

# Poverty and Inequality Implications of Fiscal Policies

## The Case of Brazil

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## Abstract

This paper investigates the impacts of the Brazilian fiscal system on poverty and inequality, with a focus on the effects on vulnerable populations. Leveraging a broadly applied and accepted methodology and several household surveys and administrative data, the paper shows that Brazilian fiscal policies in 2019 were typically poverty- and inequality-reducing, but with a large heterogeneity in the effectiveness of fiscal tools. The poverty impacts of fiscal policies increased over time due to direct transfers. Income inequality reduction is among the highest in a comparable set of middle-income countries, yet the post-fiscal Gini is still high at 0.521. The results indicate that elderly people

are the largest beneficiaries of the fiscal system and households with children experience a smaller decline in poverty from government transfers compared to those with no children. At the individual level, the findings also show that children and young adolescents (ages 0–15) were made poorer after taxes and transfers, which suggests that Brazilian fiscal policies in 2019 also increased poverty rates for some population groups. These findings contribute to provide a comprehensive overview of the fiscal system in Brazil and have wide-ranging consequences for the formulation of public policies.

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## **Poverty and Inequality Implications of Fiscal Policies: The Case of Brazil**

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## 1. Introduction

The COVID-19 pandemic coupled with the inflationary effects of the war in Ukraine have put enormous economic pressure on countries, with consequential negative effects on their populations. Global GDP decreased by 3.4% in 2020, with drops varying from -6.4% in Latin America and the Caribbean (LAC) to -2% in Europe and Central Asia (World Bank, 2022e). Inflation reached high levels equivalent to 3.5% in 2021 globally, 2.6% in Europe, 4.7% in the U.S., and 3.9% in LAC. The combination of lower economic opportunities with higher costs of living is expected to have largely affected low-income and the most vulnerable households, such as women and non-college-educated youth, as they used to work in sectors that were hit the hardest by closures (Agrawal et al., 2021, OECD, 2022), and devote a larger share of their resources to purchase food (MacDonald et al., 1991, Kaufman et al., 1997).

Countries across the globe put in place a myriad of emergency measures aimed at shielding the most vulnerable households. Ranging from cash transfers to incentives for firms to reduce contracted hours of employees or offering loan guarantees and direct lending facilities to preserve jobs (OECD, 2021, Gentilini et al., 2022a), these programs are estimated to have cost over USD 3 trillion in 2020-2021 (Gentilini et al., 2022b). As economies were slow to recover, countries face a major fiscal crunch, with more than 80 percent of the emerging markets and developing economies projected to have higher debt-to-GDP ratios in 2022 than in 2019 (World Bank, 2021a). At the same time, poverty rates are expected to be as high as the pre-pandemic period (World Bank, 2022d), highlighting large potential scarring effects – as poverty is linked to reduced intergenerational educational mobility (d'Addio, 2007, Black et al., 2020, Razzu and Wambile, 2022), and limited access to both high-quality jobs (Brummund et al., 2018) and family planning resources (Lee and Miller, 1990, Cavalcanti et al., 2021). Thus, continuous support to vulnerable populations poses an ever-pressing question for policy makers in the context of historically low fiscal space.

This paper studies the Brazilian case. Being the 12<sup>th</sup> largest economy of the world, Brazil is home to over 210 million, or about a third of the population in Latin America (World Bank, 2022d). Between 2019 and 2020 its GDP fell by 4.6%, and its GDP per capita by 4.1%, yet poverty in 2020 decreased due to the Auxílio Emergencial program, which cost BRL 293 billion (World Bank, 2022c). By some accounts, Brazil's response was one of the strongest in LAC (Busso et al., 2021), and possibly one of the largest in the world (World Bank, 2022c). Nevertheless, in 2021 poverty bounced back up. The Brazilian government will thus need to substantially increase the efficiency of its spending if it is to continue helping the poor and vulnerable in a fiscally sustainable way. In this context, this paper aims to contribute to the dialogue on the possible avenues to achieve this goal by analyzing the incidence of fiscal policies in Brazil with an emphasis on their impacts on poverty and income inequality among vulnerable populations. Both the system as a whole and each fiscal policy separately are analyzed in terms of its contribution to poverty and inequality using the Commitment to Equity (CEQ) methodology (Lustig, 2018). The study focuses on a pre-pandemic year (2019) to circumvent potential data issues and represent a relatively stable fiscal situation.<sup>1</sup>

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<sup>1</sup> The years 2020 or 2021 witnessed substantial changes in the social safety system in Brazil. The changes were, however, temporary and the emergency programs have been lifted as of 2022. The year 2019 is also preferred because there were significant changes in the data collection approach of the national household survey that was used for this analysis. For a short presentation of those changes, see Lara Ibarra and Vale (2022).

This paper innovates in a few areas. First, we are, to the best of our knowledge, the first paper to explore the impacts of the fiscal system on vulnerable populations both at the household and individual levels for the case of Brazil. We conduct an analysis of the impacts on poverty and income inequality across demographic groups considering particularly the presence of children and elderly in households' compositions, and also at the individual level. Such categorizations are important given the long-standing evidence of high poverty rates among children and low poverty rates among elderly in Brazil (World Bank, 2018, World Bank, 2022b), and recent literature finding that households with children were more likely to have been affected by the COVID-19-induced economic crisis (World Bank, 2021b, CBPP, 2022). Second, we provide an update to earlier work (Higgins and Pereira, 2014) on fiscal incidence analysis for Brazil that reflected the country's situation in 2008/2009. An update is warranted for several reasons. For instance, the personal income tax structure has changed. In 2008, there were only three tax brackets, with different tax rates: 0%, 15% and 27.5%. There is also now an additional bracket targeting those with lower income levels, whose tax rate is 7.5%, and another intermediate bracket before the maximum, at 22.5%. Also, in 2014 a major economic crisis hit Brazil leaving scarring effects among households in the bottom of the distribution (World Bank 2022b). Moreover, the number of beneficiary families in the largest conditional cash transfer program, the Bolsa Família, increased by 26% in the period 2008-2019, while resident population increased by only 10% (Brazil, 2022c). All these changes represent major modifications in the fiscal incidence landscape. Third, the paper incorporates an analysis of Brazilian indirect taxes under the same cross-country and time comparable methodology.

Our results indicate that the Brazilian fiscal policies are typically poverty- and inequality-reducing, but with a large heterogeneity in the effectiveness of fiscal tools. We document that the fiscal system in 2019 reduces extreme poverty by 5.9 percentage points (p.p.) and moderate poverty by 0.6 percentage points.<sup>2</sup> Our results also indicate that indirect taxes are responsible for a large increase (6.1 p.p.) in poverty, but the poverty reduction effects of rural pensions, BPC, Abono Salarial and Bolsa Família more than compensate that. Despite the modest overall reduction in moderate poverty, we show a substantial decline in both the poverty gap (4.7 p.p.) and the squared poverty gap (5.9 p.p.) in terms of moderate poverty when we shift from market income plus pensions (MIPP) to consumable income. Considering the extreme poverty line, fiscal policies reduce the poverty gap by two-thirds (6.9 p.p.) and the squared poverty gap to a fifth of its original value (a 7.1 p.p. decrease). This means that even though the fiscal system does not reduce much the moderate poverty headcount ratio, it does alleviate the situation of the poor. Notably, out of 40 countries with poverty rates available in the CEQ database, only 11 were reducing moderate poverty from MIPP to consumable income.<sup>3</sup>

We also show that income inequality, measured by the Gini index, is reduced by 6.4 points when we compare the pre-fiscal income concept (MIPP) with consumable income. We additionally show that such

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<sup>2</sup> The threshold for moderate poverty is half of the 2019 minimum wage (BRL 499), while that for extreme poverty is the one that defined eligibility to the Bolsa Família program in 2019 (BRL 178), respectively. In the section reserved for international comparisons, we use a different poverty line because we want to ensure that our results are comparable with CEQ assessments for other countries.

<sup>3</sup> For international comparisons, moderate poverty is measured at US\$5.50 per day in 2011 purchasing parity power (2011 PPP). While here we define moderate poverty at R\$550 per month (equivalent to US\$7.05 per day in 2011 PPP), the CEQ database does not have results for other poverty lines. It is worth noting that the World Bank updated its poverty lines to 2017 PPP and that the current line recommended to upper middle-income countries is US\$6.85 per day. This last is equivalent to R\$521 per month at 2019 prices, very close to the half the national minimum wage line (R\$550) used as the main reference in this paper.

a reduction in inequality is a consequence of the imposition of direct taxes and direct transfers, and that the effects of indirect taxes (from disposable to consumable income) appear to be small. Considering in-kind transfers (due to publicly provided education and health services), the reduction in the Gini is 15.6 points. Importantly, we document that the inequality reduction from MIPP to consumable income is among the highest in an international comparison considering the countries of the CEQ database, only trailing behind South Africa and Argentina. We also find that inequality reduction due to fiscal policies was higher in 2019 than in 2009: 6.4 versus 3.1 Gini points (comparing MIPP with consumable income). To be sure, the post-fiscal Gini coefficient is still very high (0.521) and among the top 9 in a subset of 52 countries of the CEQ database and in the top third of 18 upper-middle income economies.

Our results also indicate that direct transfers and public services typically benefit mostly the poorest. We document that half of the direct transfers go to the first income quintile, which includes the population in extreme poverty and part of those in moderate poverty. Bolsa Familia is the program with the highest progressivity, followed by rural pensions and Benefício de Prestação Continuada (BPC). They represent an important share of MIPP for the first quintile of the income distribution as measured by the pre-fiscal income. The results also suggest that the first and second income quintiles are net cash beneficiaries of the fiscal system, while the third, fourth and fifth are net payers. When considering the total fiscal position, which includes the education and health in-kind benefits, the results show that the first three quintiles are net receivers, while the last two are net payers of the fiscal system. At the same time, we document a large heterogeneity in the distribution of government expenditures. The first quintile of MIPP income distribution receives about 70% of Bolsa Familia's transfers, 55% of rural pension, 45% of BPC transfers, and only 1% of Abono Salarial. This group is estimated to receive 35% of expenditures in primary education and 6% of expenditures in tertiary education. In contrast, the fifth quintile receives close to 37% of expenditures in tertiary education.

When it comes to in-kind transfers, we find that more than 60% of the preschool and primary education benefits are received by the first two MIPP quintiles. Interestingly, the benefits decrease with income and are very low for the richest quintile. Secondary education benefits are not that much concentrated in the first MIPP quintile (27%), but the benefit share also declines with income and reaches 6% in the fifth quintile. Tertiary education benefits, in turn, stand in stark contrast: the share of benefits is positively correlated with income, and about 35% of the benefits go to the richest quintile and less than 10% to the poorest one. We also document that the tax incidence of primary education is higher than 100% of MIPP in the first income quintile, and decreases substantially in the second quintile (21.1%), reaching 0.3% in the last quintile. Higher education is also more important in the first quintile than for the richest, with tax incidence being equivalent to about 31.4% of MIPP in the first quintile, 7% in the second one, and less than 1% in the last one. Preschool education incidence is about 11% in the first quintile, decreasing to 2.2% in the second quintile and less than 1 percent in the rest of the distribution.

Age and race groups are affected differentially by fiscal policies. We find suggestive evidence that the elderly (those aged 60 or more) are the largest beneficiaries of the fiscal system in Brazil. The elderly are eligible for pensions providing 1 minimum wage (BRL 999 in 2019 or USD 181) even with no to limited number of formal labor contributions to the pension system.<sup>4</sup> Poverty rates among the elderly goes from 37.6 to 14.8 percent due to fiscal policies. Moreover, we document that fiscal system makes children and young adolescents (i.e., aged 0-15) poorer, as the post-fiscal poverty rate is greater than the pre-fiscal

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<sup>4</sup> Considering an exchange rate of USD/BRL = 5.5.

poverty rate for these individuals. This demonstrates that, even though the fiscal policies are poverty-reducing in 2019, there are groups of individuals who are worse off after taxes and transfers. We also find that the reduction in poverty due to fiscal policies is larger for households headed by Afro-Brazilians (-6 p.p.) than whites (-5.1 p.p.). This finding is even more relevant given the previous evidence for Brazil that fiscal-induced poverty reduction in 2008/2009 was higher for whites than Afro-Brazilians (Pereira, 2016). When we look at the individual level, we document that the difference in terms of pre- and post-fiscal poverty rates is substantial between elderly Afro-Brazilians and whites: 9.3 percentage points. Conversely, we find virtually no difference between Afro-Brazilians (+2.3 p.p.) and whites (+2.7 p.p.) when comparing the post- and pre-fiscal poverty rates among children and young adolescents.

This paper contributes to the literature on fiscal incidence analyses that have been extensively applied to a variety of countries and contexts (Lustig, 2018, Cuesta et al., 2012, Higgins and Pereira, 2014, Bucheli et al., 2018, Greenspun et al., 2019, Lara Ibarra et al., 2019, Meija-Mantilla et al., 2019, Pabón et al., 2021). The available empirical evidence suggests that fiscal policies across the globe are often poverty- and inequality- reducing, and that reductions are typically more pronounced when in-kind transfers are considered. Sometimes, however, the effects of the fiscal system can be detrimental. In Zambia and Uganda, for instance, the poverty headcount ratio increases by 2.3 p.p. when considering the post-fiscal income (De la Fuente et al., 2017, Meija-Mantilla et al., 2019). Even though direct transfers were found to be pro-poor in such countries, they are not large enough to counteract the purchasing power declines caused by indirect taxes. Similarly, neither the presence of elderly in the household structure is a warranty of poverty decline nor the presence of children implies in increases in the likelihood of poverty, as demonstrated in the case of Armenia (Tarlovsky and Icaza, 2022). The same is also true when it comes to the ability of fiscal systems to mitigate existent gaps across gender, racial and other groups in a country's population. Therefore, updated fiscal analyses are fundamental to designing well-informed policy actions, as governments seek to be as effective and efficient as possible to protect the most vulnerable populations.

The results in this paper are consistent and complementary to a recent study on fiscal incidence analysis for the case of Brazil. In a recent study, Silveira and Palomo (2023) use the latest national household budget survey (Pesquisa de Orçamento Familiar, POF 2017-2018) and find that direct cash transfer and in-kind transfers are the main poverty and inequality reducing mechanisms of the Brazilian fiscal system. Using self-reported data in the survey, the authors document the regressive character of the public servants' pensions system (*Regime Próprio de Previdência Social*, RPPS) and regressive impacts of indirect taxes. Differently from Silveira and Palomo (2023), our paper models and simulates direct taxes and contributions instead of using survey responses. By considering different elements like job status and family composition, our estimates aim to add more consistency between the reported income and the direct taxes assessment. We also model rural pensions as a separate cash transfer and contributory pensions are treated as deferred income, while their treatment of government transfers is estimated as an alternative scenario. An advantage of our study is its cross-country comparability to the large body of work based on a comparable methodology. However, we are not able to separate between the pensions system for private-sector workers, the *Regime Geral da Previdência Social* (RGPS), and the pensions system for public servants, the RPPS (for details on the pension system, see Paiva (2016)).

The remainder of this paper is organized as follows. Section 2 shows the details of the methodology and presents the data sources. Section 3 presents the main results, while Section 4 shows the fiscal incidence

analysis focused on the demographic groups of interest. Section 5 discusses international comparisons. Section 6 concludes.

## 2. Methodology

### 2.1 CEQ methodology

The fiscal incidence analysis for Brazil 2019 follows the Commitment to Equity (CEQ) methodology developed by Lustig (2018). The methodology estimates income concepts that assess how the fiscal system and specific interventions affect poverty and inequality (see Figure 1). We apply this approach to answer the following questions: How much does the fiscal system contribute to changing market income inequality? Does it help reduce poverty? Which taxes and transfers are progressive or pro-poor? What would be the distributional impacts of specific fiscal interventions?

In this analysis, the following income concepts apply:

**Market income** includes labor income (gross employee cash or near cash income, gross non-cash employee income, and employers' social insurance contributions), income from capital assets (rent of property or land, interest, dividends, and profits), and private transfers (pensions from private pensions plans, and net regular inter-household cash transfers), the value of goods produced for own consumption and the imputed value of owner-occupied dwellings and other income sources.<sup>5</sup>

**Market income plus pensions (MIPP)** is the sum of market income, contributory old-age pensions minus contributions to old-age pensions (INSS, Cota Patronal, and FGTS). This is considered the "pre-fiscal" income of households, as it represents a benchmark to which we compare households' situation before any interactions with the country's fiscal policies, i.e., before any taxes are paid, before any contributions are made or any transfers are received.

**Disposable income** is constructed by adding direct transfers and subtracting direct taxes and social contributions not directed to old-age pensions from market income plus pensions. Brazil's direct taxes include personal and property taxes (IPTU and ITR). Direct transfers include Abono Salarial, Bolsa Família, Benefício de Prestação Continuada, Abono Salarial, Salário Família, Rural Pensions, Unemployment Benefits, and other government cash transfers (see also section 3.3).

**Consumable income** subtracts indirect taxes from disposable income.<sup>6</sup>

**Final income** adds to consumable income benefits through social spending on health and education.

As so much depends on the design and functions of the pension system in each country, there needs to be a consensus in the literature on how to treat contributory pensions and related contributions. There are usually two scenarios. One option takes Pension as Deferred Income (PDI). Under PDI, old-age pension income is treated as deferred income and therefore added to market income, and pension contributions are treated as savings. A second option is the Pensions as Government Transfers scenario (PGT), in which

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<sup>5</sup> The approaches to evaluate own consumption and imputed rent are described in Section 3.3.

<sup>6</sup> When available, this income concept adds a monetary value of indirect subsidies. This study does not include any indirect subsidies.



pension income is treated as government transfers and pension contributions as taxes and thus subtracted from market income in line with the standard EU measurement of disposable income. This study follows the recommended guidelines by Lustig (2018) and estimates the two scenarios, but the PDI one is used as the main specification. Despite deficits in some Brazilian public provisional plans, contributions to pensions still represent a significant form of forced savings. Currently, transfers from the Central Government to fund the pension system are relatively low compared to social security contributions. According to our estimates, social contributions revenue was 11.6 percent of GDP in 2019, and the Federal Court of Accounts of Brazil estimated a deficit of 4.2% of GDP considering all provisional systems.<sup>7</sup> This means that 26.6% of the pensions are paid by government transfers, which is a non-negligible share, much closer to a fully contributory than a fully government-subsidized regime. Therefore, we argue that the PDI approach is a better fit for the Brazilian pension system in 2019. Notwithstanding, we also present the results relative to the PGT approach in the Appendix, and they are qualitatively similar. In this direction, Silveira and Palomo (2023) demonstrate that the pension system in Brazil is such that two-thirds of the pensions are given to beneficiaries of RGPS and one-third to those of RPPS. The authors also show that the pension system for private-sector workers is slightly progressive or neutral, while that of public servants is regressive.<sup>8</sup> As a consequence, we argue that our results can be understood as representing the net effect of the overall pension system in Brazil.

To unpack the distributional impacts of the fiscal system, the following standard indicators are used:<sup>9</sup>

**Concentration coefficient:** The coefficient of concentration (a quasi-Gini) is an index summarizing the *concentration curve* of a tax (typically between 0 and 1) or transfers (which ranges from -1 to 1). The curves from which the measure is derived cover the cumulative percentage of households, from poor to rich, ranked by MIPP, on the horizontal axis and the cumulative percentage of tax paid or transfers received by each centile, on the vertical axis. The concentration coefficient equals the integral of the cumulative proportion of people in a centile minus the cumulative proportion of the total amount of a tax or transfer that goes for that centile. The closer a policy concentration coefficient is to 1, the more unequal it is distributed among the population (i.e., it has a high “concentration”). Graphically, more concentrated policies show stronger curvature of their concentration curve (Figure 2). Notably, a transfer can have a negative concentration coefficient. Such transfers are labeled as “progressive and pro-poor.”<sup>10</sup> The concentration coefficient is used with the pre-fiscal income Gini (before any taxes and transfers) to construct the Kakwani index.

**Kakwani index:** This is useful for determining the progressivity of taxes or transfers. The Kakwani index for taxes is defined as the difference between the concentration coefficient of the tax and the Gini for pre-fiscal income; for transfers, it is defined as the difference between the Gini for pre-fiscal income and the concentration coefficient of the transfer. A Kakwani index will be positive if a tax is globally progressive,

<sup>7</sup> See <https://sites.tcu.gov.br/contas-do-governo/07-resultado-previdenciario.html>.

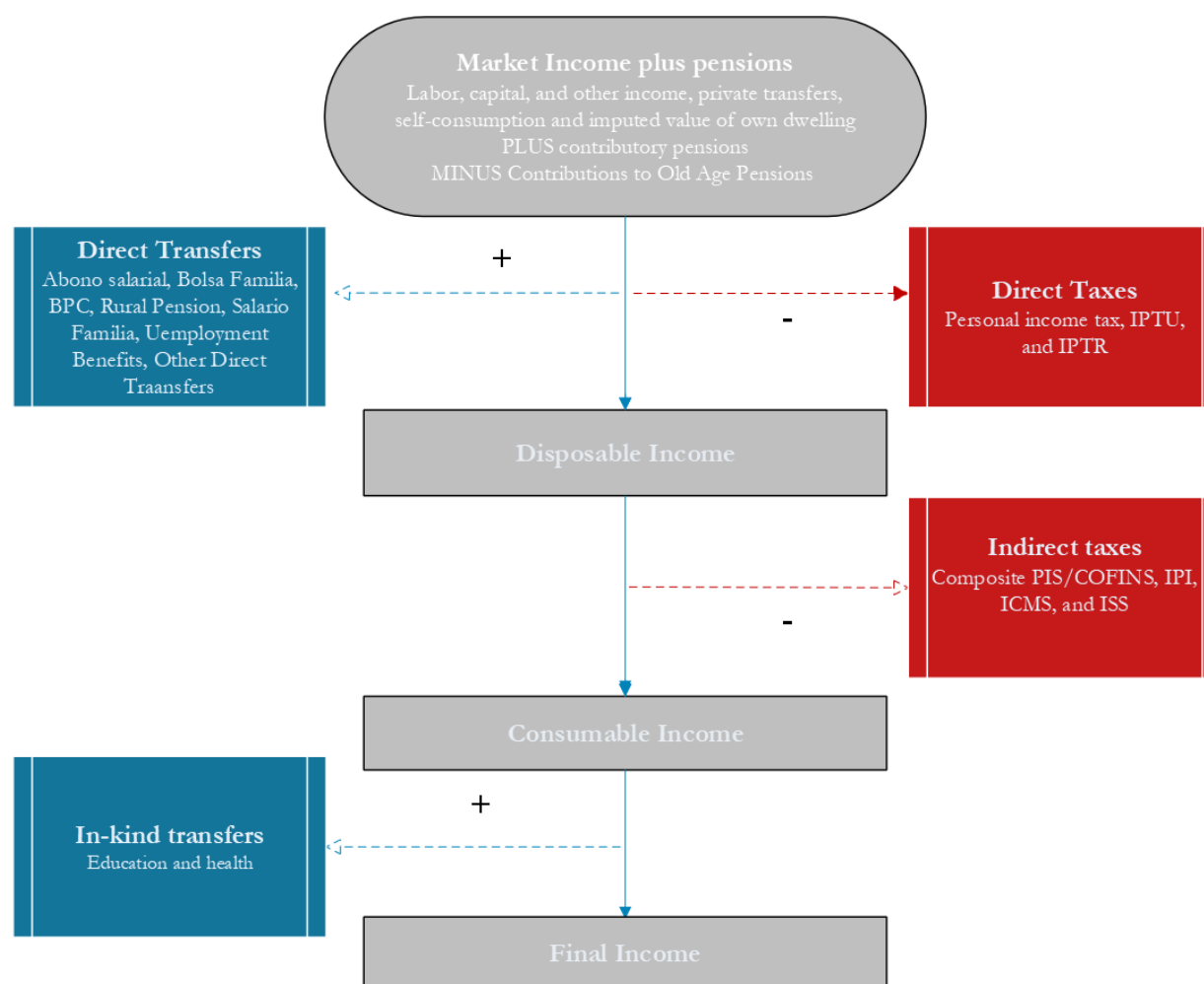
<sup>8</sup> The authors show that the pensions transfer from RGPS represent between 5 and 14 percent of the gross income of those in the bottom 40 percent of the income distribution, while those from RPPS represent less than 1 percent in this group. In contrast, in the top 10 percent of the income distribution, RPPS represents 9 percent of the gross income and RGPS only 7 percent.

<sup>9</sup> For more details, see Lustig 2018.

<sup>10</sup> This type of transfers is also referred as being absolute progressive because poorer individuals get larger transfers in absolute terms (and not only larger transfers as a share of their income).

negative if it is regressive, and 0 if it is proportional. An index for transfers is positive if a transfer is progressive in relative terms.<sup>11</sup>

**Figure 1. CEQ Income concepts: Pensions as deferred income scenario (PDI)**



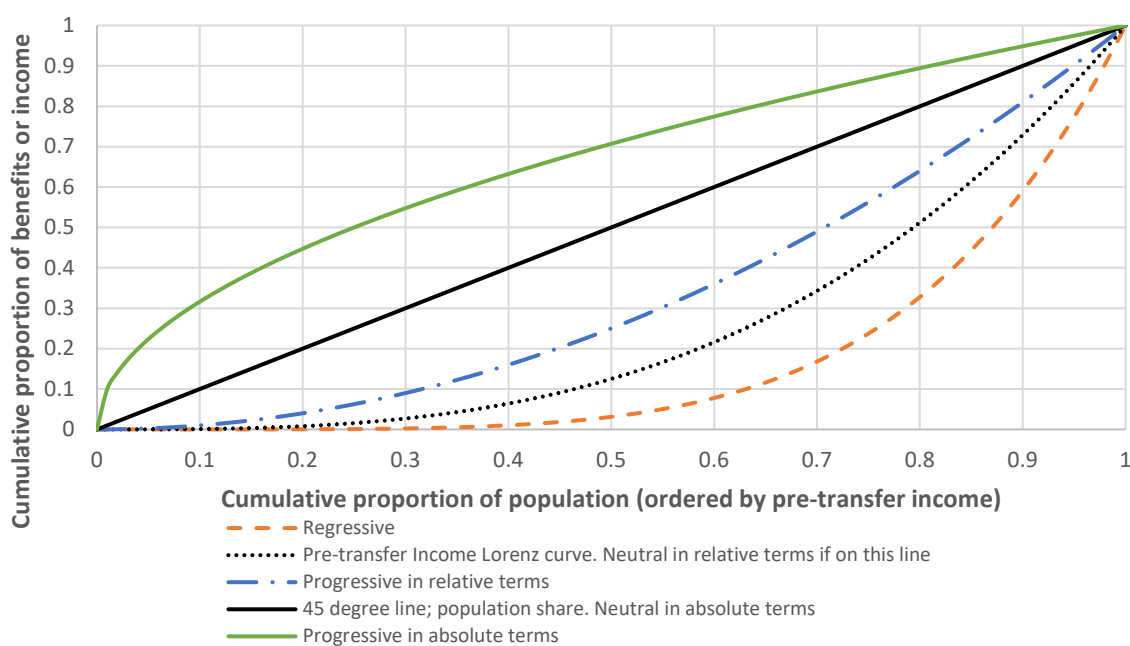
Source: authors based on Lustig (2018).

**Redistributive effect:** This indicator captures the marginal contribution of a fiscal policy to the Gini coefficient of inequality. The marginal contribution is the difference between the Gini coefficient with and without the tax or transfer. If positive, it captures a redistributive effect, corresponding to a lower Gini after the tax or transfer.

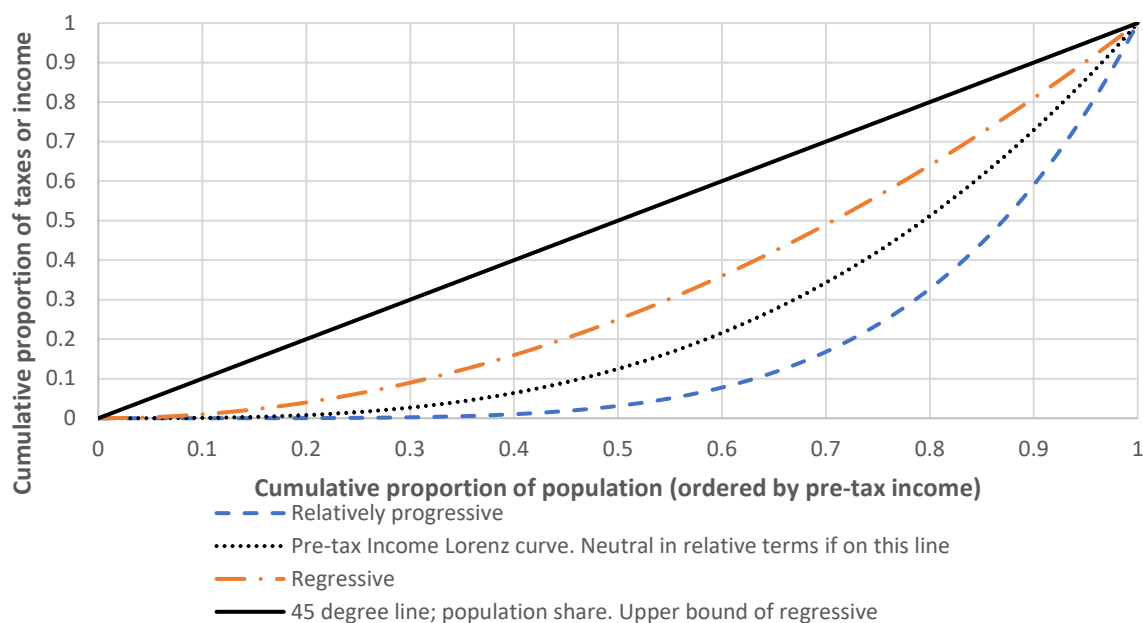
<sup>11</sup> A tax is progressive if the proportion paid in relation to pre-fiscal income increases as income rises. This happens when the concentration curve is completely below the pre-fiscal income Lorenz curve. A transfer is progressive in relative terms if the proportion received in relation to pre-fiscal income decreases as income rises. This happens when the concentration curve lies between the pre-fiscal income Lorenz curve and the 45-degree line.

**Figure 2. Graphical Representation of Progressivity and Regressivity of Taxes and Transfers**

**a. Government Transfers**



**b. Government Taxes**



Source: adaptation from Lustig (2018).

**Poverty reduction effect:** This captures the marginal contribution of the fiscal system element(s) to poverty defined at a particular poverty line. Again, the marginal contribution is understood as the difference

between the poverty rate with and without the tax or transfer. If positive, it captures a poverty reduction effect, corresponding to a lower poverty rate after the tax or transfer.

Note that a progressive tax does not necessarily reduce inequality,<sup>12</sup> which would instead require a positive redistribution effect, or poverty, which would require a positive poverty reduction effect. Similarly, a tax can reduce inequality but, at the same time, increase poverty.<sup>13</sup> For a complete picture, measures of progressivity must therefore be combined with marginal contributions to evaluate the effects of fiscal interventions on poverty and inequality.

## 2.2 Data sources

The study relies on a variety of data sources including household surveys, government expenditures from administrative sources, and findings from earlier studies. We describe them in detail below.

### A. Household Surveys

**PNAD-C.** The national household survey (*Pesquisa Nacional por Amostra de Domicílios Contínua*, PNAD-C) is the main source of information in Brazil about labor market outcomes, educational attainment indicators and households' income sources. We use the 2019<sup>14</sup> annual release of the survey data as published by the Brazilian national statistical office (*Instituto Brasileiro de Geografia e Estatística*, IBGE). The survey comprises 150,667 households and 443,790 individuals interviewed during the 2019 calendar year.

**PNS.** The national health survey (*Pesquisa Nacional de Saúde*, PNS) 2019 interviewed 100,541 households. PNS was designed to collect information about the population's health conditions, surveillance of chronic noncommunicable diseases (NCDs) and their associated risk factors. It also aimed to verify the performance of the national health system regarding both access and use of available services and

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<sup>12</sup> In the literature, this is known as the Lambert conundrum (Lambert 2001; Lustig & Higgins, 2018). Taxes, for instance, can be regressive according to the Kakwani index but when combined with transfers make the system more equalizing than without the regressive taxes. For a thorough discussion see Enami, Lustig, and Aranda (2018).

<sup>13</sup> See Higgins and Lustig (2018).

<sup>14</sup> Survey data for 2020 and 2021 was available when this paper was written. However, there are several reasons related to the unusual COVID-19 conditions in Brazil that make conducting a fiscal incidence analysis in those years less desirable. First, the years 2020 and 2021 are not considered 'typical years' as the pandemic had major disruptions on the economy and the labor income. The employment rate of the working-age population dropped by 5.4 percentage points between 2019 and 2020. At the same time, the government put in place emergency measures including a cash transfer program called "Auxílio Emergencial" (AE) that reached over 67 million people (circa 42% of the country's adult population) with a generous payment of R\$600 (55% of the minimum wage). Second, in 2021, AE was substantially reduced in terms of coverage and benefits, while other emergency measures expired. The labor force participation (at 60.6 percent) was far below its pre-pandemic levels of 63.9% and unemployment rates were at its highest point (14 percent) in a comparable series since 2012. Moreover, the social distancing measures established to contain the virus spread challenged the data collection by the National Statistical Office of Brazil (IBGE). Consequently, the response rates in both 2020 and 2021 were much lower than in previous years and IBGE undertook a series of mitigation measures to preserve the data (IBGE 2021, IBGE 2022). The effects of these atypical situations over income, poverty and inequality estimates were documented in Lara Ibarra and Campante Vale (2022) and Lara Ibarra and Campante Vale (2023). Specific work on the effects of AE on poverty can be found in World Bank (2022d).

continuity of care. The information about public health services included in this survey is used to assess health benefits.

**POF.** The national household budget survey (*Pesquisa de Orçamentos Familiares*, POF) 2017/18 is a nationally representative budget survey that collects detailed expenditure data from more than 178,000 individuals and 58,000 households. Besides the household budget composition, POF also collects demographics and living conditions data, including the nutritional profile and subjective perceptions of quality of life. POF 2017/18 was collected between July 11, 2017, and July 9, 2018.

**Indirect taxes.** The indirect taxes estimation is based on Lara Ibarra et al. (2021). They estimate a composite measure of indirect taxes that includes PIS/COFINS or *Programas de Integração Social e de Formação do Patrimônio do Servidor Público* (PIS), and *Contribuição para Financiamento da Seguridade Social* (COFINS)<sup>15</sup>; IPI or *Imposto sobre Produtos Industrializados*<sup>16</sup>; ICMS or *Imposto sobre Circulação de Mercadorias e prestações de Serviços de transporte interestadual, intermunicipal e de comunicação*<sup>17</sup>; and ISS or *Imposto Sobre Serviços*: a municipal services tax that is regulated at the federal level. These estimates are based on data from the POF survey.

#### B. Administrative sources

**Government expenditure at the federal level.** The Brazilian Ministry of Finance (*Secretaria do Tesouro Nacional*, STN) compiles figures about government expenditures in Brazil. This information includes consolidated executed government and revenue collection for the year 2019.

**Social protection data.** Open Data Portal from Brazil's government has information about the total expenditure and number of beneficiaries for Direct Transfers: *Abono Salarial*, *Bolsa Família*, *Benefício de Prestação Continuada*, *Salário Família*, and *Unemployment benefits*.<sup>18</sup>

**Education expenditure.** We use the estimates of direct investment per student in nominal values estimated by the National Institute of Educational Studies and Research Anísio Teixeira (*Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira*, INEP). These estimates are used as a valuation of the public education price to add on the final income of families that have members attending public education.

**Health expenditure.** The figures for health by type were obtained from Brazil's National Health Accounts 2015-2019 (Brazil, 2022a). This report includes disaggregated figures for current government health expenditure in five categories: (i) curative attention, (ii) dental care, (iii) rehabilitation, (iv) medicines, exams, and ambulance and (v) others. Such estimates are used to produce a monetary valuation for the public health services' price and add to the final income of families that may have benefited from these services.

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<sup>15</sup> These taxes are levied on revenues under cumulative and non-cumulative systems; some items have exemptions.

<sup>16</sup> It is a tax on imports and manufactured products; for some items, it works like a value-added tax; for others, it works like excise.

<sup>17</sup> This is a value-added tax on the circulation of goods and provision of interstate, inter-municipal transportation and communication services.

<sup>18</sup> Available at <https://portaldatransparencia.gov.br/beneficios>.

## 2.3 Application of the fiscal incidence analysis<sup>19</sup>

### *Taxes and contributions*

**Direct taxes and social security contributions.** The approach to estimate personal income taxes is explained in detail in World Bank (2020). In summary, the method consists in a simulation approach that builds tax units based on gender, age, school enrollment, income, and relation to the household head to identify taxable income. The tax regime is estimated according to individuals' status in the labor market, which fundamentally depends on labor force participation, employment, type of business and type of employment contract if working. Therefore, the estimated taxable income is adjusted according to the inferred tax regime, tax deductions, and statutory rates. For personal income taxes, formal workers in PNAD-C were identified and classified into one of the following four categories: (i) private sector, (ii) public sector, (iii) military, or (iv) self-employed and business owners. The latter were classified as paying taxes as (i) an individual microentrepreneur (*Microempreendedor Individual*, MEI); or (ii) a firm registered under the SIMPLES Nacional regime; (iii) a firm registered under a non-simplified tax regime (i.e., we refer to such firms as “PJ regular”); or (iv) a self-employed worker (see the details in World Bank, 2020, pp. 5-7).<sup>20</sup> Informal workers are identified if they are non-registered salary workers (no *carteira assinada*), or if they are employers or self-employed that do not have either a business registration (CNPJ) nor pay the social security contribution (INSS). Informal workers are considered to not pay personal income taxes. For social security, we estimate individuals' pensions contributions and employer contributions (FGTS and Cota patronal, see the details in World Bank, 2020, pp. 7-9). Informal workers who reported to contribute to pensions are estimated to pay through the voluntary regime.

To estimate IPTU/ITR, we use data from POF 2017/18 to fit a regression that explains the behavior of the sum of IPTU and ITR as a function of disposable income, area of residence (urban or rural), Brazilian state,

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<sup>19</sup> There are some differences in terms of the CEQ approach between this paper and that from Higgins and Pereira (2014) for Brazil relative to 2008/2009. First, Higgins and Pereira (2014) use survey responses at face value, as in Silveira and Palomo (2023), while our paper models and simulates direct taxes. Second, our study has a broader coverage of direct transfers. Third, Higgins and Pereira (2014) account for electricity subsidies, while we do not. Fourth, the health imputation figures for 2009 were made using the health module of PNAD 2008, while we use PNS 2019. The authors calculated the average benefit received per health visit facility visit and then imputed it to households that reported attending a public health facility. The estimates from Higgins and Pereira (2014) were calculated by state. In 2019, estimates consider the age population composition using PNS, so both are valid but with a different emphasis on group differences (geographical vs. age group). Finally, education estimates in 2019 used per-pupil INEP estimates, but for the year 2018. For 2009, the authors used state-level estimates, one value for all education except tertiary and another for tertiary with data from national accounts. So, the 2009 estimates could better reflect geographic differences, while ours may probably better capture differences in educational per capita benefits. Nonetheless, there is suggestive evidence that differences in the results of this work and Higgins and Pereira (2014) may in fact reflect the actual changes of the fiscal system. Higgins and Pereira (2014) found that Brazil 2009's fiscal system was reducing poverty and inequality until disposable income, but results for poverty are reverted when indirect taxes were accounted for. Meanwhile, Silveira and Palomo (2023) use POF 2017/2018 and find that indirect taxes have a regressive effect, but that this effect is smaller than that from POF 2002/2003. This smaller effect is in line with our finding of marginal positive impacts on poverty of fiscal policies.

<sup>20</sup> SIMPLES Nacional is the Brazil's simplified tax regime for small and micro firms, which also encompasses a sub-regime for nanoentrepreneurs named *Microempreendedor Individual* (MEI). Firms whose profits are larger than a given threshold are not allowed to opt in for the simplified tax regimes such as SIMPLES Nacional and MEI, and these firms were classified under the category “PJ Regular” to account for the fact that they typically face a higher tax burden.

and type of address (house, apartment or other) for addresses owned by the survey's respondents. The estimated coefficients were applied to the same variables of the PNAD-C for the group of homeowners.

**Indirect taxes.** To estimate indirect taxes, we use the estimates from Lara Ibarra et al. (2021) based on the POF survey. To impute the results in PNAD-C, we create a tax burden share (tax burden/consumption) in POF and calculate different measures of the average tax burden shares. These average shares were then smoothed using a *lowess* estimation. Different options were evaluated: using percentiles of disposable income, percentiles of disposable income by urban and rural, percentiles of tax burden for each group by urban and rural population, and percentiles of tax burden statewide. We opted for using the tax share burden by disposable income per capita percentile in urban and rural zones because it offers a better estimation than the national percentile. The results were comparable to alternative options and, importantly, alternative imputations yield qualitatively similar results.<sup>21</sup> The smoothed tax burden shares were then multiplied by disposable income in PNAD-C.<sup>22</sup>

It should be noted that the range of indirect tax burden is wide. For example, for the tax burden as a ratio to disposable income, the interquartile range is nine, and the difference between the max and minimum is around 39 percentage points. This broad range results from estimating the tax burden from a composite measure of different indirect taxes, with distinct tax bases, rates, and disparate patterns of taxable consumptions according to income. However, the average by decile and urban/rural resulted in a share of outliers (outside the range of the mean  $\pm$  two standard deviations) that corresponds to less than 5 percent of the observations.

Table 1 presents the set of taxes and contributions in Brazil in 2019 and indicates whether each of them was included in the analysis. Most policies are explicitly considered in the investigation. Taxes and contributions added up to 44.1% of the Brazilian GDP in 2019. Indirect taxes are the most important component of the GDP share (15.3%), followed by social contributions (11.6%), and direct taxes (9.7%). Indirect taxes represent the highest contribution to government revenues (34.7%). ICMS, in turn, is by far the most relevant tax both in terms of share of GDP or total government revenues, followed by the personal (IRPF) and the corporate income taxes (IRPJ, CSLL and others).

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<sup>21</sup> The ratio of indirect taxes to MIPP in the urban/rural scenario used in this paper is 16.69 percent, which is close to 16.72 percent in the estimation by state and 16.68 in the nationwide estimation.

<sup>22</sup> Brazil's indirect tax incidence (i.e. the total indirect tax payments as a share of the total of households' MIPP) is higher than most other countries in the CEQ sample. Brazil has one of the highest indirect tax incidence (16.7%), trailing only South Africa in 2014/2015 (Goldman et al., 2020), with an estimated incidence of indirect taxes of 19.7%. This figure also exceeds Brazil's estimate for 2009, which was 14.5% (Higgins et al., 2020). Notably, these countries also have a high indirect tax incidence among the poorest households. In 2019, Brazil's first quintile tax incidence was high at 58.1%. This rate is above that of Argentina's 2017 (44%) and Brazil's 2009 estimate (39%), but still below the estimate for South Africa (above 90%). A few factors can explain this high incidence for the first quintile. First, indirect tax collection is high in Brazil, even higher than all tax collection as a share of GDP in other countries. Second, many households in the bottom quintile rely on government transfers and can consume (and pay corresponding consumption taxes) above their market income plus pensions. Third, we use a composite measure that includes different indirect taxes (PIS/COFINS, ISS, and other taxes) to capture the complexity of different levels of government. However, only the POF survey provides all the necessary information for these estimates. The imputation from POF to PNAD-C was based on the smoothed average tax burden of indirect taxes by centile and rural/urban areas, which leaves out some outliers.

**Table 1. Taxes and contributions in Brazil, 2019**

	<b>Brazilian Reais (in millions)</b>	<b>Share of revenues (%)</b>	<b>GDP (%)</b>	<b>Included in analysis</b>
<b>Total Revenue &amp; Grants</b>	3,086,897	100.0	44.1	
<b>Revenue</b>	3,086,886	100.0	44.1	
<b>Tax revenue (including social contributions)</b>	1,748,573	56.6	25.0	
<b>Direct taxes</b>	677,661	22.0	9.7	
<b>Personal Income Tax (IRPF)</b>	219,386	7.1	3.1	Yes
<b>Corporate Income Tax (IRPJ, CSLL, others)</b>	207,532	6.7	3.0	No
<b>Income Tax (other)</b>	108,659	3.5	1.6	No
<b>Payroll Tax (salario educaco, others)</b>	24,239	0.8	0.3	No
<b>Property Tax (IPTU, ITR, ITBI, IPVA, others)</b>	117,845	3.8	1.7	Partial
<b>Social contributions</b>	811,036	26.3	11.6	
<b>Social security</b>	529,979	17.2	7.6	Yes
<b>Other social contributions</b>	281,057	9.1	4.0	No
<b>Indirect taxes</b>	1,070,912	34.7	15.3	
<b>General taxes on goods &amp; services</b>	963,607	31.2	13.8	Yes
<i>IPI</i>	52,440	1.7	0.7	Yes
<i>ICMS</i>	508,128	16.5	7.3	Yes
<i>COFINS</i>	237,372	7.7	3.4	Yes
<i>PIS</i>	51,390	1.7	0.7	Yes
<i>ISS</i>	71,806	2.3	1.0	Yes
<i>Other sales taxes</i>	42,471	1.4	0.6	No
<b>Excise taxes</b>	2,776	0.1	0.0	Yes
<b>Taxes on specific services</b>	25,514	0.8	0.4	No
<b>Taxes on use of/permission to use goods</b>	35,021	1.1	0.5	No
<b>Taxes on international trade &amp; transactions</b>	42,933	1.4	0.6	No
<b>Other indirect taxes</b>	1,061	0.0	0.0	No
<b>Nontax Revenue</b>	527,278	17.1	7.5	No
<b>Grants</b>	11	0.0	0.0	No

Source: Brazil (2022b). IRPF stands for Imposto de Renda da Pessoa Física, IRPJ for Imposto de Renda da Pessoa Jurídica, CSLL for Contribuição Social sobre o Lucro Líquido, IPTU for Imposto sobre a Propriedade Territorial Urbana, ITR for Imposto sobre a Propriedade Territorial Rural, ITBI for Imposto sobre Transmissão de Bens Imóveis, IPVA for Imposto sobre a Propriedade de Veículos Automotores, IPI for Imposto sobre Produtos Industrializados, ICMS for Imposto sobre a Circulação de Mercadorias e Prestação de Serviços, COFINS for Contribuição para o Financiamento da Seguridade Social, PIS for Programa de Integração Social, and ISS for Imposto sobre Serviços.

### *Direct transfers and in-kind transfers*

**Direct transfers.** Following World Bank (2020), direct transfers in this study are both simulated and imputed. The transfers analyzed are:

- *Unemployment benefits.* The insurance to unemployed is given to formal workers after their contracts are terminated with no just cause, to employees who have their contracts suspended due to professional training program sponsored by the employers, to fishermen in periods in which fishing is prohibited, and to workers rescued from forced labor. Workers are entitled to three to five monthly payments and the number of payments depends on job tenure before contract termination or



suspension, and the worker's previous formal employment spells. PNAD-C collects information about individuals who report to have received the insurance in the period of the survey. It also asks about the time individuals had been actively searching for a new job, though it does not collect precise information about the time when the termination occurred and about the previous labor history. Unemployment benefit amounts are reported in the survey and used in our estimations.<sup>23</sup>

- *Salário Família*. The benefit is granted to formal workers who have children or stepchildren aged 14 or less and receive a salary up to a limit (BRL 1,364.43 in 2019) . In case of disabled children, there is no age limit to the benefit. PNAD-C does not have information on disability, so we consider individuals as disabled when they declare to have received BPC and to be under 65 years old. It is important to note that both parents can receive Salário Família if their salary is below the threshold and they have a child under 14 years old or with a disability. Workers receive a benefit that is proportional to the number of children that match these conditions.
- *Abono Salarial*. This benefit is paid to formal workers who earn up to a limit (two minimum wages). To be eligible, workers must satisfy two criteria: i) have been registered in PIS/PASEP for five years or more and ii) have worked for at least one month in the current calendar year.<sup>24</sup> Because PNAD-C does not provide information on enrollment in PIS/PASEP database, we assume that a person needs to have five years of potential experience to be considered a beneficiary of Abono Salarial, defined as age minus years of schooling minus 5. The benefit value is calculated based on the number of months worked in the previous calendar year considering all formal jobs. Given that this information is not available in PNAD-C data, we use the number of months worked in the current job (capped at 12 months).
- *Bolsa Família*. PNAD-C has a specific question about Bolsa Família, which allows us to identify those who declared to be beneficiaries of such program. However, the total number of beneficiaries measured by the PNAD-C question is substantially smaller than those from administrative records. Given this study's objective of providing relative comparisons of fiscal policies, it is therefore important to rely on an estimate of the number of Bolsa Família beneficiaries closer to official accounts. To do this, we calculate individual's per capita household income – under certain assumptions – to determine eligibility to the Bolsa Família program. The main assumption is that individuals under-report their total income, and that the level of under-reporting is higher the lower their formal income is. In particular, we assume that a pre-determined share of households' declared informal income is considered for the Bolsa Família eligibility (World Bank, 2020).
- *Benefício de Prestação Continuada (BPC)*. There are two different groups targeted by BPC: the elderly poor and the poor with disabilities. In principle, PNAD-C captures information about respondents' BPC beneficiary status. For individuals in the first group, we verify individuals' age to confirm the BPC beneficiary status. For the latter, we use the same criteria used to identify persons with disabilities in the case of Salário Família. An important stylized fact of PNAD-C is that the number of individuals reporting to have received BPC is smaller than the number of actual BPC beneficiaries according to administrative data. To represent the BPC population in this fiscal incidence analysis we also note that

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<sup>23</sup> The minimal insurance was the minimum wage in 2019 (BRL 998.00), while the maximum could not surpass 1.74 minimum wages (BRL 1,735.29). In certain cases, we correct the data to make the unemployment insurance income to lie within this range.

<sup>24</sup> PIS stands for Programa de Integração Social and PASEP for Programa de Formação do Patrimônio do Servidor Público. Both are public funds for unemployment, child benefit and allowance for formal low-paid workers. Workers can only qualify for PIS and PASEP if they are registered in the PIS/PASEP database.

the number of individuals who declare to have received standard pensions is actually higher in PNAD-C than in administrative records.<sup>25</sup> This suggests that some respondents are mistakenly reporting to have received pensions when they are actually BPC beneficiaries. We thus adjust the under-declaration of BPC beneficiaries in PNAD-C by allocating some of the pensioners to the BPC program. The reallocation is done from urban pensioners to either BPC or rural pensions by using a linear probability model that identifies the most likely low-asset individuals, which are arguably those who are more likely to be BPC beneficiaries and that reported to be pensioners.<sup>26</sup>

- **Rural pension.** Rural pensions can be contributory but are treated as noncontributory because most of the beneficiaries are informal workers who have never paid social security contributions (in this case, only retired by age). Any man over 60 or woman over 55 with at least 180 months of rural activity is eligible for a rural pension by law. Unfortunately, rural pensions are not directly identifiable in PNAD-C 2019: the survey does not distinguish pensioners who receive their benefits through the rural pension program from those who contributed through their formal employment (*aposentado urbano*). It also does not distinguish pensioners from their survivors (*pensionista*). Given this data limitation, we impute the status of rural pension recipients using a reallocation methodology from the broad pensioners pool. In particular, we identify as rural pensioners men over 60 and women over 55 living in rural areas and whose declared pension value is smaller than 2.5 minimum wages in 2019. Survivor beneficiaries of rural pensioners, in turn, are identified as either: a) individuals living in a rural area who declared to receive a pension, and that did not fit the age criteria; or b) individuals living in a rural area who declared to receive a pension, fit the age criteria and whose pension value was higher than 1.5 minimum wages.<sup>27</sup> All rural pension beneficiaries are assumed to receive a 13<sup>th</sup> salary.

**In-kind transfers.** The in-kind transfers included in the analysis provide a monetized estimation of the public services received by Brazilian families. There are two main transfers included in the study:

- **Education.** The in-kind transfers from access to public education were modeled based on the direct identification of beneficiaries, i.e., students enrolled in public education, and the imputation of the direct investment benefits based on INEP's latest estimates (i.e., relative to the year 2018). The analysis covers (i) preschool, (ii) primary, (iii) secondary, (iv) tertiary, and (v) youth and adult education. For each of these levels, INEP publishes the average public expenditure per student. The identification of public education beneficiaries in each level is undertaken using PNAD-C data, as it contains specific variables that allows us to identify those who reported to be attending public schools (which is applicable only for individual aged 5 or more).<sup>28</sup> Once the beneficiaries of each level are

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<sup>25</sup> This was the case in PNAD-C 2017 (World Bank, 2020) and also in PNAD-C 2019.

<sup>26</sup> Other technical details can be found in World Bank (2020).

<sup>27</sup> Using PNAD-C data for 2015, the last year where explicit questions about worker and survivor's pensions were included in the survey, World Bank (2020) finds that approximately 95% of the individuals receiving pensions with values equivalent to about 2 minimum wages were receiving both a worker and a survivor's pension. By focusing on thresholds equivalent to 1.5 and 2.5 minimum wages, we thus aim to maximize the likelihood of correctly identifying a rural pension beneficiary.

<sup>28</sup> Information on daycare or preschool attendance for children 0-4 years old is not available in the PNADC. According to the Education Census 2019 (Brazil, 2020b) about 3.8 million children were enrolled in daycare facilities and about 81 percent enrolled in the public system or in 'creches conveniadas' (a public entity that receives a per student transfer from the municipal government) and about 5.2 million children ages 4 and 5 were enrolled in preschools (of which 74 percent were in public facilities). A back of the envelope calculation suggests that in 2019 about 5 million

identified, we impute the average expenditure per student of the corresponding level as an in-kind transfer for each of them.

- *Health.* Using the PNS survey, we identify the usage of public health services by age and sex in five categories: (i) curative attention, (ii) dental care, (iii) rehabilitation, (iv) medicines (covered by the government), laboratory exams and (v) other diagnostics. These are the categories for which the Brazilian Ministry of Health publishes detailed information on the total public expenditure per type of health service (Brazil, 2022a). Currently, 2019 is the latest year for which such information is available. Given that PNAD-C does not have questions about usage of public health services, we resort to an alternative approach to impute in-kind health transfers to the population. It involves randomly selecting some individuals in PNAD-C to set them as fictitious users of public health services and then impute the average public expenditure per patient as an in-kind health transfer to them. The number of individuals set as fictitious beneficiaries in PNAD-C is determined so as to mimic the actual usage of public health services by age and sex according to PNS data.<sup>29</sup> To calculate the average public expenditure per patient, we use information on the total expenditure from the Ministry of Health and calculate the population-weighted number of fictitious beneficiaries in PNAD-C data. Since the data on total public expenditure per patient is disaggregated into the aforementioned five categories (i.e, curative attention, dental, rehabilitation, etc.), this procedure is carried out separately for each of them.

Finally, we present in Table 2 the list of public transfers, contributory pensions and other social spending items in Brazil relative to 2019 and their corresponding share in both the total government expenditure and GDP. The table also indicates the expenditure items considered in our fiscal incidence analysis. We see that total expenditure accounts for 49.3% of the GDP and that social spending has a major influence in this share (24.5%). It encompasses social protection (19.8%) and direct cash transfers (7.9%). Health- and education-related expenses, in turn, have very similar contributions to the share: 2.4% and 2.2%, respectively.

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children ages 0-4 (or 35 percent of this population) were enrolled in publicly supported daycare. This study does not incorporate a valuation of this service.

<sup>29</sup> We considered 182 groups, 91 for females (from ages 0 to 90) and 91 for males (from ages 0 to 9).

**Table 2. Social Spending in Brazil by program or transfer, 2019**

	Brazilian Reais (in millions)	Share of expenditures (%)	GDP (%)	Included in the analysis?	Source
<b>Total Expenditure</b>	3,450,294	100.0	49.3		a
<b>Social Spending</b>	1,718,071	49.8	24.5		
Social Protection	1,389,407	40.3	19.8		
<b>Direct cash transfers</b>	552,400	16.0	7.9		
<b>Conditional/Unconditional Cash Transfers</b>	56,761	1.6	0.8		
<i>Bolsa Família</i>	31,159	0.9	0.4	Yes	d
<i>Salário Família</i>	3,502	0.1	0.1	Yes	e
<i>Abono Salarial</i>	17,603	0.5	0.3	Yes	f
<i>Other social transfers</i>	4,505	0.1	0.1	Yes	
<b>Noncontributory Pensions</b>	137,210	4.0	2.0	Yes	
<i>Rural pension</i>	81,882	2.4	1.2	Yes	g
<i>BPC</i>	55,328	1.6	0.8	Yes	f
<b>Near Cash Transfers*</b>	n.a.			No	
<b>Other</b>	164,457	4.8	2.3	No	b
<b>Social insurance</b>	837,007	24.3	12.0		
<b>Old-Age Pensions</b>	572,739	16.6	8.2	Yes	a
<b>Unemployment</b>	37,521	1.1	0.5	Yes	a
<b>Other</b>	226,748	6.6	3.2	No	a
<b>Education</b>	166,204	4.8	2.4		
<b>Pre-school</b>	51,448	1.5	0.7	Yes	b
<b>Primary</b>					
<b>Secondary</b>	20,167	0.6	0.3	Yes	b
<b>Post-secondary non-tertiary</b>	n.a.			No	
<b>Tertiary</b>	80,049	2.3	1.1	Yes	b
<b>Education n.c.p.</b>	14,542	0.4	0.2	No	
<b>Health</b>	153,325	4.4	2.2	Yes	b, h
<b>Housing &amp; Urban</b>	9,135	0.3	0.1	No	b
<b>Subsidies (to corporations)**</b>	18,309	0.5	0.3	No	c
<b>Economic affairs</b>	99,329	2.9	1.4	No	b
<b>Defense, public order and safety spending</b>	233,294	6.8	3.3	No	b
<b>Other</b>	1,381,290	40.0	19.7	No	b

Sources: a. Brazil (2022b). b. Brazil (2020). c. IMF (2023). d. Open Data Portal Brazil Government. e. World Bank (2018). f. Fiscal transparency Portal Brazil Government. g. ECLAC (2023). h. Brazil (2022a). Notes: "n.a." stands for not applicable. BPC stands for Benefício de Prestação Continuada.\* Includes Food, School, Uniforms, etc. \*\* While Higgins and Pereira (2014) include indirect subsidies to electricity consumption in the analysis, we find that the subsidies directly targeting families (e.g., social tariff, universalization, rural) amounted to no more than 0.1 percent of the GDP in 2019 with a limited number of beneficiaries and effects over the welfare results.

### *Other in-kind income*

The estimation of households' market income incorporates the value of goods produced for own consumption and the imputed value of owner-occupied dwellings and other income sources. None of these measures are readily available in the survey data. We now describe our approach to incorporate them in the analysis.

Value of own consumption was estimated in the following way. First, self-consumption was estimated from the POF survey using the ratio of households' reported value (of withdrawals from business or own production) to disposable income. Next, the average of these ratios by state and percentile was estimated and then imputed to households in PNAD-C according to their state of residence and position in the income distribution. Each household's monetary value of own consumption was obtained by multiplying the imputed ratio by disposable income.

The imputed value of own dwelling was obtained with a hedonic price model, where household rent is a function of the dwelling characteristics, including location, structural attributes and neighborhood characteristics (see Balcázar et. al, 2017). In particular, we estimate a model where the value paid for housing rents is a function of the number of rooms, the number of bathrooms, whether the household belongs to an urban or rural area, the state of the federation to which it belongs, an interaction term between the state and area of residence, access to sanitary services, access to drinking water, as well as the materials of the floor, ceiling, and walls. The fitted coefficients from the previous regression with information from homeowners were the source of the estimated imputed value of homeownership.

### 3. Impact of the fiscal system on poverty and inequality

#### 3.1 Net payers and net beneficiaries

We first assess the impacts of fiscal policies by analyzing households' changes in their net cash position and total fiscal position. The net cash position is the combination of taxes and transfers within each quintile of the pre-fiscal income distribution. Figure 3 panel a shows, for each quintile, the incidence of fiscal interventions according to households' MIPP. The fiscal interventions that represent an income gain to the household are shown with positive values in the horizontal axis, while those that represent an income loss are shown with negative values. The net cash position (green dotted line) shows each quintile's sum of all cash interventions. Meanwhile, the total fiscal position (blue dashed line) includes all interventions, including in-kind benefits (such as education and health). Hence, the net cash position is related to consumable income, while the total fiscal position is related to final income.

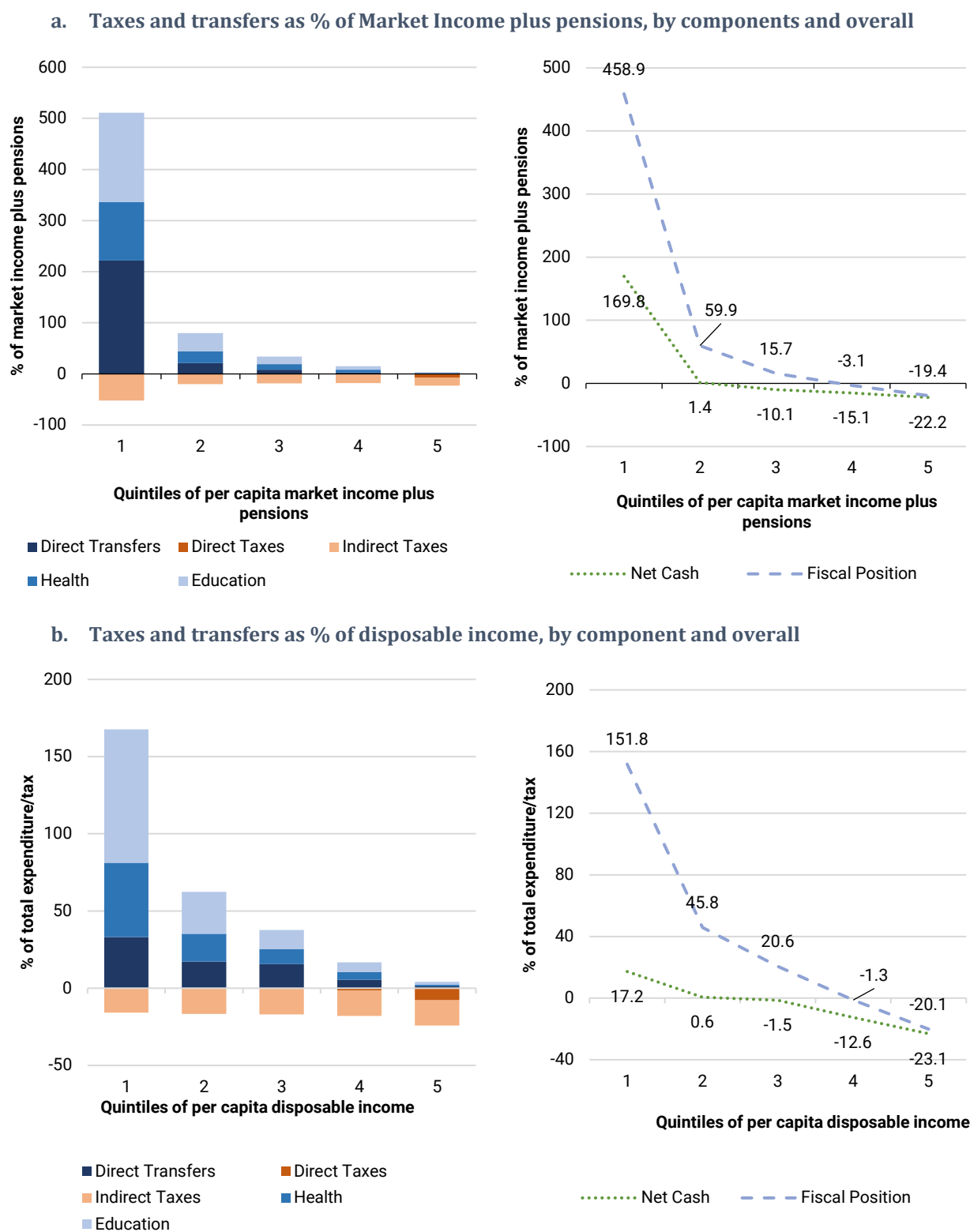
Quintiles one and two are net cash beneficiaries of the fiscal system, with a cash gain equivalent to 169.8 and 1.4 percent of their market income plus pensions, respectively. In contrast, the rest of the households are net payers of the fiscal system. The cash loss ranges from -10.1 percent of MIPP in quintile 3 to -22.2 percent of MIPP in quintile 5. The net cash position for the first quintile seems high due to a sizable population whose livelihood heavily depends on direct transfers and that have a very low level of market income plus pensions.<sup>30</sup> While households in quintile 2 are net beneficiaries of the fiscal system, their net benefits are low. Finally, when looking at the total fiscal position of households (blue dashed line), which includes the in-kind benefits from health and education, the results show that quintiles 1-3 are net receivers, while quintiles 4-5 are net payers of the fiscal system.

To illustrate how important the transfers are for disposable income (i.e., market income plus pensions minus direct taxes plus direct transfers), Figure 3 panel b illustrates the patterns of the net cash and fiscal position using households' disposable income as a benchmark. Similar to the incidence using MIPP as reference, the first two quintiles are net cash beneficiaries, while the first three quintiles are fiscal beneficiaries.

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<sup>30</sup> According to market income plus pensions estimates made using PNAD-C and POF, around of 2.7% of the individuals of the first quintile report a market income plus pensions equals to zero. Such households rely on receiving rural pensions, BPC pensions, unemployment benefits, and other direct transfers.

**Figure 3. Net Payers and Net beneficiaries of fiscal policies**



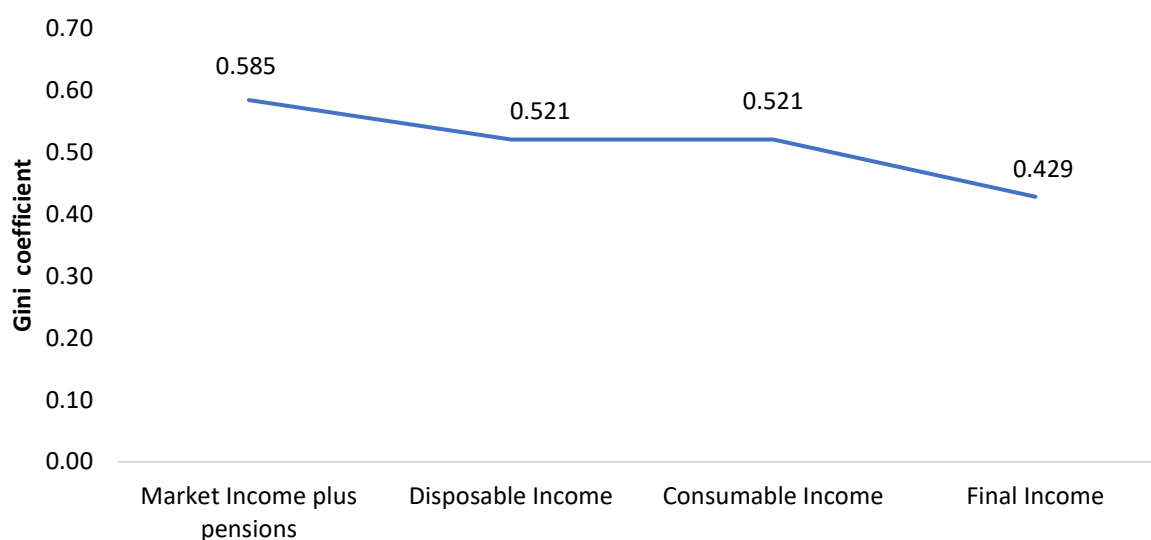
Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal.

### 3.2 Overall impacts on inequality and poverty

Government taxation and spending reduce inequality. Measured by the Gini coefficient, inequality is reduced by 6.4 points when we shift from the concept of MIPP to consumable income (Figure 4). The reduction is a result of the imposition of direct taxes and direct transfer receipts. The effect of indirect taxes (from disposable to consumable income) appears to be small. This result does not seem to be inconsistent with the trend found by Silveira and Palomo (2023), which suggest that the marginal effect of indirect taxes on the Gini of final income fell from 0.022 in 2002-2003, to 0.016 in 2008-2009, and then 0.011 in 2017-2018. When we include the in-kind benefits such as education and health, the reduction turns out to be 15.6 Gini points. As we will see later, this is a consequence of education and health being progressive and relatively high in size for the bottom 60% of the population.

The inequality reduction from market income plus pensions to consumable is among the two highest in the CEQ Latin American sample of eighteen countries, similar to that of Argentina.<sup>31</sup> It is also the second in terms of inequality reduction when final income is the end income, only trailing behind Argentina (16.9 Gini points).

**Figure 4. Inequality. Gini Coefficient for CEQ Income Concepts**



Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal.

Poverty is reduced only slightly when comparing the poverty headcount rate of pre-fiscal income with that of consumable income. However, the Brazilian fiscal system reduces extreme poverty. Extreme poverty based on consumable income is 5.1 percentage points lower than that of MIPP (Table 3).<sup>32</sup> Direct

<sup>31</sup> The sample includes Argentina, Brazil, Mexico, Costa Rica, Uruguay, Panama, the República Bolivariana de Venezuela, Colombia, Dominican Republic, Ecuador, Chile, Honduras, Peru, El Salvador, Bolivia, Nicaragua, Guatemala, and Paraguay.

<sup>32</sup> The thresholds for determining whether a household is poor are BRL 499 for moderate poverty and BRL 249.5 for extreme poverty considering the per capita household monthly income.

taxes, direct transfers, and indirect taxes drive the changes in poverty from market income plus pensions to consumable income. The impact of indirect taxes practically wipes out the poverty gains for moderate poverty and has a sizable effect on the extreme poverty reduction. The higher poverty reduction in extreme poverty is due to direct transfers being concentrated in the first quintile (see next section).

Fiscal interventions lead to an important reduction in both the poverty gap and the squared poverty gap. For the extreme poverty line, the poverty gap reduces to half and the squared poverty gap to a third, from MIPP to consumable income. So, even though the fiscal system does not reduce the headcount, it does alleviate the situation of the poor.

**Table 3. Poverty headcount ratio by income concept**

	<b>Market income plus pensions</b>	<b>Disposable Income</b>	<b>Consumable Income</b>
<b>Extreme poverty</b>			
Headcount Index	14.9%	7.1%	9.0%
Poverty Gap	10.5%	2.8%	3.6%
Squared Poverty Gap	8.9%	1.3%	1.8%
<b>Moderate poverty</b>			
Headcount Index	32.8%	26.0%	32.2%
Poverty Gap	19.1%	11.5%	14.4%
Squared Poverty Gap	14.5%	6.9%	8.6%

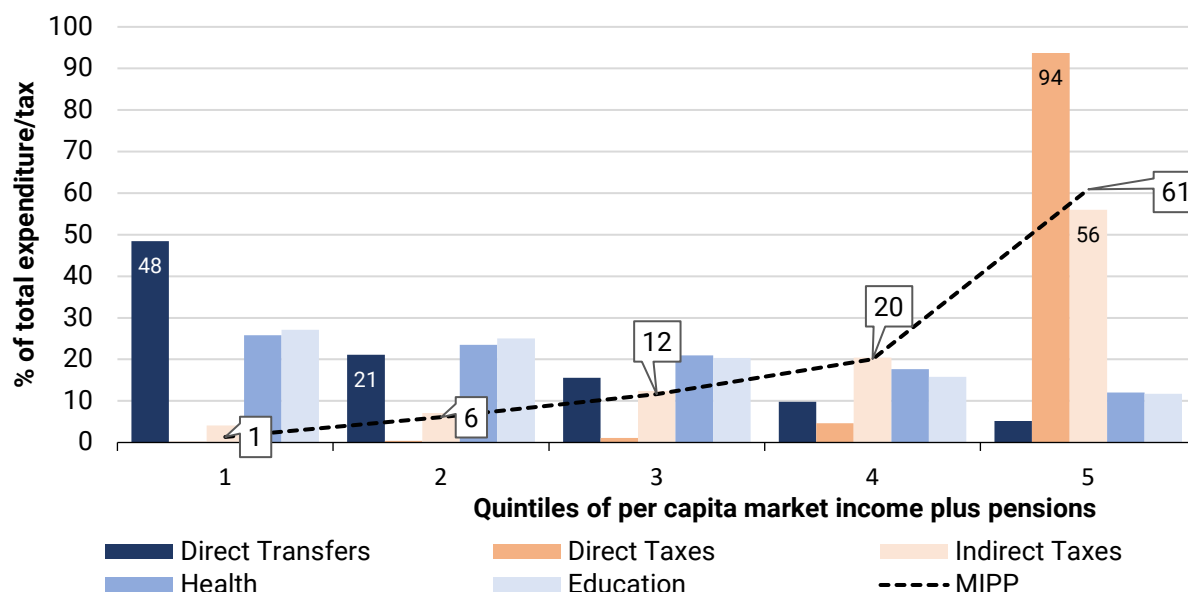
Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal. Notes: The moderate poverty line used is half a minimum wage of 2019 in Brazil: BRL 499, while the extreme poverty line is BRL 178.

### 3.3 Concentration of taxes and transfers

Two aspects stand out regarding the concentration of fiscal interventions in Brazil: direct transfers and direct taxes. Half of the direct transfers go to the first income quintile: this group includes the population in extreme poverty and part of those in moderate poverty (Figure 5). This could be a reason for the reduction in extreme poverty being higher than that in moderate poverty. We also observe that the richest income quintile pays almost all direct taxes and the proportion of indirect taxes paid by the highest income quintile is close to their share of market income plus pensions. Meanwhile, the share of direct transfers, education, and health is higher than the participation in market income plus pensions for the first three quintiles. When we consider education in-kind transfers, it is higher for the first quintile and gradually decreases until the fifth quintile, which receives about 12% of total education expenditures. The distribution of health benefits, in turn, is similar to that of education but with a slightly lower percentage for the bottom 40% of the population and slightly higher for the top 40%.



**Figure 5. Concentration shares of fiscal interventions (% of total interventions per quintile)**



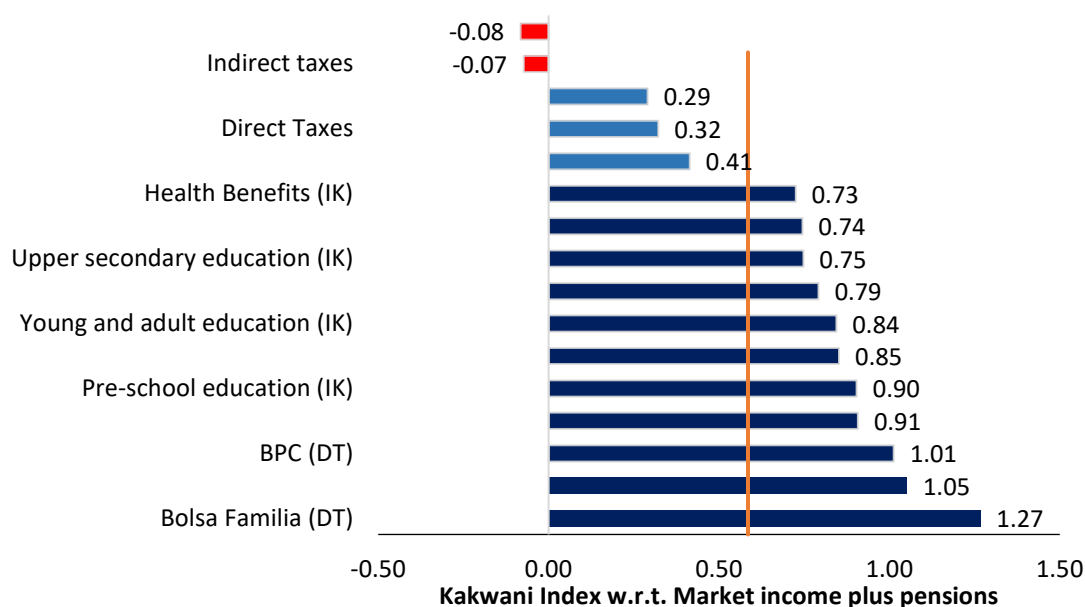
Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal.

### 3.4 Progressivity

Most direct transfers, education, and health benefits are pro-poor because the absolute value of the transfer is higher for lower-income households. Rural pensions, Bolsa Família, and BPC have the highest Kakwani indexes, meaning that they are the most progressive fiscal interventions because most of the benefits go to the bottom quintile and a smaller share goes to the top quintile (Figure 6). Both primary and preschool levels are more concentrated in low-income households. However, tertiary education benefits are progressive but not pro-poor.<sup>33</sup> That is, the Kakwani coefficient is positive, but lower than as the Gini of MIPP (0.585). This is also the case of direct taxes and Abono Salarial. The social security contributions are proportional to the market income, with a slight tendency to be progressive, while the employer contributions to the pension system (Cota Patronal) and employer contribution to FGTS are proportional, leaning to be regressive.

<sup>33</sup> In the CEQ methodology, a government transfer is considered regressive if the benefits are distributed more unequally than pre-fiscal income (MIPP). This concept is different from the “concentration coefficient” of a transfer that only describes the distribution of the transfer across income groups.

**Figure 6. Progressivity of fiscal interventions (Kakwani coefficient)**



Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal. Notes: DT = direct transfers; IK = in-kind benefits. The vertical line indicates the Gini coefficient considering market income plus pensions.

### 3.5 Incidence and concentration of taxes and transfers

#### *Taxes*

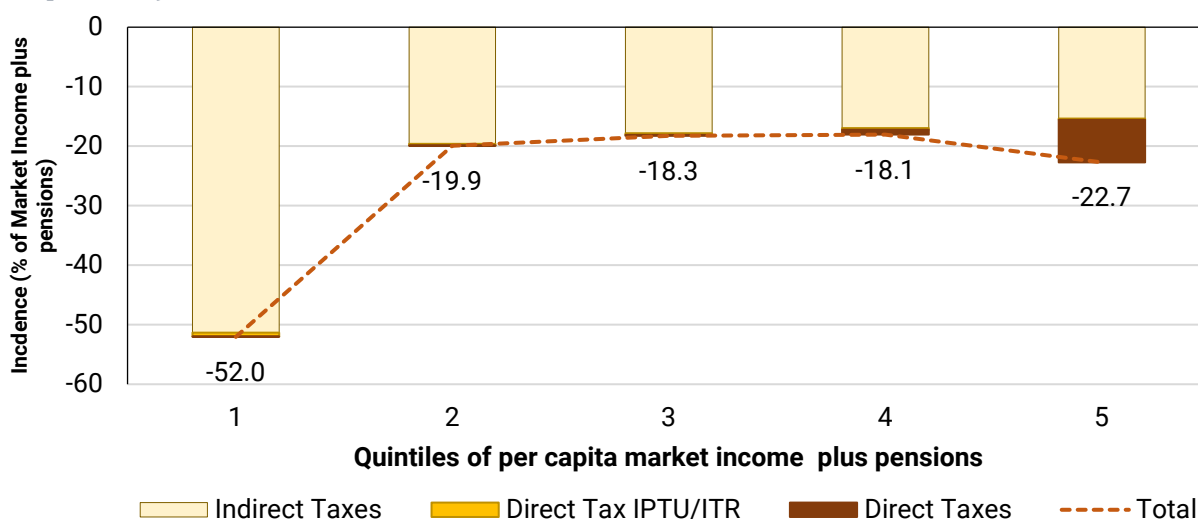
The tax burden for the first MIPP income quintile is much higher than that for the rest of the population (Figure 7). Practically all taxes paid by the first decile are in the form of indirect taxes. Indirect taxes as a share of MIPP for the first quintile households are high (51.3%).<sup>34</sup> This is likely a consequence of the existence of a high share of households with low MIPP who rely completely on direct transfers to finance their consumption.<sup>35</sup> At the same time, the tax incidence for quintiles 2 to 4 is similar, though the tax burden increases slightly because the direct taxes burden increases more than the decline in the incidence of indirect taxes. Tax incidence rises in the fifth decile, mainly due to a more significant effect of direct taxes, even though the top 20% of the population pays less indirect taxes as a share of their market income plus pensions. The importance of property taxes (IPTU/ITR) as a share of the market income plus pensions is very low (0.2%).

<sup>34</sup> According to CEQ Standard Indicators there are a few country cases that, as Brazil, have a high tax incidence for the bottom quintile: Argentina 2017 (46.3%), Spain 2017 (34.4%), South Africa 2010 (119.0%) and South Africa 2015 (100.7%). The factor that influences these high values the most is the low share of market income plus pensions in the first quintile. The average share of the first quintile of countries available in the CEQ Data Center is 4%. For Brazil 2019, only 1.4% of income is captured by the first quintile, while South Africa's values do not exceed 0.5%, and Argentina and Spain do not exceed the first quartile value. In Brazil, it is feasible for households in the first quintile to pay such a high proportion of their pre-fiscal income because the amount received from direct transfers (Figure 9) raises their consumption capacity and, therefore, the amount of taxes paid.

<sup>35</sup> The average disposable income for households in the first decile of the MIPP distribution is almost 12 times higher than the average of their market income plus pensions. For the second decile, the average disposable income is 67% higher than MIPP.

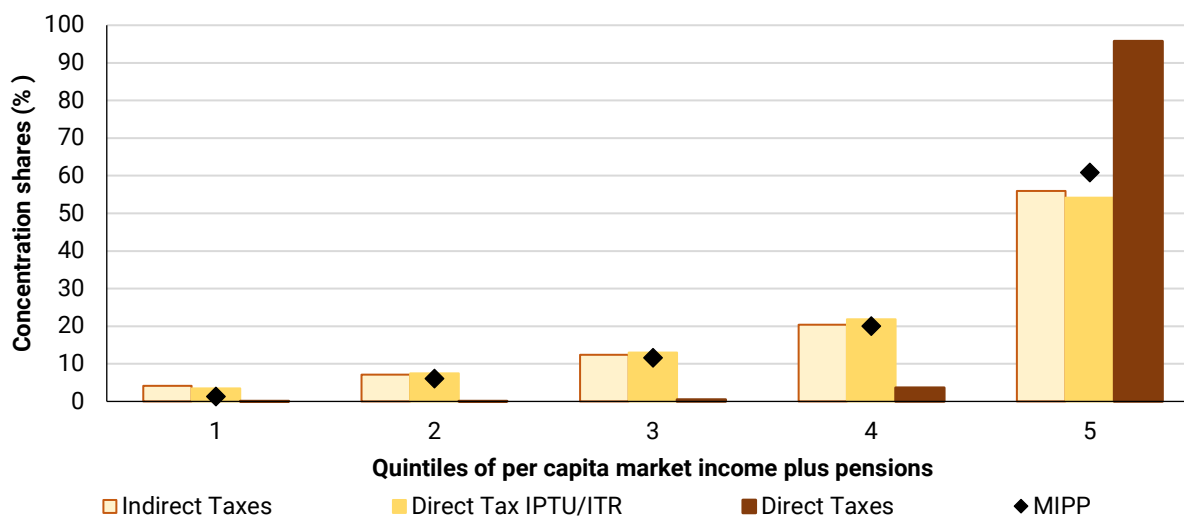
Households in the two highest MIPP quintiles pay most of the taxes calculated in this exercise. In fact, the richest 20% of the population pays close to 95% of the observed income tax. This group also pays more than half of indirect taxes (Figure 8). Notably, the observed low concentration of indirect taxes among the poorest households can be consistent with a high incidence of indirect taxes. Although the poorest 20% pay about 4% of these taxes, their share of MIPP is only 1.4%. In addition, indirect taxes are, on average, equivalent to 16.7% of households' market income plus pensions.

**Figure 7. Incidence of taxes by quintile of per capita market income plus pensions (% of market income plus pensions)**



Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal. Notes: IPTU stands for Imposto sobre a Propriedade Territorial Urbana, while ITR stands for Imposto sobre a Propriedade Territorial Rural. Notes: the bars represent the distribution of payments within each quintile.

**Figure 8. Concentration of taxes (% of fiscal interventions)**



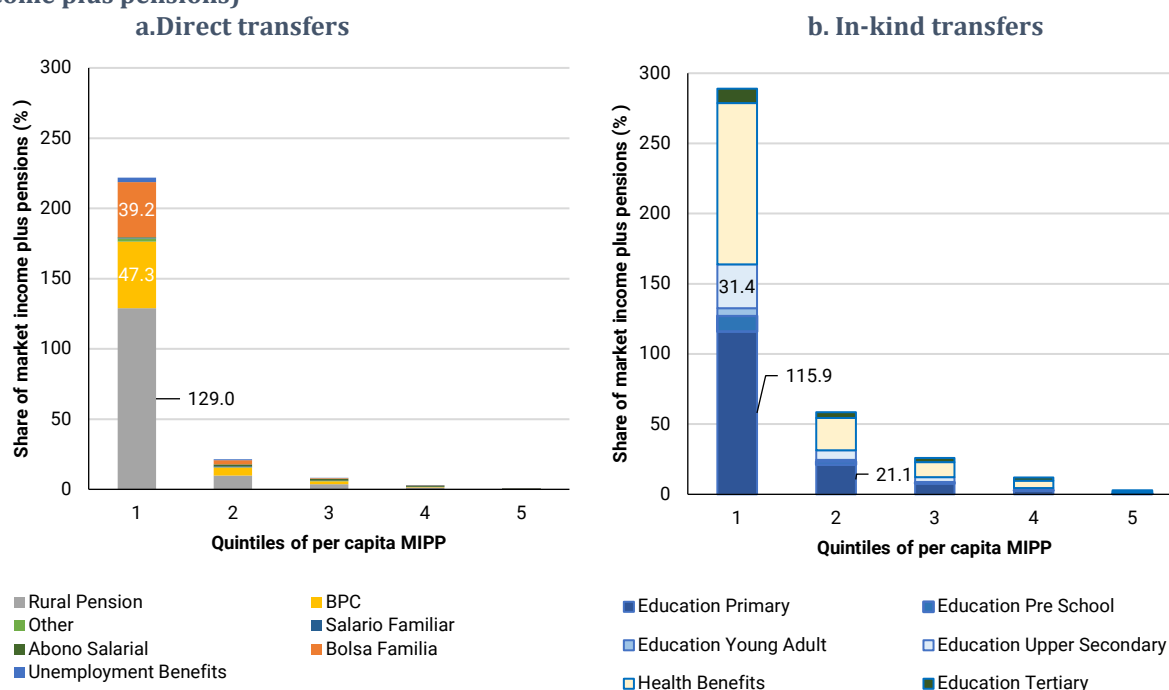
Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal. Notes: IPTU stands for Imposto sobre a Propriedade Territorial Urbana, while ITR stands for Imposto sobre a Propriedade Territorial Rural. Notes: The bars represent the share of each tax paid by a given quintile.

## Transfers

The direct transfers as a proportion of MIPP are high for the Bolsa Familia, BPC, and rural pension transfers (Figure 9). These programs are equivalent to 39.2%, 47.3% and 129% of the market income plus pensions in the first quintile, respectively. A large proportion of these direct transfers recipients are people living in poverty and not involved in economic activities, thus explaining these programs' high incidence.<sup>36</sup> For households in the second MIPP quintile, rural pensions, BPC and Bolsa Familia represent a nonnegligible share of MIPP (9.8, 5.6, and 2.9 percent). Meanwhile, unemployment insurance is equivalent to about 3.1% of MIPP among households in the poorest quintile, whereas the Abono Salarial is equivalent to 1.5% and 1.3% of MIPP among households in the second and third quintiles.

The incidence of primary education is higher than 100% of MIPP of households in the first quintile, decreasing substantially in the second quintile (21.1%) and reaching 0.3% in the richest group. Higher education is also more important for the poorest quintile than for the richest, though it is equivalent to about 31.4% of MIPP in the first quintile, dropping to 7% in the second quintile, and less than 1% in the fifth quintile. Preschool education incidence is about 11% in the first quintile, decreasing to 2.2% in the second quintile and less than 1 percent in the rest of the distribution.

**Figure 9. Incidence of transfers by quintile of per capita market income plus pensions (% of market income plus pensions)**



Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal.

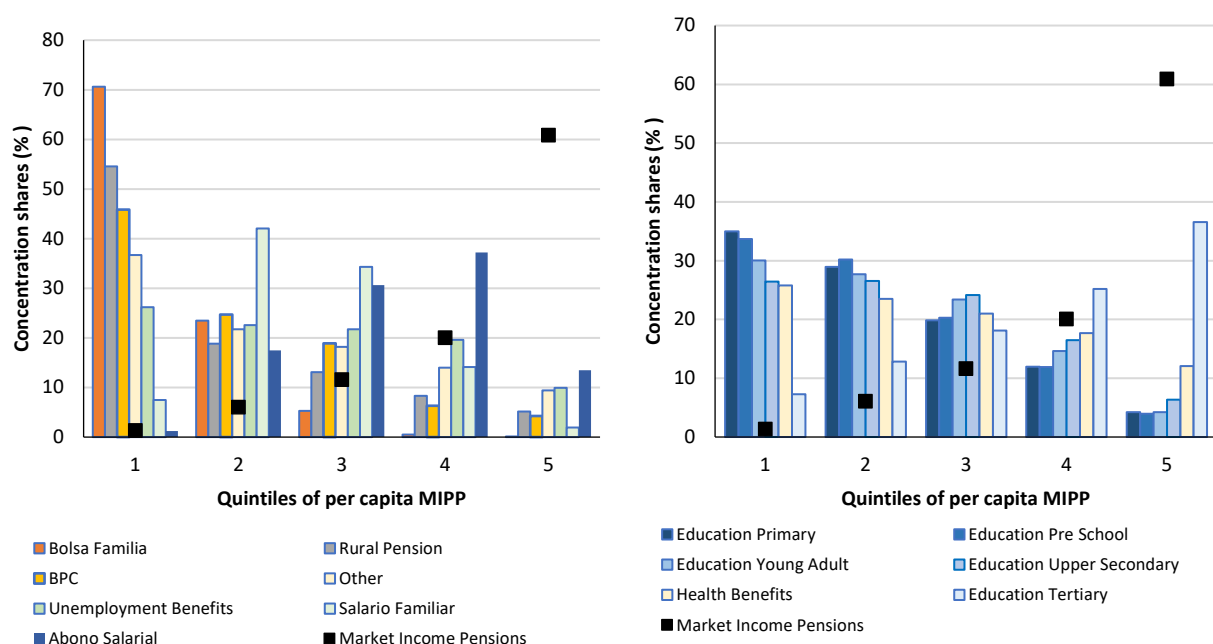
Looking at how the benefits of transfers are distributed across the population, we find that Bolsa Familia, rural pensions, and BPC are highly favorable to the first quintile (Figure 10 panel a). More than half of Bolsa Familia transfers and rural pensions are concentrated in the first decile, while close to 46% of the

<sup>36</sup> While high, the Brazilian incidence ratio of direct transfers among first quintile households is still below that of South Africa (500%).

BPC transfers go to the first MIPP quintile. Also, unemployment benefits slightly favor the first quintile and then gradually decrease.<sup>37</sup> There are, however, other programs that are more concentrated in the middle of the distribution. Salário Família, for example, is concentrated in the second and third quintiles (totaling 76% of the benefits), while Abono Salarial is concentrated in the third and fourth quintiles (receiving 68% of the benefits).

Preschool and primary education benefits tend to be concentrated in the bottom of the distribution. Over 60% of the benefits are received by the first two MIPP quintiles (Figure 10 panel b). Moreover, their benefits decrease as income increases and are very low for the wealthiest quintile. About 27% of upper secondary benefits are received by the first MIPP quintile, with the benefit share declining with income and reaching 6% in the top quintile. Tertiary education benefits stand in stark contrast. The share of benefits is positively correlated with income: about 35% of the benefits go to the top quintile and less than 10% to the lowest income quintile.

**Figure 10. Concentration of transfers by quintile of per capita market income plus pensions (% of total)**  
**a. Direct transfers** **b. In-kind transfers**



Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal.

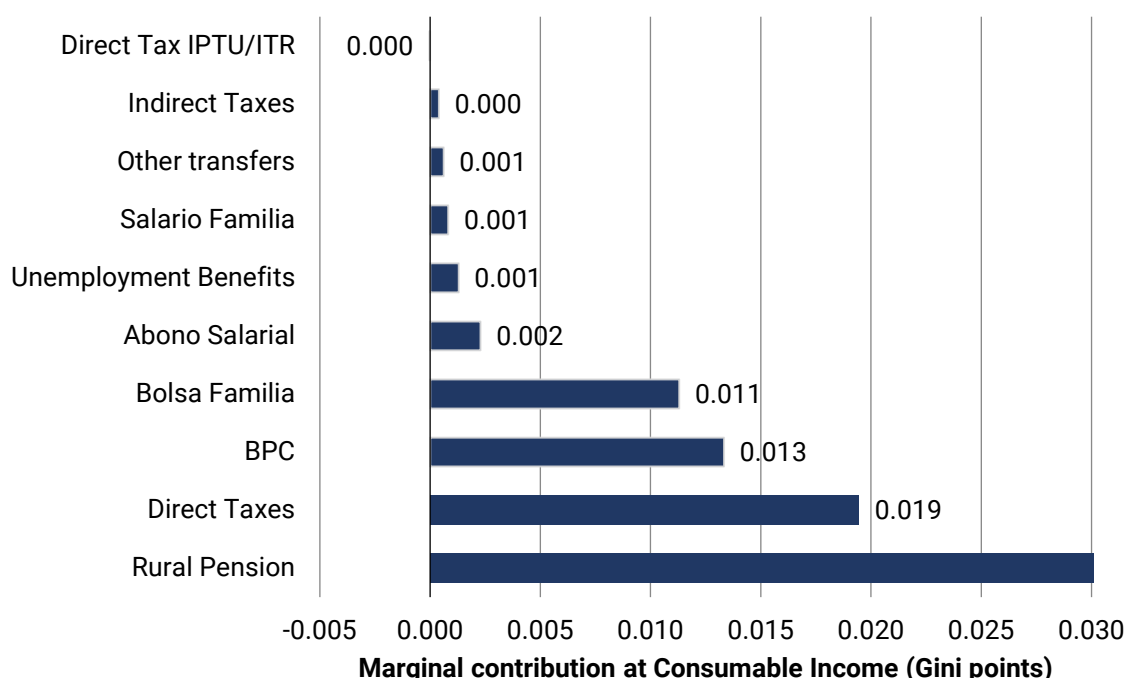
<sup>37</sup> Given the high level of labor informality in Brazil and the strict unemployment benefit rules, one might be surprised by the fact that the quintile with the highest concentration share (26.2%) in terms of the unemployment insurance (UI) is the first one. It is important to keep in mind that the first MIPP quintile captures low-income individuals, including currently unemployed individuals that could have been formally or informally employed. Since the unemployment benefit is included in the disposable income concept, but not in the MIPP one, it is plausible to observe in the first MIPP quintile a (high-skilled) unemployed individual who is a UI recipient. When replicating the analysis of the concentration shares using the disposable income, we find that the quintile with the highest share in terms of the UI is the second one (23.24%), what reflects the more "intuitive" results of concentration of UI benefits in other quintiles of the distribution.

### *Policy contributions to poverty and inequality*

The inequality reduction from MIPP to consumable income is mainly a result of rural pensions, which contribute with a 3-Gini-point decrease, followed by direct taxes, which contribute with 1.9 Gini points (Figure 11). Other interventions such as BPC and Bolsa Família program contribute each with a reduction of about one Gini point. The sum of interventions such as Salário Família, Abono Salarial, unemployment benefits, and other transfers is estimated to have a negligible impact on Gini. Indirect taxes and property taxes do not appear to have a significant impact on inequality either.

Estimates of the inequality reduction from MIPP to final income suggest it is mainly explained by spending on health and primary education, with the latter leading to a four-point reduction on Gini. Then, secondary education reduces the Gini by one point, and the sum of other levels of education reduces inequality by one Gini point.

**Figure 11. Marginal effects to inequality (Gini coefficient points), by fiscal intervention**



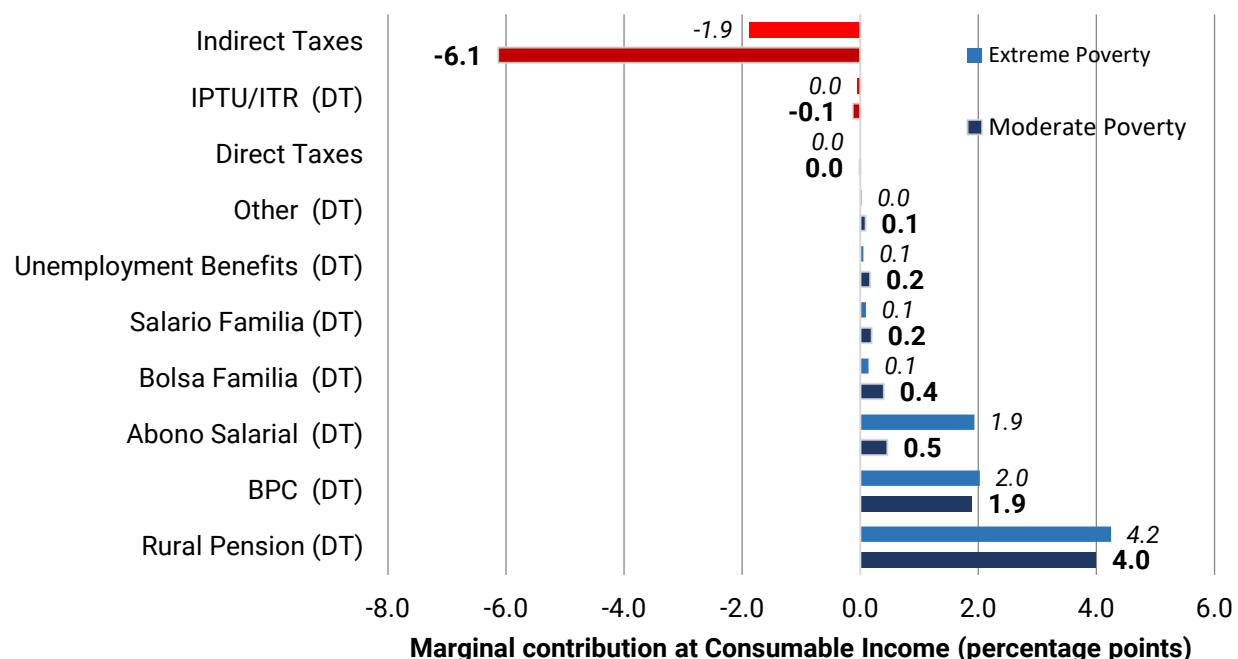
Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal. Notes: IPTU stands for Imposto sobre a Propriedade Territorial Urbana, while ITR stands for Imposto sobre a Propriedade Territorial Rural. BPC stands for Benefício de Prestação Continuada.

The combined impact of transfers and taxes results in a poverty decline, with rural pensions contributing the most to this poverty reduction (4 p.p), followed by BPC (1.9 p.p.). Other transfers have a lower impact, such as Bolsa Família and Abono Salarial, each contributing with about 0.4 p.p. to the poverty reduction.<sup>38</sup>

<sup>38</sup> Bolsa Familia, Brazil's flagship program, has been halted as a strong contributor to poverty reduction in Brazil (Souza et al., 2019, Paiva et al., 2021, Souza, 2022). The results presented here are consistent with these studies

On the opposite direction, the most important contributor are the indirect taxes, which increase poverty by 6.1 percentage points (Figure 12).

**Figure 12. Marginal contributions to poverty reduction (percentage points)**



Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and administrative data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal. Notes: IPTU stands for Imposto sobre a Propriedade Territorial Urbana, while ITR stands for Imposto sobre a Propriedade Territorial Rural. BPC stands for Benefício de Prestação Continuada. Notes: Moderate and extreme poverty are based on poverty lines of BRL 499 and BRL 178, respectively.

#### 4. What are the implications for vulnerable demographic groups?

We complement this incidence analysis by disaggregating the results by the demographic composition of households. In particular, we look into how the headship structure, and the presence of both children and elderly can be determinants of the net effects of fiscal policies in Brazil. In this exercise, children are considered all members aged 15 or less who are neither the household head nor the household head's spouse, while an elderly member is an individual aged 60 or more.

Table 4 presents the households' demographic characterization. There are twelve categories, four for each type of household headship. The rationale for such categorization is three-fold. First, headship structure is likely to be deeply connected with economic agency, as it is a major determinant of

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since the benchmarks are not the same. Bolsa Família's evaluations focus on families that are potentially poor after (potentially) receiving other government transfers. Here, the relative contribution to poverty reduction uses as a benchmark a pre-fiscal situation so that larger transfers (such as pensions) can have larger effects on poverty reduction than programs like Bolsa Família.

households' economic position. Second, some of the most important cash transfer programs in Brazil are conditional on having children and have specific rules for them such as Bolsa Família and Salário Família. At the same time, children demand investments from the households' budget, but cannot readily generate labor income. Therefore, it is not ex-ante clear what the net effect on household economic position is. Third, elderly members often do not generate labor income, but may be recipients of contributory pensions or eligible to compensatory income in the form of non-contributory pensions. This latter case includes programs like BPC and rural pensions, for example. Hence, the presence of elderly may reduce the likelihood of a household to be in poverty.

**Table 4. Categorization of households by headship, presence of children and presence of elderly**

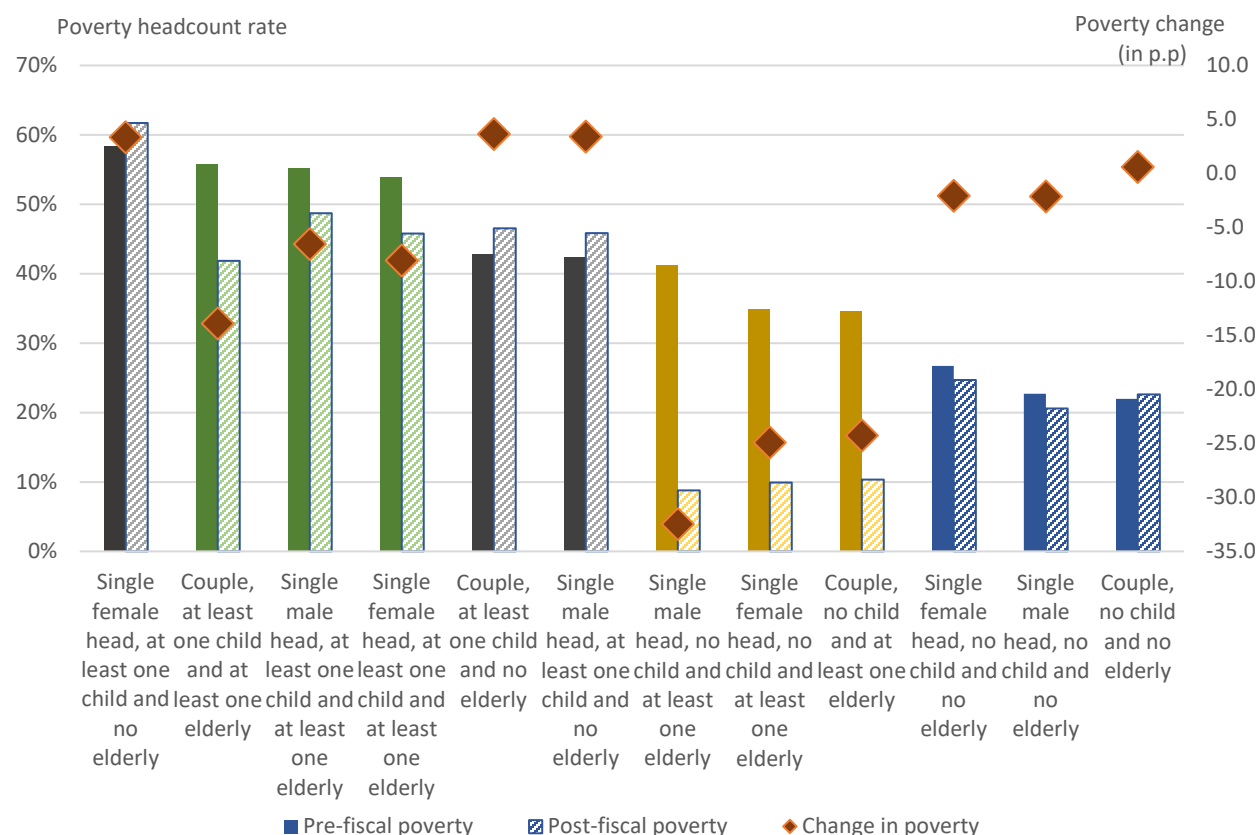
Family composition	Presence of children	Presence of elderly	Proportion of households in population (%)
Single male	No child	No elderly	7.6
Single male	No child	At least one elderly	3.8
Single male	At least one child	No elderly	1.0
Single male	At least one child	At least one elderly	0.3
Single female	No child	No elderly	7.8
Single female	No child	At least one elderly	8.8
Single female	At least one child	No elderly	6.6
Single female	At least one child	At least one elderly	1.6
Couple	No child	No elderly	19.3
Couple	No child	At least one elderly	11.9
Couple	At least one child	No elderly	29.1
Couple	At least one child	At least one elderly	2.2

Source: authors' estimations based on PNAD-C 2019. Family composition is determined by whether there is at least one household member that declared to be the spouse of the household head, while the presence of children and elderly is determined by the presence of individuals aged 0-15 (who are neither the household head nor the spouse) and 60 or more, respectively.

Figure 13 shows the poverty rates considering both the pre- and post-fiscal income aggregates for the twelve household categories of interest. It also presents the change in poverty rates. The first six bars represent households with at least one child, while the last six represent those with no child. Among the former, the presence of elderly is concentrated in the second, third, fourth bar, while among the latter it is concentrated in the seventh, eighth, and ninth bar. There seems to exist four distinct groups in terms of the change in poverty: (i) households with elderly but no children, (ii) households with both elderly and children, (iii) households with children but no elderly, and (iv) households with no children and no elderly. The presence of elderly – regardless of headship structure – makes the household better off after fiscal policies and transfers, while the presence of children seems to have the opposite effect. Figure 14 shows that results that create population groups based on a *proxy* for economic agency rather than headship structure, considering the highest-earning individual as the household main breadwinner, are qualitatively similar.

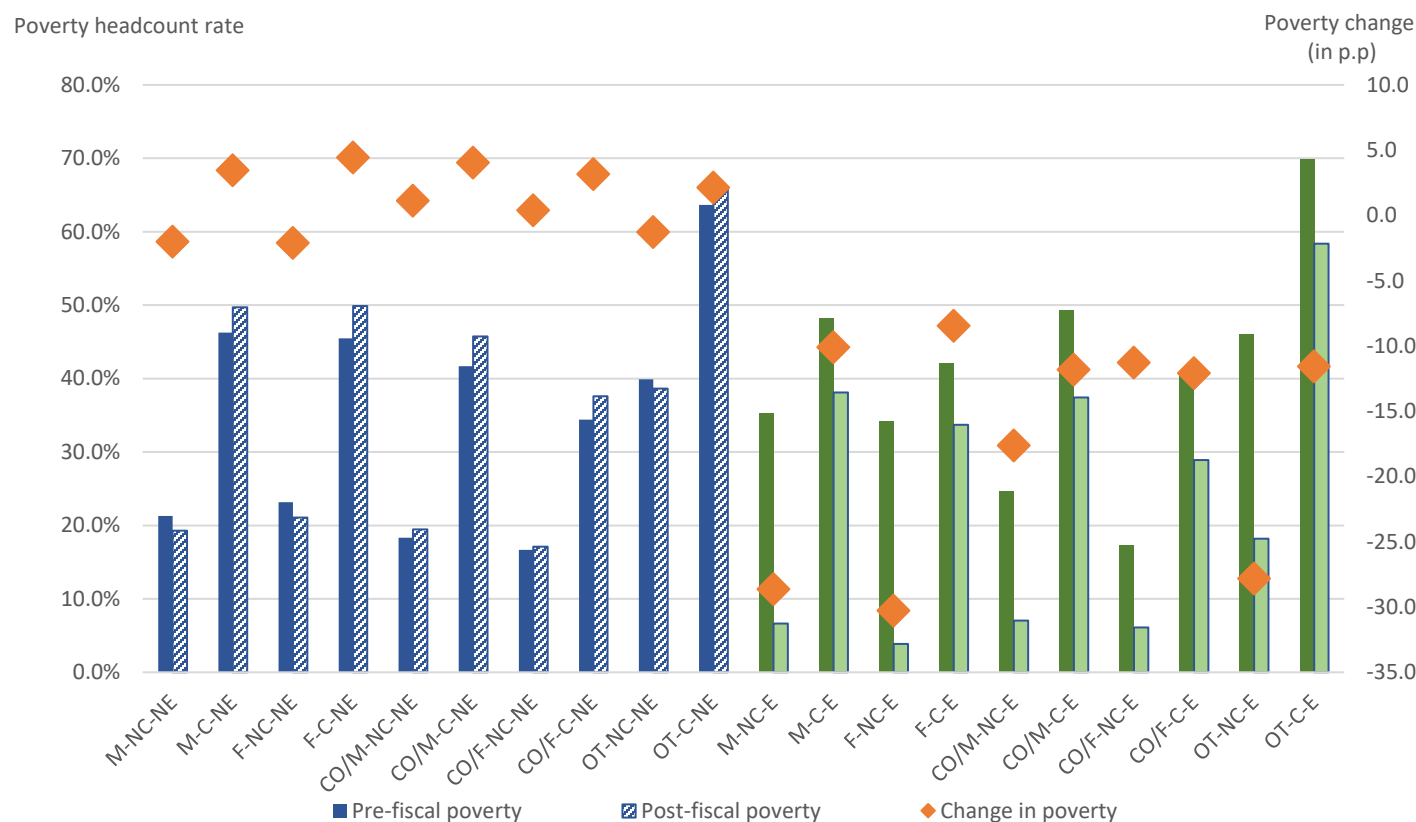


**Figure 13. Moderate poverty headcount rates considering both pre- and post-fiscal income aggregates, separately for households with different compositions in terms of headship, presence of child and presence of elderly**



Source: authors' estimations based on PNAD-C 2019. Notes: family composition is determined by whether there is at least one household member that declared to be the spouse of the household head. Pre-fiscal poverty indicates the poverty headcount rate considering market income plus pensions, while the post-fiscal poverty indicates the poverty headcount rate considering consumable income. The household is considered to have children if there is at least one member aged 15 or less who is neither the household head nor the spouse, and to have an elderly if there is at least one member aged 60 or more. Similar colors highlight demographic groups with similar changes in poverty.

**Figure 14. Moderate poverty headcount rates considering both pre- and post-fiscal income aggregates, separately for households with different compositions in terms of economic agency, presence of child and presence of elderly**



Source: authors' estimations based on PNAD-C 2019. Notes: M stands for single male breadwinner, F for single female breadwinner, CO/M for couple with a man as the main breadwinner, CO/F for couple with a woman as the main breadwinner, and OT for households in which there are either no members with strictly positive habitual labor income or both heads earn the same income amount. Similarly, C stands for "at least one child", NC for "no child", E for "at least one elderly member", and NE for "no elderly". Family composition is determined by whether there is at least one household member that declared to be the spouse of the household head. Economic agency is determined considering the highest-earning individual in terms of habitual labor income as the household main breadwinner. The household is considered to have a child if there is at least one member aged 15 or less who is neither the household head nor the spouse, and to have an elderly member if there is at least one member aged 60 or more. Pre-fiscal poverty indicates the poverty headcount rate considering market income plus pensions, while post-fiscal poverty indicates the poverty headcount rate considering consumable income. The bars in green follow the same logic of the other bars, although they are colored differently to emphasize the existence of different groups in terms of the presence of elderly (i.e., those in green have elderly while those in blue do not).

Table 5 complements the analysis by presenting the poverty rate by age groups. The analysis is undertaken at the individual level, but we consider the per capita familiar income for poverty calculation purposes. In line with previous results, we find that elderly members benefit the most from the fiscal system, with a 22.7-percentage point reduction in the poverty rates, and are the only ones for which poverty rates decrease from pre- to post-fiscal income aggregate. Meanwhile, children are the most negatively affected group, with a 2.4-percentage points increase in poverty rate. They are followed by the youth (1.2 p.p.), i.e., those aged 16-17, and non-elderly adults (0.2 p.p.), i.e., those aged 18-59. Such results point to a pattern in which the poverty rates for non-elderly adults, but also for the youth, are not much affected by the fiscal system.

**Table 5. Moderate poverty headcount rates considering both pre- and post-fiscal income aggregates, separately for individuals aged 0-15, 16-17, 18-59 and 60 or more**

Age group	Proportion of individuals (%)	Pre-fiscal income	Post-fiscal income	Change (in p.p.)
Individuals aged 0-15	22.3	54.2%	56.6%	2.4
Individuals aged 16-17	3.1	51.6%	52.8%	1.2
Individuals aged 18-59	58.9	35.2%	35.4%	0.2
Individuals aged 60 or more	15.7	37.6%	14.8%	-22.7

Source: authors' estimations based on PNAD-C 2019. Notes: Pre-fiscal income considers the household-level market income plus pensions, while the post-fiscal income considers the household-level consumable income. The proportion of individuals indicates the number of individuals in each group as a share of the total number of individuals in PNAD-C.

To understand the effects of headship structure, Table 6 presents the poverty rates for three related dimensions. In panel A, we show the categorization in terms of whether the household is single-headed or two-headed. In panel B, in turn, we split households into those headed by a female and those headed by a male and, finally, in panel C we show the combination of these two criteria. As can be seen, the post-fiscal poverty rate is smaller than the pre-fiscal one for all groups, which suggests that all are benefited by the fiscal policies.

Table 6 indicates that the change in poverty rates is larger in absolute terms for (i) single-headed households, and (ii) those headed by men. The differences, nonetheless, are not substantial, except when we compare two-headed households (-1.8 p.p.) with those headed by single males (-8.0 p.p.). Additionally, the results show that female-headed households are more likely to be poor than those headed by a male both in terms of the pre- and post-fiscal income. The same does not apply to single-headed families compared to their two-headed counterparts because the gender dimension plays a role in creating some differences. For example, the poverty rate considering the pre-fiscal income for households headed by single females is 45.3%, while that for households headed by single males is 32.7%, or the equivalent to an 12.6-percentage points difference. Further, the poverty rate for the latter is substantially smaller than that for two-headed households: 39.7%, a difference equivalent to 7 percentage points.

**Table 6. Moderate poverty headcount rates considering both pre- and post-fiscal income aggregates, separately for households with distinct compositions in terms of headship structure and gender of the head**

Household group	Proportion of households (%)	Pre-fiscal poverty rate	Post-fiscal poverty rate	Poverty change (in p.p.)
<b>Panel A. Headship structure</b>				
Single-headed household	27.7	42.0%	36.1%	-5.8
Two-headed household	72.3	39.7%	37.9%	-1.8
<b>Panel B. Gender of the household head</b>				
Female household head	45.6	42.7%	40.2%	-2.5
Male household head	54.4	38.3%	35.1%	-3.2
<b>Panel C. Combining headship structure with the gender of the head</b>				
Single female household head	20.5	45.3%	40.2%	-5.0
Single male household head	7.3	32.7%	24.6%	-8.0
Two-headed household	72.3	39.7%	37.9%	-1.8

Source: authors' estimations based on PNAD-C 2019. Notes: Pre-fiscal poverty indicates the poverty headcount rate considering market income plus pensions, while the post-fiscal poverty indicates the poverty headcount rate considering consumable income. The proportion of households indicates the number of households in each group as a share of the total number of households in PNAD-C. The household was considered two-headed if there is at least one member that declared to be the spouse of the household head.

#### 4.1 Does fiscal policy have the same welfare impacts across racial groups?

Racial disparities are historically high in Brazil and fiscal policies hold the promise of contributing to mitigate such gaps. Therefore, a relevant question is to determine whether the most vulnerable racial groups are better off after taxes and transfers. Table 7 presents the poverty rates for households headed by white, Afro-Brazilians and non-white, non-Afro-Brazilians. For all groups, the fiscal system tackles poverty and the effect is larger for Afro-Brazilian-headed families (-6.0 p.p.). The fiscal system appears to be more poverty-reducing for Black and Pardos than whites even though the gap in poverty rates for post-fiscal income across groups is still significant: 20 percentage points. Such results are even more important given the previous evidence for Brazil relative to 2008/2009 (Pereira, 2016) that the fiscal system used to contribute more to reduce poverty among households headed by whites than blacks and pardos considering different poverty lines.

**Table 7. Moderate poverty headcount rates considering both pre- and post-fiscal income aggregates, separately by household head's race**

Race of household head	Prop. of households (%)	Pre-fiscal income	Post-fiscal income	Change from pre- to post-fiscal income (in p.p.)
White	38.8	23%	18%	-5.1
AfroBrazilian	60.0	44%	38%	-6.0
Non-white, non-AfroBrazilian	1.2	39%	35%	-3.9

Source: authors' estimations based on PNAD-C 2019. Notes: Pre-fiscal income considers the household-level market income plus pensions, while the post-fiscal income considers the household-level consumable income. Afro-Brazilians are those declared to be either Black or Pardos. Proportion of households indicate the number of households in each group as a share of the total number of households in PNAD-C.

Table 8 extends the analysis for poverty rates by incorporating the gender dimension in the racial differentials. The results point that households headed by Afro-Brazilian males are those who benefit the most (-3.4 p.p.), followed by those headed by white males (-2.8 p.p.) and Afro-Brazilian females (-2.6 p.p.). We also note that the reductions in poverty rates are larger for male-headed households than for female-headed ones across all racial groups.

**Table 8. Moderate poverty headcount rates and Gini index considering both pre- and post-fiscal income aggregates, separately by household head's gender and race**

Race/gender of the head	Proportion of households (%)	Pre-fiscal income	Post-fiscal income	Change from pre- to post-fiscal income (in p.p.)
White female head	16.0	26.4%	24.0%	-2.4
White male head	20.3	24.1%	21.2%	-2.8
AfroBrazilian female head	29.1	51.6%	49.0%	-2.6
AfroBrazilian male head	33.3	46.9%	43.4%	-3.4
Non-white, non-AfroBrazilian female head	0.6	45.4%	44.4%	-1.1
Non-white, non-AfroBrazilian male head	0.7	46.0%	43.7%	-2.2

Source: authors' estimations based on PNAD-C 2019. Pre-fiscal income considers the household-level market income plus pensions, while the post-fiscal income considers the household-level consumable income. Afro-Brazilians are those declared to be either Black or Pardos. Proportion of households indicate the number of households in each group as a share of the total number of households in PNAD-C.

Table 9 presents the results relative to poverty rates with an individual-level perspective in terms of age and race. We document three sets of findings. First, the impact of the fiscal system is positive and greater for whites than Afro-Brazilians among all age groups, with the exception of the elderly. It is interesting that, among elderly people, Afro-Brazilians fare better than whites after taxes and transfers, and the difference is substantial: 9.3 percentage points considering the change from pre- to post-fiscal poverty rates. Second, within each racial group, the elderly are those who benefit the most from the fiscal system. Third, the elderly are also the only group for which all racial groups benefit from transfers and taxes, which is consistent with the findings from previous tables.

**Table 9. Moderate poverty headcount rates considering both pre- and post-fiscal income aggregates, separately for distinct groups of individuals in terms of race and age**

Race/age of the survey respondent	Proportion of individuals (%)	Pre-fiscal poverty rate	Post-fiscal poverty rate	Change in poverty (in p.p.)
White aged 0-15	8.0	37.9%	40.6%	2.7
AfroBrazilian aged 0-15	14.1	63.2%	65.5%	2.3
Non-white, non-AfroBrazilian aged 0-15	0.2	71.9%	72.5%	0.6
White aged 16-17	1.0	34.6%	36.4%	1.8
AfroBrazilian aged 16-17	2.1	59.9%	60.8%	0.9
Non-white, non-AfroBrazilian aged 16-17	0.0	62.2%	64.7%	2.6
White aged 18-59	22.1	21.1%	21.4%	0.4
AfroBrazilian aged 18-59	36.2	43.8%	43.8%	0.0
Non-white, non-AfroBrazilian aged 18-59	0.6	40.0%	41.6%	1.6
White aged 60+	7.2	26.2%	8.5%	-17.8
AfroBrazilian aged 60+	8.3	47.4%	20.3%	-27.1
Non-white, non-AfroBrazilian aged 60+	0.2	32.9%	14.6%	-18.3

Source: authors' estimations based on PNAD-C 2019. Notes: Pre-fiscal poverty indicates the poverty headcount rate considering the household-level market income plus pensions, while the post-fiscal poverty indicates the poverty headcount rate considering the household-level consumable income. Afro-Brazilians are those declared to be either Black or Pardos. The proportion of individuals indicates the number of individuals in each group as a share of the total number of individuals in PNAD-C.

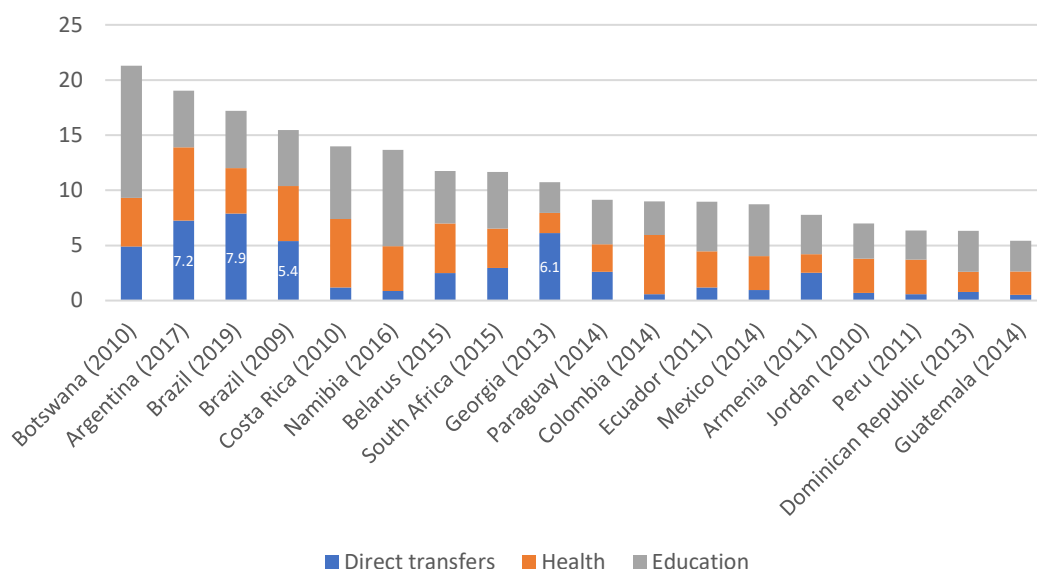
## 5. International comparisons

Brazil has one of the highest social expenditure and fiscal revenue levels for an upper-middle income country in the sample of available CEQ assessments (Figure 15). The direct transfer expenditure as a percentage of GDP is the highest (7.9%) in the sample, even greater than the total social expenditure of at least five countries. Only Argentina also dedicates more than 7% of its GDP to direct transfers, and the size of direct transfers in Brazil is more prominent in 2019 than in the previous fiscal incidence analysis relative to 2009 (5.4%). On the other hand, public education expenditure is the fourth highest in the sample, only trailing Costa Rica. It is similar to that of South Africa and Argentina, and is slightly higher than that for Brazil in 2009. Government health spending is above the average, and in the top 7 among 18 countries, behind Latin American countries like Argentina, Costa Rica, and Colombia.

Tax revenues are the highest in the sample of countries (Figure 16). Only Belarus approaches Brazil, followed by Argentina and Brazil 2009 estimates. The top component of Brazil's government revenues are the indirect taxes, which are well above the average of other countries in the sample, surpassed only by countries like Namibia, Belarus, and Botswana. The value of indirect taxes as a percentage of GDP is slightly above that of Argentina and Brazil's 2009. Social contributions (11.6%) are also much higher than in almost all other countries in the sample, whose average is 3.9% of GDP. Only social contributions from Argentina, Brazil (in 2009 and 2019), and Belarus exceed 8% of GDP. Third, the direct taxes revenues in Brazil were also above average in 2019, with a value very close to the 2009 estimate, and only behind the

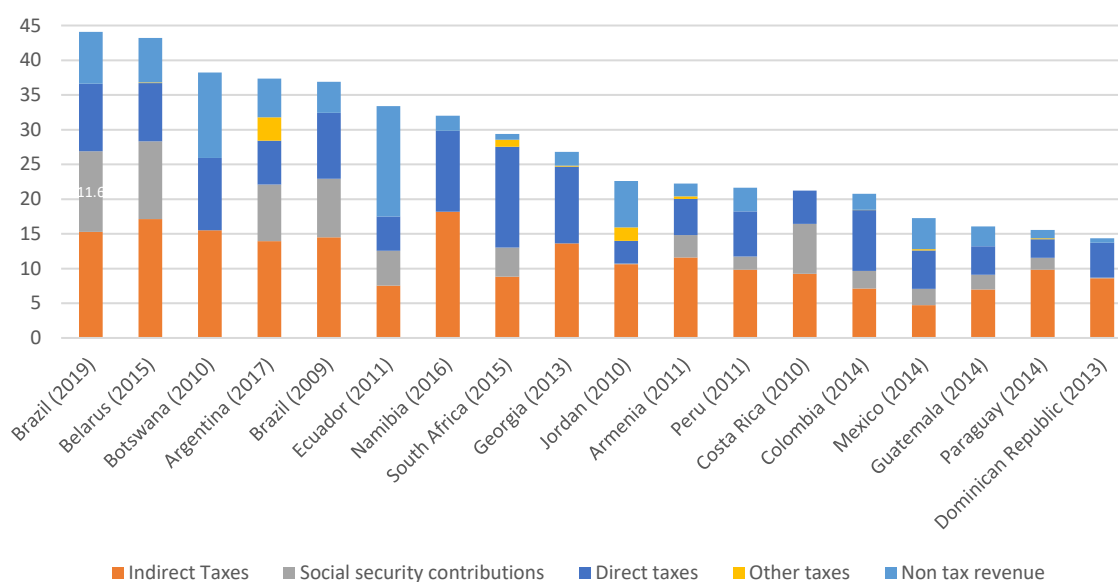
level of South Africa, Namibia, Georgia, and Botswana. Finally, Brazil's 2019 non-tax revenues, also above the sample average, are in third place, only below Ecuador and Botswana.

**Figure 15. Components of social spending, upper-middle-income countries (% of GDP)**



Source: Authors based on CEQ Data Center.

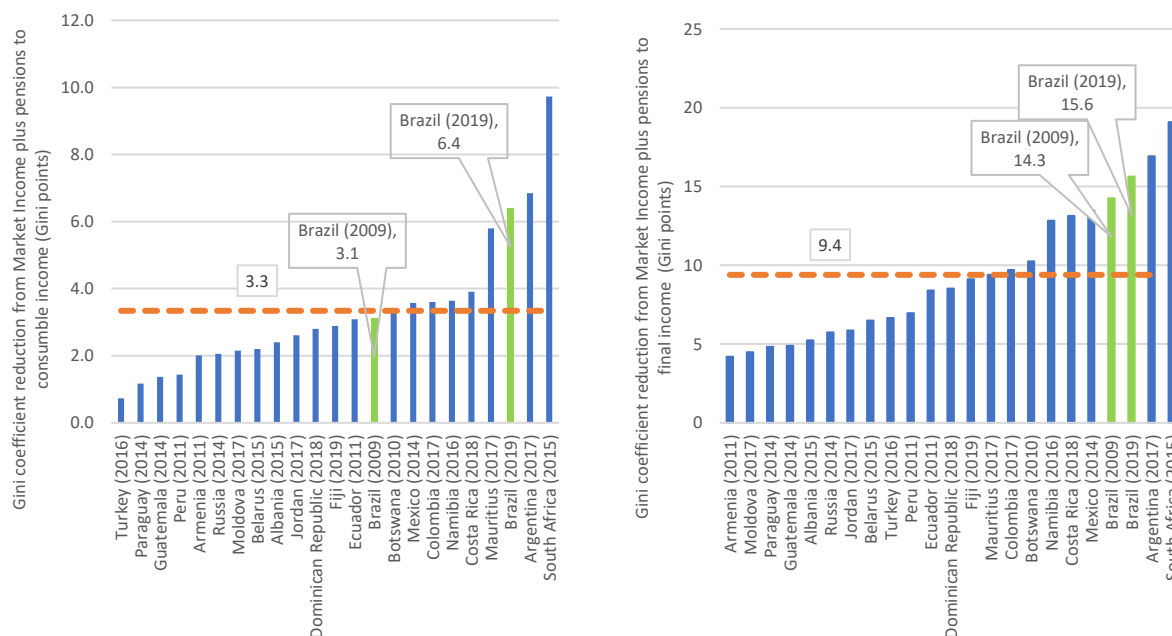
**Figure 16. Components of government revenue, upper-middle income countries (% of GDP)**



Source: Authors based on CEQ Data Center. Notes: Data for Brazil 2019 covers only Central Government.

Brazil's comparative results regarding middle-income countries show that it is a country that reduces inequality the most when including all taxes and transfers and the education and health benefits (Figure 17). Brazil in 2009 was less successful in reducing inequality, excluding education and health, even when the country's results were above the average. In contrast, the drop in the Gini coefficient in 2019 is lower when including only direct taxes, indirect taxes, and direct transfers; still, it is among the three highest.

**Figure 17. Inequality reduction, upper-middle income countries (Gini coefficient points)**  
**From Market income plus pensions to Consumable**      **From Market Income plus pensions to Final**

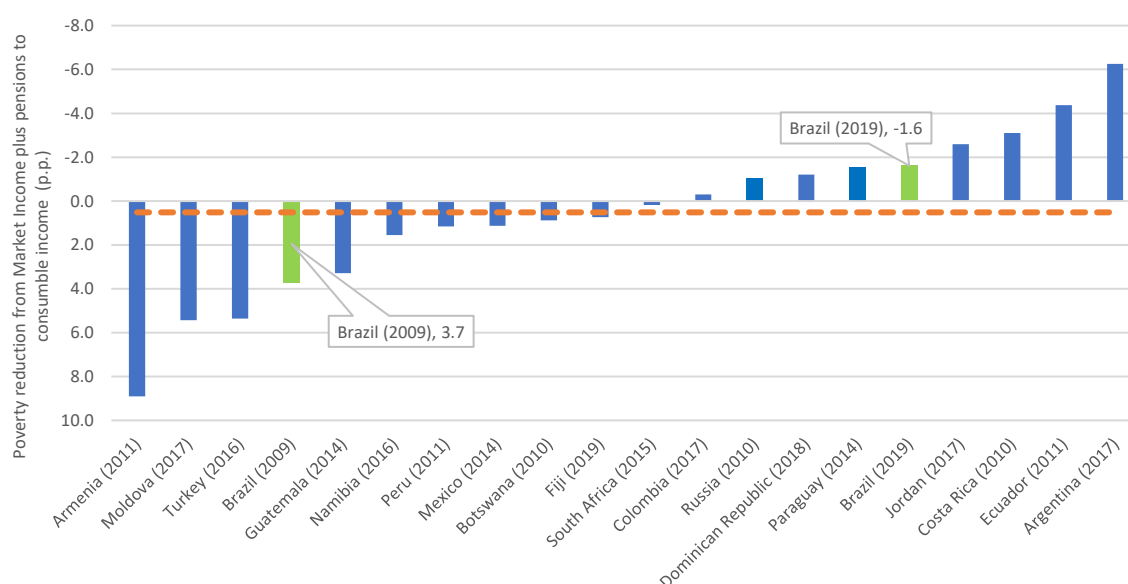


Source: CEQ Data center.

In terms of poverty reduction, the effect of the fiscal system in Brazil is less favorable (Figure 18). Although it is above average, the reduction is low, and even other countries in the region, such as Argentina, Ecuador, Costa Rica, and the Dominican Republic, achieve better results. A common factor Brazil has with such countries is that poverty reduction comes from direct transfers. As mentioned above, Brazil has the highest amount of direct transfers as a percentage of GDP. When moving to consumable income and incorporating the effects of indirect taxes and subsidies, poverty rises in almost all of them, except Ecuador, where subsidies exceed the effect of indirect taxes.



**Figure 18. Poverty reduction, upper-middle income countries (percentage points)**



Source: CEQ Data center. Notes: international comparisons are made using the World Bank international poverty line of USD 5.5 per person per day in purchasing power parity (PPP) 2011.

The results presented here suggest that fiscal policies in Brazil have improved over time in terms of their impacts on poverty and inequality reduction. In 2009, the difference in Gini between MIPP and consumable income was 3.1 compared with 6.4 in 2019. Moreover, the impacts on poverty have gone from being welfare decreasing (i.e. fiscal policies increased poverty in 2009 by about 3.7 p.p. using the \$5.50 USD 2011 PPP poverty line) to being welfare increasing and poverty reducing (estimated at -1.6 p.p.). In the 2009 study, the negative effects of indirect taxes on poverty are only partially compensated by the effects of direct transfers. Current estimates suggest that direct transfers (marginally) overcome the negative impacts of indirect taxes. Finally, net cash beneficiaries of fiscal policies belonged to deciles 1 and 2 in 2009 (first quintile), but in 2019 households up to the third decile are net cash beneficiaries. Finally, the fiscal position is favorable up to the seventh decile in both CEQ estimations.

## 6. Conclusions

This paper aims to contribute to the literature on distributional effects of fiscal policies. Using the case of Brazil in the period right before the COVID-19 pandemic, we document a series of important facts about the country's fiscal system in 2019 on poverty and inequality, with an eye on vulnerable populations, such as elders and children. We show that the effects of some fiscal interventions do improve poor people's lives, while there are still many others that reinforce their vulnerability.

Leveraging the CEQ methodology and both household survey and administrative data, we find that both poverty and income inequality decrease from the pre-fiscal income to different concepts of post-fiscal income. Extreme poverty reduces by 5.1 p.p. and moderate poverty by 0.6 p.p. Income inequality, in turn, declines by 6.4 Gini points from MIPP to consumable income. Despite the relatively low reduction in the poverty headcount ratio, we demonstrate that the Brazilian fiscal policies do alleviate the situation of the poor, as both the poverty gap and the squared poverty gap reduce by two-thirds and to a fifth in terms of

extreme poverty, respectively. Notwithstanding the large impacts of fiscal policies, Brazil remains one of the most unequal countries with a Gini coefficient of 0.521.

Our results also indicate that direct transfers and public services benefit mostly the individuals from the first quintile of the pre-fiscal income distribution. Programs such as BPC, Bolsa Familia, and rural pensions are key examples of such direct transfers that mainly go to the poorest. We also show that the Brazilian fiscal system tackles more poverty among households with elderly people, while seems to have the opposite effect on those with children. Importantly, we also document that the current policies lead to higher poverty reduction for Afro-Brazilians of all ages, except the children (i.e., aged 0-15). However, poverty remains high among Afro-Brazilians at 38 percent (compared to 18 percent among whites).

Such analyses hold the promise of providing actionable information for policy makers and fostering data-driven insights for researchers on possible reforms to the fiscal system that could improve its capacity of shortening gaps and promoting welfare-enhancing interventions. The recent move towards increases in transfers to children residing in low-income households seems like a step in the right direction. Coupled with an integral sustainable fiscal strategy, such efforts can boost the poverty reducing power of the Brazilian fiscal system.

Certain assumptions of the current methodology can and should be addressed in future research. One of the most relevant ones is that of the uniform impact of government expenditures on educational or health services. As a work on the varying quality of learning has demonstrated (World Bank 2022a), it could be important to allow varying effects of expenditures that help effectively attain higher levels of human capital. On the health side, literature suggests the Brazilian public system encumbers patients with long waits for some health services that could be translated into economic costs that are not being appropriately accounted (Marinho, 2009). Information contained in indicators such as the World Bank's Human Capital Index may provide a sensible *proxy* measure to account for differences in quality.

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## Appendix. Results of the Fiscal Analysis Based on Pensions as Government Transfers

In the Pensions and Government Transfers (PGT) scenario, market income is considered the “pre-fiscal” income. Market income includes factor income, self-consumption, and the imputed value for the use of own housing and does not consider pensions as part of this income and does not subtract social security contributions. As shown in Appendix Table A.1, column 2, contributory pensions are higher in relation to pre-tax income for the PGT scenario, around 14.6%. Besides, social contributions are sizable but smaller than pensions (about 13% of market revenue).

In addition, the payment of social contributions by the poorest 40% ranked by market income only reaches 3% of the total social contributions. At the same time, the first income quintile absorbs almost 37% of the total contributory pensions. That combination of pensions and contributions reduces inequality, and the Gini falls by 3 points, as seen in columns 2 and 3. Despite being relatively large, this effect is much smaller than the net effect of direct transfers, which, as seen in Appendix Table A.2, reduce inequality by almost 6 points (see column 4 of Appendix Table A.1). The Gini coefficient, without the effects of fiscal policy in this scenario, is 0.616.

Regarding poverty reduction, the net effect on pensions and social contributions produces a decrease of around four percentage points. However, considering that although some people have a market income below the poverty line, this is because they are people outside the labor market who obtain practically all their resources from these pensions. In other words, rather than being poor, they are outside the labor market because they have the means provided by pensions.

**Table A.1: Main results under the PGT scenario**

	<i>Brazil 2019</i>	<i>Market Income</i>	<i>Market Income + Pensions</i>	<i>Disposable Income</i>	<i>Consumable Income</i>	<i>Final Income</i>
<i>Inequality</i>	Gini	0.616	0.585	0.521	0.521	0.429
	Theil Index	0.745	0.674	0.533	0.533	0.376
	90/10	1185.218	39.345	12.886	12.709	5.597
<i>National Extreme PL</i>	Headcount Index	24.2%	18.4%	10.5%	13.3%	
	Poverty Gap	17.7%	12.2%	4.6%	5.7%	
	Squared Poverty Gap	15.4%	10.1%	2.5%	3.2%	
<i>National Moderate PL</i>	Headcount Index	36.7%	32.8%	26.0%	32.2%	
	Poverty Gap	24.3%	19.1%	11.5%	14.4%	
	Squared Poverty Gap	19.9%	14.5%	6.9%	8.6%	

Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and admin data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal.

Appendix Table A.2 shows results on the size, the concentration coefficient, the Kakwani coefficient, and the marginal contributions to inequality and poverty. Concerning market income from the PGT analysis, the contributions of contributory pensions are pro-poor (see the negative concentration coefficient in the third column). Their marginal contribution to inequality reduction is almost 3 Gini points. In comparison, its marginal contribution to poverty reduction in terms of the national line is nearly 7 points. In this case, some people have meager incomes close to zero and depend exclusively on contributory pensions. In the case of social security contributions, they are generally neutral, although the sum of all contributions has a slightly progressive effect. In this case, the original income distribution starts from a Gini of 0.61. The

marginal contribution to inequality of each contribution is practically zero. Concerning poverty, the combination of all contributions has a poverty-increasing effect in percentage terms.

In contrast, at the individual level, only the employer pension contributions have a significant effect, around one percentage point. Finally, the progressivity of fiscal interventions regularly maintains the same sign. However, this scenario has a higher degree of progressivity for direct transfers compared to Kakwani's coefficient for the PDI scenario. The impact of transfers is more significant because there is a larger population group with near-zero market income, excluding pensions and direct transfers. At the same time, the degree of concentration of direct transfers on lower-income families is the highest of all fiscal interventions. As a result, these benefits are even more concentrated concerning the PDI scenario.

**Table A.2: Summary of indicators for PGT scenario**

	<i>Size*</i>	<i>Concentration Coefficient</i>	<i>Kakwani Coefficient</i>	<i>Redistributive Effect</i>	<i>Poverty Reduction Effect</i>
				Marginal Contribution	Marginal Contribution (Moderate poverty)
<b>Disposable Income</b>	<b>1.0279</b>				
Contributory pensions (Per capita)	0.1459	-0.0961	0.7123	0.0297	0.0680
All contributory pensions	0.1459	-0.0961	0.7123	0.0297	0.0680
Direct transfer: Noncontributory pension (Per capita)	0.0321	-0.4419	1.0581	0.0239	0.0395
Direct transfer: other (Per capita)	0.0009	-0.2252	0.8414	0.0005	0.0009
Direct transfer: salario familiar (Per capita)	0.0009	-0.0086	0.6248	0.0007	0.0014
Direct transfer: unemployment benefits (Per capita)	0.0016	-0.0974	0.7136	0.0011	0.0015
Direct transfer: BPC (Per capita)	0.0140	-0.4943	1.1105	0.0105	0.0174
Direct transfer: abono salaria (Per capita)	0.0051	0.2885	0.3277	0.0019	0.0046
Direct transfer: Bolsa Familia (Per capita)	0.0075	-0.6035	1.2197	0.0094	0.0055
All direct transfers excl contributory pensions	0.0622	-0.3944	1.0106	0.0486	0.0708
All direct transfers incl contributory pensions	0.2080	-0.1853	0.8015	0.0852	0.1471
Direct taxes (Per capita)	-0.0462	0.7933	0.1771	0.0163	-0.0001
Direct tax: IPTU/IPTR (Per capita)	-0.0025	0.4723	-0.1439	0.0000	-0.0016
Total employer contribution to pension system (Per capita)	-0.0660	0.6359	0.0197	0.0027	-0.0135
Contributions to pensions INSS (Per capita)	-0.0416	0.6608	0.0446	0.0030	-0.0068
Employer contribution to FGTS (Per capita)	-0.0239	0.6192	0.0030	0.0003	-0.0043
All direct taxes	-0.0487	0.7770	0.1608	0.0163	-0.0017
All contributions	-0.1315	0.6407	0.0245	0.0068	-0.0238
All direct taxes and contributions	-0.1801	0.6776	0.0614	0.0209	-0.0249

**Table A.2: Summary of indicators for PGT scenario (continued)**

	<i>Size*</i>	<i>Concentration Coefficient</i>	<i>Kakwani Coefficient</i>	<i>Redistributive Effect</i>	<i>Poverty Reduction Effect</i>
				<i>Marginal Contribution</i>	<i>Marginal Contribution (Moderate poverty)</i>
<b>Consumable Income</b>	<b>0.8586</b>				
Contributory pensions (Per capita)	0.1459	-0.0961	0.7123	0.0585	0.0872
All contributory pensions	0.1459	-0.0961	0.7123	0.0585	0.0872
Direct transfer: Noncontributory pension (Per capita)	0.0321	-0.4419	1.0581	0.0309	0.0399
Direct transfer: other (Per capita)	0.0009	-0.2252	0.8414	0.0006	0.0009
Direct transfer: salario familiar (Per capita)	0.0009	-0.0086	0.6248	0.0008	0.0017
Direct transfer: unemployment benefits (Per capita)	0.0016	-0.0974	0.7136	0.0013	0.0020
Direct transfer: BPC (Per capita)	0.0140	-0.4943	1.1105	0.0133	0.0189
Direct transfer: abono salaria (Per capita)	0.0051	0.2885	0.3277	0.0023	0.0046
Direct transfer: Bolsa Familia (Per capita)	0.0075	-0.6035	1.2197	0.0113	0.0040
All direct transfers incl contributory pensions	0.2080	-0.1853	0.8015	0.1344	0.1555
Direct taxes (Per capita)	-0.0462	0.7933	0.1771	0.0195	-0.0001
Direct tax: IPTU/IPTR (Per capita)	-0.0025	0.4723	-0.1439	0.0000	-0.0013
Total employer contribution to pension system (Per capita)	-0.0660	0.6359	0.0197	0.0034	-0.0179
Contributions to pensions INSS (Per capita)	-0.0416	0.6608	0.0446	0.0036	-0.0094
Employer contribution to FGTS (Per capita)	-0.0239	0.6192	0.0030	0.0004	-0.0071
All direct taxes	-0.0487	0.7770	0.1608	0.0194	-0.0014
All contributions	-0.1315	0.6407	0.0245	0.0084	-0.0323
All direct taxes and contributions	-0.1801	0.6776	0.0614	0.0249	-0.0331
Indirect taxes (per capita)	-0.1693	0.4445	-0.1717	0.0004	-0.0613
All indirect taxes	-0.1693	0.4445	-0.1717	0.0004	-0.0613
All taxes	-0.2180	0.5188	-0.0974	0.0167	-0.0630
<b>Final Income</b>	<b>1.0062</b>				
Contributory pensions (Per capita)	0.1459	-0.0961	0.7123	0.0393	
All contributory pensions	0.1459	-0.0961	0.7123	0.0393	
Direct transfer: Noncontributory pension (Per capita)	0.0321	-0.4419	1.0581	0.0256	
Direct transfer: other (Per capita)	0.0009	-0.2252	0.8414	0.0005	
Direct transfer: salario familiar (Per capita)	0.0009	-0.0086	0.6248	0.0006	
Direct transfer: unemployment benefits (Per capita)	0.0016	-0.0974	0.7136	0.0010	
Direct transfer: BPC (Per capita)	0.0140	-0.4943	1.1105	0.0108	
Direct transfer: abono salaria (Per capita)	0.0051	0.2885	0.3277	0.0016	
Direct transfer: Bolsa Familia (Per capita)	0.0075	-0.6035	1.2197	0.0085	
All direct transfers incl contributory pensions	0.2080	-0.1853	0.8015	0.0961	
Direct taxes (Per capita)	-0.0462	0.7933	0.1771	0.0208	
Direct tax: IPTU/IPTR (Per capita)	-0.0025	0.4723	-0.1439	0.0002	
Total employer contribution to pension system (Per capita)	-0.0660	0.6359	0.0197	0.0080	
Contributions to pensions INSS (Per capita)	-0.0416	0.6608	0.0446	0.0065	
Employer contribution to FGTS (Per capita)	-0.0239	0.6192	0.0030	0.0023	
All direct taxes	-0.0487	0.7770	0.1608	0.0209	
All contributions	-0.1315	0.6407	0.0245	0.0171	
All direct taxes and contributions	-0.1801	0.6776	0.0614	0.0349	
Indirect taxes (per capita)	-0.1693	0.4445	-0.1717	0.0123	
All indirect taxes	-0.1693	0.4445	-0.1717	0.0123	
All taxes	-0.2180	0.5188	-0.0974	0.0298	
All taxes and contributions	-0.3494	0.5647	-0.0515	0.0412	
In-kind Health Benefits (per capita)	0.0604	-0.1648	0.7810	0.0350	
Net health transfers	0.0604	-0.1648	0.7810	0.0350	
In-kind benefits education pre-school (Per capita)	0.0045	-0.2246	0.8408	0.0035	
In-kind benefits education primary (Per capita)	0.0449	-0.2390	0.8552	0.0343	
In-kind benefits education upper secondary (Per capita)	0.0161	-0.1416	0.7578	0.0099	
In-kind benefits education tertiary (Per capita)	0.0192	0.2901	0.3261	-0.0007	
In-kind benefits education young & adult education (Per capita)	0.0024	-0.2043	0.8205	0.0015	
Net education transfers	0.0871	-0.1029	0.7191	0.0503	

Source: authors' estimations based on surveys PNAD-C, POF, and PNS, and admin data from the Ministry of Finance, Ministry of Health, and Government Open Data Portal. Notes: \* Information presented with respect to original income