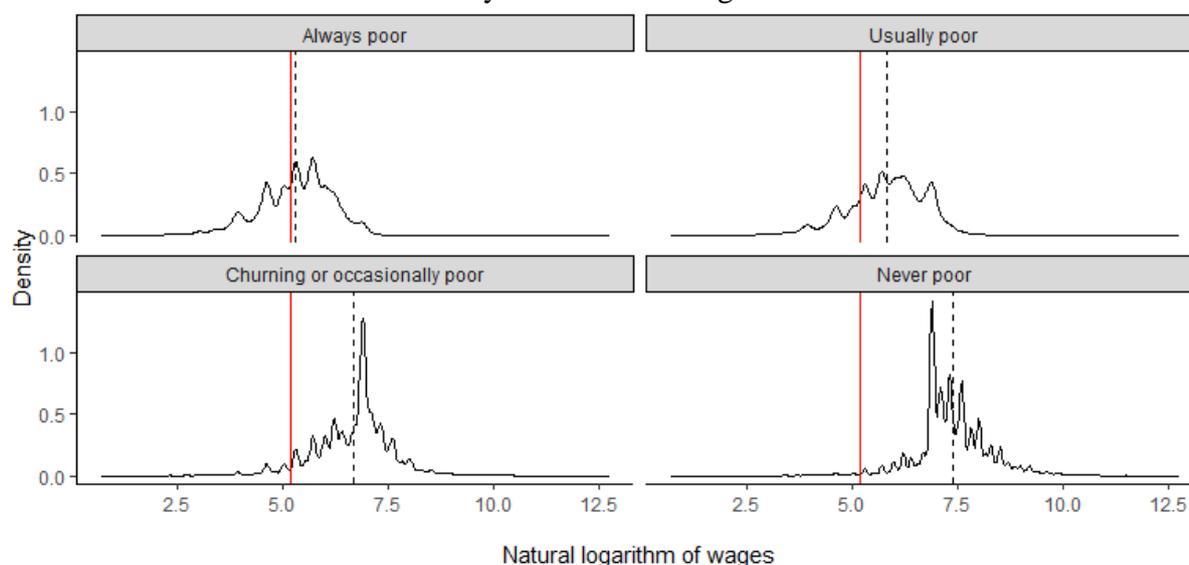
Chart 1 illustrates that the proportion of always poor families follows a downward trend until 2015, reducing from 18.39% in 2012 to 17.71% in 2015. However, from 2015, with the warming of the economic crisis in Brazil, the proportion of families with this situation of poverty grows and reaches 20.20% in 2018/2019. The proportion of usually poor families does not present great variation, declining from 4.4% in 2012 to 4.29% in 2018/2019. The combination of always and usually poor families indicates the proportion of chronic poor families in the analyzed sample, which increases from 22.79% in 2012 to 24.49% in 2018/2019.

Families with transitory poverty – churning or occasionally poor – are 14.27% of the total families in 2012, and 13.31% in 2014. However, in the context of the economic crisis and its consequences, which also affect the transitory poor, the share of these families increase to 14.15% in 2016 before resuming their downward trend, reaching 13.46% in 2018/2019. In 2018/2019, 37.95% of families suffer some type of deprivation, whether permanent, chronic poverty, or temporary, transitory poverty, compared to 37.06% in 2012. Thus, it is possible to observe that the increase of approximately 1.81 p.p. in always poor households is due to the relative reduction in all other categories, that is, part of the transitory poor and non-poor households now face longer periods in poverty.

In relation to the average income of individuals in the different dynamic categories of poverty, the always poor have an average per capita household income of R\$ 279.08 in 2018/2019, while the usually poor have an average income almost twice as high, R\$ 495.17. As for the transitory poor, the average income is R\$ 1226.12, and for the never poor, R\$ 2523.64, in the same year. Chart 2 demonstrates the wage differences among the members of the different categories in 2018/2019, where the dashed line represents the average salary (or labor income) and the red line denotes the distance of their income in relation to the Bolsa Familia eligibility criterion.

⁷ It should be noted that the 2018 data base contains the families that begin to be interviewed this year and end the interview in 2019, so it contain all quarters of 2018 and 2019.

Chart 2: Density of individual wage in 2018/2019



Source: Own elaboration based on PNADC (IBGE) 2018/2019 data.

Note: The dashed line represents the average salary of individuals in each specific category; the red line represents the eligibility criterion of the Bolsa Familia Program in 2018/2019 (R\$178).

As for the average number of family members, there are no marked disparities among the categories of poverty analyzed, varying between, on average, two members in families that are always poor to three members in families that are never poor. The analysis of the age structure of the families shows that 17.06% of the members of families who are always poor are children—individuals aged 14 years or less—in 2018/2019. It is worth noting that the proportion of children in the families reduces in all the groups during the analyzed period (2012–2019): 26.21% vs. 22.48% for the usually poor, 23.12% vs. 19.05% for the churning or occasionally poor, and 19.9% vs. 18.83% for the never poor. However, as is evident, the fall is more pronounced among families who are always poor.

Regarding the age of the heads, it is possible to verify that, throughout the entire period, the heads of low-income households are the oldest and have an average age of approximately 63.6 years in 2018/2019. This shows the strong presence of elderly or individuals close to retirement age in this category of more severe chronic poverty. It is important to note that in this categorization, we are using only the labor income of families, disregarding non-labor income, such as cash transfer programs and pensions, which could keep elderly people out of this situation. The usually, churning or occasionally and never poor heads have an average age of approximately 54.48, 52.11, and 47.34 years, respectively during the same year.⁸

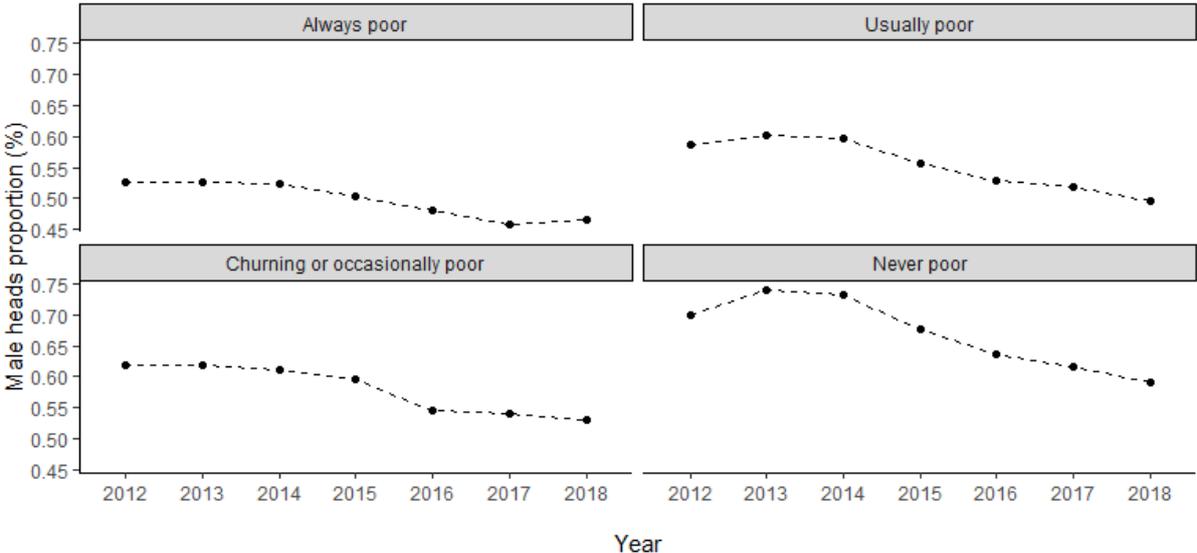
When analyzing the proportion of white heads in the family categories, it is observed that 48.86% of the heads of never poor households in 2018/2019 are white individuals. In the always poor and usually poor families, these proportions are 43.56% and 30.07%, respectively. Finally, in families that are churning or occasionally poor, or transitory poor, 38.27% of the heads are white. These statistics show that the situation of staying for longer periods in poverty is also related to the socioeconomic exclusion based on characteristics of race.

The proportion of male heads decreases in all the categories during the analyzed period, and consequently, the proportion of female heads increases in all the categories (Chart 3). This fact may be related to the increasing female participation in the labor market and the

⁸ It is possible that, when considering the total family income, including, therefore, pensions and cash transfers, such proportion does not exist and, thus, the elderly may not be so present in the chronic poor population.

increase in women's qualifications and reserve salaries. This determines that the head of the household—which is usually decided by the possession of the highest relative income within a household or greater decision-making power and intra-family bargaining—is a woman. In addition, in part of the households headed by women the spouse does not exist, that is, they are families in which the woman is the main or the only source of family income. In 2018/2019, the never poor category has the highest proportion of male heads (59.06%), while the always poor category has the highest proportion of female heads (53.39%) of the total heads. Thus, despite the increase in the proportion of female heads over time, the predominance of female heads in households with lasting poverty may be indicative of the existence of a single economically active person in the household.

Chart 3: Proportion of male household heads 2012-2018/2019



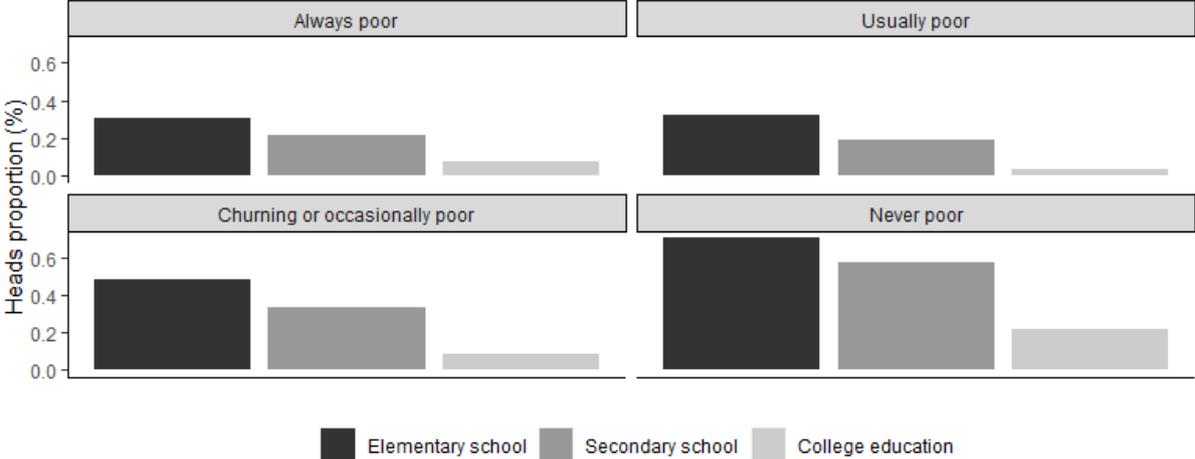
Source: Own elaboration based on PNADC (IBGE) 2012-2019.

In the analyzed period, household heads become more educated in all the categories analyzed. However, for a specific level of education, a high degree of inequality exists between the chronic, transitory, and non-poor categories. The proportion of heads with a complete college education is higher in families that are never poor—14.51% in 2012 and 21.58% in 2018/2019. Among the transitory poor heads, this proportion is 5.63% and 8.63%, respectively. Among the always poor and usually poor, these percentages are 4.95% and 2.05% in 2012, and 7.96% and 3.65%, respectively, in 2018/2019. In this sense, college education presents the greatest inequality among categories. Chart 4 illustrates the inequality in schooling among the heads of different strata for 2018/2019.

For the proportion of heads of the economically active population, the inequality between the different strata of poverty and non-poverty is high. In 2018/2019, only 14.28% of the always poor heads are in this category, while among the never poor heads, this proportion is 83.04%. For the other members, we observe that in families that are never poor, 61.42% of individuals are economically active in 2018/2019. In families that are always poor, only 14.44% of individuals are in this condition. In the usually and transitory poor families, this percentage is 32.55% and 47.15%, respectively. Therefore, it is possible to ascertain that one of the conditioning factors of the situation and duration of poverty may be the presence of members who can work in the labor market, that is, the greater the portfolio of human capital to be used in times of falling income, less is the probability that the family will experience a long period of deprivation. We can also verify an important relationship between the effective participation of the family head in the labor market and the situation of permanence in

poverty. To the extent that economically active individuals have greater access and better insertion in the labor market, this relationship becomes negatively correlated with the duration of poverty.

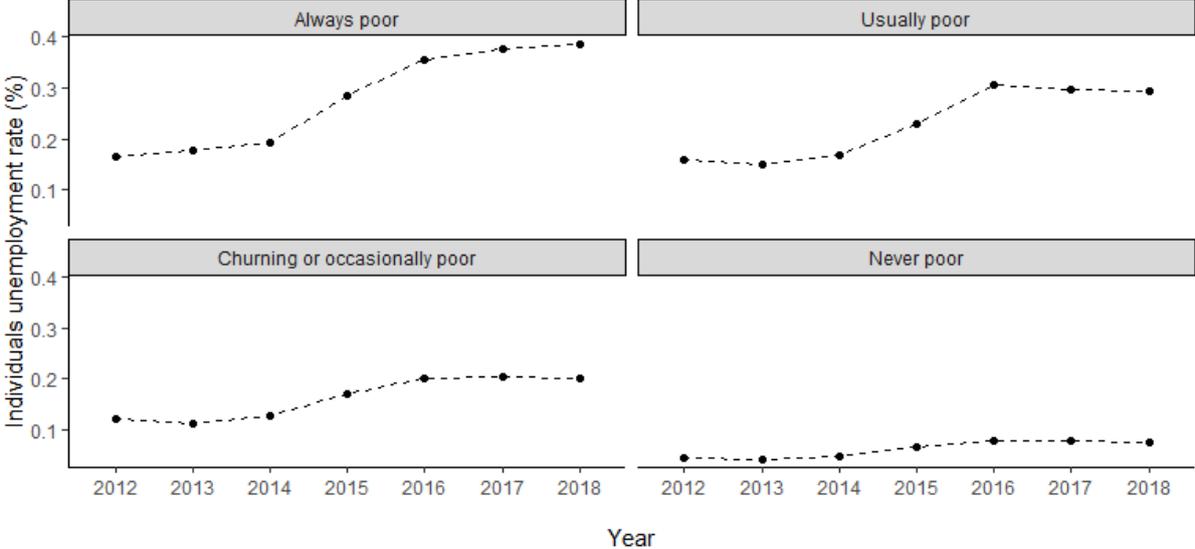
Chart 4: Proportion of household heads by level of education in 2018/2019



Source: Own elaboration based on PNADC (IBGE) 2018/2019.

The effects of the economic crisis stand out mainly on the unemployment rate among individuals. Chart 5 illustrates that the transitory poor and, especially, the chronic poor are affected the most by unemployment. An increase in the unemployment rate is observed among all categories of families, especially during periods of recession (2015 and 2016), but this growth is even more pronounced among members of chronic poor families: in 2014, 19.20% of members of the always poor family category, 16.88% of the usually poor, 12.92% of the churning poor, and 4.80% of the never poor category are unemployed; in 2018/2019, 38.4%, 29.42%, 20%, and 7.67% of the members of the respective categories of families are unemployed.

Chart 5: Proportion of unemployed individuals 2012-2018/2019

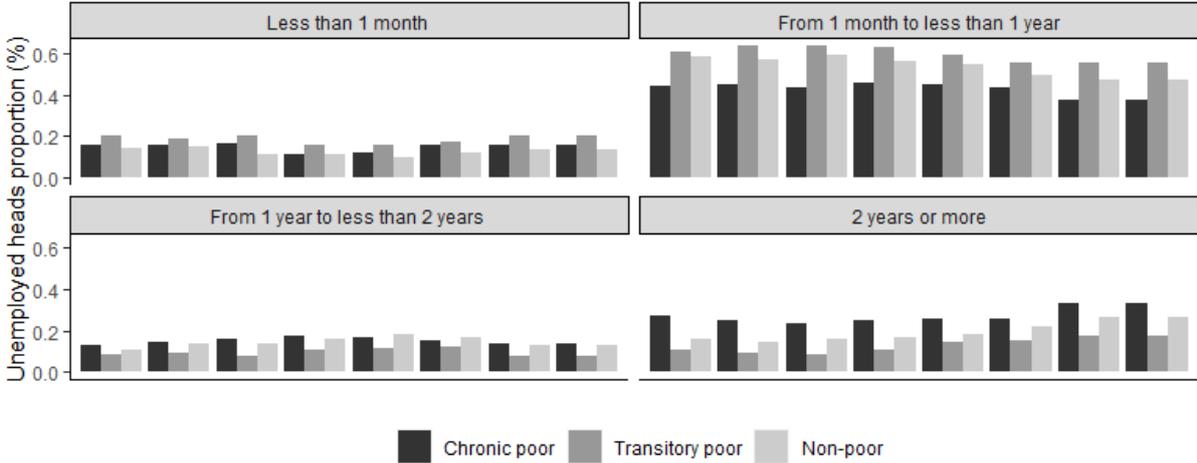


Source: Own elaboration based on PNADC (IBGE) 2012-2019.

For household heads, we observe that in 2014, 13.52% of the always poor, 10.36% of the usually poor, 8.75% of the transitory poor, and 1.42% of the never poor heads are

unemployed. However, after the negative effects of the crisis, in 2018/2019, the levels worsen significantly: 30.77% of the always poor, 23.42% of the usually poor, 15.06% of the transitory poor, and 3.18% of the never poor heads are unemployed. Even though all the categories are negatively affected, the poor, mainly those who remain in poverty for long periods, are affected the most by the crisis. In addition, Chart 6 illustrates that unemployed chronic poor heads face longer periods of unemployment—about 32.76% of their unemployed heads had been unemployed for two years or more in 2018/2019 compared to 23.29% in 2014. Thus, a significant part of those who became unemployed at the beginning of the crisis remained in the same condition, while the transitory poor remained for shorter periods in unemployment. This is so because 17.11% of the transitory poor were in the same situation of lasting unemployment in 2018/2019, suffering only a temporary shock of labor income. This demonstrates, once again, how the first group—the chronic poor—can suffer from a poverty trap via unemployment, which extends the situation of deprivation.

Chart 6: Proportion of heads by duration of unemployment (2012-2018/2019)



Source: Own elaboration based on PNADC (IBGE) 2012-2019.

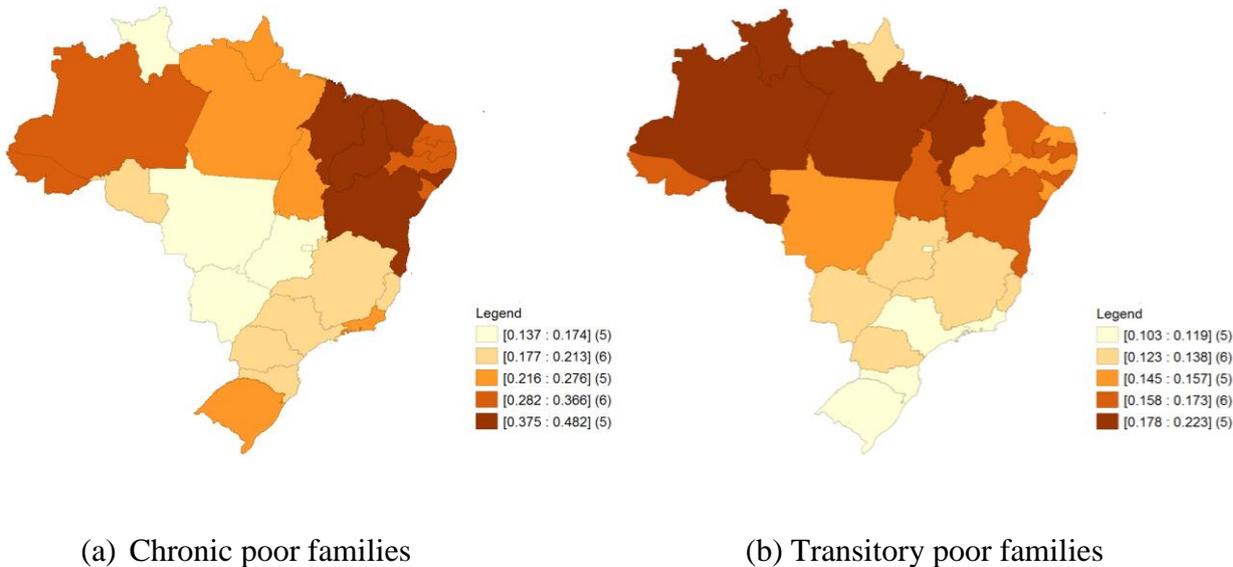
Another analysis related to the performance of family members in the labor market is the average number of weekly hours worked. When analyzing the average weekly working hours of heads of households between 2012 and 2019, a decrease in working hours can be observed for heads of all categories, a fall possibly associated with the economic crisis in the country and the consequent increase in the lower skill-level occupations. In the last year, the always poor, usually poor, transitory poor, and never poor heads devote approximately 25.7, 27.5, 33.6, and 40 hours a week to work, respectively. The lower average number of hours worked among individuals who are always and occasionally or churning poor may be related to a higher incidence of the lower skill-level occupations.

The status of informality in the labor market and the inactivity of heads of households also have a significant positive correlation with the length of permanency of families in poverty, that is, the higher these indicators, the longer the family remains below the poverty line. Among employed heads, 85.8% of household heads who were always poor were in a job without a formal contract in 2012, which increases by 11.11 p.p. to reach 96.91% in 2018/2019. The proportion of heads in an informal situation in the labor market has been evolving with the economic crisis. The usually poor heads show an increase of 8.27 p.p., reaching 91.31% in 2018/2019. The heads of transitory poor households in an informal situation increases from 49.07% in 2014 to 59.24% in 2018/2019. However, the never poor heads have the lowest proportion and evolution of informality, increasing from 20.37% in 2014 to 25.14% in 2018/2019, a 4.77 p.p. increase. A comparison with the proportion of

informality between the always poor and the never poor clarifies the relationship between the work situation and poverty and their length of permanency on poverty.

Finally, the proportion of inactive heads, that is, heads of working-age who are outside the workforce, does not change significantly between 2012 and 2019, but demonstrates strong heterogeneity among the four different strata. In 2018/2019, 85.67% of the chiefs who were always poor, 57.71% of the usually poor, 39.07% of the transitory poor and 16.87% of the never poor, belonging to the working-age population, were inactive.

Figure 1: Quantile maps of the proportion of chronic and transitory poor families in Brazilian states in 2018/2019



Source: Own elaboration based on PNADC (IBGE) 2018/2019.
 Note: The proportion of chronic and transitory poor households is calculated relatively to the total of households.

In 2012, 27.62% and 34.21% of families who are always and usually poor are located in rural areas, respectively. In 2018/2019, these proportions drop to 23.65% and 28.83%, respectively. This downward trend is repeated for all the categories analyzed, but the proportion of transitory poor and the never poor families living in rural areas is considerably lower, reaching 16.91% and 9.32%, respectively, in 2018/2019. In contrast, the proportion of individuals in metropolitan regions increased between 2012 and 2019. In terms of categories, 30.02% of the always poor, 29.46% of the usually poor, 39.01% of the transitory poor, and 41.97% of the never poor are located in metropolitan regions in 2018/2019. The largest growth in metropolitan regions and the largest decrease in rural areas of individuals occur for the usually poor and the always poor (chronic poor) categories, indicating the increasingly urban character of poverty in Brazil.

The regional disparities that exist in the proportion of families in the categories of chronic and transitory poverty are presented in Figure 1. The quantile maps in this Figure show that the two categories that make up chronic poverty, always poor and usually poor, have the highest relative proportion of households in the northeast region over the entire period analyzed. In 2018/2019, 34.75% and 43.84% of the families in these categories live in the northeast region (the state of Alagoas has the highest proportion of chronic poor among all Brazilian states—48.23% of its population is chronically poor), the highest relative proportion among all macro-regions. The transitory poor and never poor families are predominantly

located in the southeast region, the region with not only the most dynamic labor market in the country but also the highest incidence and the absolute number of poor families. In contrast, the north region, in relative terms, has the highest proportion of transitory poor households, especially the state of Amazonas, with 22.31% of its population in a situation of transitory poverty. The midwest and south regions have the lowest proportions of chronic and transitory poor.

Table 2: Description of families in the specific categories of chronic and transitory poverty for 2018/2019

Variables	Hulme and Shepherd's (2003) specific categories			
	Always poor	Usually poor	Churning or occasionally poor	Never poor
Average household income	R\$279.08	R\$495.17	R\$1.226.12	R\$2.523.64
Households (%)	20.20%	4.29%	13.46%	62.06%
Family size	3.2	3	3.2	3.5
Children (%)	17.06%	22.48%	19.05%	18.83%
Elderly (%)	43.98%	22.31%	18.58%	10.38%
EAP (%)	14.44%	32.55%	47.15%	61.42%
Unemployment rate	38.40%	29.42%	20.00%	7.67%
Rural (%)	23.65%	28.83%	16.91%	9.32%
Metropolitan region (%)	30.02%	29.46%	39.01%	41.97%
Northeast (%)	34.75%	43.84%	27.64%	17.06%
Southeast (%)	40.96%	31.62%	41.74%	52.16%
South (%)	13.60%	9.00%	14.07%	17.02%
North (%)	6.18%	11.23%	9.75%	5.79%
Midwest (%)	4.52%	4.33%	6.81%	7.97%
Age of the head	63.61	54.48	52.11	47.34
EAP head	14.28%	42.08%	60.64%	83.04%
Married head	45.39%	55.75%	57.65%	71.59%
Male head	46.61%	49.68%	53.07%	59.06%
White head	43.56%	30.07%	38.27%	48.86%
Elementary school head	30.64%	32.19%	47.88%	70.44%
Secondary school head	21.73%	19.56%	33.64%	57.19%
College proportion head	7.96%	3.65%	8.63%	21.58%
Unemployed head	30.77%	23.42%	15.06%	3.18%
Informal head	96.91%	91.31%	59.24%	25.14%
Average weekly working hours for heads	25.67	27.53	33.6	40

Source: Own elaboration based on PNADC (IBGE) 2018/2019 data.

Note: EAP: Economically active population.

Table 2 ends this section, summarizing the descriptive statistics of the sample families, by chronic, transitory, and non-poverty categories.

5. Econometric estimation results from multinomial logit

The multinomial logit estimates confirm the aspects previously reported. According to the model, the greater the number of family members, the lower the probability of belonging to chronic and transitory poverty in relation to the never poor category. On the other hand, the presence of a child under the age of six in a household increases the likelihood of the family belonging to any category of poverty, being higher for families facing chronic poverty.

Regional characteristics reinforce heterogeneity between households from different strata. The probability of belonging to the always poor, usually poor, and the transitory poor group is greater for households that live in the northeast and north regions than for the never poor households. Furthermore, being in rural areas also increases the likelihood of belonging to transitory poverty and, to a greater extent, chronic poverty. Conversely, the likelihood of belonging to these categories for metropolitan households is smaller than that for the never poor category.

Regarding the variables of household heads, older heads, and, in a counterintuitive way, male heads are more likely to belong to some category of poverty given the condition of non-poverty. Furthermore, white and married heads are less likely to be chronic or transitory poor. It is also possible to verify that heads who have completed secondary school or, especially, complete college education, are less likely to belong to the group of always poor, usually poor, churning, or occasionally poor.

For heads, the variables with the most notable results, in terms of probability, are unemployment and inactivity. As for the first variable, unemployed heads have a 45.57% probability, compared to the never poor, of belonging to the stratum of always poor, reinforcing the importance of labor income in the composition of family income, and therefore, in the exit of poor families from a more lasting situation of deprivation. In addition, inactive heads are also highly likely to belong to the transitory poverty category, to the group of usually poor and, substantially more, to the always poor (84.15%) compared to the never poor. Employed heads also have important heterogeneities. Heads employed in an informal situation are more likely to be always poor (25.47%), usually poor (12.12%), and transitory poor (2.79%) compared to the never poor category.⁹

The results found in this study through descriptive and econometric analyses are similar to the results of national and international literature on the poverty dynamics. The findings of Gonçalves and Machado (2015), with the PME (IBGE) longitudinal data for certain metropolitan regions and using the methodology of Hulme and Shepherd (2003), converge with the estimates found in this research. Between 2002 and 2011, households with children, unemployed heads, and a greater number of members were more related to the group of always poor, usually poor, and transitory poor in relation to the never poor. The presence of individuals with secondary and college education, economically active members, members employed in the formal sector, the presence of elderly people, and a greater number of hours worked by individuals and their heads reduce the likelihood of belonging to any category of poverty. Males, whites, married, and older heads reduce the likelihood that the household will be chronic or transitory poor. As explained above, the presence of the elderly is correlated to poverty when only labor income is considered. However, when pensions and other sources of income are added to calculate the total household income, the effect is reversed and the correlation becomes negative, demonstrating the importance of pensions in keeping the elderly out of poverty.

⁹ It is worth mentioning that such estimates contain biases, since there are variables not available in the Continuous PNAD, such as the health situation of the heads of family, whose absence implies endogeneity.

Table 3: Estimated odds ratios

Variables	Always poor	Usually poor	Churning or occasionally poor
Family size	0.485*** (0.00232)	0.861*** (0.00518)	0.873*** (0.00256)
Rural household	5.070*** (0.0897)	3.785*** (0.0836)	1.891*** (0.0232)
Metropolitan household	0.726*** (0.00660)	0.756*** (0.0114)	1.008 (0.00679)
Presence of children (< 6)	2.955*** (0.0451)	1.883*** (0.0366)	1.444*** (0.0128)
Northeast	3.151*** (0.0691)	3.196*** (0.110)	1.832*** (0.0268)
Southeast	1.362*** (0.0279)	1.013 (0.0345)	1.003 (0.0139)
South	1.099*** (0.0252)	0.88** (0.0348)	0.947** (0.0151)
North	2.315*** (0.0655)	2.751*** (0.110)	2.048*** (0.0355)
Age of head	1.040*** (0.000386)	1.014*** (0.000601)	1.009*** (0.000288)
Male head	1.477*** (0.0155)	1.224*** (0.0209)	1.125*** (0.00869)
White head	0.927*** (0.00911)	0.742*** (0.0119)	0.843*** (0.00604)
Married head	0.394*** (0.00442)	0.336*** (0.00597)	0.467*** (0.00395)
Secondary school head	0.678*** (0.00735)	0.586*** (0.00934)	0.731*** (0.00583)
College education head	0.574*** (0.00713)	0.272*** (0.00646)	0.454*** (0.00449)
Unemployed head	45.57*** (0.936)	21.03*** (0.513)	8.080*** (0.102)
Inactive head	84.15*** (0.0412)	16.82*** (0.305)	4.937*** (0.0412)
Constant	0.00914*** (0.000346)	0.0133*** (0.000774)	0.161*** (0.00411)
Year	Yes	Yes	Yes
Quarter	Yes	Yes	Yes
Pseudo R ²	99,83%	99,83%	99,83%
Number of observations	1.159.795	1.159.795	1.159.795

Source: Own elaboration based on PNADC (IBGE) 2012-2019.

Notes: Standard deviation in parentheses; p-value<0.05: *, p-value<0.01: **, p-value<0.001: ***; base category: never poor.

Ribas et. al. (2011), through the construction of a pseudo-panel with PNAD data from 1993 to 2003, also present similar results. The authors point out that those most likely to be chronically poor are households living in the northeast and north, with non-white, less

educated, and younger heads. Transitory poverty, on the other hand, is more common among female-headed, unemployed, and informal households, due to greater income volatility. The authors point out that, if the persistence and transience of poverty are caused by heterogeneity between the variables of the households and their heads, policies that seek to interrupt chronic and transient poverty through direct income transfer may incur inefficiencies because the adverse elements are not considered in the formulation of such policies. Therefore, these elements need to be focused on by policymakers.

6. Conclusions and final remarks

The results of this article allow us to verify that families that live in rural regions and in the northeast and north Brazilian regions are more likely to be in a situation of deprivation whether transitory or, especially, chronic. Other relevant characteristics associated with this situation are: the greater number of children, the presence of less educated members, a lower percentage of economically active individuals, and the presence of non-white, unemployed, informal, single and older heads. Therefore, it is important to highlight the importance of public policies aimed to the human capital developing and job opportunities, both with the objective of increasing the income of disadvantaged households, especially those facing greater periods of poverty. In addition, the higher concentration of elderly and children in chronic poor families shows the importance of focalized cash transfer programs and pensions, besides daycare centers and primary schools, in order to allow the insertion of individuals, especially women, allocated to domestic activities.

Furthermore, the results of the paper demonstrates the importance of public policies that aim to protect economically active individuals, especially the chronic poor, from income volatilities related to unemployment, such as unemployment insurance. In addition, we verify that the adverse effects of the economic crisis most affected the chronic poor – with an increase of 19.2 p.p. in their unemployment rate, which is an evidence of the relevance of public policies focusing on this most disadvantaged group of households and that consider their spatial, socioeconomic and demographic heterogeneity.

APPENDICES

APPENDIX A: Proportion of families in specific categories of chronic and transitory poverty by Hulme and Shepherd (2003) using the Bolsa Familia Program eligibility criterion.

Year	Specific categories of chronic and transitory poverty			
	Always poor	Usually poor	Churning or occasionally poor	Never poor
2012	18.39%	4.40%	14.27%	62.94%
2013	18.64%	4.41%	13.65%	63.30%
2014	18.71%	4.21%	13.31%	63.77%
2015	17.71%	4.21%	14.24%	63.84%
2016	18.38%	4.28%	14.15%	63.18%
2017	19.35%	4.14%	13.71%	62.80%
2018/2019	20.20%	4.29%	13.46%	62.06%

Source: Own elaboration based on PNADC (IBGE) 2012-2018/2019.

APPENDIX B: Multinomial logit results for family and head variables.

Variables	Always poor	Usually poor	Churning or occasionally poor
Family size	-0.723*** (0.005)	-0.149*** (0.006)	-0.136*** (0.003)
Rural household	1.623*** (0.018)	1.331*** (0.022)	0.637*** (0.012)
Metropolitan household	-0.321*** (0.009)	-0.280*** (0.015)	0.008 (0.007)
Presence of children (< 6)	1.083*** (0.015)	0.633*** (0.019)	0.368*** (0.009)
Northeast	1.148*** (0.022)	1.162*** (0.034)	0.605*** (0.015)
Southeast	0.309*** (0.020)	0.013 (0.034)	0.003 (0.014)
South	0.095*** (0.023)	-0.012** (0.039)	-0.054** (0.016)
North	0.839*** (0.028)	1.012*** (0.040)	0.717*** (0.017)
Age of head	0.039*** (0.000)	0.014*** (0.001)	0.009*** (0.000)
Male head	0.390*** (0.010)	0.202*** (0.017)	0.118*** (0.008)
White head	-0.076*** (0.010)	-0.298*** (0.016)	-0.171*** (0.007)
Married head	-0.930*** (0.011)	-1.090*** (0.018)	-0.760*** (0.008)
Secondary school head	-0.389*** (0.011)	-0.535*** (0.016)	-0.314*** (0.008)
College education head	-0.555*** (0.012)	-1.303*** (0.024)	-0.790*** (0.010)
Unemployed head	3.819*** (0.021)	3.046*** (0.024)	2.089*** (0.013)
Inactive head	4.433*** (0.014)	2.823*** (0.018)	1.597*** (0.008)
Constant	-4.695*** (0.038)	-4.320*** (0.058)	-1.827*** (0.026)
Year	Yes	Yes	Yes
Quarter	Yes	Yes	Yes
Pseudo R ²	99,83%	99,83%	99,83%
Number of observations	1.159.795	1.159.795	1.159.795

Source: Own elaboration based on PNADC (IBGE) 2012-2019.

Notes: Standard deviation in parentheses; p-value<0.05: *, p-value<0.01: **, p-value<0.001: ***; base category: never poor.

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