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**DISTRIBUTIVE IMPACTS OF SOCIAL
SECURITY FINANCING IN BRAZIL**

**Sergei Soares
Carolina Bloch**

DISCUSSION PAPER



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ABSTRACT

This paper seeks to estimate the distributive impact of the taxes and other fiscal contributions that finance social security in Brazil. Making a certain number of strong hypotheses relative to the fiscal incidence of social security financing, we compute a measure of incidence that aggregates the distributive effect of the different taxes that compose tax revenues. For this, we use concentration coefficients computed by Silveira and Passos (2017) weighted by the importance of each tax in funding social security (basically by distinguishing individual social security contributions from taxes collected by the states and the Union). Our results indicate that the financing of social security in Brazil is only slightly progressive, given that the concentration coefficient of these taxes is not much lower than the Gini coefficient nor than the concentration coefficient of social security benefits.

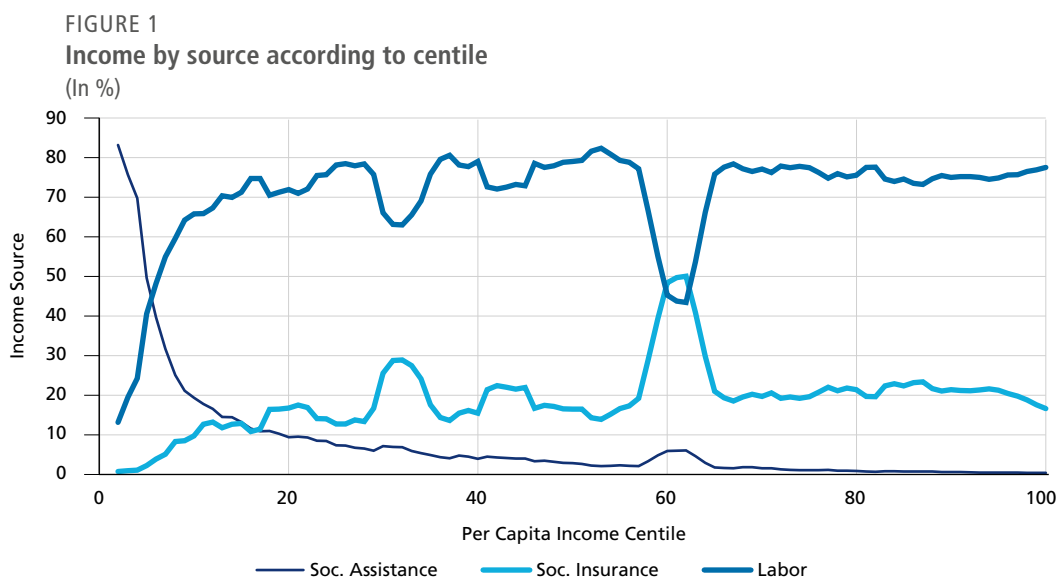
Keywords: fiscal incidence; social security.

1 THE DISTRIBUTIVE IMPACTS OF SOCIAL SECURITY IN BRAZIL

Social security is, in budgetary terms, by far the most relevant public policy in Brazil. According to the *Boletim de Políticas Sociais* No. 26, R\$ 508 billion were spent on benefits related to the General Social Security Regime and another R\$ 311 billion were spent on benefits related to the various public employee regimes in 2016. In demographic terms, Social Security is also quite relevant. The General Regime pays benefits to 29 million people and the various public employee regimes to another four million. Almost 85% of the elderly are covered by social security benefits. About 71.6% of the working age population is affiliated to a social security regime. Considering that informality haunts about 40% of labor relations in Brazil, these coverage rates are exceptional and this is the result of rural Social Security. If people in families with some kind of Social Security tie are included, 81% of the Brazilian population lives in households in some way affiliated to or benefitting from the various social security systems. The fiscal, social and economic relevance of Social Security is immense.

Income from Social Security, however, is much less relevant from the distributive point of view. Although some types of benefits are quite distributive, if social security is taken as a whole, it basically reproduces the inequality of the income distribution of those that contribute to it. Authors such as Hoffmann (2013), Souza, Vaz and Paiva (2018), and Medeiros and Souza (2014) show this using different methodologies.

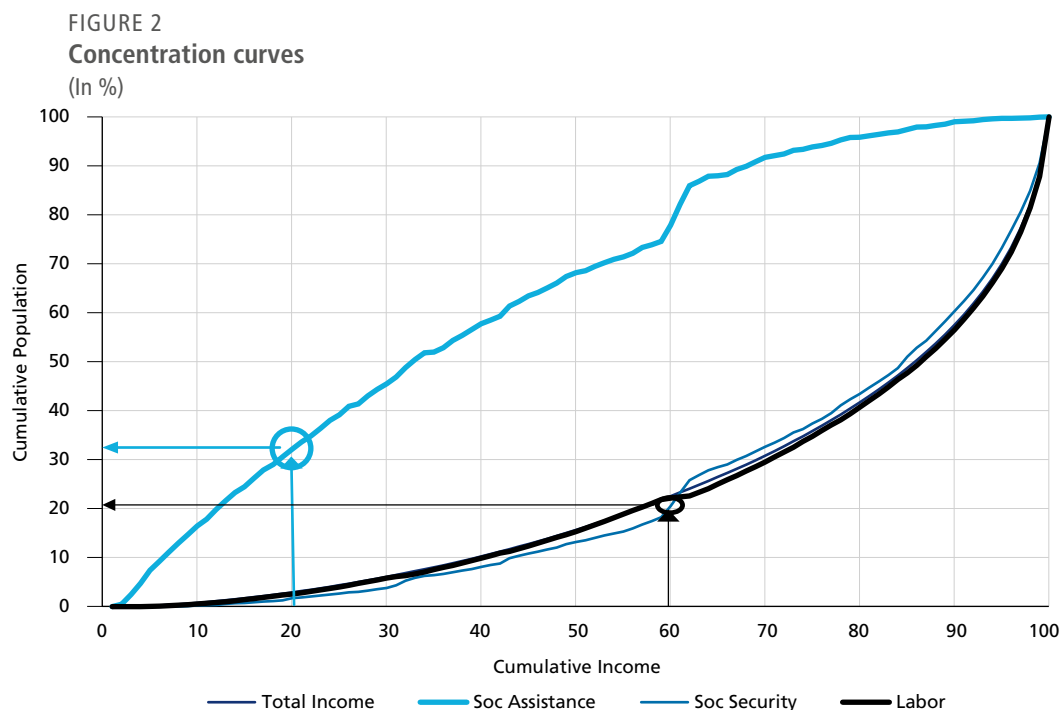
Figure 1, based upon the 2018 Continuous Household Survey (PNADC), shows the distribution of income source according to per capita income centile.



Source: PNADC, first interview 2018.

Labor income (solid blue curve) is responsible for about 75% of total income for centile above the 20th Social security income (in black) appears to be somewhat more pro-rich. While for centiles between the 20th and the 50th, it appears to be less than 20% of total income, for centiles above the 50th, it appears to be about 20% of total income. Social assistance income (in red), on the contrary, tends to very relevant to the poorest households but much less relevant to those in the six upper deciles.

Another way to see the same data is using Concentration Curves (figure 2). A Concentration Curve is nothing more than a running sum of income from a given income source. For example, the red circle in figure 2 shows that the 20% poorest Brazilians receive 32% of social assistance income. The black circle shows that the 60% poorest appropriate only 21% of social security income.



Source: PNADC, first interview 2018.

The clearest result is that total income and labor income have very similar distributions. This should not be a surprise with regards to labor income since 74% of household income comes from its laborers. What should perhaps be an unwelcome surprise is that social security income basically reproduces inequality in Brazil. This is in stark contrast to most developed countries where social security reduces inequalities.

The number that encompasses the information in a Concentration Curve is the Concentration Coefficient. The Concentration Coefficient varies from -1 when a given income source or benefit goes entirely to the poorest person in a large population to 1 when the benefit is entirely in the hands of the richest individual. A value of zero means that it is equally distributed among the population (at least relative to income). In general, a benefit or income source is considered progressive if its Concentration Coefficient is inferior to the Gini Coefficient and regressive otherwise. For taxes and other negative incomes, Concentration Coefficients are regressive if their Concentration Coefficients are higher than the Gini.

TABLE 1
Concentration coefficients for income sources in Brazil

| Income Source | Percentage of total income (%) | Concentration coefficient |
|--|--------------------------------|---------------------------|
| Total Income (Gini Coefficient) | 100.0 | 0.540 |
| Social Assistance | 1.7 | -0.272 |
| Social Security | 20.2 | 0.544 |
| Labor Income | 74.4 | 0.551 |

Source: PNADC, first interview 2018.

Table 1, above, restates that the income from the various social security regimes is slightly income concentrating. The effect is so slight that Social Security can be considered neutral, which means that it reproduces the unequal Brazilian income distribution form which its contributions are drawn. Given the immense inequality in Brazil, this finding is a disgrace.

Nothing above is news, as it has already been reported in Hoffmann (2013), Souza, Vaz and Paiva (2018), Caetano et al. (2016), and Medeiros and Souza (2014), among others.

However, as the Commitment to Equity (Lustig, 2018) work has argued, the distributional impact of a given public policy depends not only upon who is receiving benefits but also on who is paying for them. The objective of this text is to make the best estimate possible of the fiscal incidence of the taxes that finance Social Security. Unfortunately, the 2017/2018 POF Consumption Survey data is not yet available to researchers and thus we will not make any new estimates of fiscal incidence for Brazil. We will instead use estimates for fiscal incidence found in the literature using the 2008/2009 POF.

2 FISCAL INCIDENCE OF SOCIAL SECURITY FINANCING

We need two pieces of information to estimate the fiscal incidence of the taxes that finance Social Security benefits in Brazil. The first, obviously, is how much each tax contributes to financing Social Security. The second is the Concentration Coefficient (CC) of each tax. The Concentration Coefficient of Social Security financing is thus a weighted average of the Coefficients of each tax in which the revenue raised by each tax is its weight. In symbols:

$$CC_{social\ security} = \sum_k CC_{tax\ k} \frac{revenue_{tax\ k}}{total\ revenue} \quad (1)$$

Conceptually it is quite simple. If the weighted average of the Concentration Coefficients of the taxes which finance Social Security is above the Gini Coefficient, then this financing is progressive (reduces inequality at the margin). Otherwise it is regressive. Alternatively, we could compare the tax and benefit Concentration Coefficients.

Unfortunately, neither the tax-specific Concentration Coefficients nor the revenue raised by each tax in financing Social Security are easily calculated. Their estimation requires many heroic hypotheses.

Let us begin with which taxes finance Social Security benefits. The first is easy. Almost all of the Individual Social Security Contribution finances Social Security benefits. More than that, each person's contributive history largely determines when they can retire and how large their pension will be. However, this tax finances only R\$ 513 billion of the R\$ 818 billion in pension expenditures.

This leaves 37.7% of pension expenditures to be financed through other taxes. In principle, the 1988 Constitution determines which taxes are earmarked for Social Security: CSLL, Cofins, PIS/PASEP and so on (see appendix A for the definitions of each tax). But unfortunately, things are not that simple. These taxes are all subject to the *Desvinculação dos Recursos da União* (DRU). The DRU is a Constitutional Amendment which allows the government to take up to 30% of all taxes, including all those mentioned above, and use them for whatever it likes (usually to pay interest on the debt). Further complicating the calculation is the fact that the Social Security budget (post-DRU and including health expenditures) has a large deficit, which is financed by all other taxes (i.e. those not earmarked for Social Security). Finally, the pension systems of the states are also in the red and faced a financing shortfall of about R\$ 90 billion in 2016. The

municipal systems as a whole are in the black and enjoyed an R\$ 11 billion surplus in 2016 (though this will not last long).

In other words, barring the Individual Contribution, any link between specific taxes and Social Security expenditures has long been lost. The solution we found was to assume that 98%¹ of the Individual Contribution finances Social Security and then lump all the other state and Federal taxes together proportional to how much revenue each one brings in. We can separate state and Federal taxes since they go into different wallets. In symbols:

$$CC_{ss} = \frac{502 CC_{individual} + 89.6 \sum_{state\ tax\ s} + CC_s Weight_s + 227 \sum_{federal\ tax\ f} CC_f Weight_f}{818.6} \quad (2)$$

In which R\$ 502 billion is total revenues from the Individual Contribution, R\$ 89.6 billion is the deficit of the state pension systems, and R\$ 227 billion is the deficit of the Federal systems. These numbers come from the *Boletim de Políticas Sociais* No. 26. The *weights* and *weight_f* represent revenue from each individual state and federal tax minus whatever revenue sharing goes to other federative levels.

This arrangement is far from ideal, but it is the best we can do.

Silveira and Passos (2017) publish estimations for Concentration Coefficients for various taxes, but, once again, there are many hypotheses and limitations. The first limitation is that all the estimations refer to 2008 and 2009, which are the years of the latest POF Consumption Survey. In other words, we use revenue data from 2016 and Coefficients from almost ten years before.

The second set of limitations arises from hypotheses made in order to calculate the economic incidence for the various taxes. Taxation on labor incomes, on consumption, and on businesses make the lion's share of public sector revenues in Brazil.

Let us begin with the Individual Contribution; we assume that 100% of its tax burden falls on the worker being taxed. Of course, the real economic incidence will depend upon the elasticities for labor demand and labor supply. Assuming the whole tax burden is paid workers is to assume that labor supply is totally inelastic and that

1. 98% and not 100% because of the surplus in the municipal systems.

all workers will work the same number of hours with the same effort, regardless of the after tax wage. This is a reasonable assumption for primary workers with heavy family responsibilities, but is far less reasonable for secondary workers. A young worker who lives with his parents and is both studying and working and may well decide to work fewer hours or even not to work at all if the taxman takes a very large bite from his earnings.

Likewise, we suppose that entire burden of consumption taxes falls upon the consumer. Once again, this supposes that consumption is inelastic. No one will increase his or her saving rate in order to avoid paying a broad tax on consumption; this is a reasonable hypothesis for people who are not rich facing a broad flat consumption tax. Unfortunately, a broad and flat consumption tax is as rare in the Brazilian tax jungle as dinosaurs among animals breathing today. All consumption taxes in Brazil – IPI, ICMS, ISS or Cofins – tax some goods and services more heavily than others and many goods are entirely exempt. Two vary according to jurisdiction, including ICMS, which is the most important tax in the nation. There is little to no doubt that consumption taxation changes behavior heavily. However, there is no way to realistically take into consideration the complexity of the Brazilian tax jungle when estimating consumption tax incidence. Both Silveira and Passos (2017) and Siqueira, Nogueira and Souza (2012) suppose that the consumer pays all; there are no studies of incidence that make any other hypothesis.

Tax incidence on business taxes is even harder. Businesses are fictitious people who interact with countless real people, but it is the real individuals who ultimately pay the taxes. But how much do the stockholders and executives, the consumers, and the workers of a business pay when taxes such as the ISS or IRPJ are increased to pay for more pensions? Since there are no estimates for business tax incidence for Brazil, we will use Serrato and Zidar (2016) who estimate, using certain variations in corporate taxes in the United States, economic incidence of business taxes in that country. These are not numbers that a priori are valid for Brazil, but *faute de mieux*, they are what we will use. Serrato and Zidar (2016) estimate that 40% of taxes fall upon owners and management, 35% upon workers, and the remaining 25% upon the rest of society, which we will approximate as falling upon consumption.

With all our heroic but necessary assumptions explicit, let us go to results.

The Concentration Coefficient for the Individual Contribution is estimated by Silveira and Passos (2017) at 0,6294. Medeiros and Souza (2014) estimate the same statistic at 0,635. We will, in the interest of coherence, use the Silveira and Passos (2017) number, but following Medeiros and Souza (2014) would yield essentially the same

result. This tax finances two thirds of pension expenditures in Brazil so it is the main driver of the final result.

Table 2, below, shows the Concentration Coefficients and revenues for the remaining federal taxes, again based upon Silveira and Passos (2017).² All revenues are already corrected for revenue sharing with states and municipalities.

In other words, the Concentration Coefficient of the Federal Tax burden, excluding the Individual Contribution and correcting for revenue sharing, is 0.5646.

TABLE 2
Concentration coefficients for federal taxes in Brazil

| Tax | Concentration coefficients | Revenue weight (%) |
|--------------------------------|----------------------------|--------------------|
| Cofins | 0.3698 | 35 |
| IRPF | 0.8905 | 22 |
| IRPJ | 0.6664 | 11 |
| CSLL | 0.6664 | 11 |
| PIS/PASEP | 0.3698 | 9 |
| IPI | 0.3595 | 4 |
| IOF | 0.8905 | 3 |
| Imposto sobre a Importação | 0.3595 | 3 |
| CIDE combustíveis | 0.4579 | 1 |
| Total Impostos Federais | 0.5646 | 100 |

Sources: Silveira and Passos (2017); Serrato and Zidar (2016).

The last piece of the puzzle is the Concentration Coefficient of the R\$ 89.6 billion provided by the treasure vaults of Brazil's 27 states to their deficit ridden pension systems. Table 3 shows the ICMS and IPVA Concentration Coefficients estimated by Silveira and Passos (2017) as well as their revenue weights already corrected for revenue sharing with municipalities. In addition, the Concentration Coefficient for the FPE revenue sharing fund can be calculated using the Concentration Coefficients on table 2.

2. Silveira and Passos (2017) calculate CCs for IRPF, IPI, CIDE combustíveis, and PIS-COFINS. The CCs for CSLL and IRPJ were obtained using the Serrato and Zidar (2016) weights; the IRPF CC was used as a proxy for capital income (40%), the CC for the individual contribution as a proxy for labor income (35%) and the IPI as a proxy for consumption (25%). The IOF CC was calculated using the IPI CC.

TABLE 3
Concentration coefficients for state revenues

| Tax | Concentration Coefficients | Revenue Weight (%) |
|--------------|----------------------------|--------------------|
| ICMS | 0.3703 | 74 |
| FPE | 0.7432 | 17 |
| IPVA | 0.6328 | 9 |
| Total | 0.4567 | 100 |

Sources: Silveira and Passos (2017); Table 2.

We now have the three Coefficients needed to calculate the progressivity of Social Security financing. The result is:

$$(502 \times 0.6294 + 89.6 \times 0.4567 + 227 \times 0.5646) / 818.6 = 0.592 \quad (3)$$

In other words, Social Security financing is slightly progressive; its Concentration Coefficient (0.592) is slightly superior to the Gini Coefficient (0.540) as well as somewhat superior to the Concentration Coefficient of Social Security benefits (0.544). A modified Kakwani progressivity index for Social Security could be calculated as $0.592 - 0.544 = 0.048$, which suggests that marginal reductions in Social Security benefits if accompanied by marginal reductions in their financing would slightly increase the Gini Coefficient.

Once again, given the size of Brazilian inequality and the fact that in most OCDE countries retirement benefits are quite progressive, reducing inequality by several Gini points, this is a poor result.

3 CONCLUSION

Our objective in writing this text was to contribute to the debate on social security reform by estimating the Concentration Coefficient of social security financing in Brazil and comparing it to both the Gini Coefficient and the Concentration Coefficient of social security benefits. The main result is that social security goes from slightly regressive to slightly progressive when its financing is taken into consideration. Given the magnitude of Brazilian inequality and the fact that many social security regimes in other countries are strongly progressive, this is a poor result.

Given the many strong hypotheses and the many imperfections underlying the estimates presented here, they should be interpreted with caution. However, we believe that we can contribute to the discussion on distributive impacts of Social Security

through this tax incidence analysis. After all, when the State transfers resources, who is paying the bill is as important as who is getting the benefits (which is why those who like equality usually also like progressive taxation).

Much more work must be done on this issue when the 2017/2018 POF data are made public. One important limitation of this text will be minimized when consumption survey and fiscal revenue data are aligned. However, the many hypotheses made on economic incidence of the different taxes will remain. Ultimately, this means that results like these, even when better calculated, must always be seen as contributions to the Social Security debate and not the final word on its distributive impacts.

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APPENDIX A

TABLE A.1
Taxes and revenue sharing

| Taxes | |
|----------------------------|---|
| CIDE Combustíveis | Contribuição de intervenção no domínio econômico incidente sobre as operações realizadas com combustíveis R\$ 50 to R\$ 100 per cubic meter |
| Cofins | Contribuição para o Financiamento da Seguridade Social net profits 3% or 7.6% |
| CSLL | Contribuição Social sobre o Lucro Líquido 9% 32% |
| ICMS | Imposto sobre Operações relativas à Circulação de Mercadorias e Prestação de Serviços de Transporte Interestadual e Intermunicipal e de Comunicação 0% to 33% |
| Imposto sobre a Importação | Imposto de Importação |
| IOF | Imposto sobre Operações de Crédito, Câmbio e Seguros |
| IPI | |
| IPVA | |
| IRPF | |
| IRPJ | |
| PIS/PASEP | |
| Revenue sharing | |
| Cota Parte ICMS | 75% of ICMS 50% of IPVA |
| FPE | 22% of |
| FPM | 2 |

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