The State and income inequality in Brazil

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Abstract

Using a factor decomposition of the Gini coefficient we measure the contribution to inequality of direct monetary income flows to and from the Brazilian State. The income flows from the State include public sector workers' earnings, Social Security pensions, unemployment benefits and Social Assistance transfers. The income flows to the State comprise direct taxes and employees' social security contributions. Data comes from the Brazilian POF 2008-9. The results indicate that the State contributes directly to a very large share of inequality. Income factor components associated *to work in the public sector – wages and pensions – are very concentrated and regressive. Components related to the private sector are also concentrated, but progressive. Contrary to what has been found in other countries, public spending with work and social policies is concentrated in the elites and, taken as a whole, tends to increase inequality. Redistributive mechanisms that could reverse this inequality, such as taxes and social assistance, are very progressive but proportionally small; consequently their effect is completely offset by the regressive income flows from the State.*

1. Introduction

The level of inequality among individuals is obviously influenced by their personal characteristics. However, these attributes do not operate in a vacuum: institutions affect the way personal characteristics become a source of advantage of one person over another. Among all institutions capable of substantially modifying inequality, the State deserves highlighting: on the one hand, very few institutions can legitimately regulate the way society operates as the State can; on the other, no other single institution has the State's legitimacy to continually mobilize resources and redistribute them.

From an egalitarian point of view, the worse the distribution of personal characteristics that can affect inequality is, the more important the State action to reverse this inequality becomes. This applies to many developing countries, but is particularly true in the case of Brazil, where the State has a reasonably large fiscal capacity, yet the levels of income inequality are historically among the highest in the world. The State, however, is not a completely autonomous institution and its actions, in part, reflect existing distributional conflicts. As a matter of fact, instead of reducing inequality the State may actually amplify it. The objective of this study is to measure the net contribution of the State to income inequality in Brazil and examine the direct determinants of this contribution.

In more specific terms, we are testing the hypothesis that the State plays a perverse distributional role in Brazil, contributing to a large share of income inequality, as it operates its wage and social and tax policies in a three-tiered way: on the first level, it supports an elite of workers in the public sector with high wages and pensions; on the second level, it provides intermediate pension benefits and unemployment insurance only to formal workers in the private sector; finally, on the third level it gives little weight to redistributive measures such as taxes and basic income policies for the low income masses in the informal sector.

Underlying this hypothesis is the idea that the regressive actions of the State are a typical result of path-dependency in politics. Since its inception, the Brazilian welfare state followed a corporatist model that offered protection to workers in the more developed sectors of the labor market – including State workers – but excluded most of the population from it. This arrangement further entrenched in power some strong organized groups, such as state bureaucrats and public servants which came to exert considerable influence upon a large share of social spending and the State's wage policies.

Inequality is often associated with weak public institutions. We, however, offer a different argument. We maintain that knowing who benefits most from public institutions is more important to inequality than knowing how large and well consolidated these institutions are. Powerful public and private institutions can, in point of fact, be worse than weak ones. If the quality of institutions is understood only as a combination of their stability, autonomy and size, then we claim that it is not the quality of the institutions what matters most to inequality.

It is also common to link social policies to inequality reduction, particularly by relating directly the budget allocated to these policies to the level of equality in a society; in another words, bigger welfare states tend to result in lower inequality. Our study does not endorse this view without reservation, as not only the level but the distribution of policies determines the way they affect inequality. Actually, we argue that a bigger welfare state can increase inequality; it all depends on the general progressivity

of social policies.

Indeed, previous comparative studies of developed countries, predominantly of members of the Organization for Economic Co-operation and Development (OECD) have shown the State reduces inequality. These studies found that public work contributes to reduce inequality (Blau and Kahn 1996; Gustafsson and Johansson 1999; Milanović 1994), that strong unions and centralized bargaining of wages typical of public workers are determinants of lower levels of income inequality (Checchi and García-Peñalosa 2010; Gottschalk and Smeeding 1997; Gustafsson and Johansson 1999) and that corporatist welfare state policies are more capable of reducing inequality than targeted policies because of the 'paradox of redistribution', that is, (contributory) universalism legitimizes more spending than targeting and it is the level of expenditures what matters most to inequality (Goudswaard and Caminada 2010; Korpi and Palme 1998; Mahler and Jesuit 2006; Smeeding 2005). Other studies have identified that taxation, particularly direct taxation, tends to be progressive and the higher it is, the lower is inequality (Atkinson 2003; Gottschalk and Smeeding 1997; Goudswaard and Caminada 2010).

Although some of these conclusions depend very much on the methodology used, particularly those related to how the contribution of social benefits is computed (Fuest et al. 2010; Wang et al. 2012), they seem to be correct for OECD countries. Our results, however, indicate that, except for what refers to taxation, they cannot be generalized to apply to a developing country or, at least, to Brazil. A public sector with well organized workers and a fairly large welfare state, in terms of public expenditure, does not translate automatically to less income inequality in the country.

There is an extensive literature on the analysis of public expenditures. The first generation of this literature was based on analyses of the composition of the budget, that is, studies in the sphere of allocation of resources. The following generation of studies, the analyses of the quality of expenditures, moved from the sphere of allocation to that of production and focused on issues such as the efficiency, efficacy and effectiveness of public expenditures. In this study we take a different step, in the direction of the sphere of distribution. Our concern is not about what is being produced and how it is being produced with public resources, but what is the direct impact of public expenditures on income inequality, including the expenditures with administration and the production of goods and services. Moreover, our focus is not only on the expenditures but also on the collection of resources by direct taxation. Specifically, we simultaneously take into account all three major types of income flows between the State and families: taxes, transfers and payments to public sector workers.

By decomposing income inequality we found that public work - especially the public-private wage gap - contributes to increase inequality, probably because the labor movement of public sector workers is stronger than its counterpart in the private sector. Corporatism does result in a high level of social spending, but this expenditure is very concentrated, the extreme opposite of what happens with targeted assistance (excellent distribution but at a low level). In the case of direct taxes, we have a convergent finding: direct taxes are very progressive, although they represent a small share of total taxation in the country. The final outcome of this interplay of factors is that, in Brazil, the direct income flows to and from the State contribute to about one third of all inequality in disposable income. The advantages of public workers in wages and pensions, alone, contribute to around one tenth of this inequality.

Our study has shortcomings that deserve to be anticipated. First, we restrict our analysis to the direct monetary income flows between families and the State. This excludes the distributive impacts of three major types of State intervention: taxes and

transfers to firms and the provision of public services. The former is an indirect income flow, while the latter if a non-monetary transfer.

It is simply not possible to estimate reliably how both impinge upon income inequality. On the one hand, Brazil is a federation with intricate – and occasionally overlapping – tax, exemption and subsidy schemes, which adds an extra layer of uncertainty to the difficult task of determining the economic – and thus distributive – incidence of such State interventions. On the other hand, it is also nearly impossible to assign prices to all the non-monetary goods and services provided by the State, which include, but are not limited to, social services such as education and health and infra-structured such as roads, ports power lines and so on. Many of these services are provided for free or are subsidized (to the consumer). For instance, there is no reasonable way of pricing public primary education in Brazil, which notoriously of lower quality than private education, given that these policies – including, but not limited to, teacher salaries – are partly determined at the city level in the more than five thousand Brazilian cities, sometimes varying school by school? Even if we had the individual cost of each student in each school, we would not be able to match them with the survey data we have.

Although this is a potentially serious shortcoming, we stil believe the monetary income flows analyzed below are of interest by themselves, for two reasons. First, the wages and transfers that we do analyze cover a large share of all State expenditures: as of 2006, they combined for over 21% of GDP, whereas the total tax revenue reached slightly over 34% of GDP (Mostafa et al. 2010; Santos 2010). Second, it is not far-fetched to speculate that the net effect of all indirect and non-monetary income flows is regressive. If the admittedly strong assumptions of the sparse literature on the subject are to be believed, then the regressiveness of the indirect taxes, interest payments, subsidized credit, among others, swamp the moderately egalitarian profile of education and health care expenditures (Mostafa et al. 2010; Pintos-Payeras 2010; Silveira 2010).

Finally, another shortcoming of our approach is that we do not take into account the dynamic effects over the distribution of incomes of, say, changes in overall consumption caused by higher salaries paid to a group of workers, or of the macroeconomic multiplier effects of social assistance and pensions. To the extent of our knowledge, no computable general equilibrium model has achieved a level of precision that would be required by estimates by centile needed for the decomposition we use and, even if that was possible, we believe that the necessary data to feed such models does not exist.

We are sure that this is not a comprehensive list of the shortcomings our study has, but it points to some difficulties we found, which, in any case, are shared with most other studies on income distribution based on household survey data. Yet, we believe that a distributive profile of direct income flows to and from the State still brings important information about the determinants of inequality in a country. Recognizing these limitations we opted to still conduct the decompositions, but interpreting them *cum grano salis*.

2. Methodology

2.1. Data

The microdata used in the study comes from the Brazilian Consumption and Expenditure Survey 2008-9 (Pesquisa de Orçamentos Familiares - POF), which was

carried out between June 2008 and June 2009 by the Brazilian Institute of Geography and Statistics (IBGE), the country's central statistics office. The methodology for data collection is based on consumption and expenditure diaries filled out for each family during a period of two weeks, plus individual questionnaire interviews with each family member to collect additional social, demographic and economic information. The POF has national coverage and a total sample size of roughly 190 thousand people in 56 thousand households, which corresponds to a population of 189 million people in 57.5 million households.

The POF is primarily a consumption-oriented survey but it also collects extensive data on incomes. The 2008-2009 round covers around 110 different income sources with a 12-month reference period, making the POF the most reliable survey regarding income data in Brazil. As a benchmark, it is worth mentioning that Pesquisa Nacional por Amostra de Domicílios (PNAD), a well-known household survey in Brazil, only collects incomes and earnings for approximately ten income sources with a thirty-day reference period. The POF is particularly suited for the analysis of capital, social assistance and otherwise infrequent incomes. As a result, the reported income levels are usually higher than in other household surveys and closer to the National Accounts estimates.

Our main variable of interest is the disposable household *per capita* income, which encompasses labor and capital incomes and public and private transfers and benefits net of direct taxes and employees' Social Security contributions. Non-monetary incomes such as in-kind payments, which make a very small part of family incomes in Brazil, were discarded. Similarly, free public services, such as health and education, were also disregarded, as mentioned above. A negligible number of households with negative disposable income were left out of our analysis.

Both income and tax data were deflated to January 2009 using a standard consumer price index. Although absolute income levels are only of marginal interest to us, for the sake of comparison the tables below provide information on them in 2009 PPP Dollars (using the United Nations' Millennium Development Goals PPP conversion factor of 1.71[1]).

2.2. Inequality decomposition

The measure of inequality used in the study is the Gini coefficient, which ranges between zero (in the case of a perfectly egalitarian distribution) and one (when all income belongs to a single individual). The Gini coefficient is additively decomposable by income sources or factor components (Rao 1969). In the factor components decomposition, total inequality can be represented as the sum of the concentration coefficient of each factor weighted by the share of this factor in total income:

$$G = \sum_{k=1}^{K} \phi_k C_k$$

(1)

Where ϕ_k is the income share of factor component *k* and C_k is the concentration coefficient of factor *k*, given by:

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1 See: <http://unstats.un.org/unsd/mdg/SeriesDetail.aspx?srid=699>. Page viewed on May 19th 2013.

$$C_k = G_k R_k = G_k \frac{\text{cov}(y_k, F)}{\text{cov}(y_k, F_k)}$$

(2)

Where G_k is the Gini coefficient of factor k, R_k is the Gini correlation between factor k and total income, F is the cumulative distribution of total income, and F_k is the cumulative distribution of factor k (Lerman and Yitzhaki 1985)).

The concentration coefficient ranges from -1 to +1, attaining its minimum value when all income from source k flows to the poorest individual in the overall distribution of income and its maximum when it flows to the richest individual.

There is, however, one scenario which might cause both the Gini and the concentration coefficients to violate their typical ranges: when an income factor has both positive e negative values, there is a possibility that both its Gini and concentration coefficient might fall outside the (0,1) and (-1,1) ranges, respectively (Chen et al. 1982; Pyatt et al. 1980; Rao 1969). This is of concern, as, for instance, both the public-private wage gap (see below) and the net State-related income factors are expected to have both positive and negative values.

There are three alternatives to deal with this situation. The first option is to adjust the scale of the Gini in order to force the typical intervals. The downside of this approach is that it changes the scale of the Gini, therefore causing the impression of an artificial reduction of the measured levels of inequality. The second option is to divide the factor component with positive and negative values in two subfactors, one with only positive values and another with only negative ones. Each subfactor will have concentration coefficients varying within the conventional scale and no change will happen in the observed level of total inequality. The third option is to make no adjustment and accept concentration coefficients outside the conventional range. This option allows the analysis of the contribution of the unusual factor to inequality without compromising decomposability, as only the interpretation of the potentially problematic coefficients would have to be altered.

Because our main objective is to estimate the relative contribution of income factor components to total inequality, we opted for the last two ones, that is, to disaggregate all factors with positive and negative values into subfactors with strictly non-positive and non-negative values, while also accepting an unconventional range for the original factor. By doing so we did not compromise the comparability of our results with other studies.

Finally, it is worth noting that the income factor decomposition of the Gini coefficient also yields a progressivity index and the marginal contribution of each factor to total inequality (Lerman and Yitzhaki 1985; Stark et al. 1986). The progressivity index indicates whether that factor is more equally distributed than the total income. *Progressive* means 'less unequal than total inequality', not that an income necessarily tends to drive the distribution to perfect equality. Actually, a very unequally distributed source of income can be considered progressive in an extremely unequal society. The marginal contribution to inequality of an income factor indicates how a change in the share of a factor would affect total inequality or, in other words, how an increase in the participation of a source would rise (or reduce) inequality. The progressivity index and the marginal contribution are analogous in mathematical structure but different in interpretation, the latter being more intuitive and thus preferred in our analysis. The marginal contribution of factor k is given by:

$$\frac{\partial G / \partial e_k}{G} = \frac{\phi_k C_k}{G} - \phi_k$$

(3)

Equation (3) shows that percentage change in the Gini coefficient resulting from an exogenous marginal percentage change in factor k hinges on the relationship between C_k and G: if factor k is regressive ($C_k > G$), then its relative contribution to total inequality is higher than its income share and its marginal effect is inequality-increasing and vice-versa if factor k is progressive ($C_k < G$).

In order to carry out the decomposition of the Gini coefficient expressed in equations (1-3) we began by dividing the disposable household income into three major groups: income flows *from* the State, *to* the State and from the Private Sector. We then further subdivided the first two groups, as explained below. Incomes from the Private Sector were disaggregated solely into labor earnings and other incomes. The latter comprises a heterogeneous assemblage of income sources, such as capital and property, alimony, private pension plans, scholarships, and so on.

2.3. Income flows from the State

2.3.1. Public servants' earnings

The labor market in Brazil is segmented between the private and public sectors. Because of this segmentation we treat the earnings of public servants as a sum of two components: their (conterfactual) private sector market earnings and the public-private wage differential.

To estimate these counterfactual wages we resorted to the decomposition proposed by Juhn, Murphy and Pierce (JMP), which allowed us to isolate price, quantity and residual effects using linear regressions (Juhn et al. 1993). First, we estimated a wage equation for the reference group, the workers in the public sector, and an equation for the equivalent group, the private sector workers. Then we applied the regression parameters and the distribution of residuals of the equivalent group to the reference group to estimate the counterfactual wage of public sector workers. By subtracting the two we obtained the wage differential.

Formally, given a vector of independent variables X, the basic wage equations for public and private sector employees (w and q, respectively) can be written as:

$$\ln(w_i) = X_i \beta_w + u_{iw}$$

(4)

$$\ln(q_i) = X_i \beta_q + u_{iq}$$

(5)

The residuals (u_{iw} and u_{iq}) can be conceptualized as the result of two components: the relative rank of the individuals in the distribution of residuals (τ_{iw} and τ_{iq}) and the distribution function of the residuals (F_w and F_q). Thus, for instance, the residuals from equation (5) are given by:

$$u_{iq} = F_q^{-1}(\tau_{iq} \mid X_i)$$

(6)

To predict the public sector workers's counterfactual wages (cw_i) we apply the coefficients (β_q) and the quantile function (F_q^{-1}) estimated for private sector workers (equation 5) to the observed characteristics of public sector workers:

$$\ln(cw_i) = X_{iw}\beta_q + F_q^{-1}(\tau_{iw} \mid X_i)$$

(7)

The public-private wage differentials are given by the subtraction of counterfactual wages from the observed wages ($w_i - cw_i)$. Positive ($w_i > cw_i)$ and negative ($w_i < cw_i)$ differentials were also classified as separate income sources.

Two methodological issues may influence the results of the JMP decomposition. The first relates to the definition of the two groups being compared. Ideally, the group of private sector workers should be as comparable as possible to those in the public sector. In the Brazilian case, this means that some occupational groups – for instance, rural and domestic workers – ought to be excluded, as well as all informal and self-employed workers. Unfortunately, the POF has only very limited occupational data, so we defined the group of comparable private sectors workers as all non-domestic formal private sector employees, which were identified as those individuals with private sector jobs who reported Social Security contributions and whose earnings were equal to the minimum wage or higher. Fortunately, the PNAD 2008 data shows that such criteria are accurate for our purposes: rural workers combine for only 6% of this group.

The second potentially troublesome methodological issue relates to problems arising from selection bias. Equations 4-7 assume that workers are randomly assigned between sectors, which is obviously not true. Therefore, we tested four different specifications of our model. First, we estimated the wage equations without any sort of correction for selection bias. Then, we tested three different selection models and subsequently added the relevant Inverse Mills Ratios (IMRs) to the wage equations: a public or formal private job probit (only for those working in the formal sector, public or otherwise); a work/does not work probit; and a work/does not work and public/formal private bivariate probit (in this case, there were two IMRs). The additional identification variables were the relationship to the household head (four dummies, with the household head as reference), the presence of children in the household (dummies for children between 0 and 6 and between 7 and 15 years old) and the presence of other public sector workers in the household (one dummy).

The wage equations themselves used the standard set of independent variables: education (six dummy variables; four years of schooling or less as reference); age and age squared; duration of job tenure (two dummies; workers with less than one month on the job as reference); gender (one dummy variable for men); race (one dummy variable for whites and Asians); states (26 dummy variables; state of Rondônia as reference); urbanization status (one dummy variable for urban areas). The dependent variable was the log of the monthly earnings.

All four models yielded similar results. For instance, the public-private wage gap was largest in the simple model with no selection equation and smallest in the most complex model with the bivariate probit, but the difference between the two was

negligible: in the former, we estimated that public sector workers earned on average 23.6% more than they would in the formal private sector; in the latter, the wage premium was at 23.0%. Likewise, the distribution of counterfactual public sector earnings – as measured by the Gini index – ranged from 0.425 to 0.427.

Therefore, we judged the results to be sufficiently robust to changes in definitions and model specifications so to allow us to present only the results based on the more complex model, that is, the one that employs the bivariate probit as the selection equation.

One could argue, of course, that our model might be robust but still biased, insofar our set of independent variables and selection equations do not fully take into account all sorts of potential selection biases. As it is, there is no conclusive evidence either way. However, it is worth mentioning that our results are consistent with estimates based on different methods and data sets (Barbosa 2012; Barbosa and Souza 2012; Vaz and Hoffmann 2007).

2.3.2. Social Security pensions

Brazilian public pensions are organized as a mandatory pay-as-you-go system and divided in two subsystems, or regimes in Brazilian terminology: one for private sector workers and another for public sector workers. Even though both subsystems are paid with public resources and share some common rules, they are overall very different.

For our purposes, there are three differences worth emphasizing. First and foremost, the private sector regime has a legal cap that limits the values of its pensions and the employees' Social Security contributions. This cap does not apply to the public sector pensions. Recent reforms have changed this, but their effects will take a long time to kick in as the cap will be imposed only upon workers who joined the public sector after the reforms were signed into law. In other words, it will take some thirty-odd years before both regimes converge regarding the benefit cap. Even then, there will remain some important differences, as these reforms also created voluntary retirement funds to supplement the public servants' pensions. These funds are set to have more stringent rules than the current arrangement, but they are still going to be partly subsidized.

The second importance difference regards the role of the minimum wage. Both pension regimes are tied to the minimum wage, which is the legal floor for all Social Security benefits. Nevertheless, while there are very few minimum wage recipients among retired public servants, about two-thirds of all private sector pensions are at the minimum wage level (R$ 465 as of June 2009, or PPP$ 272, about seven times less than the cap of PPP$ 1882). This means that the annual adjustments to the minimum wage have a huge impact on these private sector pensions, which become delinked from their recipients' contributions. Since the minimum wage has been rising in real terms since the mid-1990's, it could be argued that a large share of pensions in Brazil have become a hybrid between a contributory and non-contributory benefit. This is especially true of the so-called "Rural pensions", which were created by the 1988 Federal Constitution to protect rural workers and subsistence farmers who could not maintain their contributions and enlarged the scope of Social Security in Brazil beyond the formal, largely urban labor market.

The third and final difference relates to the rules governing the adjustments of the benefits. For private sector workers, benefits either follow the minimum wage or are otherwise adjusted annually for inflation. Former public servants, however, enjoy what is called "earnings parity" with current public servants, as their benefits are automatically adjusted when the latter's wages are raised. The reforms approved in 2003

and 2005 have also eliminated this privilege, but all public servants who have joined the public sector before 2003 are eligible for pensions with earnings parity.

In sum, it is hardly controversial to posit that the rules governing the public servants' pensions are more generous than for the private sector. Both regimes run significant annual deficits – between 1% (private sector regime) and 2% (public servants' regime) of GDP - and thus have to be partly subsidized by the State.

For the Gini decomposition the public pension incomes were divided first into two main categories, that is, pensions for private sector workers and pensions for public sector workers. This latter group was further subdivided into pensions equal or below the cap and pensions above the cap. Finally, the pensions above the cap were split into two income factors, one equal to the cap and the other representing the "surplus" some retired public servants enjoy as they are not subjected to the pension cap applied to private sector workers.

2.3.3. Social Assistance transfers

Social Assistance encompasses all non-contributory cash benefits, except for the Rural Pensions, which are part of the Social Security pensions. Two major federal programs are responsible for almost all transfers: the Benefício de Prestação Continuada (BPC) and the Bolsa Família. The BPC is an unconditional monthly benefit equal to one minimum wage targeted to poor people aged 65 or more or with severe disabilities. The Bolsa Família program started in the early 2000s as a result of the unification of previously existing federal cash transfer programs. It is targeted to poor and extremely poor families, especially those with children.

2.3.4. Unemployment benefits

Formal workers must contribute to an employment insurance fund, known in Brazil as FGTS, for its acronym in Portuguese. These contributions are registered in individual accounts. Upon dismissal workers are entitled to receive a monthly benefit for a certain period of time. This benefit is proportional to the previously received wages. They can also drawdown the funds of their individual accounts upon dismissal, retirement or contraction of serious illnesses (such as HIV or cancer), or to finance the purchase of a house. Both the insurance premium and the drawdown were classified in the category of unemployment benefits and computed as they are in the database.

2.4. Income flows to the State

Income flows to the State comprise direct taxes and the employees' contributions to Social Security. Taxes include all direct taxes registered by survey, with income, vehicle and land taxes being by far the most important ones.

As with pensions, Social Security contributions were divided into two income factors, contributions to the private and public sector social security funds. Most active public and private sectors workers pay a flat rate around 11% of their wages as Social Security contributions (in the latter case only up to value of the wages below the pension cap). Workers of the public sector pay a similar rate on their wages and pensioners of the public sector pay the same rate on the part of their pensions that exceeds the cap.

The public sector workers' contributions were divided into contributions up to the cap and above the cap. Finally, this last factor was split into the share of the contributions equal to the cap and the share exceeding the cap. Thus, whenever public sector workers earned twice as much as the benefit cap, their Social Security

contributions were split evenly between the latter two income factors. It is also worth noting that all contributions made by retired public servants are considered as part of the last income group. Also, their contributions had to be imputed, as the POF only collects disaggregated data on the contributions of the active workers.

Finally, it must be stressed that a large share of the funding of the pension system is covered by contributions made by employers and other indirect taxes. As our focus is only on the direct transfers, we did not make any calculations involving these indirect contributions.

3. Results and discussion

The descriptive statistics for the income factor components are shown in Table 1. More than 40% of the household disposable income flows from State transfers and payments, which are delivered to families encompassing almost two-thirds of the total population. Once we subtract the taxes and contributions, the net income flow from the State falls to 30% of the disposable income. Only 10% of the population lives in households that neither pay nor receive any money from the State.

Public servants' earnings and Social Security pensions dwarf the other State-related income factor components. Consequently, the overall contribution of the State to income inequality is largely determined by their distribution, which is, in turn, heavily influenced by the distribution of the public-private wage gap and the differentiation of pension rules for workers in each sector. Wage premiums and pension advantages for the public sector workers add up to 6% of the disposable per capita income and are more than double the sum of unemployment benefits and social assistance transfers, providing higher benefits to a much smaller clientele.

Table 1. Income factor components' descriptive statistics: average monthly household per capita income, percentage of household disposable per capita income, percentage of the population in affected households and average monthly household per capita income conditional on being affected – Brazil, 2008-9

Income factors	Monthly per capita income 2009 PPP Dollars	% of DPI	% of pop affected	Conditional per capita income 2009 PPP Dollars
1 Public servants' earnings	**66**	**18.3**	**15.7**	**424**
1.1 Simulated	54	14.8	15.7	343
1.2 Public-private wage gap	13	3.5	15.7	81
1.2.1. Positive	*15*	*4.1*	*8.5*	*174*
1.2.2. Negative	*-2*	*-0.6*	*7.1*	*-29*
2 Unemployment benefits	**5**	**1.3**	**16.3**	**29**
3 Social Security pensions	**74**	**20.4**	**30.9**	**239**
3.1 Private sector	51	14.1	28.0	182
3.2 Public sector	23	6.3	4.3	534
3.2.1 <= pension cap	*9*	*2.4*	*3.5*	*241*
3.2.2 > pension cap	*14*	*4.0*	*1.0*	*1,448*
3.2.2.1 Share = cap	6	1.7	1.0	638
3.2.2.2 Share > cap	8	2.2	1.0	810
4 Social assistance transfers	**4**	**1.0**	**21.2**	**17**
5 Private Sector labor earnings	**227**	**62.8**	**86.1**	**264**
6 Other Private Sector incomes	**27**	**7.6**	**24.6**	**112**
7 Taxes	**-41**	**-11.4**	**72.2**	**-57**
7.1 Direct taxes	-27	-7.6	60.5	-45
7.2 Social Security contributions	-14	-3.8	50.9	-27

7.2.1 Private sector	*-8*	*-2.2*	*41.4*	*-19*
7.2.2 Public sector	*-6*	*-1.6*	*14.8*	*-39*
7.2.2.1 <= pension cap	-2	-0.7	12.5	-20
7.2.2.2 > pension cap	-3	-0.9	7.5	-44
7.2.2.2.1 Share = cap	*-1*	*-0.3*	*2.1*	*-55*
7.2.2.2.2 Share > cap	*-2*	*-0.6*	*7.5*	*-28*
8 Disposable per capita income	**362**	**100.0**	**99.9**	**362**
8.1 State, gross	149	41.0	65.1	228
8.2 State, net	107	29.7	89.9	119

Source: POF 2008-9.

Note: *Public servants' earnings* is the simulated counterfactual (1.1) plus the public-private wage gap (1.2). The gap is positive when observed earnings are higher than the ones simulated by the JMP decomposition and negative otherwise. *Social Security pensions* is the sum of private and public sector's pensions (3.1 + 3.2). The *public sector's pensions* is the sum of *pensions below or equal to the cap* (3.2.1) and *pensions above the cap* (3.2.2). The latter were divided into two components, the share up to the value of the private sector cap and the share above it (3.2.2 = 3.2.2.1 + 3.2.2.2). The same applies to the *taxes*, which are the *direct taxes* plus the *Social Security contributions* (7.1 + 7.2 = 7.1 + 7.2.1 + 7.2.2.1 + 7.2.2.2.1 + 7.2.2.2.2). *Disposable per capita income* is the sum of all positive incomes (1 + 2 + 3 + 4 + 5 + 6) and the negative incomes (7). The *gross State* transfers are the *public servants' earnings* (1) plus *unemployment benefits* (2) plus *Social Security pensions* (3) plus *social assistance transfers* (4). The *net State* incomes flows are the *gross* transfers plus the negative incomes (7).

The results of the factor decomposition of the Gini coefficient of household disposable per capita income in Brazil are presented in Table 2. The first column shows the concentration coefficient of each income factor component, and the second the absolute contribution of the factor to the Gini (the product of the concentration coefficients by the income shares shown in Table 1), which is transformed into a relative contribution in the third column. The last column shows the marginal contribution of the factor to inequality, indicating how a percentage change in each factor would affect total inequality.

Table 2

Income factor decomposition of inequality in household disposable per capita income, Brazil, 2008-9

Income factors	Concentration Coefficient	Contribution Gini	% of Gini	Marginal contrib (%)
1 Public servants' earnings	**0.741**	**0.136**	**24.2**	**0.059**
1.1 Simulated	0.701	0.104	18.5	0.037
1.2 Public-private wage gap	0.909	0.032	5.7	0.022
1.2.1. Positive	*0.851*	*0.035*	*6.2*	*0.021*
1.2.2. Negative	*0.490*	*-0.003*	*-0.5*	*0.001*
2 Unemployment benefits	**0.591**	**0.008**	**1.4**	**0.001**
3 Social Security pensions	**0.582**	**0.119**	**21.1**	**0.008**
3.1 Private sector	0.474	0.067	11.9	-0.022
3.2 Public sector	0.824	0.052	9.3	0.030
3.2.1 <= pension cap	0.624	0.015	2.6	0.003
3.2.2 > pension cap	0.943	0.037	6.6	0.027
3.2.2.1 Share = cap	*0.916*	*0.016*	*2.8*	*0.011*
3.2.2.2 Share > cap	*0.964*	*0.021*	*3.8*	*0.016*
4 Social assistance transfers	**-0.348**	**-0.003**	**-0.6**	**-0.016**
5 Other labor earnings	**0.522**	**0.328**	**58.4**	**-0.044**
6 Other incomes	**0.729**	**0.055**	**9.8**	**0.023**
7 Taxes	**0.707**	**-0.081**	**-14.3**	**-0.030**
7.1 Direct taxes	0.744	-0.056	-10.0	-0.025
7.2 Social Security contributions	0.635	-0.024	-4.3	-0.005
7.2.1 Private sector	*0.542*	*-0.012*	*-2.1*	*0.001*
7.2.2 Public sector	*0.765*	*-0.012*	*-2.2*	*-0.006*
7.2.2.1 <= pension cap	0.571	-0.004	-0.7	0.000

7.2.2.2 > pension cap	0.912	-0.008	-1.5	-0.006
7.2.2.2.1 Share = cap	*0.883*	*-0.003*	*-0.5*	*-0.002*
7.2.2.2.2 Share > cap	*0.928*	*-0.005*	*-1.0*	*-0.004*
8 Disposable per capita income	**0.561**		**100**	**0.000**
8.1 State, gross	0.631	0.259	46.1	0.051
8.2 State, net	0.602	0.178	31.8	0.021

Source: POF 2008-9.

Note: *Public servants' earnings* is the simulated counterfactual (1.1) plus the public-private wage gap (1.2). The gap is positive when observed earnings are higher than the ones simulated by the JMP decomposition and negative otherwise. *Social Security pensions* is the sum of private and public sector's pensions (3.1 + 3.2). The *public sector's pensions* is the sum of *pensions below or equal to the cap* (3.2.1) and *pensions above the cap* (3.2.2). The latter were divided into two components, the share up to the value of the private sector cap and the share above it (3.2.2 = 3.2.2.1 + 3.2.2.2). The same applies to the *taxes*, which are the *direct taxes* plus the *Social Security contributions* (7.1 + 7.2 = 7.1 + 7.2.1 + 7.2.2.1 + 7.2.2.1 + 7.2.2.2.2). *Disposable per capita income* is the sum of all positive incomes (1 + 2 + 3 + 4 + 5 + 6) and the negative incomes (7). The *gross State* transfers are the *public servants' earnings* (1) plus *unemployment benefits* (2) plus *Social Security pensions* (3) plus *social assistance transfers* (4). The *net State* incomes flows are the *gross* transfers plus the negative incomes (7).

The State gives an important contribution to the income inequality in Brazil. About one- third of total inequality can be directly related to transfers made from the State to individuals, even after discounting the equalizing effect of direct taxes and contributions. This contribution would probably be higher if indirect transfers – such as subsidies and tax exemptions to companies – were also computed, but the available data does not allow us to go beyond speculation regarding this situation.

Proportionally, the State contributes more to inequality than the private sector. Most of inequality appears in the private sector, as it responds to 70% of the disposable income, more than twice the share of net State transfers. However, incomes in the private sector are less concentrated and this leads to a contribution to inequality of 68%. The State, responsible for 30% of incomes, contributes to 32% of inequality. The marginal contribution of the State to income inequality is slightly positive; more precisely, a proportional 1% increase in net State transfers would increase the Gini coefficient by 0.021%. The role of the State in inequality deserves further analysis, particularly in two aspects, wages and pensions.

3.1. Public sector wages

In several developed countries public work contributes to reduce inequality (Blau and Kahn 1996; Gustafsson and Johansson 1999; Milanović 1994). This, however, is not the case in Brazil. Remuneration for work in the public sector is more concentrated and has a higher marginal contribution to inequality than remuneration in the private sector. With a share of 19% of total incomes, the wages in the public sector contribute to 24% of inequality, whereas the private sector earnings contribute to 58% of total inequality, in spite of amounting to 63% of all incomes.

There are two effects behind the regressiveness of public sector wages: a composition effect and a segmentation (price) effect. The composition effect results from the fact that job positions in the public sector are, for the most part, open to a specific group of workers. Mostly, those are workers with higher education and better qualifications than the average of the labor force. As these workers are better remunerated across the entire labor market, they would occupy the higher strata of the income distribution, even if the wage structures in the public and private sector were the same (Bender and Fernandes 2009; Foguel et al. 2000; Vaz and Hoffmann 2007).

The segmentation effect, in turn, is associated to the particularities of the public sector in determining wages, not only because the objectives of this sector are different from those of the private sector but also because the collective organization of workers

in this segment of the labor market is very specific. While wage schedules in private enterprises are usually guided by profit-maximization, public administrators are influenced by political goals. They may use the State wage policy as a means to increase their popularity and gain support from the bureaucracy to pursue those goals, which easily results in higher wages for government employees (Gregory and Borland 1999). Moreover, if unionization is marked by corporatism, powerful unions operating in the well organized and legally protected segment of the labor market versus weak association among informal workers, can, in point of fact, increase total inequality.

There is much evidence of composition and segmentation effects acting to create a public-private wage differential in Brazil. Most of the differences in averages are due to composition effects, yet there is a segmentation effect acting to make salaries in the public sector higher than those paid in the private sector for equivalent workers in equivalent jobs (Belluzzo et al. 2005; Bender and Fernandes 2009; Braga 2007; Foguel et al. 2000; Panizza and Qiang 2005; Vaz and Hoffmann 2007; Vergara 1991; Vergara and da Silva Wiltgen 1995).

The factor decomposition in Table 2 shows that the fact that the State hires workers with better qualifications than the average of the labor force – the composition effect – is more relevant for household disposable per capita income inequality than the consequences of segmentation on the prices of labor. About 18% of total inequality is related to the particular composition of the public sector whereas 6% refers to the wage differential favoring workers in public sector. Still, the importance of this wage premium to inequality should not be overlooked. It is extremely concentrated and its regressive impact on the Gini coefficient is sufficient to offset over half of the progressive impact of the income tax.

3.2. Social Security Pensions

The final outcome of the combination of redistributive and regressive benefits that characterize public pensions in Brazil is far from egalitarian, contributing to 21% of total inequality in the country. High levels of regressiveness are a characteristic of the pension system of several Latin American countries (Arza 2008; Esquivel 2011; Lavado 2007; Soares et al. 2009). However, the disaggregation between public pensions for workers in the private sector and for the public sector shows that the system is heterogeneous. With regard to public pensions, the country lines up with other countries with a corporatist bias in the origin of their social policies (Palme 2006; Pedraza et al. 2009; Wang et al. 2012), but with a much worse distribution of benefits from these policies.

In practice, the Brazilian Social Security system is stratified into at least three tiers. At the bottom, there are the subsidized minimum wage pensions, paid either to former rural or urban workers who were on the fringes of the formal market. In the middle, there are the other private sector pensioners and the public servants whose pensions are lower than or equal to the private sector pension cap. At the top, there are the few public sector retirees whose pensions exceed the cap. Public pensions are the most important item of social spending in Brazil.

Pensions for workers in the public sector are very concentrated – they have a coefficient of concentration of 0.824, 47% higher than the already excessive concentration of incomes in Brazil, 0.561. Although only 4% of the population lives in families receiving them, they amount to 6% of all incomes and respond to 9% of the Gini coefficient. There is no other source of income with such a high proportional contribution to inequality.

The pensions above the cap have the highest concentration among all income

factors; the share above the cap of these pensions, alone, amounts to 2% of all incomes and 4% of total inequality. Progressive contributions to the system made by active workers could counteract the effects of the concentration of pensions on inequality, but they do not. Social Security contributions are generally progressive but they are only a small fraction of total income, so their impact upon inequality is limited: almost all of their equalizing effects are offset by the share of public servants' pensions above the cap.

Public pensions for the workers in the private sector are also concentrated, but given the level of inequality in Brazil, they end up being slightly progressive. While public pensions for private sector workers represent 14% of all family incomes, they contribute to 12% of total inequality. This better distribution results from a combination of three factor components: first, rural pensions provide income for families that otherwise would be very poor; second, the minimum wage floor pushes up those who were low income workers and made small contributions; third, a cap ensures that pensions will not reach very high values.

Behind the concentration of pensions is the momentum created by a once strongly corporatist welfare state. The Brazilian pension funds were organized in the 1920s by occupational categories, following a design similar to that found in Bismarckian welfare state policies. The sectoral funds in the private sector were unified in a common fund during the 1960s, but unification did not affect the pension funds for workers of the public sector. A series of attempts were made to make the two subsystems converge, but none fully succeeded (Marques and Euzéby 2005; Melo and Anastasia 2005). Only after recent reforms the convergence begun, but full unification will take decades, as the equalizing rules apply only to new hires in the public sector. Unless some equalizing mechanism is put in place, the inequality that is already perpetuated by a contributory system will be sustained until the demographics of the pension system change completely.

3.3. Other income flows to and from the State and Private Sector incomes

Not all State transfers are inequality-increasing. Social assistance - basically targeted cash transfers of anti-poverty programs - is highly progressive and contributes to reverse inequality (Hoffmann 2009; Soares et al. 2009). However, as they represent a minor share of the income received by families (1%), their contribution to reduce inequality is minimal (-1%). Such an impact is so small that it is completely offset by unemployment insurance benefits and individual accounts drawdowns, which also amount to a minor share of total incomes (1%). The celebrated Brazilian two pillared anti-poverty system, based on the Bolsa Família and the BPC, is only a small droplet of redistribution in a large pool of State regressive actions.

Some studies of OECD countries argue that universalist policies legitimize more social spending, and therefore countries with corporatist models of a welfare state are more capable of reducing inequality than those which targeted social assistance (Korpi and Palme 1998) (Smeeding 2005). A recent research of 28 OECD countries around 2004 estimate that welfare states, on average, reduce inequality by 35% (Wang et al. 2012). This estimate, however, should be taken with caution, as it is based on a methodology of sequential accounting decomposition, that is, the simple recalculation of inequality after the counterfactual suppression of a source of incomes. When the same data is analyzed with the factor decomposition methodology, the conclusion is that welfare benefits play a negligible role in reducing inequality (Fuest et al. 2010; Lefebvre 2007; Wang et al. 2012).

There is no evidence that more social spending reduces inequality in Brazil.

Expenditures for regressive pensions already add up to a fifth of all family income – a high proportion, even comparing to OECD countries – but progressive targeted social assistance has not increased accordingly and still is twenty times lower than that.

In the Brazilian case it makes more sense to argue that workers in the more developed sectors of the economy form an organized interest group much more powerful than the unorganized mass formed by potential beneficiaries of social assistance. Historically, the elites in all Latin American countries, Brazil not being an exception, used social security to coopt the military, public servants and some unions to their projects and attract support to generate political stability. The end result is a stratified social protection system where, on one extreme, a large number of poor families can only count on meager social assistance benefits or minimum wage pensions upon retirement, and, on the other extreme, a restricted number of well-paid public servants have an outstanding income protection system.

Different from what Korpi and Palme defend for OECD countries, it seems that what matters to inequality in a late development welfare state is not so much the design of the policies (targeted versus universal) but the unbalance of power between oligarchies and the rest of the population that precedes that design and determines the level of transfers to different social groups, irrespective of the aggregate level of spending.

Taxes and contributions to pensions could reverse the regressive effect of social security, as they often do in OECD countries (Atkinson 2003; Gottschalk and Smeeding 1997). Indeed, direct taxation, almost entirely based on income taxes, is very progressive and contributes to reduce the Gini by 10%. Brazil, however, still has a taxation scheme that dates back to the mid 1960s and is typical of semi-industrialized countries, with more than 80% of its taxes being indirect and taxation on real estate property and inheritances being virtually residual. As a consequence, most of the tax load is levied on production and consumption and therefore paid more or less equally by the entire population (Pintos-Payeras 2010). The problem resides not so much in the level of taxation, but on its composition. Our study does not include individual data about indirect taxes, but it is reasonable to infer that if all taxes had the distributional profile of the income taxes, then inequality in the country would be much lower, even if the regressive state transfers were kept as they are.

The 'Other incomes' received from the private sector include real estate rents and interests, and therefore tend to be concentrated. Nevertheless, they contribute to only 10% of total inequality. We believe this contribution is not larger because a reasonable share of capital incomes are directly paid to companies and financial funds – not individuals – and because the incomes directly received by families are underreported. If fully accounted, rents and interests directly and indirectly received would probably increase total inequality.

4. Conclusions

The State contributes with a large share of the high level of income inequality in Brazil; proportionally, it contributes more to inequality than the private sector. The factor decomposition of the Gini coefficient of household disposable per capita income inequality shows that about one- third of all inequality in the country is directly related to transfers, payments and taxes that flow between the State and families. The two major types of State income flows affecting inequality are wages and pensions. The other two -thirds of total inequality are related to transfers from the private sector, which are, mostly, some form of remuneration to work.

Contrary to what has been found in OECD countries, public sector wages in Brazil are more concentrated than those of the private sector, resulting in a disproportionate contribution of public work to inequality: while public sector wages amount to little less than a fifth of all incomes, they contribute to almost one quarter of inequality. There are two effects making these wages regressive. The first one is a composition effect, that is, workers in the public sector are better qualified than the average of the labor force, and thus receive higher wages. The second is a segmentation effect, caused by different institutional settings that result in different prices being paid to labor, or, in another words, a particular wage structure.

By estimating wage differentials using counterfactual simulations we found that, for the most part, public sector workers are better remunerated than their counterparts in the private sector. In this sense, Brazil is in line with many Latin American countries, not to mention a few European ones. This wage differential currently contributes to about 6% of inequality. It is a small contribution, but its importance in the long term should not be underestimated as, in the future, it will be replicated by the pension system. Neither should its relevance in terms of being an income flow from the State be neglected, as the effect of this wage premium on inequality is sufficient to offset half of the progressive effect of direct taxes. The composition effect is much more important to explain why wages in the public sector affectinequalities: about 18% of total inequality is related to the fact that workers in the public sector possess characteristics which the labor market recognizes as important and remunerates better.

Pensions are the second major type of State transfer in Brazil. They amount to 20% of all incomes. As a whole, the pension system combines redistributive and regressive benefits but its outcome is slightly inequality-increasing. Pensions contribute to about one fifth of all inequality. This occurs because the system is contributory – therefore it tends towards the replication of previous inequalities – and divided into two subsystems operating with distinct rules. The subsystem for private sector workers has a floor and a cap, which restricts the range within which the value of pensions can vary. The subsystem for public sector workers, in turn, also has a floor, but not a cap, therefore allowing much more variation.

The characteristics and composition of the workers in the public sector results in higher wages and, consequently, higher Social Security contributions and higher pensions. This, combined with the absence of a cap makes the public workers pension subsystem regressive. This share of pensions that exceeds the cap is so regressive that it, alone, offsets the sum of the progressive effects of all direct contributions to pensions, both from private and public sector workers. It appears that this negative effect on inequality will persist for decades, as the convergence of the two sectors will happen only in the long term since the equalization of rules applies only to new hires of workers in the public sector.

In summary, there is evidence that the State operates its wage and social policies in a three-tiered way: on the first tier, it maintains an elite of public sector workers with high wages and pensions, concentrating incomes with very regressive transfers; on the second tier, it provides intermediate pension benefits and unemployment insurance only to formal workers in the private sector – these benefits are still concentrated, but progressive; lastly, on the third tier it has highly progressive measures, such as progressive taxes to all and basic income policies for the low income masses in the informal sector, but the share of these measures in total income is small. The final balance is that the State contributes to increase inequality. Egalitarian transfers such as social assistance and taxes are more than offset by regressive transfers as public wages and pensions.

Finally, a few comments about the limitations of this study. One of its weaknesses is that we were not able to correctly describe the distributional profile of indirect transfers to the State, such as indirect taxes and contributions to pensions made by the employers, and of some direct and indirect transfers from the State, such as interest paid to bonds. The datasets we have either neglect or underestimate these transfers. For the same reason we were not capable of measuring incomes indirectly received by families in the form of capital gains of companies. We believe that if these were taken into account, the inequality levels in Brazil would be much higher than they already are.

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