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## **INFORMAL AND SMALL**

HOW LABOR MARKET INSTITUTIONS  
AFFECT INEQUALITY, INCOME VOLATILITY  
AND LABOR PRODUCTIVITY IN BRAZIL

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## INFORMAL AND SMALL

HOW LABOR MARKET INSTITUTIONS AFFECT INEQUALITY,  
INCOME VOLATILITY AND LABOR PRODUCTIVITY IN BRAZIL<sup>1</sup>

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## Abstract

This paper outlines the main labor market regulations, social protection programs and tax regimes and how they affect formalization, inequality, income volatility, and firm size and productivity in Brazil. We argue that the current social protection system creates incentives for low-skilled workers to remain informal, increase turnover, and may contribute to the large income volatility. Moreover, special tax regimes and special contributory systems for poor independent workers may subsidize small and less productive firms, thus resulting in misallocation of labor and capital, as well as increasing inequality. Overall, the social protection system in Brazil is redistributive, but its progressive features could be enhanced, especially regarding the pension system. Reforms in the whole system could increase efficiency and reduce inequality at the same time.

JEL Code: D22, E24, H24, J46, N36

Keywords: Brazilian economy, informal labor market, tax incentives, social protection, labor productivity

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*Background Paper for the UNDP LAC Regional Human Development Report 2021. The views and recommendations presented in this paper are from the authors and do not necessarily represent the official position of UNDP.*

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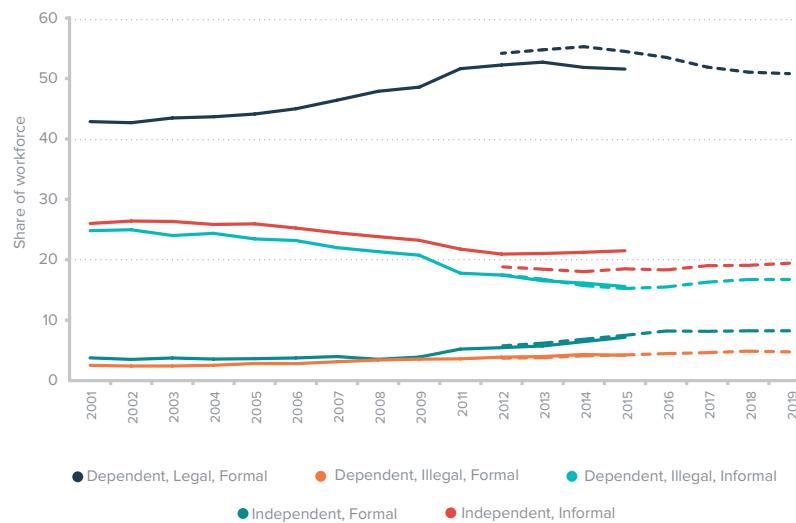
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## 1. Introduction

Large informal sectors are typical of developing economies, and this is not different for Brazil. In the largest country in Latin America, over one third of its working population in 2019 were not formal, meaning they did not contribute to the social security system, what is mandatory for all Brazilian workers. Figure 1 summarizes the share of workers in Brazil across five categories between 2001 and 2019, using data from nationally representative surveys, the Pesquisa Nacional por Amostra de Domicílios (National Household Sample Survey, PNAD) and the Pesquisa Nacional por Amostra de Domicílios Contínua (Continuous National Household Sample Survey, PNADC).<sup>1</sup>

**Figure 1.** Composition of the Brazilian workforce, 2001 to 2019



Sources: Continuous lines: 2001-2015 data of PNAD (Pesquisa Nacional por Amostra de Domicílios, National Household Sample Survey) (dashboard), Brazilian Institute of Geography and Statistics, Rio de Janeiro, <https://www.ibge.gov.br/estatisticas/sociais/educacao/19897-sintese-de-indicadores-pnad2.html?=&t=o-que-e>. Dotted lines: 2012-2019 data of PNADC (Pesquisa Nacional por Amostra de Domicílios Contínua, Continuous National Household Sample Survey) (dashboard), Brazilian Institute of Geography and Statistics, Rio de Janeiro, <https://www.ibge.gov.br/estatisticas/sociais/educacao/17270-pnad-continua.html?=&t=o-que-e>.

Note: See the text for more information on the surveys.

In this work, we use a different classification from what is usually adopted in works on Brazilian labor markets. For us, formality is defined based on contributory status with the social security system. Legal workers are those with legal labor contracts, as discussed below. Moreover, dependent workers are those subordinated to a firm, while independent workers are self-employed workers, whether they provide services to a firm or not. In general, however, it is common to group workers in three categories: formal, informal, and self-employed. Under that definition, the formality dichotomy is exclusive of dependent workers and

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<sup>1</sup>The PNAD and PNADC are both nationally representative household surveys. The former collected cross-sectional data and ended in 2015. The latter was designed to replace the first, starting in 2012. PNADC is a rotating panel data survey that interviews Brazilians for five consecutive quarters (similar to the Current Population Survey in the United States), while PNAD interviewed them only once every year.

is based on the existence of legal labor contract, with no regard for contributions to the social security system. In general, there are no formality concerns towards self-employed workers.

Dependent workers who are legally employed by a firm encompassed around half of the working population in 2019. These are the workers with the most secure jobs in the country, protected by the Brazilian Labor Regulations (*Consolidação das Leis do Trabalho*, CLT). The benefits that legal dependent workers are entitled to are many, the most important ones being: (1) automatic contributions to the social security system through their employers; (2) minimum wage; (3) mandatory savings account that receives monthly deposits by employees through the Fundo de Garantia do Tempo de Serviço (Worker Severance Indemnity Fund, FGTS); (4) severance payments in case of unlawful firing; and (5) unemployment insurance (UI). Other benefits include Christmas bonuses, paid vacations, transport subsidies, and wage subsidies for low-wage earners.<sup>2</sup>

Dependent workers who do not have a legal contract with their employers may nonetheless choose to independently contribute to social security system as *individual contributors*.<sup>3</sup> These dependent workers—illegally hired but formal with respect to social security—corresponded to a little less than 5% of the labor force in Brazil in 2019. Firms that hire dependent workers—i.e., workers who are subordinated to their employers—without labor contracts according to Brazilian regulation are breaking the law and are subject to fines, even if their employees contribute to the social security system.

Informal workers are also those dependent workers who have been hired without a legal working contract and that choose not to be an *individual contributor* to the social security system. These labor arrangements are illegal, and their employers are subject to fines in case they are caught by labor inspectors. These workers comprised nearly 17% of the working population in 2019.

Independent (self-employed) workers can either be registered as a legal entity (that is, they are associated with a number on the Cadastro Nacional de Pessoas Jurídicas (National Registry of Legal Entities, CNPJ) or may simply work as private individuals.<sup>4</sup> Independent workers comprise the other half of informal workers. They too must contribute to the social security system, although lack of enforcement and incentives prevent them from doing so. They comprised nearly 20% of the Brazilian labor force in 2019.

Finally, independent workers can formalize by contributing to the social security system under a few different regimes. In most of these regimes, they are not required to have a CNPJ, and we collapse all the independent workers who contribute to the social security system as legal, whether they are registered as legal entities or not.<sup>5</sup> The share of these workers in the Brazilian labor force was 8.25% in 2019.

What is behind such large numbers of informal and independent workers? For one thing, Bra-

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<sup>2</sup> These wage subsidies are the Salário Família (family allowance) and the Abono Salarial (salary grant).

<sup>3</sup> We characterize the various options of these workers in more detail below.

<sup>4</sup> The CNPJ numbers are unique identifiers of firms. They are used for tax collection in Brazil. We only have information on whether independent workers are registered as legal entities from PNADC, available only after 2012. In 2019, 1.3% of the workforce was independent and informal, but had a CNPJ, or less than 10% of informal independent workers.

<sup>5</sup> We also collapse all dependent informal workers as illegal, since for them it is not possible to be informal and legal simultaneously. This is the reason why we have five categories in a system based on three dichotomous classification variables.

zil is one of the countries in which it is most expensive to hire workers legally (Alaimo *et al.*, 2017; Souza *et al.*, 2012). These costs arise mostly from payroll taxes that may surpass rates of 50% and are not always linked to direct benefits for workers. Firing costs are also high in Brazil, and, given the high turnover in the labor force, they may become a real burden for employers who must provide part of their revenues to pay these costs. Moreover, the design of contributory and non-contributory retirement systems in Brazil is such that low-wage workers have few benefits associated with contributing to the social security system as formal workers. Coupled with a somewhat large UI benefits, this also contributes to higher turnover and informality. Finally, the minimum wage is another factor that may prevent low-skilled workers from finding jobs in the formal sector, especially if combined with other costs associated with formality that pile on, such as high payroll taxes and the Christmas bonus. If the minimum wage is binding, firms are incapable of shifting payroll taxes to workers in the form of lower wages, which may prevent them from formally hiring low-skilled workers.

Informal low-wage earners may also be subject to informality traps that arise from the eligibility criteria of Bolsa Família, Brazil's conditional cash transfer (CCT) program. Bolsa-Família is a means-tested program based on household income per capita. Thus, the high value of the minimum wage among legal workers implies that most Bolsa Família beneficiaries obtaining such jobs will fail to meet that criterium to access the program, unless they have many dependents in their household. That feature will provide an incentive for lesser detectable labor income sources, such as informal activities. Alongside high turnover rates and longer unemployment spells for low-wage earners, this may create another barrier to formality in Brazil.

Figure 2 displays the prevalence of each type of worker by decile of household per capita income. We clearly observe that informality is mostly associated with low-wage earners. Moreover, not only does the share of legal dependent workers increase across deciles, but so does the share of formal independent workers.

The share of formal workers has grown since the early 2000s, except for the period after 2015 when Brazil entered a severe recession (see Figure 1). Why did formality increase during the period despite the high costs of hiring formal labor in Brazil? This trend is in part influenced by external factors that also affected other Latin American countries as well as by internal factors that contributed to large economic growth rates and a decline in income inequality.<sup>6</sup> Nonetheless, Brazil has also implemented a series of policies in the last decades explicitly aiming at expanding the coverage of social security among independent workers: the Simplified System of Contribution to social security, implemented in 2007, and the microentrepreneur regulations from 2009 (microempreendedor individual, MEI).<sup>7</sup> The importance of these programs is clear if we compare changes in formality between 2007 and 2015.<sup>8</sup> The share of dependent, legal, and formal workers expanded from 46.5% to 51.5%, while the dependent, illegal, formal workers (covered by the Simplified System of Contribution) and the independent formal workers (covered by the MEI) rose from 7.1% to 11.4%. Moreover, these two categories of formal workers have not ceased to increase in importance

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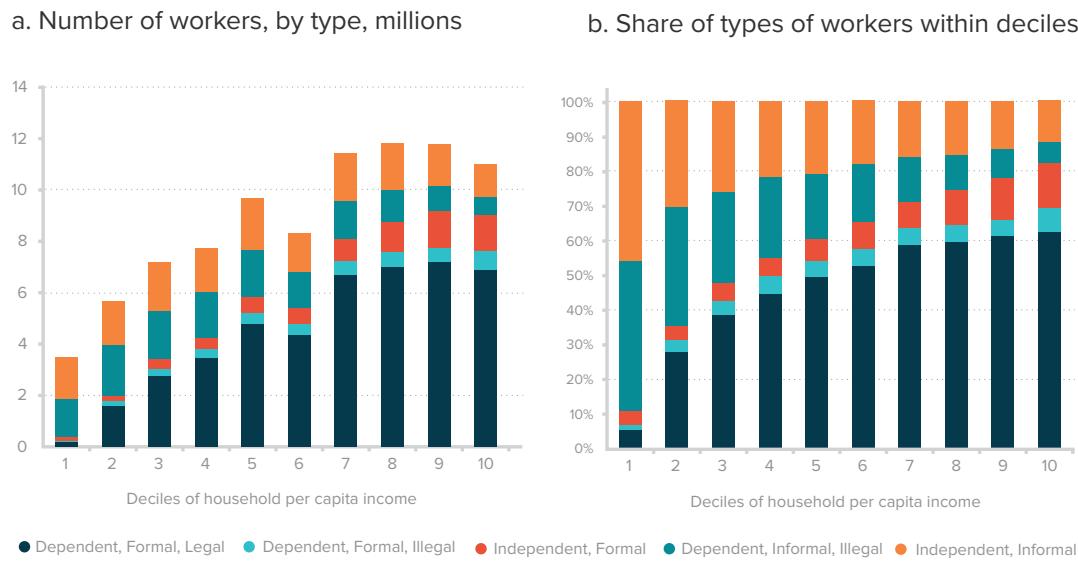
<sup>6</sup> For a recent review of the causes behind the reduction in inequality in Latin America and Brazil, see Messina and Silva (2018) and Firpo and Portella (2019).

<sup>7</sup> The simplified system should not be confused with the *Simples Nacional*, the simplified tax system regime available for small firms since the same year, which is discussed below.

<sup>8</sup> We avoid comparing with 2019 because of the changes in the survey from PNAD to PNADC. Even though both are representative of the whole country, there were some differences in the estimated share of workers between these two surveys, especially dependent, legal, and formal workers.

since 2015, despite the reduction in the share of formal, legal, dependent workers. Although these programs have the merit of reaching for more vulnerable workers, their full impact in the economy is yet to be assessed. This paper highlights the large incentives that these programs create for workers to remain independent or work in small firms, which may negatively impact aggregate productivity, even if they are formal under one of the special regimes. Moreover, these contributory systems suffer from extreme actuarial imbalances, which may worsen deficits in the Brazilian social security system in the long run (Costanzi, 2018).

**Figure 2.** Type of workers, by decile of household income per capita, 2019



Source: PNADC 2019.

In the 2000s, Brazil also implemented Simples Nacional, a special tax regime for small firms. This regime unified many taxes on revenue, profits, and payroll. However, not only did it simplify tax collection among firms that opted for it, but it also reduced tax rates among most eligible firms, with larger tax cuts among firms with lower revenues. This paper also explores how this change in tax regime can be interpreted as the provision of subsidies to small and less productive firms, thus contributing to the existence of too many small firms with low productivity in Brazil (Dutz, 2018).

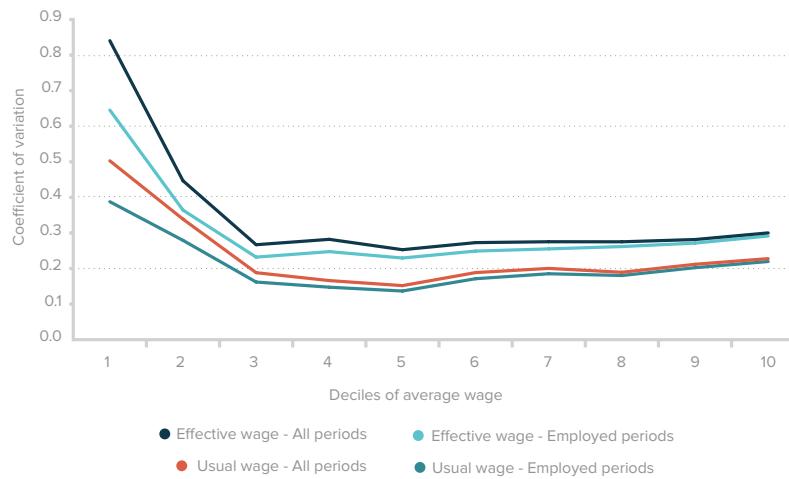
Apart from disincentives to formality, all these regulations may also contribute to the increase in the volatility of earnings among low-skilled workers by limiting their options to access stable jobs. We can observe earnings for up to five consecutive quarters using panel data on Brazilian workers from the PNADC. For each worker, we can then compute the coefficient of variation of their earnings.<sup>9</sup> Figure 3 plots the average coefficient of variation across the earnings distribution in Brazil using four different definitions of earnings that consider usual and actual earnings and excluding or not periods of unemployment (that is, imputing wage zero for periods when the worker is unemployed).<sup>10</sup> We observe that workers in the bottom

<sup>9</sup> The coefficient of variation is the ratio between the standard deviation of a variable over the average.

<sup>10</sup> Usual earnings are the earnings workers generally receive for their work, excluding extraordinary or non-continuous gains, such as yearly bonuses, overtime, delayed or anticipated payments, Christmas bonuses, and so on. Actual earnings are the exact value of the earnings, including extraordinary sources and regardless of any unexpected volatility.

20% of the earnings distribution are much more susceptible to income shocks, which is an obstacle to reducing poverty.

**Figure 3.** Earnings volatility, Brazil, 2018/2019



Source: PNADC 2018/2019.

Note: Earnings volatility is measured using individual coefficients of variation across time periods.

The main objective of this paper is to draw attention to how all these regulations may impact formality, wage inequality and volatility, and the size and productivity of firms. We do not aim at establishing robust causal estimates of the effects on all these outcomes. Rather, we rely on economic reasoning, descriptive analysis, and the relevant literature to highlight how these factors act together to impact wages, formality, and firm size.

The remainder of this paper is divided in the following sections. Section 2 presents the main social protection programs in Brazil, together with their budgets and number of beneficiaries. Then, it moves to assess their possible impact on income inequality. Section 3 discusses how the minimum wage can have impacts in the economy that are far beyond its potential effect on employment and the wages of workers more likely to be affected by it. Section 4 describes in more detail the system of payroll taxes in Brazil, how it varies according to different forms of labor contract, and the extent to which workers are expected to benefit from them. In section 5, we discuss the Brazilian social security system and how it creates disincentives to formality, especially among low-wage earners. Section 6 argues that, given the high levels of the minimum wage, informal workers in poor households who rely on CCTs might avoid jobs with legal contracts for fear they might lose their benefits. Given the high turnover among these workers, a legal labor contract may be a bet that is not always worth taking. Section 7 discusses how UI may create incentives for firms and workers to collude, resulting in lower wages and higher turnover. In section 8, we complement the analysis in the previous sections by discussing the different tax regimes that firms may opt for and how these tax regimes end up creating subsidies for firms that remain small. Section 9 assesses whether these labor market and tax regulations are associated with high levels of income volatility among low-wage earners. Section 10 concludes by summarizing the findings and evidence presented in this paper, as well as discussing a few policy recommendations aimed at improving the economic environment in Brazil.

## 2. The social protection system in Brazil and its effects on inequality

After Brazil's re-democratization in the mid-1980s and the enactment of a new Constitution in 1988, a large system of social protection was developed in the country. The Brazilian social welfare system is based on three pillars: social security, social assistance, and public health. The public health system is universal because access does not depend on formality status and is available to everyone.<sup>11</sup> Social assistance is comprised mostly of means-tested programs that target poor households, and eligibility does not depend on formality status at all. Social assistance programs include the Bolsa Família, a CCT program, and Benefício de Prestação Continuada (Continuous Benefit Program, BPC), a non-contributory pension with a benefit value equal to one minimum wage that is meant for poor workers who have reached retirement age without a contributory pension.<sup>12</sup> The social security system is, in principle, universal because participation is mandatory for all who are economically active. Although retirement is the main benefit provided by the social security system, it also offers illness and accident protection, death benefits, maternal leave, and other special pensions and benefits. Moreover, dependent workers also have access to UI if they have been legally hired by firms.

Table 1 summarizes information on the main programs available in Brazil, including data on total expenditure, the number of beneficiaries, expenditure as a share of gross domestic product (GDP), and average monthly benefits. We defer a discussion on the design of these programs, including eligibility rules, to sections below in which we focus on labor market incentives introduced by each of them. Here we simply highlight the size of these programs and how they may increase or decrease inequality. Expenditures within the public health system are not included in Table 1 because we do not have good estimates on the number of beneficiaries, but public health expenditures amounted to R\$253.7 billion in 2017, or 3.9% of that year's GDP (Rocha, Furtado, and Spinola, 2020; IBGE 2019).<sup>13</sup> They are estimated to be progressive (Higgins and Pereira, 2014).

<sup>11</sup> Public health care is provided by the Sistema Único de Saúde (Universal Health System).

<sup>12</sup> Disabled individuals in poor households also have access to BPC. We distinguish between the program that has age requirements (BPC-Elderly) and the one that has disability requirements (BPC-Disabled).

<sup>13</sup> Total health expenditures, including private expenditures, were R\$608.3 billion, or 9.2% of GDP.

**Table 1.** Expenditures on social programs, 2018

	BPC-Elderly	Bolsa Família	INSS, rural	INSS, urban	Unemployment insurance	FGTS, withdrawals	FGTS, deposits	Abono Salarial	Salário-Família <sup>a</sup>
Expenditures, R\$, billions	23.29	30.63	107.35	392.26	33.09	111.41	120.66	16.94	3.3
Beneficiaries, millions	2.05	14.14	9.6	20.68	2.12	2.68	5.73	17.75	5.79
Share of GDP, %	0.34	0.45	1.57	5.73	0.48	1.63	1.76	0.25	0.05
Avg. monthly benefit, R\$	947.31	180.46	932	1580.65	1299.7	3460.32	1755.59	79.5	47.56

Source: Boletim Estatístico da Previdência Social, v. 25, n. 5. May, 2020.; Ministério da Cidadania, CECAD, <https://cecad.cidadania.gov.br/painel03.php>; Fundo de Garantias do Tempo de Serviço, <https://www.fgts.gov.br/Pages/sobre-fgts/numeros.aspx#section3>; Programa de disseminação das estatísticas do Trabalho, Tabelas de Séries Históricas, <http://pdet.mte.gov.br/component/content/article?id=1778>; Portal da Transparéncia, <http://www.portaltransparencia.gov.br/programas-e-acoes/acao/0581-abono-salarial?ano=2018>

Note: All values are based on 2018 prices. INSS = National Institute of Social Security. a. Values refer to estimates for 2014 (Barros et al., 2016).

The first program is the BPC, a social assistance program with a benefit valued at one minimum wage for vulnerable individuals in poor households. It has two target populations, the elderly and the disabled. Here, we only focus on the first because the benefit has impacts on labor market decisions. In 2018, Brazil spent more than R\$23 billion, or 0.34% of GDP on transfers to more than 2 million elderly in poor households.<sup>14</sup> Since the benefit is always the same, one minimum wage or R\$954 in 2018, the average benefit is almost the same, R\$947.31, with differences because of the number of beneficiaries (based on data from December only).

Another social assistance program is Brazil's CCT, the Bolsa Família. The government transferred nearly R\$30 billion to around 14 million poor households in 2018 (of around 69 million households in the country). The average household benefit is therefore quite small, only R\$180 per household per month (less than 20% of the average minimum wage). The program costs only around 0.45% of GDP.

The Regime Geral de Previdência Social (General Regime of Social Security, RGPS) is the Brazilian social security system that covers workers in the private sector<sup>15</sup> Apart from pension benefits, it also provides other services such as illness and accident benefits, maternal leave, and other special pensions and benefits. It comprises both contributory and non-contributory benefits and is divided into two main clienteles. The first is the rural clientele, which include rural producers who have access to benefits even if they do not contribute continuously to the protection system (the non-contributory branch). They have access to a special retirement benefit for which eligibility depends only on proving that they have worked in a rural area for at least 15 years. The benefit is one minimum wage. Total expenditures among the rural clientele were R\$107.35 billion in 2018, benefiting more than 9 million individuals and representing a cost of 1.57% of GDP. The average benefit was R\$932 per month, a little below the minimum wage. The second and largest clientele is urban. This involved benefits to more than 20 million individuals in 2018. Total expenditures were around R\$392 billion, or

<sup>14</sup> The expenditure levels in the BPC-Disabled and the BPS-Elderly are similar.

<sup>15</sup> Workers in the public sector are covered by special retirement systems that are discussed below.

almost 6% of GDP.<sup>16</sup> The average benefit is almost R\$1,600 per month, a little over 1.5 minimum wages. Although this part of the program is contributory, the benefits paid by the urban RGPS are not fully covered by contributions, and the system is thus subsidized.

Total expenditures on UI were R\$33 billion in 2018, around 0.5% of GDP. The number of beneficiaries was 2.12 million, and the average monthly benefit was R\$1,300. The FGTS is a mandatory savings account that is firm-employee specific. The savings are also associated with firing regulations. Firms that fire workers unlawfully must make deposits to this account that are proportional to total savings. Workers can only withdraw money from their accounts after they have been fired or if they retire. In 2018, R\$111 billion were withdrawn from 2.68 million accounts, representing nearly 1.6% of GDP. The average monthly value of the withdrawals was R\$3,460, more than three minimum wages. The total value deposited on the more than 5 million FGTS accounts was R\$120 billion. The average monthly value of these deposits was R\$1,755, or around two minimum wages.

The last two benefits presented in Table 1 are wage subsidies for legal dependent workers. They are directed towards low-wage earners that have children (Salário Família) or that have remained employed with legal labor contracts for long periods (Abono Salarial). Total expenditures with the Abono Salarial were almost R\$17 billion in 2018, benefiting 17.75 million workers. The monthly benefit, however, is small, around R\$80. The Salário Família is an even smaller program, with total expenditures of around R\$3 billion benefiting almost 6 million workers with average monthly payments at less than R\$48. Total expenditures on these programs as a share of GDP are around 0.3%, smaller than that of the Bolsa Família or the BPC-Elderly combined.

The overall impact of the social protection system on inequality depends on the incidence of transfers across the distribution of household income per capita. Figure 4 plots the number of beneficiaries of some non-contributory programs in Brazil using data from the PNADC 2019. They include the BPC (for both the elderly and the disabled), Bolsa Família, rural retirement, and other programs.<sup>17</sup> We observe that Bolsa Família is highly targeted towards households in the lowest deciles of the household income per capita distribution, meaning that it not only plays a role as a poverty reduction program, but it also contributes to a reduction in overall inequality. The BPC and rural retirement, however, are more concentrated on households in the middle of the income distribution. This is in part because its value is attached to the minimum wage. Given that the minimum wage is relatively close to the median income, most households that receive this benefit end up in around decile 6 of the income distribution. Their contribution towards inequality reduction is thus less obvious than Bolsa Família. Silveira *et al.* (2020) estimate the concentration index of Bolsa Família and the BPC at around negative 0.54 and negative 0.08, respectively.

The effect of the retirement system in Brazil is less clear, especially if we account for the existence of the special regimes of public servants Regime Próprio de Previdência Social (Special Social Pension Regime, RPPS). Table 2 displays the expenditures on the RGPS (including both rural and urban clientele) and three branches of the RPPS system: those of

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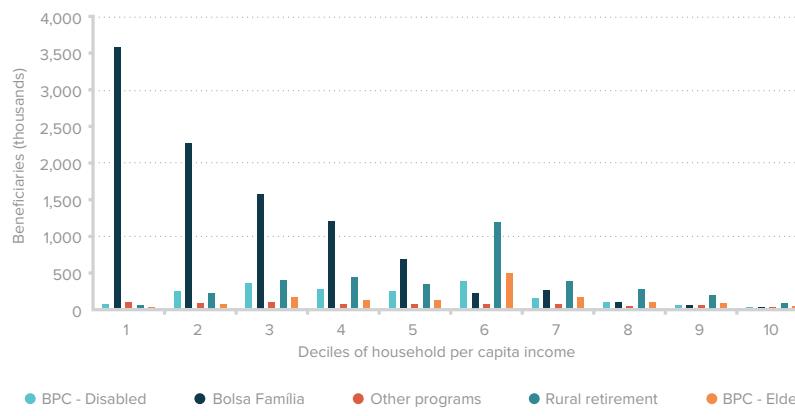
<sup>16</sup> Here we do not include the non-contributory benefits that are paid through the urban RGPS and include the BPC for both the elderly and the disabled.

<sup>17</sup> The number of beneficiaries of rural retirement is estimated based on the number of individuals that live in rural areas and receive pensions of exactly one minimum wage. All these program benefits have no clear identification on PNADC, apart from the fact that they are classified as social assistance.

Union civil servants, Union military personal, and state and municipal civil servants. All exhibit large deficits. The RGPS has the largest deficit, around 2.86% of GDP in 2018. Nonetheless, if we consider the number of contributors and beneficiaries, the huge per capita deficits in all three public pensions systems dwarf that of the RGPS. As a result, even though the aggregate deficit of the public system is the same as in the general system, it serves around 10% of the individuals in the RGPS, which results in large public transfers to the more well off and to greater inequality.

Although the RPPS system is clearly inequality-enhancing, the overall effects of the RGPS on inequality are not straightforward. On the one hand, the distribution of benefits favors households in the top and middle of the income distribution (Figure 5). Similarly, implicit subsidies tend to be higher among individuals with higher earnings, meaning that the government is transferring more resources to more well off households (World Bank 2017). On the other hand, replacement rates, the ratios between the retirement benefit and the last wage received, are much higher among low-wage earners (Afonso 2016), especially because the benefit floor is indexed to the minimum wage, which, as we show below, has increased in real terms.

**Figure 4.** Number of beneficiaries of social programs, Brazil, 2019



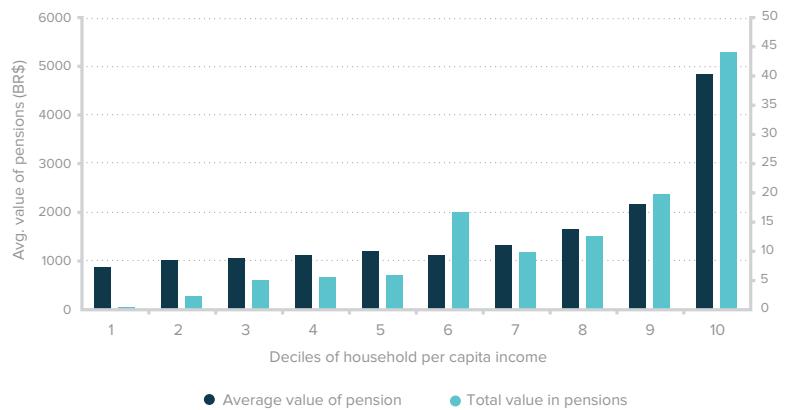
Source: PNADC 2019.

**Table 2.** Social security systems, results, 2018

	RGPS	RPPS-Union, civil	RPPS-Union, military	RPPS-States and municipalities
a. Revenue (R\$, billions)	391.18	33.68	2.36	114.39
b. Expenditures (R\$, billions) (2)	586.38	83.48	46.21	219.91
c. Result (R\$, billions) (A - B)	(195.20)	(49.80)	(43.85)	(105.52)
d. Contributors	52.37	0.69	0.38	4.97
e. Beneficiaries	35.06	0.74	0.39	3.38
Result/ Contributor (R\$ k.) (C/D)	(3.73)	(72.31)	(114.85)	(21.23)
Result/ Beneficiary (R\$ k.) (C/E)	(5.57)	(67.21)	(113.07)	(31.22)
Result - Share of GDP (C)	(2.86%)	(0.73%)	(0.64%)	(1.55%)

Source: Anuário Estatístico da Previdência Social, 2018; Boletim Estatístico da Previdência Social, v. 25, n. 5 and v. 24, n. 12.

Note: All values are expressed in current 2018 prices.

**Figure 5.** Total and average value of pensions per decile of household per capita income

Source: PNADC, 2019.

The Lorenz curves computed by the World Bank (2017) are similar for income and pensions per capita, although the distribution is more unequal at the bottom of the distribution for pensions than for income. Nonetheless, these numbers include pensions from both RPPS and RGPS. Silveira *et al.* (2020) use data from the 2017/2018 Pesquisa de Orçamento Familiar (Household Expenditure Survey, POF), which gathers data on expenditures and income to compute the concentration index for several sources of income. The index is 0.58 for the primary source of income, while the RGPS is 0.43, indicating a contribution to overall inequality reduction. The RPPS, by contrast, shows an index of 0.82. Soares and Bloch (2020) look

more closely at the financing of the pension system; 37% of overall social security expenditures are funded by the government. They estimate a concentration index for Union (Federal) and state taxes in Brazil of 0.56 and 0.45, respectively, while the concentration index of the contribution of individuals to social security is 0.63. The concentration index for the financing of the overall pension system is 0.59, while the concentration index of benefits is 0.54, indicating that benefits are more equally distributed than contributions. Nonetheless, both are quite close to the Gini coefficient, estimated at 0.54. Hence, social security appears to have only a small progressive impact on income distribution.

The impact of UI benefits on inequality are more clearly redistributive than the impact of the pension system. This can be seen in Figure 6, where we plot the average value of benefits and total expenditures by decile of household per capita income. The majority of households that received UI benefits are in the middle of the income distribution, but the value of the benefit is more or less the same across deciles. This occurs because the UI benefit has a floor equal to the minimum wage, while the ceiling is around only 1.7 minimum wages. Silveira *et al.* (2020) estimate the concentration index of the UI benefits at around 0.21, much smaller than that of all income sources. However, because UI represents only a small share of total income, its effects on income distribution are quite limited.

**Figure 6.** Expenditures and average unemployment benefit, by decile of household income



Source: PNADC, 2012, 2015 and 2019.

We do not have data on the distribution of the FGTS or on wage subsidies for formal workers. The latter are probably redistributive because they benefit workers who earn up to two minimum wages. But, given their limited size, their impact on inequality is probably small. The FGTS probably has a small effect on inequality because it is financed through a flat rate on wages. Nonetheless, the overall impact is potentially redistributive because firms that unlawfully fire workers must pay fines in the form of FGTS deposits. Because turnover is higher among low-wage earners, they are likely the ones that benefit most from such fines, even though the idea of benefiting from unlawful firing hardly makes any sense.

In subsequent sections, we discuss in more detail the design of all these programs, trying to evaluate the incentives they create among workers and firms and how these may favor particular productive arrangements and labor force participation.

### 3. The minimum wage and its impact on inequality

The minimum wage is probably one of the most important prices in the Brazilian economy. It not only states the minimum payment that legal dependent workers must receive, but it also affects the floor payment of many contributory and non-contributory benefits in Brazil's protection system. Among the programs that have their floor benefits pegged to the minimum wage are contributory pensions, the BPC, rural retirement, and UI. Moreover, firms and workers use the minimum wage as a reference price, in what the literature has labeled the lighthouse effect (Lemos, 2009). The wages of many informal workers are determined by the minimum wage, even though they are not subject to such regulations. Similarly, formal workers may also have their wages quoted as multiples of the minimum wage. Figure 7 plots the distribution of wages among formal and informal workers in the private sector in 2001 and 2019.<sup>18</sup> As expected, the share of workers receiving less than the minimum wage is higher in the informal sector, while the share of workers receiving more than the minimum wage is higher in the formal sector. The importance of the minimum wage is also clear in both groups because the mode in both distributions is around the minimum wage.

As the real value of the minimum wage increased in 2001-2019, it dragged along a large mass of workers (see Figure 7). The minimum wage has risen considerably in the last decades in Brazil. Figure 8 plots an index of the value of the minimum wage, together with a price index, between 1995 and 2019. We observe large real gains in the minimum wage, especially in the early 2000s. The minimum wage has been adjusted yearly since the monetary stabilization program that put an end to hyperinflation in Brazil in 1994. After 2007, a law established a rule for the adjustment of the minimum wage: the average GDP growth of the previous two years, plus inflation, assuring real increases in the value as long as the economy is growing.<sup>19</sup>

**Figure 7.** Wage distribution in the formal and informal private sector, 2001 and 2019

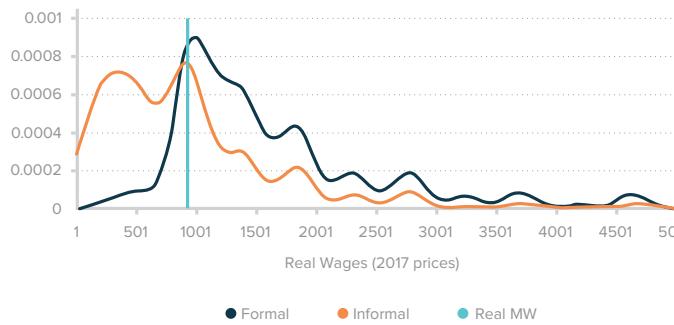
a. 2001



<sup>18</sup> We also limit the range of real wages to R\$5,000, for a better presentation of wage distribution. The percentage of workers receiving more than that is 5.4% and 6.5% in 2001 and 2019, respectively.

<sup>19</sup> The law was in force until 2018. Today, there is no rule guiding new values, although adjustments have been made close to the inflation rate, preserving the real value of the minimum wage.

b. 2019



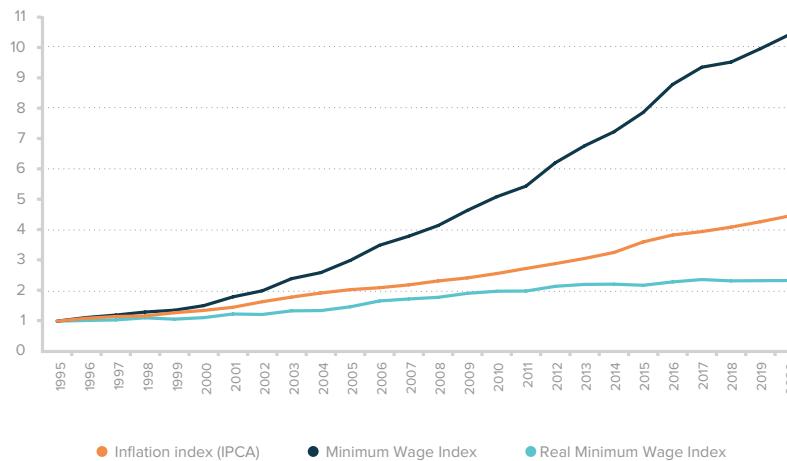
Sources: PNAD 2001; PNADC 2019.

Note: Wage distributions include all dependent and independent workers in the private sector with formal and informal jobs. They exclude workers in the public sector and workers with monthly earnings higher than R\$5,000. MW = minimum wage.

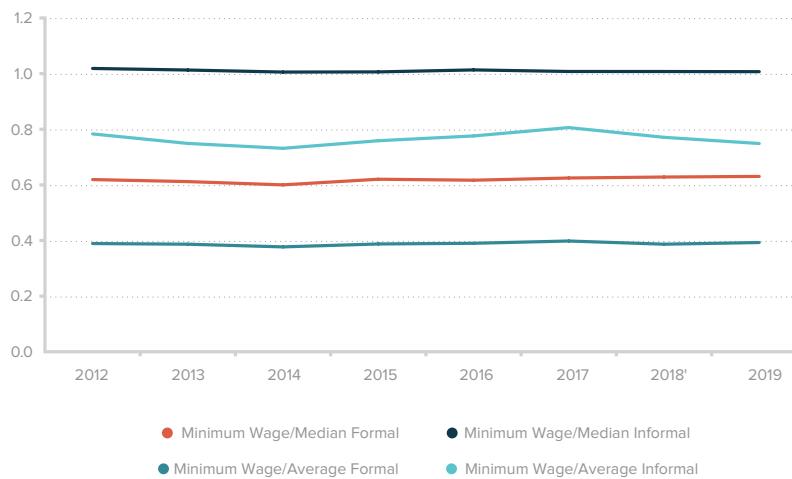
Despite real increases in the minimum wage, its bite has remained more or less the same since 2012. Figure 8, panel b, displays the ratio of the minimum wage over the median and the average wage in the formal and informal sectors for full-time workers. The size of the ratio is similar to the median wage in the informal sector. It is 80% of average wages in the informal sector, 60% of the median wage in the formal sector, and 40% of the average wage in the formal sector.

**Figure 8.** Trends in the minimum wage across time

a. Minimum wage and inflation index



### b. The bite of the minimum wage, 2019



Sources: Data of the Institute of Applied Economic Research; PNADC 2019.

The overall impact of the minimum wage on the income distribution is difficult to estimate. It depends not only on how much it increases wages in the bottom of the distribution, but also on possible unemployment effects. Moreover, the minimum wage can spill over to higher points of the income distribution or to the informal sector. In general, the literature on the minimum wage in Brazil has not presented evidence of any substantial employment effects or large displacement of workers to the informal sector (Lemos, 2009; Corseuil, Foguel, and Hecksher, 2015; Saltiel and Urzúa, 2021). This might in part derive from the attenuation of the effect by economic growth, as argued by Saltiel and Urzúa (2021).

Most studies find an impact on inequality. However, the majority highlight redistributive effects (Menezes-Filho and Rodrigues, 2009; Firpo and Reis, 2007; Engbom and Moser, 2018; Haanwinckel, 2020). The finding that the minimum wage has inequality-decreasing effects may be a consequence of simultaneous economic growth. Ferreira, Firpo, and Messina (2021) estimate that minimum wage increases were associated with higher inequality in 1995-2002, but with lower inequality in 2002-2012. Neumark, Cunningham, and Siga (2006) find that minimum wage increases were associated with higher inequality in 1996-2002. Therefore, even though the evidence is not conclusive, it does point towards the redistributive effects of the minimum wage, especially if real increases occur during economic booms.

The effects of the minimum wage in the Brazilian economy go beyond possible employment and wage effects on those workers more likely to be affected by the minimum wage. Because many benefits are indexed to the minimum wage, increases in the minimum wage automatically raise government expenditures on social programs, especially by expanding the deficit in social security.<sup>20</sup> Furthermore, a higher minimum wage is likely to affect formality through three other channels. First, it boosts the cost of hiring formal workers. Haanwinckel and Soares (2020) estimate a search model with an informal labor market using Brazilian data for 2003-2012. Based on simulations, they show that the increase in formality would

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<sup>20</sup> Only the floor of pension benefits is indexed to the minimum wage. Non-binding pensions are adjusted by inflation only. Nonetheless, the fiscal impact is large because most benefits are exactly one minimum wage. Moreover, real increases in the minimum wage also compress the distribution of pension benefits.

have been higher had the minimum wages remained the same as in 2003, thus suggesting that the minimum wage has negative impacts on formalization. According to them, the main driver behind the rise in formality was the changes in workforce composition, driven by an expansion in the supply of skilled workers. Second, a higher minimum wage enhances the incentives for informality associated with the design of some programs. For instance, the informality trap created by Bolsa Família (discussed in section 6) is more stringent, the higher the minimum wage. Third, because the contributions of independent workers are based on the value of the minimum wage even though their earnings are not, if the minimum wage rises in real terms, it becomes more difficult for low-income independent workers to formalize. They are required to reserve a larger share of their earnings to pay for the same social benefits they received previously, which amounts to a real increase in the price of social security and leads to lower demand.

## 4. Payroll taxes and contributions

Payroll taxes and contributions fund many programs in Brazil. Table 3 summarizes the information about them. Most importantly, they finance social security through the contributions of both workers and employers. On signing legal job contracts with private firms, employees are automatically enrolled as *worker contributors* in the general social security system (RGPS). Employers must contribute towards the system with a payroll tax of 20%, while dependent workers must contribute 8% to 11% of their wages, up to a cap close to six minimum wages.<sup>21</sup> The cap does not apply to the part paid by firms. These contributions are directed not only to retirement plans, but to the whole RGPS system, which includes illness and accident insurance, maternal leave, pensions, and other benefits.

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<sup>21</sup>The exact thresholds vary from year to year, but generally remain around six minimum wages.

**Table 3.** Contribution rates by employers and workers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Employer									
	Wage range, MWs <sup>a</sup>	Worker	RGPS	Additional risk	Mandatory saving, FGTS	System S <sup>b,c</sup>	Education wage <sup>c</sup>	Incr <sup>c</sup>	Direct worker benefit (2+3+4+5)	Total
<b>Formal, dependent worker</b>	1-1.75	8%	20%	0.5%-6%	8%	0.6%-3.1%	2.50%	0.20%	36.5%-42.0%	39.8%-47.8%
	1.75, 2.92	9%	20%	0.5%-6%	8%	0.6%-3.1%	2.50%	0.20%	37.5%-43.0%	40.8%-48.8%
	2.92-5.85	11%	20%	0.5%-6%	8%	0.6%-3.1%	2.50%	0.20%	39.5%-45.0%	42.8%-50.8%
<b>Individual contributor, self-employed</b>	998.00-5839.45	20%	-	-	-	-	-	-	20%	20%
<b>Individual contributor, working for firm</b>	998.00-5839.45	11%	20%	-	-	-	-	-	31%	31%
<b>Individual contributor, simplified system</b>	Up to 5839.45	11% of MW	-	-	-	-	-	-	11% of MW	11% of MW
<b>MEI</b>	Monthly revenue up to 6750.00	-	5% of MW	-	-	-	-	-	5% of MW	5% of MW
<b>MEI employee</b>	998.00 only	8%	3%	-	8%	-	-	-	19%	19%

Source: Own construction using Brazilian legislation (Ministry of Economy, Portaria n.9 from 2019) and Appy, B. (2017).

Notes: a. One minimum wage (MW) corresponds to R\$988 (in 2019). b. These are the lower and upper limits of contributions to nine paralegal entities. The actual contribution varies with sector and may include more than one entity. In general, they sum to 3.1%. c. Not directly converted into benefits for workers.

Independent workers must also contribute to social security. Because *universality* is one of the founding principles, contribution is mandatory for all workers. If workers provide their services to a firm, the firm must also collect 20% of their earnings beyond the 11% that should be discounted from the payment made to the service provider. This 11% tax on payments must also follow the same cap in the case of dependent workers. This means that, up to this cap, the total contributions to the social security system are 31% of the earnings of independent workers. Independent workers who do not provide services to a firm (such as taxi drivers) must contribute individually to the social security system with 20% of their earnings and follow the same cap. Formal independent workers have access to the same benefits as dependent workers. Nonetheless, they are not covered by UI, which is for dependent workers only.

Two special contribution regimes were created in 2007 and 2009, the Simplified System of Contribution and individual microentrepreneurs (MEI).<sup>22</sup> They reduce the contribution to a fixed amount of respectively 11% and 5% of the minimum wage, with the drawback that they do not provide the full range of benefits available to regular contributors (see below). Individual contributors in the simplified system cannot provide services to firms. MEIs can do so, and they also must register as legal entities. This is the reason the contribution for MEIs is placed in the column referring to firms instead of workers. MEIs are limited to revenues up to R\$81,000 a year, or R\$6,750 a month, approximately 6.5 minimum wages per month.<sup>23</sup> They may also hire one employee who can be paid only one minimum wage.<sup>24</sup> If a worker is hired by an MEI, the MEI must collect 3% of the worker's wages in the form of contributions to the social security system, plus 8% for the worker's mandatory savings account (FGTS), which represents a 11% tax on payroll, apart from the 8% that the worker must contribute. The simplified system and the MEI are special programs that are designed to boost the coverage of social security among low-skilled workers. (We discuss them in more detail in the next sections).

Apart from the contributions to social security, firms must also pay for additional sectoral risk, which depends on the kind of activity involved on the danger associated with it. These contributions vary from 0.5% to 6%. Employers must also deposit 8% of a worker's wages in an individual account as mandatory savings, the FGTS. These accounts are firm-employee specific, and workers may withdraw money from them under a few circumstances, such as unlawful firing, retirement, illness, or to finance housing investments. These mandatory savings pay yearly interest rates of only 3%. Although Brazil has gone through a large reduction in interest rates recently, the lowest interest rate for private savings accounts was around 6% a year in the 2010s. Therefore, workers are indirectly taxed by these mandatory savings.

These listed contributions are direct (future) benefits to workers. Together, they amount to 36.5% to 45.0% of a worker's wage, depending on the wage value and the sector of activity. However, whether workers consider the benefits worth the cost is not clear. In particular, the FGTS contribution can be understood as an indirect tax, as the mandatory savings pay only a small interest rate, and workers are likely to withdraw from their accounts as soon as they can. For instance, in 2019, the government allowed for withdrawals up to R\$500 (around a half minimum wage), which resulted in more than 240 million withdrawals.<sup>25</sup>

Workers may also not value their contributions to social security so much. Low-wage earners may have better outside options that are non-contributory (see below). More importantly, workers are not entitled to restitutions of their past contributions in case they fail to achieve the minimum 15 years of contributions necessary for retirement. Because of high informality and turnover, many workers risk contributing to the system even though they will not benefit from retirement. In case this happens, their contributions can be understood as an indirect

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<sup>22</sup> Not to be confused with the Simples Nacional. The Simplified System of Contribution is a cheaper contributory system for social security for independent workers, while the Simples Nacional is designed for firms and aims at simplifying tax collection.

<sup>23</sup> The actual threshold is established for the whole year. Monthly values are only presented to simplify comparisons. It does not matter if an MEI's revenue exceeds R\$6,750 in a particular month, as long as annual earnings do not exceed the R\$81,000.00 limit.

<sup>24</sup> Moreover, MEIs have to pay an extra monthly fee of R\$1.00 if they are in the commerce or manufacturing sector, R\$5.00 if they are in the service sector, and R\$6.00 if they are in both commerce and services.

<sup>25</sup> Accounts are firm-employee specific; each worker may thus have several accounts, one for each firm where the worker is employed.

tax.<sup>26</sup> The number of individuals who do not achieve the required years of contributions can be estimated as the percentage of individuals who start receiving the BPC relative to all individuals who start receiving any retirement benefit each year. In 2018, the share was nearly 13% of all new retirees (SPREV, 2018). This indirect tax is likely to be much higher among low-wage earners because they are informal or out of the labor force more frequently. For instance, from 40% to 50% of formal workers in the bottom quintile of the earnings distribution in one year will have a formal job one year later, while the share is around 90% in the top quintile. Administrative data (SPREV, 2017) show that only half of contributors to social security do so throughout the 12 months of the year, while around 25% contribute for only 6 months, and this share is larger among independent contributors, the ones with lower earnings. The Development Bank of Latin America reports that the density of contributions in the bottom quintile of the income distribution is only 35%, compared with 71% in the top quintile (CAF 2020).

None of the remaining payroll taxes can be considered a direct benefit to workers. They are the following: (1) System S, a contribution directed at parafiscal entities that provide many services to workers and society in general, such as training, schooling, and cultural activities; (2) education wage, a payroll tax that funds programs to improve public basic education for all; and (3) INCRA, a tax that finances the Instituto Nacional de Colonização e Reforma Agrária (Brazilian Agency of Colonization and Land Reform, INCRA). These taxes add up to 5.8 percentage points to the already high payroll taxes, which may surpass 50%.

What are the impacts of such high payroll taxes on the Brazilian labor market? Baumgartner *et al.* (2020) investigate a large reduction in payroll taxes that averaged 51% in selected sectors in Brazil in 2011-2014.<sup>27</sup> They find that treated sectors observed a rise in employment of 5%, while no impact on wages were observed. Moreover, they find that the increase in hiring was driven mostly by existing firms hiring more workers instead of new firms entering the market. However, the study is based on matched firm-employee data on formal dependent workers in Brazil. The estimated effect may therefore simply be the result of reallocation of independent or informal workers.

By exploiting the introduction of the MEI legislation in 2009, Rocha, Ulyssea, and Rachter (2018) also find an increase in firm formality after tax reductions. They exploit changes in the tax rate applied to MEIs in 2011 that reduced the rate from 11% to 5% of the minimum wage, while holding constant other costs. Because the MEI is restricted to some, but not all industries, they use program eligibility as a source of exogenous treatment assignment. They find that sectors eligible for the program experience an increase of 4.3% in the number of formal firms. This expansion in formalization occurs because existing informal entrepreneurs are becoming formal. Moreover, they show that simply reducing registration costs has no impact on formalization; the effect is driven entirely by tax cuts.

A few remarks are warranted on payroll taxes in Brazil. The first is that neither UI nor health care are financed through payroll taxes. Funds for the public health system, which covers the whole population and not only formal workers, come from the overall government budget. UI is financed through revenue taxes—the PIS in the case of workers in the private sector—that are

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<sup>26</sup> However, the worker will still be covered by other benefits, such as illness and accident insurance. Therefore, the indirect tax would not strictly be 100% of the contribution, although retirement benefits are the key benefit provided by the RGPS.

<sup>27</sup> The usual tax rate of 20% on payroll was replaced by a tax on revenue of 1% or 2%.

directed towards the Fundo de Amparo ao Trabalhador (Workers Assistance Fund, FAT). This is a particular characteristic of the Brazilian system and may have important consequences in labor markets because the costs of UI are not properly internalized through contributions paid by firms. As far as we know, Brazil is the only country in Latin America that does not finance UI through payroll taxes. Second, the minimum wage may exacerbate the effects of high payroll taxes on employment, particularly among low-wage earners, because the wage floor prevents firms from shifting back contributions to workers in the form of lower wages. In this case, an overly high minimum wage may act as a tax on the hiring of legal dependent workers.

## 5. Social security and (dis)incentives to formality

The usually large tax rates applied to legal, formal jobs in Brazil are a great toll that firms and individuals must pay to formalize, unless they are allowed to take part in programs, such as the Simplified System of Contribution or the MEI. Nonetheless, a full range of disincentives emerges if the way retirement benefits are paid to contributors and the nature of the non-contributory retirement options are also considered.

Up to 2019, there were two ways in which RGPS contributors could retire in Brazil.<sup>28</sup> The first was *retirement by age*. Men who reached 65 years of age and women who reached 60 could retire if they had made at least 180 months of contributions to the system. Under this regime, the benefits paid to retirees start at 70% of the benefit-wage and increase by 1 percentage point for each year of contribution in addition to the required 15 years.<sup>29</sup>

The second kind of retirement was *retirement by years of contribution*. Men could retire through this modality after 35 years of contributions, whereas women needed 30 years. There were no age requirements in this modality, although age mattered in determining the final amount that would be paid as a benefit, with penalties for those who retired too early.<sup>30</sup> One of the differences between regular contributors and contributors either in the simplified system or in the MEI is years of contribution. Regular contributors may apply for retirement by years of contribution. For contributors either in the simplified system or in the MEI, years of contribution is only relevant for achieving a minimum when they retire by age. This difference may potentially affect worker decisions to remain in these systems longer and reduce the incentives to become legally hired by a firm.

Most important of all, both forms of retirement had a floor benefit of one minimum wage, which was adjusted automatically if necessary.<sup>31</sup> The ceiling was the same as the ceilings on contributions. In the case of the Simplified System of Contribution and MEI, the retirement benefit is one minimum wage because this is the contribution wage. If contributors do not

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<sup>28</sup> In 2019, the Brazilian Congress approved a major reform in the retirement system, particularly motivated by growing deficits in the system. We do not explore this change given that it has only recently been implemented.

<sup>29</sup> The benefit-wage is the average of 80% of the highest wages on which the beneficiary contributed to social security. The values are not adjusted by inflation.

<sup>30</sup> If the sum of the years of contribution and age is greater than 86 years among women and 96 years among men, no penalties are applied. Otherwise, a penalty calculated by a formula that accounted for years of contribution, life expectancy and age was applied.

<sup>31</sup> There are two clauses in the Brazilian Constitution stating that social security and assistance benefits, including retirement, other RGPS benefits, and the BPC, must equal at least the minimum wage. Benefits above this are adjusted by inflation.

reach the required 15 years of contribution necessary to retire by age, then they have access to a non-contributory retirement program through the BPC. The only requirements are that the individual must be at least 65 years old and have household per capita income below one fourth of the minimum wage. Hence, no contribution is required to access this benefit. The amount paid to BPC beneficiaries is also one minimum wage. However, any contributor that does not reach the minimum requirements for retirement does not have the right to reclaim their past contributions. Increases in the minimum wage will thus simultaneously raise the retirement floor benefit and the retirement benefits of MEIs, contributors to the simplified system, and participants in the BPC. This increases the incentives associated with informality, especially because retirement benefits above the minimum wage are not adjusted according to the minimum wage, but according to inflation rates.

Although the BPC is an important tool in fighting poverty among the elderly in Brazil, it introduces distortions into the labor market. This is so because the benefit paid out is precisely the floor benefit among those retiring after contributing for at least 15 years, while the age requirement is the same as the age requirement for men retiring by age, even though no contribution is necessary. This program thus creates incentives for low-wage earners to avoid formality and the associated payroll taxes. Hence, for workers receiving wages around the legal minimum wage, it might be more important to avoid the 8% contribution to social security because they will probably retire at the same age with the same benefit as dependent workers in the formal sector receiving an equivalent wage.<sup>32</sup> Because enforcement is generally weak, the incentive to be informal and not comply with mandatory contributions dominates. In this sense, the BPC promotes illegal behavior among workers and firms by offering benefits to workers who do not contribute.

Not only can workers choose whether to contribute, but they can also arbitrage (within some limits) among the many contributory regimes, assuring similar retirement benefits while they pay lower contributions. Although we postpone a full discussion of the different contributory and tax systems in Brazil to section 8, these simplified systems of contribution may bring incentives to the economy. Workers who receive the same net wage (discounted by contributions to social security) may be much less productive if they choose to take part in the economy as MEIs or in the simplified system for individual contributors rather than as legal dependent workers or regular individual contributors. This generates a form of indirect subsidy among independent low-wage earners. It is no wonder that the number of such workers has grown considerably since these categories were created. In fact, firms may pressure workers to become MEIs that provide the same services, thereby allowing the firms to avoid some payroll taxes. Although this may generate tax savings, it also increases the potential for legal disputes because MEI providers could claim they were dependent employees.

MEIs are given such a large subsidy and are allowed such high revenues that many individuals in the top of the household income distribution choose this form of contribution, thus distorting one of its objectives, to help provide social security coverage to poor individuals. Ansiliero, Costanzi, and Fernandes Roloni (2020), using data from the PNAD 2014, report that MEIs have demographic and income characteristics that are much closer to those of formal and legal dependent workers than to those of other independent workers. For example, 40% of MEIs live in households with per capita incomes higher than two minimum wages, while the share is only 15% among other self-employed workers.

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<sup>32</sup> They can also avoid a 11% or 5% tax if their alternative option is either the simplified system the MEI.

In a nutshell, this section discusses two important distortions present within the pension system in Brazil. The first is a result of a non-contributory retirement program (BPC) that provides benefits that are similar to the benefits of a contributory retirement program, thus creating incentives for informality among low-wage earners. Second, the different categories of contributors allow workers to arbitrage within the system, which ends up promoting independent workers (in the MEI or the Simplified System of Contribution) and may benefit people in the middle of the income distribution instead of people at the bottom.

## 6. Conditional cash transfers and informality traps

Brazil is home to one of the largest CCT programs in the world, Bolsa Família. This is a means-tested program that benefits around 14 million households, nearly 20% of the 69 million households in Brazil. The eligibility criteria are as follows: households with members who are pregnant or with children ages 0-17 must have per capita income of up to R\$178 (a little less than 20% of the minimum wage); households without children or pregnant woman are eligible if the household per capita income is below R\$89, which is less than 10% of the minimum wage. Moreover, transfers are conditional on children ages 0-7 receiving all vaccines; children ages 6-15 (and ages 16-17) in school with 85% (75%) attendance; and women taking part in health checkups and child-care courses if they are pregnant or breastfeeding. The basic benefit is R\$89 per month, plus an additional R\$41 per child or pregnant woman (up to five additional benefits). For adolescents ages 16-17 (up to two), transfers rise to R\$48 per adolescent. There is a flexible payment for households that are still living below the extreme poverty line even after counting the benefits that complement their incomes.

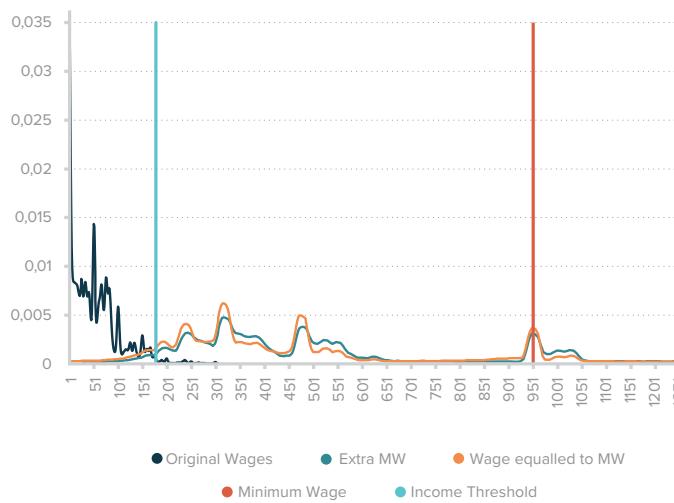
The Bolsa Família is a well-focused program because it supports mostly households in the bottom deciles of the household per capita income distribution (see Figure 4). Among its merits is the huge success in reducing extreme poverty and raising health and education among beneficiary children.<sup>33</sup>

Even though studies do not find any effects of CCTs programs on labor supply, it may be the case that individuals reallocate their work supply towards the informal sector with the objective of hiding their income from detection, thus avoiding losing their benefits. Moreover, even if Bolsa Família is not directly attached to either formal or informal jobs, it is more difficult for households to comply with a fixed income threshold if the minimum wage is rising, but the household is small. This is illustrated in Figure 9, in which we plot the distribution of household per capita income across all households that are registered to receive Bolsa Família, together with the counterfactual income distribution in case (1) a household member starts receiving one minimum wage, and (2) the income of a household member is supported to reach the minimum wage. The result is that most households would not be eligible for the Bolsa Família given the current household size.

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<sup>33</sup> For instance, see Ribeiro, Shikida, and Hillbrecht (2017); de Brauw et al. (2015b).

**Figure 9.** Household per capita income of Bolsa Família beneficiaries, actual and counterfactual



Source: 2018 data on Bolsa Família, Cadastro Único (dashboard), Ministério da Cidadania (Ministry of Citizenship), Brasília, Brazil, <https://aplicacoes.mds.gov.br/sagi/portal/index.php?grupo=212>.

Bolsa Família may therefore act as an informality trap by creating disincentives for households to supply labor to the formal sector of the economy. This is in fact the finding of de Brauw *et al.* (2015a). They show that Bolsa Família does not influence overall workforce participation or hours of work. However, they do find a shift of nearly eight hours of work per week per household member to the informal sector from the formal sector, driven mostly by urban households. Table 4 presents formality rates among poor households and households that benefited from Bolsa Família in 2004, the second year of the program, and in 2019. We observe, as expected, that poorer households exhibit higher informality rates. Yet, within the same household per capita income range, informal workers are more likely to live in households that receive Bolsa Família. Differences between 2004 and 2019 may reflect changes in average incomes in the bottom of the income distribution, increases in the real minimum wage, and the expansion of the program, which expanded from 9.9 million households in 2004 to more than 14.0 million in 2019.

**Table 4.** Formality rates among members of poor households and Bolsa Família beneficiaries

Receives Bolsa Família?	Extremely poor		Poor		One MW per capita	
	No	Yes	No	Yes	No	Yes
<b>2004</b>						
Formal	13.80	10.00	35.60	28.56	53.86	44.51
Informal	86.20	90.00	64.40	71.44	46.14	55.49
<b>2019</b>						
Formal	9.87	6.42	37.52	15.85	57.62	27.50
Informal	90.13	93.58	62.48	84.15	42.38	72.50

Sources: PNAD 2004; PNADC 2019.

Note: Extreme poor, poor and one MW per capita are households with monthly household per capita income within the following ranges: 0-R\$178], R\$178-R\$356, and R\$356-R\$998, respectively, adjusted by 2019 R\$ prices.

## 7. Unemployment insurance and labor turnover

Another benefit that covers legal dependent workers is UI. This program is financed by revenue taxes instead of payroll taxes, which is an anomaly relative to the practice in other countries that offer this benefit, including Latin American economies. In 2018, UI expenditures were around R\$33.08 billion, which would correspond to payroll taxes of around 2.5%. The UI regulation in Brazil underwent reform in 2015 that changed the eligibility criteria. Before the reform, workers were entitled to 3, 4, or 5 months of UI benefits if they had worked in registered jobs for, respectively, 6 to 11, 12 to 23, and 24 or more months. The benefit paid was an average of the last three wages and ranged from 1.0 to around 1.7 minimum wages. Because replacement rates decreased as wages rose, low-wage workers received higher relative benefits than high-wage workers. After the reform, the rule for benefit levels remained the same, but the eligibility criteria were modified to be stricter. In its final version, workers are now required to have been on the job for at least 12 months continuously to access UI benefits for the first time.<sup>34</sup> The benefit is paid for 4 months if they have worked between 12 and 23 months and then for 5 months if they have worked at least 24 months. The next requisitions have less strict requirements.<sup>35</sup>

What are the impacts of these UI rules in a country with such high levels of informality? In general, economists believe that, given the existence of the informal sector, workers would explore these rules to maximize their UI benefits by combining periods of work in the formal and informal sector. However, studies evaluating UI in the Brazilian context show that this effect is not so straightforward. On the one hand, Van Doornik, Schoenherr, and Skrastins

<sup>34</sup> There was a temporary, more restrict version that lasted for 3 months and required 18 months of tenure before accessing the benefit.

<sup>35</sup> For the second time, access to 3, 4, and 5 months of benefits are granted to those who have worked, respectively, 9 to 11, 12 to 23, and 24 or more months. For the third and subsequent requirements, the number of benefits and required tenure are the same as those before 2015.

(2018) and Carvalho, Corbi, and Narita (2018) find evidence that UI creates incentives for workers and employees to behave strategically to aim at collecting UI benefits. Using the change in legislation in 2015 as an exogenous change in policy, Carvalho, Corbi, and Narita (2018) show that UI accounts for around 11%-13% of the average dismissal rates among eligible workers. Van Doornik, Schoenherr, and Skrastins (2018) find that UI increases layoffs among legal dependent workers by 12%. They also show evidence that workers who have been laid off transition into informality and that they are recalled after benefits cease, which is evidence that firms and workers collude to extract rents from UI through lower equilibrium wages. Given the rules that determine benefit level, it is expected that such effects are much more pronounced at the bottom of the wage distribution, where replacement rates are higher. Therefore, it is possible to argue that UI benefits also contribute to the turnover rates and the transition across informal and formal sectors in Brazil, particularly at the low end of the wage distribution. This strategic behavior may arise in part because neither firms nor workers internalize the costs of UI because it is financed through revenues instead of payroll taxes, thus breaking any direct links between contributions and benefits.

On the other hand, the efficiency costs of UI in high informality contexts may be small, according to Gerard and Gonzaga (2020). Investigating the same change in UI policy, they find the presence of moral hazard in returning to legal dependent jobs. However, the efficiency costs of this behavior are lower in labor markets with higher informality. This counter-intuitive finding arises because, in markets with high informality, reemployment rates are already lower than in places with more formal jobs. Therefore, a higher share of workers would already draw UI benefits for longer periods in high informality labor markets even in the absence of moral hazard. Of course, their estimates ignore other potential efficiency costs that may arise from higher turnover, such as lower job learning and lower acquisition of specific human capital that can raise worker productivity in the long run.

UI benefits may also impact firm behavior. Van Doornik *et al.* (2020) find that more generous UI benefits are associated with a reallocation of labor supply from safer to riskier firms.<sup>36</sup> Using the change in Brazilian UI policy, they find employment drops and wage increases in response to UI that are larger among riskier firms. The reason behind this phenomenon is that, by increasing the risks associated with unemployment, workers will demand a wage compensation to work in riskier firms. They also find that individuals are less likely to start a new business in municipalities experiencing larger reductions in UI benefits. Moreover, the average quality of new business increases after UI reform.

## 8. Corporate taxes and special tax regimes

The complexity of Brazil's tax system on firms has led to the creation of the Simples Nacional, a simplified taxation system for small firms. It was passed into law in 2006 and has gone through many changes over the years. Its defining advantage is the unification of several taxes on profits, revenue and payroll into only one tax, on revenue.<sup>37</sup> The applied rate varies by sector of activity and according to total revenues, ranging from 4% to 30%. The tax rate

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<sup>36</sup> They measured risk by firm layoff intensity and credit risk.

<sup>37</sup> They are the following: the tax on the movement of goods and services, the tax on industrialized products, the income tax on legal entities, the social contribution over net profits, the tax on services, the contributions to the National Integration Program, and the contribution to the National Social Security Institute.

increases with the amount of revenue, although there is a discontinuity among firms crossing from the second-last to the last tax bracket.

Apart from simplifying the tax system and favoring the creation of new business, the Simples Nacional also works as a form of incentive for firms to stay small. As firms in the Simples Nacional grow, they either start paying higher taxes or must leave the program altogether, which increases their transaction costs by requiring the payment of more complex and potentially higher taxes.<sup>38</sup> We highlight the distortions introduced by the Simples Nacional and the MEI by illustrating the actual productivity required of workers to be profitably employed and receive the same (net) wage (Table 5).

In the first column in Table 5, we consider the case of a worker who is hired legally as a dependent worker by a firm in the regular tax system and who is paid one minimum wage. The gross wage of the worker is presented in line c. It does not include other benefits associated with a legal labor contract, such as a Christmas bonus or paid vacation. The firm must deduct 8% from the wage to pay the worker's contribution to the social security system (RGPS).<sup>39</sup> Because the minimum wage is within the earnings range that is exempt from income tax (up to R\$1.903.98 a month in 2019), the worker does not have to pay the tax. After the payment of R\$79.84 in taxes (line d), the net wage therefore becomes R\$918.16.

**Table 5.** Cost of hiring and labor productivity

	Formal, legal employee	MEI	MEI employee	Simples employee, 1st rate	Simples employee, 2nd rate	Simples employee, highest rate	Illegal, formal worker
a. Revenue	1601.90	973.06	1107.78	1146.64	1213.78	1608.72	1228.56
b. Corporate taxes	603.90	54.90	109.78	148.64	215.78	610.72	200.62
Taxes (not payroll)	261.59	5.00	0	68.80	135.94	530.88	200.62
Payroll taxes	262.47	49.90	29.94	0	0	0	0
FGTS	79.84	0	79.84	79.84	79.84	79.84	0
c. Gross wage	998	918.16	998	998	998	998	1027.94
d. Worker taxes	79.84	0	79.84	79.84	79.84	79.84	109.78
RGPS	79.84	0	79.84	79.84	79.84	79.84	109.78
Income tax	0	0	0	0	0	0	0
e. Net revenue, c – d	918.16	918.16	918.16	918.16	918.16	918.16	918.16
f. Total taxes, b + d	683.74	54.90	189.62	228.48	295.62	690.56	310.40

Source: Information summarized in Table 3.

<sup>38</sup> Whether taxes under Simples Nacional or the ordinary tax system are smaller depends on the importance of wages in total costs, profit rates, and other business's characteristics.

<sup>39</sup> This refers to the worker contribution only (first column in the first line of Table 1) and does not include the 20% tax on payroll that firms must also collect in the RGPS. If a firm legally hires a dependent worker, the firm is responsible to collect social security contributions on behalf of the dependent worker.

However, firms must also pay taxes on both revenue and payroll. Payroll taxes include all taxes in Table 3, columns 3-4 and 6-8.<sup>40</sup> Firms must also deposit 8% of worker wages into the FGTS accounts of the workers (Table 3, column 5). Firms must pay taxes that are not associated with payroll.<sup>41</sup> Overall, firms must pay R\$603.9 in taxes (line b). Therefore, adding gross wages and firm taxes (lines b + c), the minimum revenue the worker must generate to be profitable to the firm is R\$1601.90 (line a). Total taxes that must be paid are R\$682.74, including both worker and corporate taxes (line f), and represents 42.7% of the minimum revenue that renders the worker profitable (f/a).

However, workers might earn the same net wage (line d) by working under different contracts, even if they are much less productive (line a). For instance, a worker could consider working independently as a MEI. In this case, the worker would not have to pay any worker taxes because all MEI taxes are collected as a legal entity, and the earnings are below the threshold for income tax collection. Therefore, the net and gross wages (lines c and d) are the same. MEIs pay a fixed tax of 5% of the minimum wage as payroll taxes (Table 3, column 3, line 7). MEIs must also pay a small tax of R\$5.00 in case they work in the services sector. Total corporate taxes are thus only R\$54.90 (line b), and the minimum revenue a worker must generate to assume the profitability of the enterprise is R\$973.06 (lines b + c), or only 60% of the revenue required from a legal dependent worker.

Similar distortions, although less dramatic, are observed not only in the case of MEIs, but also employees hired by an MEI and legal dependent workers hired by firms under most of the tax brackets in the Simples Nacional. For instance, a firm in the first rate of Simples Nacional may hire a worker who generates only R\$1,146.46 in revenues, and the firm can still pay the worker the minimum wage. Finally, a firm may simply hire a worker illegally and pay the worker a little more than the minimum wage so that the net wage is at least R\$918.16 if the worker chooses to contribute independently to social security (Table 3, column 2, line 6). If the firm still pays taxes not associated with payroll (because, in principle, it is hiring no one), then the required productivity of a worker is R\$1,228.56, or 77% of that of a legal dependent worker. The required productivity of an illegal worker is thus even higher than that of a worker under the MEI and a Simples Nacional in the two lowest rates. This, too, highlights the large distortions introduced by these tax systems in Brazil.

These differences in the productivity required of workers introduce a misallocation of both labor and capital in the economy because equally productive activities may be profitable or not depending on the kind of legislation to which they are subject. In particular, the current legislation favors small and micro firms and independent workers to the detriment of larger firms that hire dependent workers legally. This contributes to the perpetuation of small size and low productivity in enterprises, a characteristic of developing economies in contrast to richer countries.

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<sup>40</sup> These taxes were set at the minimum possible rate in our example, amounting to 26.3%.

<sup>41</sup> These are the social contribution over net profits, the contributions to the National Integration Program, the income tax on legal entities, and the tax on services.

Table 6 contains descriptive statistics on workforce composition and firm size, using nationally representative data on both the formal and informal sectors (PNADC), as well as administrative data only on the formal sector through the Relação Anual de Informações Sociais (Annual Social Information Reports, RAIS).<sup>42</sup> We observe that formal legal workers are much more prevalent among larger firms, while illegal workers are mostly in small-size firms. Most importantly, independent workers and workers employed by firms with up to five workers comprise almost half of all workers in the private sector.<sup>43</sup> This is a large share of the workers who take part in the economic activities of small firms and microenterprises. As we can see, most of these small firms hire workers illegally: the number of illegal workers is larger than the number of legal workers. Firms with more than six workers each, however, hire mostly legal workers. Illegal labor contracts are therefore a characteristic of small firms, a pattern that has been observed elsewhere (Meghir, Narita, and Robin, 2015; Ulyssea, 2018).

**Table 6.** Workforce composition, by firm size, Brazil, 2017

a. Workforce composition, by firm size, PNADC

	Legal Millions	%	Illegal Millions	%	Independent Millions	%	Total Millions	%
<b>1 to 5</b>	4.15	6.18	6.23	9.27	22.96	34.2	33.33	49.6
<b>6 to 10</b>	4.49	6.69	1.89	2.82	0.04	0.06	6.42	9.56
<b>11 to 50</b>	6.86	10.22	1.46	2.17	0.01	0.01	8.33	12.4
<b>51+</b>	17.6	26.2	1.48	2.21	0	0	19.08	28.4
<b>Total</b>	33.1	49.28	11.06	16.47	23.01	34.3	67.17	100

b. Firm size and total legal workers, RAIS

	Firms		Total workers	
	1,000s	%	Millions	%
<b>1 to 5</b>	1891.87	69.27	4.16	11.67
<b>6 to 10</b>	403.76	14.78	3.05	8.55
<b>11 to 50</b>	363.22	13.3	7.44	20.87
<b>51 to 100</b>	38.7	1.42	2.69	7.56
<b>101+</b>	33.69	1.23	18.32	51.36

Sources: RAIS and PNADC 2017.

<sup>42</sup> The PNADC is Brazil's nationally representative panel survey that provides information on the Brazilian workforce, including legal and illegal dependent workers and independent workers. The RAIS presents administrative data on firms and employees. Therefore, it only provides information on the legal sector. See RAIS (Relação Anual de Informações Sociais) (dashboard), Ministry of the Economy, Brasília, Brazil, <http://www.rais.gov.br/sitio/index.jsf>.

<sup>43</sup> Table 6 excludes workers in the public sector, domestic workers, employers, and non-paid family helpers.

Using data from the RAIS, we observe the importance of large firms in employing legal workers. More than half of these workers are in firms with more than 100 employees. Firms that employ up to 5 workers are almost 70% of all firms registered, but they employ only 12% of the legal labor force.

As pointed out by Ulyssea (2018), more than half of Brazilian informal firms are too unproductive and would not be able to survive in the formal sector. In general, he shows that the aggregate impacts of reducing informality depend on the kind of policy that is put forth by authorities. For instance, lower entry costs in the formal sector are associated with lower total factor productivity (TFP) because they allow firms that exhibit lower productivity to survive in the formal market. Policies that reduce payroll taxes increase TFP by raising the demand for labor among formal and more productive firms and adding to the labor costs of informal and less productive firms through general equilibrium effects. Greater enforcement on the extensive margin (whether firms formalize or not) has a positive effect on TFP because it reduces the number of small unproductive informal firms. Thus, although formalization policies such as MEI or Simples Nacional might favor productivity by increasing formality, they have only a limited impact given that they favor smaller and less productive enterprises instead of benefiting all firms equally. The positive effects on TFP are minimized because only small low-productive firms formalize.

Another distortion that the Simples Nacional introduces in the economy and that may greatly affect inequality is the incentives to turn high-skilled workers into firm associates, which is a common practice among lawyers. Appy (2017) provides the example of a high-wage earner at similar levels of productivity. Table 7 displays how much taxes such a worker would pay under various contract and taxation systems. The first column depicts the case in which the worker has a legal contract as a dependent worker. Columns 2 and 3 consider the worker in association with a firm under the presumed profit regime and the Simples Nacional.<sup>44</sup>

The differences in net income across these regimes and legal labor contracts is more than 40%. These differences contribute to greater inequality because one would expect that such options are available mostly to high-wage earners.

We highlight that the use of the taxes on firm revenue that does not generate tax credits from purchased inputs—as is the case of Simples Nacional—creates other distortions in the productive sector. First, it does not offer any incentives for firms to rely on formal suppliers, which would be the case in the presence of a value added tax, for instance. In a value added tax system, firms would benefit from buying from formal suppliers because they could discount from their own taxes those values already paid in previous stages of the production chain. Second, this form of taxation places a greater burden on products that rely on a longer production chain, thus creating room for misallocation of resources. This happens because, at each stage of production, each firm that takes part in the process will have to pay a tax equal to a share of its revenue without any discount from tax credits generated by suppliers. The more firms in the production chain, the more taxes are paid. In the case of a value added tax, firms could discount from their own taxes those taxes already paid upstream (Appy 2017).

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<sup>44</sup> The presumed profit regime is a taxation regime for firms that make up to R\$78 million a year in revenue. It differs from the real profit regime in that it is simpler to compute and the taxes are computed based on shares of the revenue (presumed profits) instead of actual (real) profits.

**Table 7.** Wages and taxes under different tax regimes, 2016

	Employee	Share hold	
		Presumed profit	Simples
a. Added value of service	30,000	30,000	30,000
b. Taxes paid by firm	9,788	4,518	2,463
Taxes, excluding payroll	2,856	3,480	2,463
Payroll taxes, excluding FGTS	5,316	1,038	-
FGTS	1,617	-	-
c. Taxes paid by employee	5,103	974	974
INSS employee/self-employed	571	571	571
Income tax	4,532	403	403
d. Net income (a - b - c)	15,109	24,508	26,563
e. Total taxation (b + c)	14,891	5,492	3,437

Source: Appy 2017.

Note: Simple taxation is based on complementary law 123/2006, annex 3. INSS = National Social Security Institute.

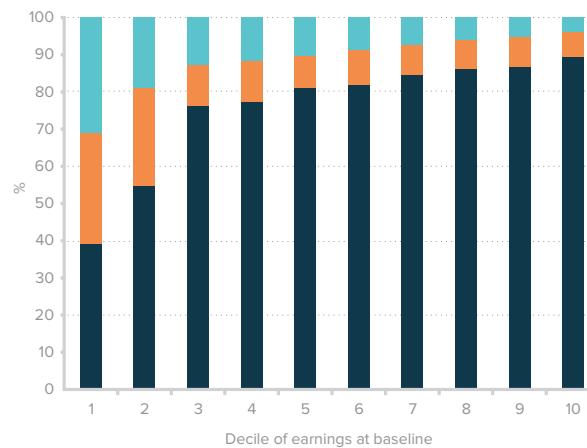
## 9. The effects of the social protection system on income volatility

Might the social protection system be responsible for the high volatility in income among low-wage earners? Among low-wage earners, non-contributory retirement is similar to contributory retirement. There is thus little incentive for low-skilled workers to remain in the formal sector. Moreover, given the design of UI, low-wage earners and employers may collude to extract rents from these benefits, thereby increasing turnover. These factors may contribute to higher transitions between formality and informality among less highly skilled workers and hence contribute to the volatility in the earnings of these workers. Figure 10 presents the share of workers that transition from formality and informality towards formality, informality, or out of the workforce by deciles of the distribution of labor earnings. In panel a, all workers were formal (contributed to social security) in 2018, while, in panel b, all workers were informal. The shares refer to the formality situation of these workers in the same quarter of 2019, one year later, according to the decile of earnings of the workers in 2018. We observe that transitions towards informality or out of the workforce are much more common in the bottom deciles of the earnings distribution. Moreover, while low-wage earners who are informal at baseline tend to leave the workforce or remain informal, high-wage earners are much more likely to transition to the formal sector.

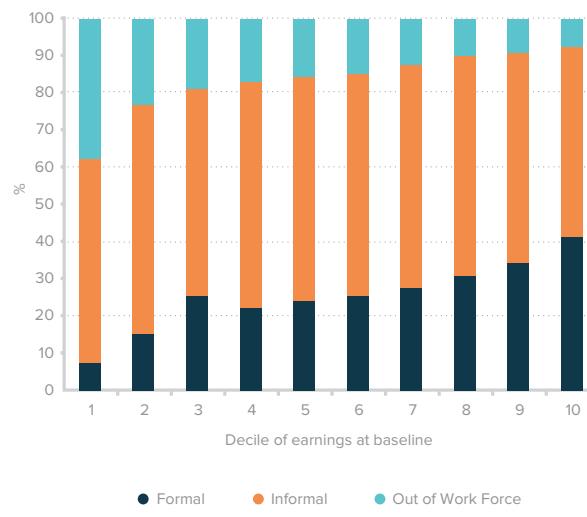
Table 8 displays yearly transitions across a broader range of categories and compares these transitions among the bottom and top quartiles of household per capita income. We observe that workers are much more likely to remain in legal dependent jobs in the top quartiles. Similarly, they are also much more likely to remain in independent jobs, probably because the nature of these jobs is different across these groups. Independent workers in the bottom of the household per capita income distribution are much more likely to leave the workforce. Similarly, dependent worker hired without legal labor contracts in the bottom of the distribution are much more likely to become unemployed or leave the workforce, while such workers in the top of the distribution are more likely to transition to a legal contract as dependent workers. If unemployed, workers in the top of the household per capita income distribution are also more likely to find jobs with legal rather than illegal labor contracts, and poor workers are more likely to become independent rather than dependent workers.

**Figure 10.** Share of transitions across formality, by decile of earnings at baseline

**a. Formal at baseline**



**b. Informal at baseline**



Source: PNADC 2018/2019.

**Table 8.** Year-to-year matrix transition, by quarter of household per capita income, 2018/2019

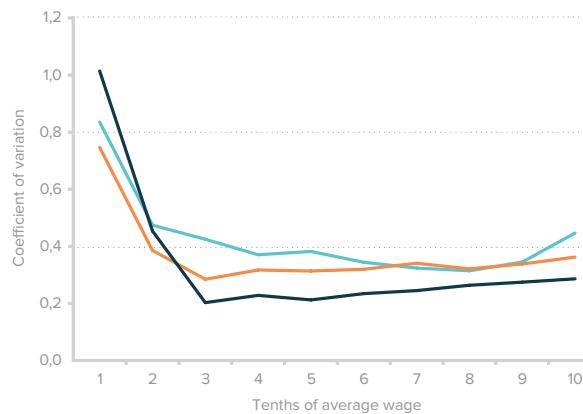
a. Bottom 25% of the household per capita income distribution					
	Legal dependent	Illegal dependent	Independent	Unemployed	Out of workforce
Legal dependent	71.1	8.7	6.9	9	4.3
Illegal dependent	4.9	48.1	12	12.2	22.8
Independent	2.3	10.3	53.5	6.5	27.3
Unemployed	12.8	17.4	13.1	30.9	25.8
Out of workforce	1.2	3.6	4.5	4.3	86.4
b. Top 25% of the household per capita income distribution					
	Legal dependent	Illegal dependent	Independent	Unemployed	Out of workforce
Legal dependent	86.2	4	2.6	3	4.2
Illegal dependent	23.3	47.7	13	5.1	10.9
Independent	5.6	6.8	75.4	3.1	9
Unemployed	21.4	13.2	9.7	29.6	26.1
Out of workforce	3.4	3.8	3.7	5.4	83.8

Source: PNADC 2018/2019.

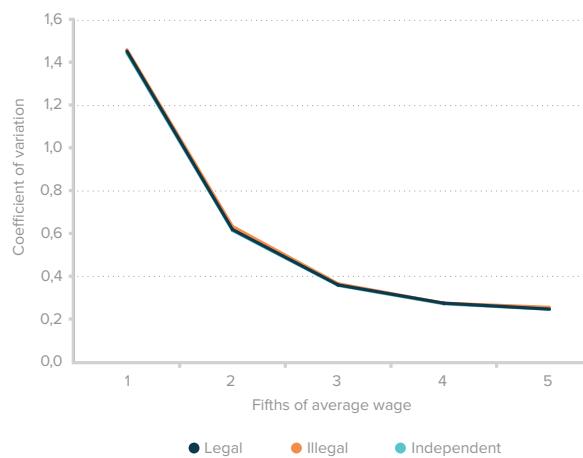
Workers in the bottom deciles of the wage distribution also face much higher volatility (see Figure 3). Is there a link between income volatility and formality? Figure 11 plots the coefficient of variation in effective wages and splits the sample among workers who had legal labor contracts at baseline, workers without legal labor contracts and independent workers (panel a). Similarly, it plots the coefficient of variation of household per capita income and splits households along the same lines, considering the occupation of the head of the household at baseline (panel b). We observe that, on both measures of volatility, the main determinant seems to be average income, rather than occupational position.

**Figure 11.** Coefficient of variation of earnings along the income distribution

a. Individual effective wage volatility



b. Household per capita income volatility, by occupation of household head



Source: PNADC 2018/2019.

Some hypotheses may be considered to explain this association between income volatility and average income rather than occupational position. First, even though formality does not impact volatility, the overall institutional setting, including social security and UI, may create incentives for high labor turnover. This increases income volatility, especially among low-skilled workers because these workers are more likely to respond to the incentives.

Second, it may simply be the case that low-skilled workers face more difficulties in remaining in the same jobs for long periods because of their lack of human capital. For instance, if the complementarity between general and specific human capital is low, there are few gains to be made by holding the same position for longer periods. Hence, even if formal job positions are available, the benefits of long-lasting job contracts are small.

Third, low-wage earners may mostly work in small firms, which are more likely to exit than larger ones (Bartelsman, Haltiwanger, and Scarpetta, 2009; Coelho, Corseuil, and Foguel, 2017). In this case, firm exits result in worker turnover. This effect would be more pronounced among workers in the bottom of the income distribution. Because high rates of job-to-job

transition are a possible reason behind higher earnings volatility, differences in worker composition across firm size is likely to impact earnings volatility. Because of this channel, special tax regimes for small firms and microentrepreneurs might be another factor increasing earnings volatility.

Of course, these explanations may reinforce one another. Thus, because losses on the investments in specific human capital are small, the benefits of being laid off and receiving the UI benefit are larger than would be the case if workers expect to receive benefits from these human capital investments in the long run. Also, if there are no risks of facing reductions in retirement value from changes in occupational position or some unemployment spells, there are no strong incentives to find stable jobs. Moreover, because there is no clear benefit of long-lasting job contracts, there is no incentive to find jobs in firms that are likely to remain longer in the market.

## 10. Conclusion

Brazil has created a large social protection system for its population. One of the greatest merits of the system is its goal to establish universal coverage in social security, social assistance, and public health care. Every individual has access to the public health system, irrespective of their positions in the labor market. Every individual is eligible to access a safety net in case their incomes fall short of some threshold. And every worker should be covered by social security because participation is mandatory. Nonetheless, many workers—around 37% of the workforce—are still left out of this arrangement. In this paper, we investigate possible factors behind this large informal sector, as well as the consequences of the social protection system and other economic regulations on inequality, income volatility, and firm productivity.

The best component of Brazil's social protection system is the Universal Health System. Although we have not spent much time discussing the design of the system, it has two prominent features that deserve praise. First, because coverage is universal and does not depend on labor market participation, public health provision does not introduce any distortion in Brazil's labor market. Second, because funding comes from the overall governmental budget and is not financed through payroll taxes on covered workers, the system is redistributive (Higgins and Pereira, 2014). The social security and social assistance components of Brazil's social protection system lack these two features, especially the pension system.

The distortionary features of the social protection system are many. As we have argued, the high level of payroll taxes, severance payments, and minimum wage favor informality, especially among low-wage earners among whom the gap between taxes paid and expected benefits is larger. At the same time, the social security system does not favor the participation of these workers in the contributory system because they have similar options in the non-contributory system. Social assistance, in the form of CCTs, also acts as a form of informality trap because individuals in poor households may prefer informal jobs that do not risk their eligibility in the program. UI provides incentives for low-wage earners to collude with employers and collect UI benefits. Hence, the system in general creates many incentives for workers to remain informal. Combined with low levels of human capital, small benefits of holding to the same occupation, and large entry and exit rates among small firms, the result is a high level of income volatility among individuals at the bottom of the income distribution.

Brazil has tried to circumvent the distortionary problems generated by the social protection system. Both the Simplified System of Contribution and the MEI have the explicit aim of enlarging social security's coverage base by providing better options for workers at the bottom of the distribution. Nonetheless, they create distortions because they provide indirect subsidies among workers who remain independent or become small-scale entrepreneurs. Moreover, it is not only workers at the bottom of the income distribution who benefit from these programs; many individuals in comfortable socio-economic situations receive subsidies that were not necessary, thus increasing inequality.

Another drawback of high payroll taxes is that they increase the costs of formal businesses. Coupled with a complex tax system, the obstacles among entrepreneurs and incumbent firms can be quite large. Aiming at solving this problem, Brazil has created a simplified tax system for small firms, the Simples Nacional. Firms operating in some sectors with revenues at certain thresholds have the option of paying only one revenue tax instead of several taxes on revenue and payroll. However, this measure also generates distortions. It creates incentives for small-size firms because these pay lower taxes. It thereby subsidizes less productive firms with small revenues.

From the redistributive point of view, social security and social assistance have ambiguous effects. Social assistance offers benefits mostly to individuals at the bottom of the household income distribution. This is especially true of Bolsa Família. This has clear progressive effects on income distribution. UI is also progressive, especially because of the limited range of values received by beneficiaries. Moreover, the minimum wage is the floor for many benefits, including UI and pensions, assuring a large compression in the distribution of such benefits in past decades, also contributing to a reduction in inequality. However, social security falls short of its potential redistributive impact. On the one hand, the general system that serves workers in the private sector (RGPS) is neutral in respect to inequality; large subsidies are still being directed to more well off workers. On the other hand, the public pension system serving civil servants and military personal (RPPS) is highly regressive. On net, the nearly 6% spent on subsidizing social security does little to improve Brazil's huge inequality problem and actually exacerbates it if we take account of the public pension system. The 3.9% of GDP spent on public health and nearly 1.0% spent on social assistance have a much clearer redistributive impact. The Brazilian case shows how universal and means-tested programs are much more likely to contribute to inequality reduction, while the pension system requires a serious rethink.<sup>45</sup>

Overall, the Brazilian social protection system is marked by a trade-off between equality and protection against efficiency. However, this trade-off is not necessary if the design of some programs would be improved. Some simple policy changes could help reduce the detrimental effects of the system on economic efficiency without compromising the security of low-wage earners. First, a reduction in payroll taxes applied to all firms could increase formality and reduce distortions. The UI benefit and FGTS could be unified and the financing redesigned, linking UI to mandatory savings and financing this through payroll taxes, thereby reducing incentives for firms and employees to behave strategically. In particular, if UI

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<sup>45</sup> There was a large reform in the Brazilian pension system in 2019 that corrected some of the distortions. Nonetheless, it will take years for these changes to have any significant impact on inequality because they do not affect established benefits. Moreover, it has not properly dealt with the large deficits in the public pension system (RPPS), especially those among the military.

were incorporated as a payroll tax, the rate would have to be around 2.5%, much below the amount paid as indirect taxes in the form of System S, the education wage, and the contribution to INCRA, which cause deleterious effects on labor markets. Existing subsidies for formal low-wage earners could be linked with Bolsa Família, thereby reducing the danger of informality traps. Nonetheless, other changes would be much more complicated to implement or design, such as reforms in the tax system, the Simples Nacional, or an overall reform in the pension system. Moreover, other public policies may also have positive indirect impacts on formalization and inequality, especially those that promote skill and human capital formation in the labor force, such as health and educational investments.

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