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POBREZA DAS MULHERES CHEFES DE FAMÍLIA DA REGIÃO NORDESTE DO BRASIL: UMA ANÁLISE MULTIDIMENSIONAL

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ABSTRACT

This paper analyses the poverty of heads of families in the Northeast Region of Brazil in the year 2015 through a multidimensional approach. To this end, the multidimensional poverty index (MPI) was estimated based on microdata from the National Household Sample Survey (PNAD). The results showed that families in the Northeast headed by women and with the presence of a spouse or partner are multidimensionally poorer than families headed by women where there is no presence of a spouse or partner. However, we could not state that there is a process of feminization of poverty in multidimensional terms when comparing the MPI result (M0) between women and men, regardless of the presence or absence of a spouse or partner. Moreover, the dimensions related to family vulnerability, availability of resources, and use of time were the factors in which women were more vulnerable in comparison to men for heads of families in the Northeast Region with no spouse or partner. These women were more deprived only in the dimension use of time compared to male heads of household in this region when considering the presence of a spouse or partner. The dimensions related to work, income, and consumption of goods were the ones that most contributed to the insertion of Northeastern women in a condition of poverty, thus being subjects that demand more attention from public authorities.

RESUMO

Este artigo analisa, por meio de uma abordagem multidimensional, a pobreza das chefes de família da Região Nordeste do Brasil no ano de 2015. Para tal, fora estimado o Índice de Pobreza Multidimensional (MPI) tendo por base os microdados da Pesquisa Nacional por Amostra de Domicílios (PNAD). Os resultados evidenciaram que na região Nordeste as famílias que são chefiadas por mulheres e que têm a presença do cônjuge ou companheiro são multidimensionalmente mais pobres em relação às famílias chefiadas por mulheres onde não há a presença de cônjuge ou companheiro. No entanto, não foi possível afirmar que existe um processo de feminização da pobreza em termos multidimensionais quando se compara o resultado do MPI (M0) entre mulheres e homens (independente da presença ou não de cônjuge ou companheiro). Também fora observado que para as chefes de família da Região Nordeste, onde não havia a presença de cônjuge ou companheiro, as dimensões relativas à vulnerabilidade familiar, disponibilidade de recursos e uso do tempo foram os fatores nos quais as mulheres se mostraram mais vulneráveis em comparação aos homens. Quando considerado a presença de cônjuge ou companheiro, essas mulheres foram mais privadas somente na dimensão de uso do tempo em relação aos homens chefes de família dessa região. As dimensões relativas ao trabalho, a renda e ao consumo de bens foram as que mais contribuíram para a inserção da mulher nordestina em uma condição de pobreza, e são assim, temas que exigem mais atenção do poder público.

Palavras-chave: Gênero. Pobreza multidimensional. Nordeste. Desenvolvimento econômico.

INTRODUCTION

Poverty is a broad, multidimensional topic and the object of study in different areas of knowledge. Poverty is not necessarily restricted to income levels and lack of certain material goods, as it is a complex social phenomenon. It can also be analyzed through the denial of socially acceptable opportunities (Codes, 2008; Helfand *et al*., 2011). In addition, the approach to poverty through different dimensions opened space for new discussions, such as gender analysis.

In Brazil, poverty is a problem that stems largely from income inequality, whose origin is historical and was aggravated by the economic development model and regional differences. Poverty evolution in Brazil in the last three decades revealed that imbalances and low economic growth in the 1980s increased social inequalities and contributed to an increased incidence of poverty. In the 1990s, the proportion of individuals living in poverty was reduced from 44% in 1992 to 34% in 1999 throughout Brazil. Furthermore, the proportion of poor people in Brazil remained at a level

close to 34%. Poverty levels observed in the 1980s and early 1990s remained relatively stable, with a reduction in indices after the implementation of the Real Plan. Economic conditions and public policies favored the improvement of poverty indicators in Brazil in the first half of the first decade of the 2000s, with improvements in extreme poverty indices observed since the implementation of the Real Plan. The number of individuals living in absolute poverty in Brazil from 2003 onwards decreased by around 20 million people and the proportion of poor people was reduced by half. This result was also followed by significant improvements in the living conditions of the Brazilian population, such as improved access to public services, higher formalization of the labor market, increased credit supply, and reduced prices of durable goods (Rocha, 2003; 2006; 2013; Oliveira, 2014).

In the Northeast Region, poverty, measured from the perspective of income, that is, via a unidimensional perspective, reached 35.55% of the population in 2009. However, poverty covered about 57% of the Northeast population in the same year from a multidimensional[1] perspective. It demonstrates that poverty is not exclusively a problem of "economic deprivation," but of greater complexity, as it considers factors such as people's living conditions: education, health, access to the labor market, housing conditions, etc. (Barros, 2014). Few studies have analyzed poverty from a gender perspective and through a multidimensional approach. Furthermore, the studies conducted considering this approach are centered on European and African countries. In a study carried out for Europe, Alkire, Apablaza, and Jung (2014) found evidence that women are multidimensionally poorer than men, with no significant variability for this gender gap across European countries.

Since few studies analyze the differences between genders for the multidimensional poverty literature, and the few existing studies center the analysis on European and African countries, and given that studies on poverty in Brazil are fundamentally centered on the analysis of the family household, not making a gender distinction, this analysis focuses on the analysis of poverty in the Brazilian Northeast Region through a multidimensional and gender approach in the period from 2004 to 2015.

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1   According to Barros (2014), poverty seen from a multidimensional perspective should consider not only information on income but also social, cultural, and political characteristics that influence the well-being of individuals.

POVERTY: CONCEPTUAL ASPECTS AND EMPIRICAL EVIDENCE FROM A GENDER PERSPECTIVE

Studies on poverty have two aspects: *a)* they relate the indispensable income capable of satisfying exclusively nutritional needs, called the indigence line or extreme poverty; and *b)* list individual needs, such as health, education, housing, and transportation, among others. This second line is called the poverty line (Kageyama & Hoffmann, 2006). Two other theoretical lines of studies on poverty can be added: that of basic needs and that of capacities. Addressing basic human needs goes beyond issues related to food and incorporates a wider range of these human needs, such as education, sanitation, and housing. This approach can capture other aspects of individuals' daily lives, not just nutritional issues, and it is extremely beneficial from an economic point of view, as it increases the individual's productivity. These aspects introduce the multidimensional nature of research related to poverty (Lopes, Macedo & Machado, 2003; Duclos & Araar, 2006).

According to Comim and Bagolin (2002), the tendency to use monetary indicators of poverty is often justified by four main factors: i) the degree of correlation between insufficient income and other deprivations related to being poor; ii) unavailability of other social statistics; iii) difficulty in weighing and aggregating different social dimensions; and iv) the need for homogeneous measures that allow to compare different regions or locations.

However, by limiting poverty to a monetary indicator, usually income, there may be a risk of overestimating poverty. An example is what happens in rural areas, where, according to Neder (2008), poverty indicators strictly based on the condition of insufficient income tend to overestimate the number of poor people and households to the extent that they do not consider the value of income from self-consumption (Salama; Destrmau, 1999).

Focusing the debate on poverty only on the one-dimensional (monetary) aspect is too simple. From this angle, studying poverty requires including the discussion regarding the individual's access to basic services from a multidimensional perspective. Thus, two other theoretical lines of poverty studies can be added: that of basic needs and that of capabilities. Addressing basic human needs goes beyond issues related to food and incorporates a wider range of these human needs, such as education, sanitation, and housing. This approach can capture other aspects of individuals'

daily lives, not only nutritional issues, and it is extremely beneficial from an economic point of view, as it increases the individual's productivity. These aspects introduce the multidimensional nature of research related to poverty when considered that way (Lopes; Macedo; Machado, 2003; Duclos; Araar, 2006).

The capabilities perspective, initially proposed by the Indian economist Amartya Sen (1983; 1984), associates poverty with the deprivation of basic needs suffered by individuals, in the absence of opportunities to perform some minimum levels of functioning. These functionings range from fundamental issues such as being well nourished and having good health to more complex issues such as being happy, having self-respect, and participating in social life.

In this view, poverty consists of different dimensions, which aggregate elements that refer to the focus on basic needs, as well as highlight the ability of individuals regarding choices relative to well-being and ways to achieve it. them. Also, this approach adds to the understanding of poverty, as it shows what quality of life people evaluate for themselves (functionings), and this chosen quality of life is not limited to the income endowment that these individuals have, but also to other factors related to living conditions.

Therefore, we can see that the core of the analysis of the capabilities approach focuses on what people are capable of being and doing, not on their income and much less on their consumption possibilities, which, in turn, represent only means to achieve well-being. People's ability to convert resources into functionings varies according to health, the presence of a physical disability, or gender. The contribution of the capabilities approach to poverty analysis is to improve understanding of the nature and causes of poverty and deprivation by shifting attention from means (income) to the ends that individuals have reason to pursue and the freedoms of achieving these ends.

In this research, poverty is understood as a multidimensional phenomenon, without disregarding the importance of insufficient income for its definition, as income is one of the necessary means of accessing and maintaining well-being. Monetary resources are important for defining poverty, as it is access to these resources that will make it possible to acquire products and services that are also accounted for in individual well-being, as well as other non-monetary factors. In summary, as emphasized by Sen (2000), income is a necessary condition but not sufficient to eliminate the condition of poverty of individuals.

FEMINIZATION OF POVERTY

Poverty and its relationship with men and women have been treated independently, which in a way explains the specific role of each one of them in the political agenda and scientific research. The theoretical development of both concepts over time has been remarkable. As seen in the previous section, the most frequent definition refers to lack of income, but several other approaches have emerged regarding its conceptualization. Poverty seen from a gender perspective outlines that women have a more intense level of poverty than men due to gender discrimination (Arriagada, 2005).

The conceptualization of poverty often neglects the existing differences between men and women in terms of access to income, resources, and services. These differences can occur within households between men and women or between individuals, i.e., between single men and single women, or between female-headed households at a disadvantage relative to male-headed households. There are also gender-based differences regarding vulnerabilities such as illness and violence (Waratten, 1995).

The concept of feminization of poverty first appears in the study by the American Diane Pearce (1978), entitled The Feminization of Poverty: Women, Work, and Welfare. The main focus of this work was the description, in statistical terms, of the increase in households headed by women in the United States, which increased from 10.1% in 1950 to 14% in 1976, that is, an increase of almost 40% (38.6%), and its correlation with the deterioration of the living conditions of these heads of household in terms of poverty measured by income. Pearce (1978) recognizes that there are poor women because they live in households headed by poor men, and the analysis focused on women "who are poor because they are women." In other words, the author investigates what the economic consequences of being a woman are without having the support of a spouse, which ends up leading to a situation of poverty.

According to Cagatay (1998), the phenomenon of feminization of poverty means one or a combination of the following findings: i) women, compared to men, have a higher incidence of poverty; ii) women's poverty is more severe than men's; and ii) over time, the incidence of poverty among women is increasing relative to the incidence among men.

Analyses on the relationship between gender and poverty have intensified mainly from 1980 onwards. Most works, especially those applied to underdeveloped countries, showed an increase in the number of poor women proportionally to the number observed for men. The "feminization of poverty"

spreads more intensely since the 1990s in the lexicon of development and social policies at a global level, circulating in discourse and as a funding requirement of various international organizations. For instance, the World Bank analyzed policies aimed at combating gender inequalities in its report entitled Toward Gender Equality and openly proposed that public policies be directed toward women concerning education, health, rural extension service, rural and urban infrastructure, and areas such as security and job and income generation (Aguilar, 2011; Farah, 2004; Godoy, 2004).

Bianchi (1999) considers that the feminization of poverty should be analyzed via poverty rates over time. In addition to the proportion of women among the poor, one must analyze the ratio between the proportion of poor women and the proportion of poor men. Thus, the feminization of poverty must be understood as the relative risk of women being in poverty compared to men.

According to Novellino (2004), the demarcation of feminization of poverty begins when the woman, without a spouse or partner, becomes responsible for supporting the family, becoming the provider of her livelihood and that of her children. According to the author, female headship is one of the indicators of poverty that afflicts many women. This statement is based on the following realities: i) there is a tendency for women to opt for part-time jobs or temporary work due to the demands of their reproductive functions; ii) there is wage discrimination, that is, on average, wages received by women are lower than those received by men; iii) women's occupations are more concentrated in activities that require less qualification and for which wages paid are lower; and iv) there is higher female participation in the lower levels of the informal economy.

There is no consensus or clarity about the meaning of the feminization of poverty or whether it can be empirically observed. Feminization of poverty has been associated, firstly, with the perception of the proportion of female-headed households (FHHs) and, secondly, with the increase in female participation in informal activities in the low-return urban sector. Thus, the concept of feminization of poverty has been used to give meaning to different propositions. The first is that women have a higher incidence of poverty than men; in the second, female poverty is more severe than that of men; and third, there is a trend towards higher poverty among women, particularly associated with rising rates of FHHs (BRIDGE, 2001).

Importantly, the feminization of poverty should not be confused with the prevalence of higher degrees of poverty among women and families headed by women, but it should be

understood through the change in the poverty profile, thus having a temporal dimension. Therefore, the process of feminization of poverty is related to the increase in poverty in the female universe over time. However, when an analysis is carried out only at a certain point in time to identify the existence of a higher tendency for women or for households headed by women to be poor, one speaks of female representation in poverty. This concept alludes to the proof of higher poverty among women or among the families headed by them at a specific point in time (Costa *et al*., 2005).

However, regardless of the type of analysis, whether over time or at a specific point in it, the most important thing is to verify the phenomenon and identify its causes. Thus, as highlighted by Shadpour (2013), the minimization of female poverty leads to a direct reduction of the condition of poverty of children, given that most single-parent families are headed by women, who, on average, have lower assets than male-headed households.

The gender perspective at the same time points to a multidimensional perspective, as it considers the multiple roles that men and women play in the family, the job market, and society (Clert, 1998). Thus, studying women's poverty from a multidimensional perspective helps to better understand which factors, in addition to income, cause this phenomenon, also indicating which of these factors public policies to combat poverty should direct their actions.

Understanding the phenomenon of female poverty requires the adoption of a multidimensional concept of poverty, which goes beyond the mere monetary dimension, as well as the combination of complementary methodologies – quantitative and qualitative – that allow measuring the incidence, intensity, and severity of poverty, covering the complex procedures that constitute the inequalities and vulnerability of the female gender, and analyzing the objective and subjective deprivation of welfare (Pereirinha, 2008).

Therefore, it is worth emphasizing once again the importance of studying this problem through a multidimensional approach to contribute to a better understanding of the process of female poverty, as the study of poverty through a gender perspective allows the understanding of a series of processes included in this phenomenon and its dynamics and characteristics in certain contexts, which explain that certain groups are more prone and exposed to a situation of poverty due to their gender.

METHODOLOGY

The data used in the present study were extracted from the National Household Sample Survey (PNAD),[2] which is carried out by the Brazilian Institute of Geography and Statistics (IBGE). The spatial cut used was the Brazilian Northeast Region, and the time cut used in the analysis was the year 2015. The MPI (Multidimensional Poverty Index) was built for families headed by women in the Northeast Region based on the data provided by PNAD and the methodology proposed by Alkire and Foster (2011) and Alkire and Santos (2010), making the adaptations of nomenclature necessary for the original model.

According to Alkire and Foster (2011), the first step that must be taken to compose the MPI consists of choosing the unit of analysis, which can be a certain region, a household, or even an individual. Subsequently, the choices of dimensions and their respective indicators (variables) must be made.

An equally important step is to define the first cut-off line, which must be specified for each indicator, as clearly as possible, so that it is easy to identify individuals or units that are or are not in a situation of poverty. In this case, MPI identifies individuals in a situation of poverty considering two cut-off points or poverty lines. The first cut-off point occurs when defining Y as a matrix (nxd), where n represents the number of basic units under analysis and d represents the number of dimensions of the index. The typical observation of Y, $y_{ij} \geq 0$, corresponds to the performance of the individual $i = 1, 2, ..., d$, that is, it is the realization of unit i regarding dimension j.

This realization will correspond to how much of the objective related to dimension j unit i manages to achieve. For example, if j is an indicator that refers to access to knowledge and unit i to the individual, then a probable measure of realization can be related to whether or not the individual knows how to read and write, and the individual will be considered deprived (D) if s/he cannot read and write and non-deprived (ND) if s/he can read and write.

In this case, unit i will be deprived (D) in a given dimension if and only if $y_{ij} < z_j$. where $z_j > 0$ represents the cut-off line under which an individual is considered to suffer deprivations in dimension j. In other words, it represents the cut-off point in the process of identifying poverty so that z represents a

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2   We decided to use the data provided by PNAD due to periodicity issues. The database of the Census, for example, produces decennial information, which would lead to a lag of 6 years, as the last Census was carried out in 2010.
* The sample was expanded using the variable V4729 "person's weight."

dimension vector (*1xd*) with all cut-off lines for all dimensions. Likewise, *c* represents a vector of dimension *nx1* such that each element corresponds to the amount of deprivation faced by unit *i*.

The second cut-off line (*k*) for identifying individuals in poverty is given by $0 < k < d$, where unit *i* is considered to be in poverty if and only if $c_i \geq k$. In this case, parameter *k* will serve to measure extreme poverty. In a situation where $k = d$, only deprived units in all dimensions will be considered poor, whereas $k = 1$ identifies as poor any deprived unit in only one dimension. In other words, the second cut-off line determines how many indicators an individual will have to be deprived of to be considered multidimensionally poor.

In case one wishes to hierarchize the dimensions of the multidimensional poverty index, it is sufficient to assign weights w_j to each of the dimensions that make up MPI such that $\sum_j^d w_j = 1$, so that each element would constitute a weighted sum of deprivations.

However, identifying which units are inserted in a situation of poverty does not in itself constitute an index of multidimensional poverty that can be applied to different regional/demographic levels. Faced with this reality, Alkire and Foster (2011) developed an index capable of comparing the occurrence of poverty between regions. The authors started from the most intuitive way of making such aggregation, called count ratio, or percentage calculation of units in poverty, represented by the ratio between the number of individuals in poverty, that is, who are deprived in one or more indicators *k*, and the total number of units in poverty in a given region, calling this measure by *H*, as presented in the following specification:

$$H = \frac{number\ of\ poor\ units}{total\ number\ of\ units\ in\ the\ region} = q/n \tag{1}$$

where *q* represents the total number of poor units.

However, according to Alkire and Foster (2011), measure *H* violates the axiom of dimensional monotonicity, as measure *H* does not increase when an individual in poverty becomes deprived in an additional dimension. The solution to this problem found by the authors consists in calculating the mean deprivation among individuals in poverty. Thus, a deprivation vector is defined only among individuals in poverty $c(k)$, in which each entry of this vector, $c_i(k)$, has a value equal to zero for

non-poor units and a value equal to c_i, which represents the number of dimensions in which unit i is deprived, for units under a poverty condition.

Thus, it allows calculating the mean poverty gap given by the sum of the deprivation proportions of all poor units divided by the total number of units in poverty.

The mean deprivation of units in poverty is given by the following specification:

$$A = \sum_i c_i(k) / qd \qquad (2)$$

where c_i represents the number of dimensions in which unit i is deprived, and qd represents the total number of poor units per dimension.

Thus, the multidimensional poverty index, given by measure M_0, can be calculated by the product between measures H and A, as shown in the following expression:

$$M_0 = H \times A \qquad (3)$$

where M_0 represents the adjusted headcount ratio (adjusted incidence calculation) given by the mean forecast among units in poverty.

MPI can also be broken down into dimensions. For this purpose, M_0 is divided for each subgroup of the population to be analyzed, allowing the analysis of the contribution of each dimension or indicator to general poverty. Measure A (sum of the proportions of deprivations of all poor units divided by the total number of units in poverty) is divided by the units in poverty in dimension j, which results in A_j. However, $A_j \times H$ leads to M_{0j}, that is, it leads to the adjusted dimension, which indicates the participation of dimension j in total poverty.

The weights given to the dimensions and components of MPI (M_0) for this research will be considered symmetrical because it is not possible to know the preferences and tastes of the population being analyzed. In this sense, the weighting of weights obeys the rule in such a way that the degree of poverty for each analyzed unit lies between 0 and 100. In this margin, the variability equal to 0 of the incidence of poverty corresponds to those units without any trace of poverty, while the variability of the incidence of poverty equal to 100 concerns the absolutely poor units.

MPI was divided into seven dimensions in this research, assessed based on information from PNAD and summarized in the multidimensional indicator, namely: i) family vulnerability; ii) access to knowledge; iii) access to work; iv) resource availability; v) use of time; vi) housing conditions; and vii)

consumption of goods. Each of these dimensions represents partial access to the necessary means for the units to be able to satisfy their needs, and, on the other hand, the achievement of ends, that is, the effective satisfaction of such needs.

These dimensions unfold into components, which total 27, and into indicators or variables, which are 37. The analysis focuses on the household unit, more specifically on families, for which identical weights are attributed to all variables belonging to the same component, as well as to all components of the same dimension and even for all dimensions.

Given its linearity, used both in the aggregation of poverty of several families and the aggregation of dimensions related to poverty, MPI allows one to obtain the degree of incidence of poverty of the entire population relative to each of its dimensions.

The first cut-off line used to compose MPI defines whether the investigated unit of analysis, in this case, women and men heads of households in the Northeast Region, is deprived (D) or non-deprived (ND) for each of the 37 variables of the seven dimensions considered in the MPI calculation. For example, in the seventh dimension "access to durable goods" in the indicator "the household has a refrigerator," the female head of household will be considered deprived (D) if she does not own this good and non-deprived (ND) if she owns the good in her domicile.

Thus, the second cut-off line (k) will determine the number of deprivations that women and men heads of households in the Northeast need to present to be framed in a situation of poverty. Following the recommendations of Alkire and Foster (2011), k chosen as the second cut-off line is $k = 12$, equivalent to 1/3 of the total variables that will be used in the MPI construction.

Dimension 1 has the components and the respective indicators that deal with the absence of family vulnerability, which can be understood as the additional amount required by the family to satisfy its essential needs with respect to what would be required by a standard family. Family vulnerability can be differentiated into three components: attention and special care for children, adolescents, and young people; special attention and care for the elderly; and economic dependence. Some considerations must be made regarding the definition of some components used in the construction of indicators of this dimension. In this study, individuals within the age group from 0 to 9 years old are considered children; children and adolescents from 0 to 17 years old; children,

adolescents, and young people from 0 to 24 years old; and elderly or individuals aged 60 years or more. Following the IBGE methodology for PIA (Population of Active Age), people aged 10 years or over were considered to be of active age.

Dimension 2, access to knowledge, is composed of three components (illiteracy, schooling, and professional qualification) and six indicators (absence of illiterate adults, absence of functionally illiterate adults, presence of at least one adult with complete elementary school, presence of at least one adult with complete high school, presence of at least one adult with some higher education, and presence of at least one worker with medium or high qualification). This dimension considers individuals aged between 25 and 59 years as adults. Individuals with medium or high qualifications were those who had completed high school and incomplete and complete higher education.

IBGE began to publish functional illiteracy rates from 1990 onwards, adopting the criterion of not self-assessment of the interviewees, but rather the number of school grades completed. Thus, a literate person can read and write a simple message or note in the language s/he knows, or even a literate person is one who has become physically or mentally unable to read or write. The criterion that an individual with less than four years of schooling is functionally illiterate was adopted for functional illiteracy. Thus, regarding literacy in this research, illiterate adults are those who cannot read and write, while functional illiterate adults are those with less than 4 years of schooling.

Access to work and income has a direct impact on whether or not the deprivations that characterize poverty are formed. Thus, the following components stand out in dimension 3, that is, access to work: availability of work, quality of the workplace, and remuneration. Members of active age are considered to be people aged 10 years or over for this dimension.

The availability of resources represents the fourth dimension that makes up MPI. This dimension is formed by three components and three indicators, the latter is per capita family income above the extreme poverty line, per capita family income above the poverty line, and most of the family income does not come from transfers. Importantly, information regarding transfers for this latter component is captured using the variable V1273 in the PNAD and considers interest on savings accounts and other financial investments, dividends, social programs, and other income that the individual normally received in the reference month. Therefore, other forms of income

transfer whether public or private are also considered in addition to transfers from social programs.

Using lines of poverty and extreme poverty or indigence are required although the focus of the present study is the analysis of poverty in families from the Northeast with female heads through a multidimensional perspective, which is based on approaches to basic needs and skills. Thus, the poverty line used to measure the multidimensional poverty of households with female heads in the Brazilian Northeast Region in 2015 corresponds to ½ the minimum wage for dimension 4. The extreme poverty line is represented by ¼ of the minimum wage for the analyzed year.

Time is a necessary resource to carry out various activities, such as study, social participation, and work. It seems much more important in the case of women, as an important part of their work (reproductive work)[3] is not valued in monetary terms but can be measured in terms of time. Thus, the fifth dimension, use of time, intends to measure the available time of household heads relative to the hours dedicated to productive and domestic work, as well as the hours spent commuting to the workplace.

The sixth dimension, which integrates the multidimensional indicator of poverty, housing conditions, is composed of eight components: home ownership, housing deficit, shelter capacity, access to water supply, access to electricity, access to sanitation, access to garbage collection, and access to the Internet.

The seventh and last dimension concerns the consumption of goods and is composed of four components: access to a stove, access to a refrigerator, access to a washing machine, and access to a microcomputer. The choice of indicators in this dimension is justified by the relevance they have in particular to issues related to food, as is the case of the appliances stove and refrigerator, and issues related to the use of time in domestic work, as is the case with the washing machine.

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3   Reproductive work refers to any and all support activities, that is, all the work provided by women that involves raising children and daily domestic activities. In the latter case, they include preparing food, doing laundry, and taking care of children, among others. In other words, it is all (unpaid) work carried out in the private and family sphere (BIROLI, 2018).

ANALYSIS OF FEMALE POVERTY IN THE NORTHEAST REGION OF BRAZIL BASED ON THE MULTIDIMENSIONAL POVERTY INDEX

There is a notable disadvantage in the Northeast Region in relation to Brazil and its other regions, especially regarding monetary poverty (Rocha, 2003 and 2006; Kageyama and Hoffmann, 2006). For this reason, the analysis of multidimensional poverty for female heads in this section will focus on that Region.

Table 1 shows the percentage of deprived heads of household in the dimensions and components of MPI for the Northeast in 2015. In general, women who did not live with a spouse or partner presented higher deprivation in the dimensions related to family vulnerability, access to work, availability of resources, and consumption of goods than women who declared living with a spouse or partner.

The deprivation observed in the family vulnerability dimension was due to the higher presence of elderly people in these families. The higher deprivation in the availability of resources was influenced mainly by the capacity to generate income and also by extreme poverty. Thus, the absence of a partner in the family makes these women more dependent on monetary transfers, with a higher chance of being immersed in a condition of indigence. In terms of access to work, the highest deprivation occurred in terms of remuneration. The higher vulnerability in the consumption of goods by heads who did not live with a spouse or partner was mainly due to lack of access to the washing machine.

However, the deprivations observed in the dimensions related to access to knowledge, use of time, and housing conditions were lower when these women did not live with a spouse or partner.

Also, men who did not live with a spouse or partner showed higher deprivation in the dimensions related to family vulnerability and consumption of goods compared to those who lived with a spouse or partner.

As observed for women heads of households in the Northeast Region, deprivation for men in this region is still intense with regard to access to work and the availability of resources. In 2015, the percentage of deprivation corresponded to 54.75% and 40.54%, simultaneously. However, these men were more deprived when they lived with a spouse or partner, mainly in terms of the availability of resources, given that deprivation for them was 10 p.p. higher compared to those who did not live with a partner or spouse.

Next, deprivations will be analyzed for each of the dimensions, components, and variables that make up the Multidimensional Poverty Index for female heads of household in the Northeast.

Table 1 | Northeast: percentage of deprived heads of household in the dimensions and components of MPI (2015).

Description	Not living with a spouse/partner		Living with a spouse/partner	
	Woman	**Man**	**Woman**	**Man**
Dimension 1 – Family vulnerability	**11.48**	**10.19**	**6.29**	**7.23**
Attention and special care for children, adolescents, and young people	3.42	3.17	4.73	2.88
Attention and special care for elderly people	36.46	34.04	14.32	21.63
Economic dependence	2.63	0.38	1.40	1.52
Dimension 2 – Access to knowledge	**10.92**	**12.97**	**13.58**	**15.38**
Illiteracy	6.75	10.14	8.17	11.33
Schooling	15.75	16.78	20.40	20.33
Professional qualification	4.76	7.23	3.91	8.59
Dimension 3 – Access to work	**53.74**	**54.75**	**52.50**	**57.39**
Work availability	42.59	41.25	42.32	54.37
Workplace quality	56.20	65.28	56.58	64.11
Remuneration	62.42	57.71	58.61	53.68
Dimension 4 – Availability of resources	**48.38**	**40.54**	**47.67**	**50.63**
Extreme poverty	18.42	7.79	15.69	17.45
Poverty	34.97	18.99	40.49	40.05
Income generation capacity	91.75	94.84	86.84	94.37
Dimension 5 – Use of time	**11.18**	**9.26**	**11.44**	**11.21**
Hours dedicated to main job higher than 44 hours per week	16.12	21.00	13.75	25.54
Hours dedicated to domestic work higher than 44 hours per week	9.19	1.16	13.59	0.67
Time spent commuting daily from home to work for more than 1 hour	8.23	5.60	6.99	7.42

Dimension 6 – Housing conditions	11.44	13.58	11.83	13.74
Home ownership	20.46	20.56	19.24	18.60
Housing shortage	13.34	12.06	16.00	15.56
shelter capacity	2.12	3.10	2.22	2.93
Access to water supply	8.75	14.12	11.88	14.46
Access to electricity	0.42	0.72	0.07	0.51
Access to sanitation	10.39	12.90	10.92	13.61
Access to garbage collection	14.11	24.98	16.37	25.53
Access to the internet	15.06	14.60	12.37	14.17
Dimension 7 – Consumption of goods	34.73	39.41	34.13	37.17
Access to stove	1.50	3.71	1.10	1.79
Access to refrigerator	3.68	6.73	3.25	4.71
Access to washing machine	66.53	74.06	65.23	71.69
Access to microcomputer	67.22	73.13	66.93	70.51

Source: Prepared by the authors based on data from PNAD (2015).

FAMILY VULNERABILITY DIMENSION

The research results showed that female heads of household are more vulnerable than men when they do not live with a spouse or partner, who also do not have a spouse/partner in the family environment in the dimensions related to family vulnerability and availability of resources.

The higher deprivation of female heads of household who do not live with a spouse/partner relative to men in the family vulnerability dimension is mainly due to the component attention and special care for the elderly, which means that the family of this woman, or even she, has a higher presence of elderly people, that is, there are individuals in the age group of 60 years or older (Table 1). This condition is unfavorable from the point of view of family vulnerability in the Northeast, but

it can be attributed to the increase in Brazilian life expectancy at birth. According to IBGE (2016), the life expectancy of Brazilians at birth was 75.5 years in 2015. In 2015, women had a life expectancy at birth of 79.1 years, while men had a life expectancy at birth of 71.93 years.

On the other hand, about 3.42% of these families with children, adolescents, and young people in the Northeast had a woman as head of household in 2015, and those who did not live with a spouse or partner were constituted by children or adolescents. Families of women with a spouse or partner presented a higher proportion of the presence of children, adolescents, and young people, with a value of approximately 4.73%, that is, this reality implies a higher family vulnerability.

Economic dependence refers to the fact that the family is in a situation where the household income comes from a small portion of its members, for example, families with a proportionally high number of children or elderly people relative to the number of adults.

The indicator "Less than half of the family members were not of active age" (V4) was considered to calculate household economic dependence. In 2015, only 2.20% met this condition, that is, about 97.80% of families in the Northeast headed by women had more than half of their members of active age. The fact of living with a spouse/partner reduces the vulnerability of these women in terms of economic dependence given that approximately 1.4% were vulnerable in this component against 2.63% of those who did not have this family member.

ACCESS TO KNOWLEDGE DIMENSION

The analysis of the behavior of deprivation between genders showed that women are less deprived in this dimension compared to men regardless of whether they live with a spouse or partner (Table 1). This result was fundamentally due to the component related to professional qualification.

The component in which these women were most deprived in 2015 was related to education, with 15.75% of them deprived in this component if they did not live with a spouse, and 20.40% of these women were deprived when living with a spouse/partner.

In 2015, about 7.19% of the female heads of household who did not live with a spouse or partner did not know how to read and write (E1). The percentage of these women deprived of the functional illiterate indicator, that is, those with less than 4 years of study (E2) revealed

that approximately 6.31% were functionally illiterate. However, the proportion of women head of household who lived with a spouse or partner and did not know how to read and write was 8.49%, while 7.85% of them were functionally illiterate.

Considering the absence of the spouse in the family environment, the results of deprivation in the schooling component revealed that approximately 17.99% of the female heads of household did not have completed elementary school (E3). Regarding indicator E5 (presence of adults without some higher education), about 25.58% of these women did not have a minimum of higher education. The vulnerability of the female head of household in the Northeast was higher in indicators E3 and E5 when they did not have a spouse or partner, i.e., 23.85% and 32.52% of these women were vulnerable in these indicators.

ACCESS TO WORK DIMENSION

Indicators of the access to work dimension showed that the vulnerability of more than half of the female heads of families in the Northeast in 2015 had difficulty in the labor market relative to their occupation, occupation quality, and income.

The indicators referring to the work availability component for the female head of family in the Northeast, considering the absence of a spouse or partner, showed that about 12.21% of the families had more than half and their members of active age employed (T1). More than half of these families did not have a worker with more than six months in the current job, with 72.98% of these families deprived of this indicator (T2). The deprivation of these women increased when living with a spouse or partner, given that about 10.30% of the families had more than half of their active-age members employed, and more than half of these families did not have a worker with more than six months in the current job (74.34%).

The indicators of the workplace quality component showed that 53.79% of the families in the Northeast headed by women had not occupied the formal sector when considering the absence of a spouse or partner, which suggests a high percentage of women employed informally and under precarious working conditions. This reality is relatively better but equally worrying when these women live with a spouse or partner, with approximately 49.82% of these families with no workers

employed in the formal sector. This result agrees with Medeiros (2003) on the issue of poverty in Brazil, in which the current structure of the labor market, with wide flexibility of employment, has been at the essence of poverty and income inequality in the country.

Most of these families were formed by at least one worker in the agricultural sector, and this proportion reached 58.6% for women without a spouse or partner and 63.33% for those who lived with a spouse or partner. It is quite understandable when considering the occupation and economic production in rural areas of Brazil, as almost half of the Brazilian population lives in predominantly rural or intermediate areas, that is, about 25.1% and 19.9%, respectively, (Serra, 2017). In terms of land use, rural areas represent 93% of the Brazilian territory (IBGE, 2016). The agricultural sector, the main activity in rural areas, is of great importance in the Brazilian economy. This sector accounted for approximately 23% of Brazil's Gross Domestic Product (GDP) in 2016.

This period showed a recovery in the labor market related to the reduction of informality in Brazil and an increase in those employed in non-agricultural activities (Pochman, 2006; Ramos, 2007 & Cardoso Jr, 2007). However, families headed by women in the Northeast Region still have a relative labor dependence on the agricultural sector, and this Region still has the problem of non-formalization of work, as most of the families do not have at least one formal employee.

About 40.02% of the women in the Northeast who did not live with a spouse or partner did not have at least one person employed with an income of more than 1 minimum wage (T5). The deprivation in this indicator was lower when they had a spouse or partner, that is, approximately 35.96%.

The second indicator, T6 (presence of employed a person earning less than two minimum wages), which forms the remuneration component, indicated that 84.82% of the families of women who did not live with a spouse or partner had no employed persons earning more than two minimum wages, but this proportion reached 81.25% of the families when women lived with a spouse or partner.

Families predominantly supported by women tend to be more likely to be poor than those predominantly supported by men due to wage discrimination by gender (Barros; Fox; Mendonça, 1994). In fact, women suffer less deprivation in terms of access to work than men, but female heads of household are more deprived when compared to men under the same condition regarding remuneration (Table 1).

The female head of household, who has to carry out several activities simultaneously (e.g., job, housework, childcare, and elderly care), often faces higher difficulties in entering the formal job market, requiring the integral participation of its members. Faced with this reality, the participation of female heads of household takes place, more frequently, in informal, unstable jobs, with less qualification and the lowest wages on the market, which are far from guaranteeing satisfactory living conditions and the future development of their families (Pacheco, 2005).

AVAILABILITY OF RESOURCES DIMENSION

The fourth dimension, availability of resources, refers to families in the Northeast headed by women who are below the extreme poverty or indigence line and the poverty line and those in which most of the household income comes from income transfers. The extreme poverty line used for this dimension was R$ 197.00, which corresponded to ¼ of the minimum wage in 2015, while the poverty line was R$ 394.00, corresponding to ½ of the minimum wage in 2015.

About 18.42% of families headed by women without the presence of a spouse or partner had a per capita family income below the extreme poverty line (R1). Approximately 34.97% of families with income below the poverty line (R2) had a per capita family income below the poverty line. A total of 15.69% of families with a spouse or partner had a per capita family income below the extreme poverty line and 40.49% had a per capita family income below the poverty line. The presence of a spouse or partner in these families showed that this presence implied a reduction in extreme poverty and, on the other hand, an increase in the proportion of families in poverty.

The indicator that measures the share of family income that comes from transfers showed that families headed by women without a spouse or partner were more vulnerable than those with a spouse or partner, with 91.75 and 86.84% of the family income originating from transfers, respectively.

Importantly, social programs of conditional cash transfers maintained an important role in increasing the degree of development of families in the Northeast, but other sources of income for families have gained more space, especially associated with retirement and pensions (Ferreira, Souza, 2011; Hoffmann, 2006). Moreover, the proportion of poor and extremely poor families continues to be a serious problem in the Northeast region, especially when these families are headed by women.

USE OF TIME

The proportion of women who did not live with a spouse or partner and were deprived of the use of time dimension corresponded to 11.18% in 2015 in the Northeast region. The presence of workers with more than 44 hours of weekly work was the indicator in which these women were most vulnerable, reaching a proportion of deprivation of 16.12%. On the other hand, the indicator in which women had a spouse or partner in the families showed a reduction in the vulnerability of the female head of household, reaching 13.75%.

The vulnerability of the woman head of household in the Northeast region regarding the time spent on the daily commute from home to the workplace is more intense when she does not live with a spouse or partner than those who have this member in the family. A total of 8.23% of these women spent more than one hour commuting to work each day when not living with their spouse and 6.99% when living with their spouse. In this case, these women would be looking for jobs in places that are increasingly distant from large urban centers, where there is a saturation of the labor market.

Regarding the male head of household in the Northeast Region, the vulnerability of women in the use of time was higher whether or not they lived with a spouse or partner, as men dedicated little time to housework despite usually dedicating much more than 44 hours per week at main job compared to women.

The fact that men dedicated more hours to weekly work compared to women shows that women are favored from the point of view of the use of time. However, this fact becomes unfavorable as these women are more deprived than men in the dimension of access to work. It may also indicate a trend in which these women opt for part-time jobs or temporary work because of the demands of their reproductive functions.

In contrast, women dedicate much more time to housework. The proportion of women who dedicated more than 44 hours a week to this type of work corresponded to 9.19% when not living with a spouse or partner and this deprivation was 13.59% when living with a spouse or partner. For men, the proportion of deprivation was 1.16% when they did not live with a spouse and only 0.67% when they lived with a spouse.

This result demonstrates that there is still a predominance of women in domestic activities in the households, which pushes them almost compulsorily into a double shift (Kon, 2002). It also corroborates the arguments by Sen (2001), in the sense that in the division of labor, expressed in relationships within homes, the burden of domestic work, also in society, falls on women.

According to Gimenez (1999), poverty seen from the perspective of gender can be understood as a direct result of women's double shift: as an unpaid workforce in their own homes. As a result, they end up dealing with greater restrictions in terms of time and mobility, and this reality causes them to dedicate fewer hours to paid jobs or training/qualification and education.

HOUSING CONDITIONS

The sixth dimension constitutes the housing conditions of female heads of households. This dimension may be considered one of the most important in capturing the living conditions of a family because it has a close relationship with health conditions, measured mainly by the indicators of the components of access to sanitation and access to garbage collection. The results of the survey showed that in the Northeast, vulnerability in the dimension referring to women's housing conditions was higher when they lived with a spouse or partner (11.83%) than those women who did not live with a spouse/partner (11.44 %).

Home ownership, housing deficit (i.e., the density of more than two residents per bedroom), and internet access were the components that most influenced the result of the proportion of deprived women in this dimension. About 20.46% of these women did not own the homes where they lived when not living with a spouse or partner, which means that 79.54% of them owned their homes. There were more than two residents per bedroom in 13.34% of these women's homes and approximately 15.06% of them did not have internet access.

This female head of household was more deprived when she lived with a spouse or partner than those who did not regarding access to basic sanitation (16.37%), housing deficit (16%), shelter capacity, the type of material used to build the home (2.22%), access to water supply (11.88%), and access to garbage collection (16.37%).

The higher deprivation of access to water supply (H5) by female heads of households is partly explained by the drought faced by the Northeast region in recent years. According to the National Water Agency (ANA), the Northeast completed its seventh consecutive year of drought in 2017, with a third (33.65%) of its territory in the highest degree of drought (level 4).

CONSUMPTION OF GOODS

The seventh dimension that makes up MPI considers the consumption of goods. It is made up of four components: access to a stove, access to a refrigerator, access to washing machine, and access to a microcomputer.

In the Northeast, the consumption of goods by families headed by women who live with a spouse or partner is better than those families with no spouse or partner. In other words, these women can guarantee better living conditions for their family members in terms of consumption of durable goods and technology (microcomputers).

Indicator C1 (household does not have a stove) of the component access to stove revealed that around 1.5% of the female heads of household (without a spouse) did not own a stove in their homes in 2015, while this proportion reached 1.1% for women living with a spouse. About 3.68% of families headed by a woman without a spouse did not have a refrigerator in their homes (C2), but this deprivation was lower for families with a spouse, reaching around 3.25%.

Ownership of a washing machine (C3) by these women is still quite limited, as more than half of the women in both cases (absence or presence of a spouse or partner), around 66.53% (absence of a spouse) and 65.23% (presence of spouse), did not have refrigerators in their homes. Possession of this good is closely related to the time spent on housework, and the lack of it means that, indirectly, these women also have their vulnerability in the use of time intensified.

Furthermore, about 67.22% of the women who did not live with a partner were considered deprived in the indicator of microcomputer ownership (C4). In contrast, women who lived with a partner had a lower deprivation for this indicator (around 66.93%). It is an important result, as access to this good plays an essential role in access to knowledge.

The deprivations in the basic conditions of existence, such as water supply, basic sanitation, and garbage collection, as well as deprivations in access to work and the availability of resources observed for female heads of families in the Northeast region, are the result of regional and local underdevelopment of this region and the financial limitation observed for these families. According to Kageyama and Hoffmann (2006), overcoming these problems arising from underdevelopment occurs through public and private investments in infrastructure and basic services and improvements in the regional educational level and conditions of access to the labor market.

Thus, work and income in the Northeast Region, especially with regard to female heads of families, are issues that require more attention from the public authorities, as the distance verified in the percentage of deprivation of these dimensions relative to heads of family in Brazil and to the man of that Region proved to be quite significant.

Similarly, ensuring that families have access to the means they need is also of paramount importance. The use of the productive capacity of individuals materializes in the opportunity to access the work they may have. The promotion of the women's labor market by specific incentives is a constitutional right, more specifically in Article 6th Item XX of the Brazilian Federal Constitution of 1988.

FEMALE MULTIDIMENSIONAL POVERTY IN THE NORTHEAST (2004 AND 2015)

The results of the incidence of poverty (H) in 2015 showed that the percentage of poor female heads of household in the Northeast was 55.22% for each k=12 when they lived with a spouse or partner, that is, less than half (44.78%) of them were non-deprived in the 37 indicators or variables included in the calculation of the Multidimensional Poverty Index. On the other hand, the percentage of poor female heads of household who did not live with a spouse or partner was 52.48%. Moreover, 66.67% of the male heads of household who lived with a spouse or partner were deprived in at least 12 indicators (k=12), but this percentage reached 57.39% when they did not live with a spouse or partner.

Regarding the intensity of poverty or average poverty (A), female heads of household in the Northeast Region living with a spouse or partner were considered poor in k=12, with an average deprivation of 10.62% of the total indicators, which corresponded to four (3.93) out of the
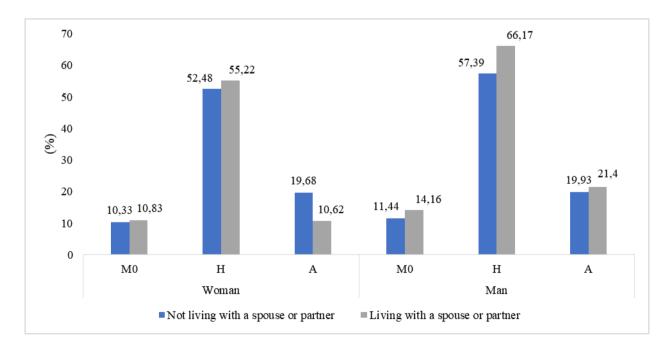
37 indicators. However, the average poverty was higher for women who did not live with a spouse or partner than those who had a spouse/partner in the family environment (around 19.68%), that is, this group presented, on average, approximately seven (7.28) out of 37 indicators. Still regarding the average poverty (A), male heads of households in the Northeast who lived with a spouse or partner (k=12) had an average deprivation of 21.4% of the total indicators, which corresponded to eight (7.92) out of the 37 indicators. In contrast, the absence of a spouse or partner in the family led to a lower average of this deprivation, with a value of around 19.23%, that is, seven (7.12) out of the 37 indicators.

The results shown by the average poverty or poverty intensity (A) indicated that the absence of a spouse or partner in the family made the intensity of poverty higher for the female head of household in the Northeast. Ferreira and Marin (2016) also observed a higher concentration of average poverty for women in the Northeast, but they did not consider the figure of the spouse or partner.

Figure 1 | Multidimensional poverty of heads of households in the Northeast Region of Brazil for k=12 (2015).

Source: Research results, prepared by the authors.

The maximum values of the adjusted incidence of poverty (M_0) for heads of households in the Northeast region of Brazil for each k=12 were 1 (the entire analyzed population is poor) and zero (there is no trace of poverty in this population). The discussions on the feminization of poverty have identified that this phenomenon is related to family headship, and most of these families are composed of a woman without a partner, that is, there is a single-income earner, and she still has generally lower income than those of men whether due to discrimination or segmentation in the labor market. The results of the present study showed that about 10.83% of women who lived with a spouse or partner were multidimensionally poorer than those who did not live with them in 2015, with multidimensional poverty of 10.33% (Figure 1).

The results related to the incidence of poverty (H), average poverty (A), and MPI presented by female heads of household in the Northeast were better than those for male heads of families in this Region. However, these results show that the presence of a spouse or partner in the family increases women's vulnerability to multidimensional poverty in the Region. According to Pearce (1978), women's poverty is also related to the fact that they live in households or families headed by poor men.

These effects reinforce the importance of trying to understand and analyze poverty from a multidimensional point of view, especially when analyzing poverty from a gender perspective. According to Oliveira (2014), monetary resources are important to reduce poverty, but they alone cannot guarantee individuals the freedom to meet their basic needs and provide the means to enable their satisfaction.

CONCLUSIONS

This study aimed to analyze the vulnerability of female heads of household in the Northeast Region in 2015 through a multidimensional approach. For this purpose, the construction of the Multidimensional Poverty Index (MPI) was used as a methodological procedure. Importantly, we dealt with a static profile of poverty, that is, the analysis refers to only a specific point in time, in this case, the year 2015.

The dimensions related to family vulnerability, availability of resources, and use of time were the factors in which women were more vulnerable compared to men for families from the Northeast with no spouse or partner. In 2015, approximately 11.48, 48.38, and 11.18% of these female heads of household were deprived in these dimensions, respectively. Women were more deprived only in the dimension use of time compared to male heads of household in the Northeast Region who lived

with a spouse or partner.

The indicator presence of elderly people in the family in the dimension family vulnerability, one of the seven dimensions that make up MPI, presented the highest deprivation for female heads of household in 2015, with a value of 36.46%, when considering the absence of a spouse or partner.

Considering that a result equal to 0 corresponds to individuals with no trace of poverty and a result equal to 100 corresponds to absolutely poor individuals, the incidence of poverty (H), poverty intensity (A), and MPI (M_0) presented by women in the Region were better than the results found for men. The analysis of the poverty intensity (A) showed that families headed by women with no spouse or partner, that is, who have only one income provider, present a worse situation than those headed by females who have the presence of a spouse or partner.

Regarding poverty incidence (H), families headed by women with a spouse or partner were more vulnerable than female-headed families who did not have a spouse or partner.

These results allow us to infer that families in the Northeast headed by women and with the presence of a spouse or partner are multidimensionally poorer compared to families headed by women with no presence of a spouse or partner, with MPI values of 10.83 and 10.33%, respectively. However, we cannot state that there is a process of feminization of poverty in multidimensional terms when comparing the result of M_0 between women and men, regardless of the presence or absence of a spouse or partner.

The vulnerability of female heads of household in the Northeast is not only determined by income when considering the presence or absence of a spouse in the family environment, as recommended by conventional theories. In fact, the dimensions related to work, income, and consumption of goods showed the highest vulnerabilities for women in the Northeast, that is, these dimensions contributed the most to the insertion of women in a condition of poverty, consequently feeding the vicious circle of poverty for women in this region. Thus, public policies to fight poverty, focusing merely on income, are not enough. In many cases, they only minimize this problem because the unidimensional approach tends to underestimate poverty and the number of poor when used alone.

Finally, the development of an approach that considers the spatial divergences regarding the urban/rural aspects of the Northeast Region of Brazil would be important to deepen the discussion on the process of feminization of poverty.

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