

Gender and the Multidimensional Poverty Index for Brazil

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Abstract: This paper analyzes the multidimensional poverty in Brazil from 2004 to 2015 with a breakdown by gender. Hence, the Multidimensional Poverty Index was constructed with eleven indicators (years of schooling, literacy, employment, income, electricity, sanitation, water, garbage disposal, cooking fuel, assets, and overcrowding) within four dimensions (education, employment, income, and living standards). Additionally, the analysis includes a breakdown by race, Federal Units, and rural/urban locations. The results suggest that the most multidimensionally poor in Brazil are women, black individuals, and those living in Alagoas and rural areas.

Keywords: Gender; Multidimensional Poverty; The Multidimensional Poverty Index; Deprivation.

Theme Area: 2. Economical Development

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JEL Codes: I32; J16

Resumo: Este artigo analisa a pobreza multidimensional no Brasil de 2004 a 2015 com enfoque em gênero. Para tal, o Índice de Pobreza Multidimensional foi construído considerando onze indicadores (anos de escolaridade, alfabetização, emprego, renda, energia elétrica, saneamento, água, coleta de lixo, combustível de cozinha, bens e superlotação) dentro de quatro dimensões (educação, emprego, renda e padrão de vida). Além disso, a análise inclui um detalhamento por raça, Unidades Federativas e localidades rurais/urbanas. Os resultados encontrados sugerem que os mais multidimensionalmente pobres no Brasil são mulheres, negros, moradores do estado de Alagoas e de áreas rurais.

Palavras-Chave: Gênero; Pobreza Multidimensional; Índice de Pobreza Multidimensional; Privação.

Área Temática: 2. Desenvolvimento Econômico

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1. Initial remarks

According to the Instituto Brasileiro de Geografia e Estatística (IBGE), Brazil had a female population of slightly over 107 million in 2019. More than 6 million of them were extremely poor, and over 21 million were poor that year (CEPAL, 2021). Compared to 2001, which had over 34 million poor women, these numbers represent an improvement in the Brazilian poverty situation. However, even with progress, it is still a problem that affects a considerable part of the Brazilian female population.

Regarding the relationship between gender and poverty, Brady and Burton (2016) pointed out that some social, cultural, and economic aspects lead women to face a higher risk of poverty than men. Behind these facts, the primary origin of gendered poverty is the inequality between men and women, which exists in different aspects, such as income distribution, access to credit, control over income and assets, and command over the property (CAGATAY, 1998; BENNETT; DALY, 2014).

In Brazil, the Feminity Index of Poverty by the Economic Commission for Latin America and the Caribbean (CEPAL) can shed some light on the gendered nature of poverty. The index is the ratio between the poverty rate of women over the poverty rate of men. In 2001, the feminity index was 105.5, while in 2019, it was 112.6. In it, values over one hundred mean higher poverty among women (CEPAL, 2021). Hence, not only are women poorer than men in Brazil, but the proportion of poor women compared to men has increased in the last decades. Thus, studying poverty as a gendered phenomenon and its evolution over the years seems relevant.

However, a gender-sensitive approach to poverty analysis involves much more than making a statistical breakdown by gender (NUSSBAUM, 2001). Besides being predominantly female, poverty in Brazil is also multidimensional (FAHEL; TELES; CAMINHAS, 2016; SILVA et al., 2016; SERRA; YALONETZKY; MAIA, 2020). Hence, people can experience several deprivations other than income, such as low consumption, inadequate living conditions, poor health, low life expectancy, lack of access to education, limited knowledge and information, and lack of power in several areas (FERREIRA, 2011). According to the World Economic Forum, Brazilian women most lack political empowerment and economic participation (WORLD ECONOMIC FORUM, 2020). They receive a lower wage for similar work, work a smaller amount of hours due to childcare and household responsibilities, do not receive support as household heads, and are more vulnerable to shocks (KLASEN; LECHTENFELD; POVEL, 2015; BATISTA, 2019; BATISTA; COSTA, 2019).

In Brazil, in the labor market dimension, women's participation rate was only 54.5% in 2019, against the male one of 73.7%. Also, the number of hours women spend in unpaid work doubled the number of men's, and women's participation in managerial positions was only 37.4% (IBGE, 2021). Another relevant dimension is living standards. According to IBGE (2020), the household arrangements formed by a single mother with children have the most living inadequacies. Thus, suggesting the importance of analyzing poverty by a gender-sensitive approach with a multidimensional focus.

Additionally, it is interesting to highlight that Brazil has been through an unstable macroeconomic and political scenario, making the poverty return rise in the last years. According to CEPAL (2021) data, poverty decreased in Brazil, reaching its lowest point in 2014 (16.5%). After that, it returned to rise, reaching 20.3% in 2017 and decreasing to 19.2% in 2019. These data show how poverty has been unstable in Brazil in recent years, which, according to Vegh et al. (2019), responds to the country's recession and highlights the business cycle's effect on social indicators. Therefore, making it relevant to evaluate its presence in the country and how it evolved over the last years.

Also, considering the country's economic situation, it is crucial to understand that economic shocks affect men and women differently (GLEWWE; HALL, 1998; BERNIELL; MACHADO; LA MATA, 2014; KOSEC; SONG, 2018). According to Batista (2019), the response to income shocks is not gender-neutral in Brazil. Economic shocks can alter the household's vulnerability status, especially those headed by a woman (BATISTA, 2019). Hence, given the country's current economic situation, it is essential to evaluate poverty in its multidimensional and gendered nature.

In this context, this research aims to assess the multidimensional poverty in Brazil, breaking it down by gender. Specifically, It seeks to evaluate whether women are more multidimensionally poor than men,

which dimensions of multidimensional poverty they are more deprived of, and how their poverty evolved between 2004 and 2015.

Furthermore, it is necessary to account for the population's ethnic minority groups since, similar to gender, race stratifies people's lives and can lead to different opportunities. Ethnic minority people, as pointed out by Reskin (2012), usually have fewer years of schooling and fewer opportunities to achieve higher education. They experience discrimination in the labor market, are segregated into low-income occupations, receive smaller wages for similar work, and have fewer opportunities to achieve higher positions. Also, black individuals have little to no access to health care and a smaller life expectancy and are frequently segregated into residential locations with a higher incidence of violence and low housing quality (RESKIN, 2012).

In Brazil, 32.9% of black people were below the income poverty line in 2018, against only 15.4% of white ones (IBGE, 2019). They represented only 29.9% of managerial positions. When intersecting gender and race, the disadvantages are even worse. Black women in Brazil received, in 2018, less than half of white men (IBGE, 2019). Therefore, the differentiation between individuals' characteristics is meaningful since the same policy can have different effects depending on the context.

Lastly, national context matters since regionalities may impact people's sources of deprivation (BRADY; BURTON, 2016). In 2019, 32% of the rural population was below the poverty line in Brazil, indicating that over 8 million people were poor in rural Brazil (CEPAL, 2021). When considering the regions, the North and Northeast have been consistently more deprived than the other regions in Brazil (RODRIGUES, 2014). Therefore, it is necessary to differentiate between the locations people live in Brazil, considering rural and urban environments and the Federal Units.

Hence, our analysis differs from other studies and adds to the literature on four main points. First, we incorporate a race analysis to account for the different experiences black and white individuals have. Second, the differences between rural/urban areas and the 26 states plus the Federal District are included. Therefore, accounting for territory heterogeneities. Third, it evaluates the temporal evolution of multidimensional poverty between 2004 and 2015. Lastly, and more importantly, we assess the different experiences men and women of each subgroup have of poverty and its multiple dimensions. Thus, the purpose here is to provide subsidies for understanding the poverty phenomenon in Brazil and, consequently, offer a more accurate background to formulate public policies that consider the country's particularities.

2. Theoretical Framework: The capabilities approach

The one-dimensional approach to poverty, extensively used in the literature, is an approach that aggregates all of an individual's achievements into a single variable, usually well-being or income, and uses an aggregate cutoff point to determine who is poor (KAGEYAMA; HOFFMANN, 2006; MCLANAHAN; KELLY, 2006). This approach is customary to consider individuals poor if they are below a specific cutoff point, such as a poverty line. However, this method does not distinguish the most widely deprived, underestimating the number of poor individuals (ALKIRE; FOSTER, 2011a). Thus, income as a single indicator of well-being is considered limited since it does not incorporate other critical dimensions of poverty (THORBECKE, 2013).

With that in mind, Amartya Sen introduced the capabilities approach as a new view of poverty. According to him, 'real poverty' arises from the deprivation of capacities and freedom. In that sense, the income approach may not be sufficient to compare different realities since it does not account for poverty's relative component. Several variables, such as gender, race, and location, enhance the differences between income and capabilities. However, despite their differences, the two approaches are interconnected and complementary. The capabilities perspective sheds light on the fact that an increase in an individual's capacities heightens its potential to be productive and raise its income, which can be especially important to reduce monetary poverty. Also, an increase in income should give the individual more means to achieve higher capabilities (SEN, 1976, 2018).

This approach is based on the fact that development should be seen as the process of expansion of freedoms. In this perspective, the development would require removing freedom deprivation sources, such as poverty, the absence of economic opportunities, negligence from the public sphere, and excessive state

intervention. In the absence of such freedom, individuals live in a critical condition, without perspectives about the future. Hence, by arguing that development is the expansion of freedom, Sen (2018) claims that reducing deprivations is one way to achieve such freedom. Therefore, according to the author, poverty must be seen as an absence of elementary capabilities instead of only income (SEN, 2018). According to him, the capabilities are the basic needs of an individual, such as education, health, well-being, freedom, political engagement, and others.

According to Alam (2011), the capabilities approach contributes to the gender and poverty debate in three main aspects. It helps to monitor the differences in fundamental achievements between men and women over space and time, draws attention to the gender inequality's regional differences, and helps to uncover aspects of it that persist regardless of the economic growth. In turn, Nussbaum (2001, 2003) suggested that the capabilities have a tight relationship with human rights, making it valuable to approach gender inequality issues. Gender inequality, as stated by her, when added to a poverty scenario, result in a severe failure of the central human capabilities. According to the author, women lack opportunities to play, cultivate cognitive faculties, do not have proper bodily integrity, and live with fear, all of which come from unequal social and political circumstances. Thus, women tend to be the most likely not to live a dignified, full, quality life. However, according to her, the capabilities approach cannot provide helpful guidance to end gender inequality and poverty if there is no definition of the central capabilities (NUSSBAUM, 2001, 2003).

In that sense, Martha Nussbaum went beyond Sen. She introduced a list of central human functional capabilities, intending to provide a threshold level for citizens to demand from their governments, which is the absolute minimum a person needs to live a full, quality life (NUSSBAUM, 2001). These capabilities represent the general goals to guide each society to specify its own needs and are (i) life: being able to live a full, normal life; (ii) bodily health: having good health, nutrition, and shelter; (iii) bodily integrity: freedom towards its own body choices, to move freely and the guarantee of security; (iv) senses, imagination, and thought: refer to the freedom to think, imagine, reasoning, express, and use its senses; (v) emotions: refers to develop emotionally, and to attach to people and things; (vi) practical reason: is the ability of critical thinking; (vii) affiliation: is the liberty of social interaction, to love, to not being discriminated or humiliated, to be treated with dignity and respect; (viii) other species: to live alongside with other species; (ix) play: to laugh, play and enjoy recreational activities; and, finally, (x) control over one's environment: having the right to political participation, hold property, and equal opportunities.

Nussbaum (2003) also highlights that the capabilities approach has an advantage over other approaches to poverty since it considers the individuals' ability to be and to do. With that, it is possible to account for the inequalities inside the families, different from the poverty measures usually made at the household level. Therefore, Sen's approach shifted poverty's unit analysis from household to individual and from the resources' focus to the control over commodities, thus, allowing individuals from the same household to have different perceptions of deprivation (JACKSON, 1998).

This advantage is especially true when considering gender inequalities. Women may live in a household with high income but have no access to it or control over it, leading them to be deprived in dimensions beyond the monetary one (BUDLENDER, 2005; BRADY; BURTON, 2016). This conception that even women living in non-poor households can be deprived is associated with social and cultural gender roles (JACKSON, 1998). In that sense, Cagatay (1998) argued that besides the bias against women and girls in allocating household resources, women face more difficulty than men in transforming capabilities into income and well-being. Hence, household variables may lead to an incomplete analysis of gendered multidimensional poverty.

Thus, when considering Sen's and Nussbaum's perspective to construct a gender-sensitive multidimensional poverty measurement, one needs to use variables at an individual level instead of the typical household level. Understanding this point enriches the comprehension of multidimensional poverty and inequality, covering more grounds for policy creation.

Therefore, according to this framework, poverty should be analyzed as a phenomenon more complex than the absence of income. When studying it, we should examine the dimensions of where people can be deprived and account for its heterogeneity. More precisely, poverty is a matter of capability failure

in a multi-attribute context. Thus, making it essential to approach the multidimensionality of poverty, dividing it into subgroups, as we do here.

3. Methodology

3.1. The Multidimensional Poverty Index

The method used to analyze the gender-sensitive multidimensional poverty in Brazil is the Multidimensional Poverty Index (MPI), developed by Alkire and Foster (2011a). The MPI introduces an intuitive approach to identifying who is poor through two cutoff points. The first one identifies whether the person is deprived of any dimension. While the second delimits how many dimensions the person must be deprived of to be considered poor. Thus, the MPI methodology can be used to identify the poor and look at which dimensions drive multidimensional poverty among different groups of people (ALKIRE; SETH, 2008).

The construction of the MPI, according to Alkire and Santos (2014), must follow the steps: 1) Define the indicators considered for each dimension; 2) Define the cutoff points, z , for each indicator; 3) Apply the cutoff points to define whether each individual, in each indicator, is deprived or not; 4) Select the weights for each indicator, which should add up to 1; 5) Create each person's weighted proportion of deprivation, which is called deprivation score; 6) Determine the poverty cutoff, k , and identify the poor individuals; 7) Compute the proportion of people identified as poor, which is the headcount ratio, H ; 8) Compute the average portion of weighted indicators in which each poor person is deprived, done by adding up the deprivation scores of the poor individuals and dividing it by the total number of poor, which will be the intensity of poverty, A ; and finally, 9) Calculate the poverty measure M_0 , multiplying H by A .

Therefore, we used the dimensions proposed by Rippin (2016), based on Nussbaum's (2001) central human functional capabilities. The dimensions and capabilities they refer to, the indicators, cutoff points, some descriptions of what we intend to capture with them, and the reference from the literature for each one can be seen in Table 1. Regarding the weights, Pasha (2017) argues that they should be different since they are based on the dimensions' trade-offs they cause. However, our MPI construction was done weighting the dimensions equally, such as each indicator in every one of them. The choice for the equal weights can be made since the index's ranking is relatively stable with a change in weighting which means that the most deprived categories tend to remain the same regardless of the weights used (ALKIRE et al., 2010). Also, equally weighting the dimensions facilitates the interpretation and the use for public policies (ALKIRE et al., 2010; ALKIRE; SANTOS, 2014). Additionally, in our MPI, the cutoff point, k , is as proposed by Alkire and Santos (2014). So, the person must be deprived of 1/3 (33%) of the indicators to be considered poor.

Additionally, it is worth mentioning that M_0 is the product of the headcount ratio and the average deprivation share. This measure is sensitive to multidimensional poverty's frequency and breadth (ALKIRE; FOSTER, 2011a). Also, it satisfies dimensional monotonicity, meaning that if a person becomes deprived in an additional dimension, M_0 will increase. Overall, we have that M_0 reflects the proportion of weighted deprivations that the poor experience out of the total potential deprivations the society could experience (ALKIRE; SANTOS, 2014).

Finally, the more significant advantage of this multidimensional poverty measure for our purpose is its decomposability. M_0 can be broken down by indicator, which means that it is possible to evaluate the contribution of deprivations in each indicator to overall poverty, and it can be decomposable by subgroups. Hence, the calculation of such an index allowed us to evaluate the temporal evolution, the geographical differences, the profile, and the various characteristics of multidimensional poverty in Brazil¹.

¹ The calculations were made using the Stata program and the MPI command within the program (the command must be installed).

Table 1: Dimensions, indicators, and cutoffs of the MPI

Dimension	Capability	Indicator	Deprived if (cutoff)	Descriptions	Reference
<i>Education</i>	Senses, Imagination, and Thought; Practical Reason	Years of schooling	Has under nine years of schooling	This indicator captures school dropouts.	Costa, Machado, and Amaral (2018)
		Literacy	Cannot read or write	Literacy captures if the person has minimal education.	Costa, Machado, and Amaral (2018)
<i>Employment</i>	Affiliation; Control over Environment; Play	Employment	Have at least one of the following: 1. Activity status as unemployed 2. Wage below minimum ² 3. Time-poor (works over 10 hours a day, counting paid and unpaid work) ³	The first one captures individuals who want to work but currently are not. The second one captures the precariousness of work. At the same time, the third one comes from the importance of leisure time.	Rippin (2016)
<i>Income</i>	Control over Environment	Income	Has an income below the national poverty line ⁴	Measures the ability to get along financially.	Rippin (2016)

(Continue)

² One may think that this indicator is correlated to the income one. However, according to Rippin (2016), the income dimension measures how well a person is able to get along financially, whereas the minimum wage captures the precarious situation of those whose work is not appropriately remunerated.

³ This dimension is essential when considering the gender-sensitive approach since women tend to be more responsible for housework and caregiving than men (BUVINIĆ; GUPTA, 1997).

⁴ For the poverty line, we considered the one proposed by Hoffman(2000), which considers as poor the individual with a monthly income below half a minimum wage.

(continued)

Dimension	Capability	Indicator	Deprived if (cutoff)	Descriptions	Reference
<i>Living Standard</i>	Bodily Health; Affiliation	Electricity	Lives in a household with no electricity	These indicators, together, capture adequate shelter conditions.	Fahel, Teles, and Caminhas (2016)
		Sanitation	Lives in a household where a toilet is not connected to the sewage collection network or is shared with other households		Fahel, Teles, and Caminhas (2016)
		Water	Lives in a household that does not have water in at least one room or has water that does not come from a cistern or spring		Fahel, Teles, and Caminhas (2016)
		Garbage disposal	Lives in a household that does not have an appropriate garbage disposal		Fahel, Teles, and Caminhas (2016)
		Cooking fuel	Lives in a household that cooks with dung, wood, or carbon		Fahel, Teles, and Caminhas (2016)
		Assets	Lives in a household that owns three or fewer of the following assets: radio, television, telephone, fridge, stove, and computer.		Fahel, Teles, and Caminhas (2016)
		Overcrowding	Lives in a household with three or more people per bedroom		Costa, Machado, and Amaral (2018)

Source: Constructed by the author, based on the literature

3.2. Data

The data used for the MPI was the Pesquisa Nacional por Amostra de Domicílios⁵ (PNAD) provided by the Instituto Brasileiro de Geografia e Estatística⁶ (IBGE). The PNAD was⁷ an annual survey made of a probability sampling of households. It is a complex and self-weighted sampling plan that ensures that all households have the same probability of selection (SILVA; PESSOA; LILA, 2002). The survey data were collected from a nationally representative sample of residents, containing individual and household data. Also, its complex sampling character implies that the analysis must be done using the sampling weights for it to be considered representative of the population. Therefore, this research used the sample's weights, strata, and primary sampling unit (PSU)⁸.

This research unit of analysis is the individual since the household analysis could fail to account for gender discrepancies inside the family unit, such as income. However, household variables were used. Additionally, the sample is made only of adults, considering the minimum active age defined by IBGE, which is 15 years old. This age restriction is essential since the inclusion of children could bias our results due to their incomplete education and lack of employment and income, which are dimensions of our index. Also, the analyzed period was between 2004 to 2015, representing the first year in which the PNAD sample included all Brazilian states' rural areas⁹ and the last year with available data. Finally, all income variables were brought to 2015 to remove the inflation influence.

4. Results

This section presents the research results. Section 4.1 explores the sample, describing some poverty and deprivation statistics. In sections 4.2 to 4.4, the results for the multidimensional poverty index are presented and aggregated into subgroups.

4.1. The deprivation profile in Brazil

Table 2 presents the proportion of people from each subgroup of the population in the sample. As can be seen, there are 243,149 observations, and the majority of them are women, black people, and those living in urban areas, which is consistent with the Brazilian demographics (IBGE, 2022).

The deprivation score column presents each group of people's average weighted proportion of deprivation considering the indicators addressed in this research (years of schooling, literacy, employment, income, electricity, sanitation, water, cooking fuel, garbage disposal, assets, and overcrowding). Therefore, on average, the Brazilian population was deprived of 29.93% of the deprivation indicators in 2015. Meaning that among all the deprivation people could experience in the country, they endure almost one-third of it. In particular, women are deprived of 34.90% of the deprivation indicators, while men are only deprived of 24.92% of them. The same occurs among black people, with a deprivation score of 53.99%, being expressively more deprived than white people (26.07%). Also, people living in the rural areas, deprived of 45.39% of the indicators, are more deprived than those living in urban areas, who are deprived of 27.51%. These results are consistent with the literature stating that women, black individuals, and those living in rural areas tend to experience more deprivations than their counterparts (RESKIN, 2012; BRADY; BURTON, 2016; AGUILAR; SUMNER, 2020).

In addition, Table 2 shows that black women are the most deprived, with an average deprivation of 38.46% of the indicators, while white men are the least deprived ones, with a deprivation score of 20.99%. Also, even white women (30.89%), the least deprived among women, have a higher deprivation score than

⁵ i.e., National Household Sample Survey

⁶ i.e., Brazilian Institute of Geography and Statistics

⁷ The survey was replaced in 2016 by another survey, named PNAD Contínua, which characteristics did not allow for the use in this research.

⁸ The variables for weights, strata, and PSU are, v4729, v4617, and v4618, respectively.

⁹ Before that, north state data were not included.

black men (28.13%), the most deprived among men. Likewise, considering rural/urban locations, women living in rural areas have the worst score of deprivation, 51.53%. Therefore, based on these data, we can verify that women are, in fact, more deprived than men in Brazil, indicating that Nussbaum's (2000) argument is valid in the country. Thus, gender's uneven social, economic, and political conditions give women unequal human capabilities (NUSSBAUM, 2000).

Table 2: Population, deprivation, and poverty profile - Brazil, 2015

	Population	Deprivation Score	Poverty amongst Subgroups	Subgroups amongst Poverty
		%		
Women	50.19	34.90	54.08	61.46
Men	49.81	24.92	34.18	38.54
White	46.01	26.07	38.80	40.41
Black	53.99	33.21	48.74	59.59
Rural	13.54	45.39	62.86	19.27
Urban	86.46	27.51	41.24	80.73
White women	23.61	30.89	48.33	25.84
Black women	26.58	38.46	59.19	35.62
White men	22.40	20.99	28.74	14.58
Black men	27.41	28.13	38.62	23.97
Rural women	06.13	51.53	74.21	10.30
Urban women	44.06	32.58	51.28	51.16
Rural men	07.41	40.31	53.48	08.97
Urban men	42.40	22.23	30.80	29.57
Total	243,149	29.93		44.17

Source: Research results

Note: The poverty amongst subgroup column presents the percentage of poor people in each subgroup. While the column named subgroups amongst poverty shows amongst the poor, the portion of people from each subgroup.

The poverty amongst subgroups and subgroups amongst poverty columns presents the poor (those deprived of 33% or more of the indicators). Therefore, 44.17% of the population was multidimensionally poor in Brazil in 2015. Also, the proportion of people below the income poverty line was calculated as a comparison. Hence, as expected, the multidimensionally poor count in the country is higher than the proportion of individuals below the income poverty line, which was 33.61%¹⁰ in 2015. Thus, the Brazilian case confirms the literature's indication that a poverty measurement considering only income is limited and underestimates the number of poor individuals (ALKIRE; FOSTER, 2011a; THORBECKE, 2013; SEN, 2018).

Following, each poverty column in Table 2 represents a different approach to the variable. The first one (Poverty amongst Subgroups) describes the percentage of poor people in each subgroup, while the second (Subgroups amongst Poverty) shows the portion of people from each subgroup amongst the multidimensionally poor. Let us clarify it. The first approach allows us to see that, among the subgroup of women, 54.08% are poor, indicating that most women are multidimensionally poor in Brazil. The second approach, in its turn, shows that, among the multidimensionally poor, 61.46% are women. Therefore, in Brazil, most women are poor, and the majority of the poor are women, indicating the existence of a female overrepresentation in poverty, as proposed by the literature (BARROS; FOX; MENDONCA, 1997; LIU; ESTEVE; TREVIÑO, 2017; BATISTA; COSTA, 2019). The same occurs with black women, who represent most multidimensionally poor people in Brazil, 35.62%, and are mostly poor, 59.19% of them.

¹⁰ The income poverty was calculated using the poverty line proposed by Hoffman (2000), considering individuals with monthly income below half a minimum wage.

Hence, it indicates that race acts as an intensifier for women’s poverty situation, as Hardy and Hazelrigg (1995) pointed out.

Some other information in these columns indicates that most multidimensionally poor are black (59.59%), but most black people are not multidimensionally poor (48.74% are poor). Here, it is essential to highlight that being black does not cause poverty but rather the discriminating attitudes towards black individuals that enhance their poverty’s causes (HARDY; HAZELRIGG, 1995). Hence, this result indicates that being poor is not an intrinsic characteristic of Afro-Brazilian people. However, the poverty phenomenon in Brazil is fundamentally black (CARNEIRO, 2015). Additionally, a significant amount of rural people are multidimensionally poor, 62.86%. However, most poor people live in urban areas (80.73%), where the mass population is in the country (IBGE, 2022). Indicating that failing to account for the national context could mislead the poverty analysis, like Costa, Machado, and Amaral (2018) stated. Besides, most men and women living in rural areas are multidimensionally poor, 53.48% and 74.21%, respectively, and most women living in urban areas are multidimensionally poor, 51.28%. The only subgroup who are not mostly poor is the urban men.

Table 3: Time evolution of the multidimensionally poor - Brazil, men, and women, 2004 to 2015

	Brazil	Men	Women
		%	
2004	75.91	68.66	82.46
2005	73.17	65.68	79.98
2006	69.99	61.94	77.29
2007	64.62	56.39	72.17
2008	61.66	52.76	69.86
2009	60.20	50.70	68.91
2011	56.11	45.55	65.76
2012	52.95	42.28	62.85
2013	51.27	40.67	61.06
2014	48.78	38.14	58.63
2015	44.17	34.18	54.08
Reduction of:	-41.81	-50.22	-34.42

Source: Research results

Table 3 and Figure 1 present the time evolution of poverty amongst subgroups. It reports the evolution of the percentage of multidimensionally poor among the country’s total population, men and women, from 2004 to 2015. As can be seen, the amount of multidimensionally poor has been reducing throughout the years. The proportion went from 75.91% in 2004 to 44.17% in 2015, a reduction of 41.81%. Also, women have higher poverty rates than men and the total population throughout the whole period analyzed, and also their poverty has been reducing at a slower rate. While men’s multidimensional poverty has reduced by more than 50%, women’s has reduced only over 34% from 2004 to 2015. These combined data suggest that women are multidimensionally poorer and more deprived than men in Brazil and that their status has been evolving slowly. These findings lead us to believe that the possibility of a convergence between men’s and women’s situations is far away in the future. In fact, according to the World Economic Forum’s (2021) global gender gap report, considering a series of dimensions, it will take 135.6 years to achieve gender equality worldwide. Therefore, it is safe to suppose that the gender gap in Brazil will not end soon.

Figure 1: Time evolution of the multidimensionally poor - Brazil, men, and women, 2004 to 2015



Source: Research results

In summary, from these data, we can highlight the need to account for people's characteristics in the search to alleviate poverty. Because, as seen, women are more deprived and multidimensionally poorer than men, which is even worse for black and rural women, and their situation has been evolving at a slower rate than men's. Therefore, neutral public politics cannot have the desired effect.

4.2. Gender and the Multidimensional Poverty Index

The data presented in this section and the next two (4.3 and 4.4) represent the Multidimensional Poverty Index (MPI) results, which is an interaction between the headcount ratio (H) and the intensity of poverty (A). Therefore, the MPI is an acute measurement of poverty. The index, as stated before, was constructed with eleven indicators (years of schooling, literacy, employment, income, electricity, sanitation, water, garbage disposal, cooking fuel, assets, and overcrowding) within four dimensions (education, employment, income, and living standards). The dimensions were weighted equally, and the indicators of the same dimension were also weighted equally. Also, the cutoff, k , set an individual as poor if they suffer deprivation of 33% or more indicators.

Table 4: The headcount ratio, the intensity of poverty, and the multidimensional poverty index - Brazil, men, and women, 2015

	Brazil	Men	Women
$k = 33\%$		%	
Headcount Ratio (H)	44.20	34.20	54.10
Intensity of Poverty (A)	56.33	55.26	56.93
Multidimensional Poverty Index (MPI)	24.90	18.90	30.80

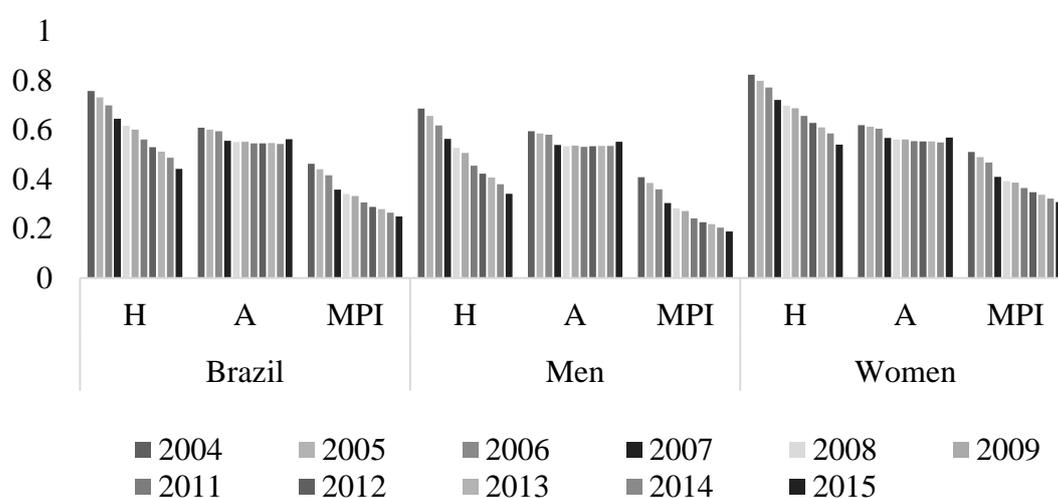
Source: Research results

As shown in Table 4, 44.20% of the Brazilian population were considered multidimensionally poor (H) in 2015, equivalent to about 90 million people, and they were deprived in 56.33% of the analyzed indicators (A). Subsequently, the MPI for Brazil in 2015 was 24.9%, representing the multidimensionally poor population share, adjusted by the intensity of deprivation they suffer. For that same year, the global MPI calculated by Alkire et al. (2015) was 15.7%, with a 29.8% headcount ratio and a 52.6% average intensity of poverty. Hence, according to our analysis, the Brazilian population was more multidimensionally poor and more intensively poor than the average global population. Additionally, when comparing our results to theirs (ALKIRE et al., 2015), Brazil has similar poverty measures to lower-middle-

income countries, even though it is an upper-middle-income¹¹ country. Therefore, according to these results, the poverty phenomenon in Brazil, considering all possible dimensions people may be deprived of, must be a focal point for public politics.

Furthermore, considering the gender analysis, Brazil has more multidimensionally poor women, 54.10%, than men, 34.20%, and they are more intensively deprived than men, even though very similar (a difference of 1.67 p.p. favoring men). These differences make women have a larger MPI than men, 11.9 p.p. higher. Therefore, these results validate the data presented before (in Table 2) and the theoretical approach that women are most likely to lack capabilities than men and not live a dignified, full, quality life (NUSSBAUM, 2001, 2003; ALAM, 2011). These results also corroborate other MPI evaluations made for Brazil, where women are more multidimensionally deprived than men (AVILA; BAGOLIN; COMIM, 2012; FERREIRA; MARIN, 2016; OLIVEIRA, 2018). Also, it can be deduced that the gendered nature of multidimensional poverty in Brazil is more a product of the high count of poor women than the intensity of deprivation they suffer since A was very similar for men and women.

Figure 2: Time evolution of the headcount ratio (H), the intensity of poverty (A), and the multidimensional poverty index (MPI) - Brazil, men, and women, 2004 to 2015



Source: Research results

Figure 2, in turn, presents the evolution of the headcount ratio, the intensity of poverty, and the multidimensional poverty index, between 2004 and 2015. As can be seen, all three variables have been in a reduction path in the period analyzed. The Brazilian headcount ratio experienced a reduction of 41.77%, while the intensity of poverty and the MPI reduced by 7.65% and 46.22%, respectively. However, similar to the previous section, women's percentage of multidimensionally poor (H) has reduced less than men's, a gap of 15.80 p.p. favoring the last ones. The same happened to the MPI. The men's has reduced by 50.22% over the years analyzed, while women's reduced by only 39.73%.

On the other hand, the intensity of poverty presented some interesting information. As shown in Figure 3, it was on a reduction path until 2006, and then, it became almost constant between 2007 and 2014, rising in 2015. Corroborating the poverty instability in Brazil that the data from CEPAL (2021) showed. A possible explanation for the rise is that 2015 was when Brazil entered into an economic crisis and as Vegh et al. (2019) stated, social indicators tend to respond to the business cycle. However, according to Glewwe and Hall (1998), people's poverty status tends not to respond immediately to macroeconomics shocks. Therefore, the economic crisis would take a little longer to reflect on the poor count (H), but it could affect how deprived the poor is (A) more suddenly.

Additionally, these results could suggest that the more recent years, not accounted for in this research database, would turn multidimensional poverty into a rising path since the economic and political crisis experienced by the country, along with the COVID-19 pandemic, are likely to impact social variables

¹¹ Classification made by the World Bank.

negatively. In fact, according to Estrela et al. (2020), gender, race, and class appear as vulnerabilities conditions to the COVID-19 exposure. Also, the data show that the intensity of poverty reduced slightly more for women than for men, which can be related to some advances made in women's rights during the period. However, this pattern probably changed in recent years since women tend to be more negatively impacted in moments of crisis than men (GLEWWE; HALL, 1998; IPEA, 2009; BATISTA, 2019).

Table 5: Contribution of each dimension to the multidimensional poverty index - Brazil, men, and women, 2004 and 2015

Dimension	Weight	Contribution to the MPI					
		2004			2015		
		Brazil	Men	Women	Brazil	Men	Women
<i>k</i> = 33%		%					
Education	0.25	18.10	19.80	16.80	16.40	19.30	14.60
Employment	0.25	41.00	41.90	40.30	44.00	44.50	43.70
Income	0.25	33.70	30.20	36.30	33.80	29.60	36.40
Living Standards	0.25	07.20	08.10	06.60	05.80	06.70	05.30

Source: Research results

Table 6: Contribution of each indicator to the multidimensional poverty index - Brazil, men, and women, 2004 and 2015

Indicator	Weight	Contribution to the MPI					
		2004			2015		
		Brazil	Men	Women	Brazil	Men	Women
K=33%		%					
Years of Schooling	0.125	15.40	16.90	14.30	14.00	15.90	12.80
Literacy	0.125	02.70	02.90	02.50	02.40	03.40	01.80
Employment	0.250	41.00	41.90	40.30	44.00	44.50	43.70
Income	0.250	33.70	30.20	36.30	33.80	29.60	36.40
Electricity	0.036	00.10	00.10	00.10	00.00	00.00	00.00
Sanitation	0.036	03.20	03.50	03.10	03.00	03.30	02.90
Water	0.036	00.50	00.60	00.50	00.40	00.50	00.30
Garbage Disposal	0.036	00.90	01.10	00.80	00.90	01.20	00.80
Cooking Fuel	0.036	00.50	00.60	00.40	00.40	00.50	00.30
Assets	0.036	00.90	01.10	00.80	00.30	00.40	00.20
Overcrowding	0.036	01.00	01.10	01.00	00.80	00.70	00.80

Source: Research results

The data presented in Tables 5 and 6 represent the contribution of each dimension and indicator to the MPI. Therefore, as can be seen, the dimension/indicator that contributed more to the Brazilian MPI in 2004 was the employment one. Its contribution has increased to 2015's MPI primarily due to reducing the contribution of education and living standards from 2004 to 2015. In addition, the dimension that contributed the least was the living standards one, with the electricity indicator being the one with the lower contribution to the multidimensional poverty measurement. The importance of the dimensions and indicators remain in the same order when considering men's and women's MPI. However, it is worth mentioning that education, employment, and living standards contribute more to men's measurement of poverty than to women's, while income contributes more to women's MPI than to men's. These results suggest that reducing the deprivation in employment would be the most effective way to reduce people's

multidimensional poverty in Brazil, regardless of gender. Also, improving women's income would have a higher impact on the MPI than improving men's.

Hence, to summarize, there are more multidimensionally poor women than men, and they experience a higher intensity of poverty in Brazil. Accounting, therefore, for the poverty's overrepresentation of women in the country. Also, women have been improving their poverty status slower than men. Thus, the differences in deprivations experienced by men and women lead them to have different vulnerability paths. Therefore, gender-neutral politics would not be successful in alleviating poverty in Brazil. Finally, improving employment would be the most effective way to reduce the multidimensional poverty index for both men and women.

4.3. Gender, race, and the Multidimensional Poverty Index

Failure to account for the additive effect race has on deprivations could lead to a misconception of the poverty phenomenon. Therefore, Figure 3 introduces race to the analysis, presenting the headcount ratio, the intensity of poverty, and the MPI by gender, race, and their interaction. As can be seen, black people have a higher count of multidimensional poor (H), 48.70%, than the white, 38.80%. They also experience a more intensive form of deprivation (A), 57.49% against 54.64% of the white, although very similar. Therefore, Afro-Brazilian people had greater MPI values than white, 28% versus 21.20%, in 2015, highlighting, once again, that Brazil's poverty phenomenon is black (CARNEIRO, 2015).

Figure 3: The headcount ratio, the intensity of poverty, and the multidimensional poverty index - Brazil, gender, and race, 2015



Source: Research results

Nevertheless, gender appears to influence people's deprivation status more than race since there are considerably more white women multidimensionally poor than black men in Brazil. According to the data, the headcount ratio for white women is 48.30%, while the one for black men is 38.60%. This result aligns with the one presented before (Table 1), that white women have a higher deprivation score than black men. However, there is still structural racism affecting every aspect of black individuals' lives in Brazil, as Carneiro (2015) stated, which would lead us to expect race to have a more significant influence on people's poverty status than gender. Nevertheless, the double jeopardy black women experience in Brazil is unquestionable and consistent with the literature (SANTOS, 2009; SILVA, 2013; CARNEIRO, 2015). They have a headcount ratio of 59.20%, while white men's is 28.70%, a count of 30.5 p.p. favoring the last. This high count leads black women to have the higher MPI value in the country, 34.30%, and white men to have the lower one, 15.30%. Finally, like gender, the intensity of poverty is similar for individuals of the same ethnicity. Therefore, black men and women experience a percentage of deprivation very similar, being slightly higher for women. The same is true for white men and women.

Therefore, we have seen that women and black people are the most multidimensionally poor in Brazil, shedding light on the greater risk of multidimensional poverty black women suffer in the country

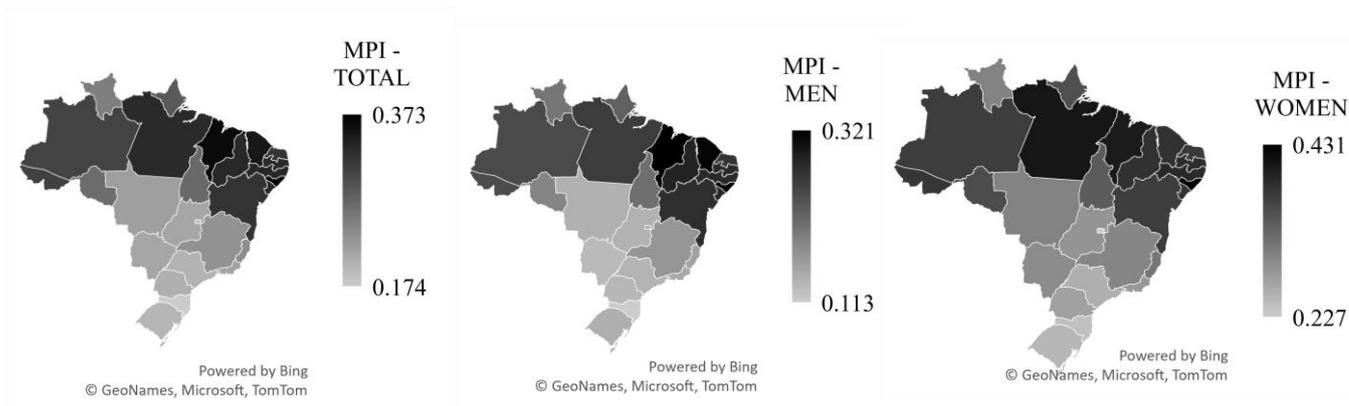
since they experience disadvantages of being from two discriminated groups. Hence, their specific situation should be accounted for when designing policies to alleviate poverty.

4.4. Gender, location, and the Multidimensional Poverty Index

Another relevant characteristic of Brazil is its continental size, with territorial divisions full of particularities that differ in economic, social, political, cultural, and physical aspects (COSTA; MACHADO; AMARAL, 2018). Therefore, failing to account for it could conceal relevant information about the multidimensional poverty phenomenon. That being said, Figure 4 reports the MPI across the country, considering the 27 Federal Units, and Figure 5 shows the rural-urban division of the data.

As presented in Figure 4, the multidimensionally poor population share, adjusted by the intensity of deprivation they suffer, the North and Northeast states had the most acute poverty measurement in Brazil in 2015. Therefore, the state with the highest MPI value was Alagoas, 37.30%, which is also valid for women, 43.10%, and the one with the highest MPI value for men was Maranhão, 32.10%. Additionally, the state with the lowest MPI value for the total population and the men was Santa Catarina (17.40% and 11.30%, respectively), and the one with the lowest MPI value for women was the Federal District with 22.70%. These results are consistent with the literature, which found that individuals living in the North and Northeast states of Brazil are the ones with the worst multidimensional poverty measures, and the ones living in the South are those doing better (RODRIGUES, 2014; FERREIRA; MARIN, 2016; FAHEL; TELES; CAMINHAS, 2016; SILVA et al., 2016).

Figure 4: The multidimensional poverty index (MPI) across the country - Total, Men, and Women, 2015
Source: Research results



In addition, Figure 5 presents the data for individuals living in rural and urban locations. As can be seen, the proportion of multidimensionally poor individuals (H) living in the Brazilian rural areas (62.90%) was significantly higher than for those living in the urban areas (41.20%) in 2015. Also, the poor individuals living in rural areas were more intensively poor than those living in the urban, with A being 62.16% for the rural against 54.85% for the urban. Therefore, the MPI is substantially higher for rural individuals (39.10%) than for urban ones (22.60%). Consistent with Rodrigues (2014), who found that Brazilian rural areas present the highest poverty incidence, regardless of the poverty measurement. Also, it corroborates Fabel, Teles, and Caminhas' (2016) findings that the country's rural areas are expressively multidimensionally poorer than the urban ones.

Figure 5: The headcount ratio, the intensity of poverty, and the multidimensional poverty index - Brazil, gender, and rural/urban location, 2015



Source: Research results

The gendered analysis of these data shows an even wider difference between rural and urban individuals since the proportion of multidimensionally poor (H) rural women was 43.40 p.p. larger than the one of multidimensionally poor urban men, in Brazil, in 2015. Rural women were also experiencing the most significant deprivation. They had an intensity of poverty (A) of 63.88%, against 60.37% of rural men, 55.56% of urban women, and 53.90% of urban men. Therefore, the higher value of MPI was theirs (rural women), 47.40%. This result suggests that living in rural areas also acts as an additive effect on women's poverty. Corroborating with Silva et al. (2016) and Serra, Yalonetzy, and Maia (2020), whose findings suggest that living in remote areas of the country, such as the rural municipalities, results in having higher multidimensional poverty. Also, the difficulties women face in these areas can reflect rural Brazil's patriarchal structure, which increases women's disadvantages inside the family and in the labor market (STADUTO; NASCIMENTO; SOUZA, 2013).

This section showed heterogeneity among the Brazilian territory with differences between people living in different states and especially between individuals living in rural and urban locations. Amongst the territory, women living in Alagoas, a northeastern state, are worse in the multidimensional poverty measurement. Also, living in rural territories puts women in double jeopardy since they suffer from the disadvantage of being women in Brazil and the deprivations that the rural provides. Therefore, location matters, and it should be accounted for to alleviate poverty in Brazil.

5. Concluding remarks

This research aimed to evaluate the gendered nature of multidimensional poverty in Brazil and its evolution between 2004 and 2015. For that, the Multidimensional Poverty Index (MPI) was constructed with data from the national household sample (the PNAD), considering eleven indicators within four dimensions. The dimensions included were education, employment, income, and living standards. Additionally, to give a more accurate profile of the poverty phenomenon in Brazil, the analysis was also divided by race, the Federal Units, and rural/urban locations.

The main results found indicate that poverty has, in fact, multidimensional and gender components in Brazil. First, the relevance of the dimensions evaluated other than income sheds light on the capability failure experienced by Brazilian individuals, highlighting the need to account for poverty's multidimensional nature. Therefore, poverty alleviation policies in the country should be done considering that several aspects affect people's abilities to live a quality life. However, our results confirm the interconnection between the capabilities and the income approaches since the income and employment dimensions were the most relevant for every person. Hence, the points requiring more attention for policy creation are; (i) the divergence between the number of people searching for jobs and the number of available

vacancies; (ii) the precariousness of work; (iii) the time poverty; (iv) the low minimum wage which is barely sufficient to achieve subsistence; and (v) the difficulty into transforming education into work and payment.

Second, women have higher deprivation scores, meaning they have, on average, a superior proportion of deprivation than men. They represent the majority of the poor in Brazil, and most of them are poor. Also, women suffer from a more intensive form of poverty than men. Hence, the MPI for women in Brazil is higher than for men. Additionally, women's poverty status has been evolving slower than men's. They have more difficulty transforming education into employment and income, and their MPI is more affected by the income dimension than men's. Thus, failing to account for the differences between women's and men's situations in Brazil could lead to policies that would even worsen the gender inequalities. In addition to the points highlighted before, Brazil's public policies should focus on giving women more means to enter and grow in the labor market. The discrimination and segregation in the labor market should be tackled with policies as early as school-aged children encouraging girls to pursue STEM (science, technology, engineering, and math) careers. Finally, women need to have available childcare, and the caregiving they exercise should be accounted for since women's time poverty tends to worsen the discrepancies between their and men's deprivation situations.

The results also showed that black women suffer more deprivations in Brazil than any other individual. These women are even more segregated and discriminated against than white women, and they encounter more obstacles in the labor market than others. Hence, public policies should try to repair the historical error committed against black individuals, which led to structural racism in the country. An example of such policies that should be integrated with those suggested before is the race quotas system. Another highlight from our results is that location, in fact, matters for poverty alleviation. Individuals living in Brazil's North and Northeast states and those living in the rural areas are the most multidimensional deprived ones. Hence, given the country's size and heterogeneity, local public policies should consider each location's specificities. For example, for rural individuals extending and facilitating access to education can have a more significant impact in alleviating multidimensional poverty than for urban ones.

Hence, we have seen here that poverty is a complex multi-attribute phenomenon that can differ based on gender, location, race, and others. Thus, neutral public politics cannot have the desired effect when pursuing poverty alleviation. In fact, they could even worsen the situation. Therefore, we believe our findings helped the understanding of Brazil's poverty and can assist the design of more focused public policies. However, the available data limited our multidimensional poverty analysis since other dimensions were also relevant to be evaluated, such as health. Providing, therefore, both a limitation of the study and an opportunity for future research.

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