

Top Income Shares and Inequality in Brazil, 1928-2012

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Abstract

In this paper, we argue that top income shares are crucial to both the levels and dynamics of income inequality in Brazil. We use income tax data to correct for the underestimation of top incomes in surveys in the years 2006-2012, and find that the Gini coefficient remained stable during this period. We also present preliminary estimates of the top 1% income share (gross taxable income only) according to income tax data since 1928. Our results suggest that income inequality in Brazil was high throughout the 20th century, though not constant. There are no signs of long-term trends towards lower or higher inequality, but top income shares have fluctuated significantly, sometimes in tandem with major political events.

Keywords: Income inequality. Top incomes. Rich. Income tax.

Introduction¹

In this paper, we take the first steps to assess the income share of the top 1% in Brazil from 1928 to 2012 according to personal income tax tabulations, comparing it with results based on survey data for the recent period of 2006-2012. We argue that top income shares have an enormous influence on both the levels and the trend in inequality in Brazil.

The purpose of our empirical analysis is two-fold. First, we expand the analysis undertaken by Medeiros, Souza and Castro (2015b) and show that the apparent decline in the Gini coefficient recorded by surveys in 2006-2012 vanishes once we correct for the underestimation of top incomes. Second, we present preliminary estimates of the income share of the top 1% since 1928, expanding and refining the results first provided by Souza (2014). We maintain that top income shares were very high in Brazil during the past nine decades, but hardly constant, and that, at least as a first approximation, their ups and downs seem to be correlated with major political changes, not reflecting any clear-cut secular pattern. It should be noted, however, that this is a work in progress and our current results reflect only the evolution of gross taxable incomes, and not total incomes over time. We hope to provide a long-term series of total incomes in the near future.

Tax data was first used to measure income inequality in Brazil by Souza Reis (1930). Brazilian research on top incomes and inequality based on income tax data became more systematic in the mid-twentieth century (Kingston, 1951; Mortara, 1949a, 1949b), approximately at the same time Lienberg and Kaitz (1951) and Kuznets (1953) were publishing their studies. In the 1970's, Alves (1971), Kingston and Kingston (1972), Langoni (1973) and Gonçalves (1976) used tax data to analyze the concentration of income at the top of the distribution

¹ Marcelo Medeiros Acknowledges the support of a PQ2 grant from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq). Pedro Souza thanks the support of the University of California, Berkeley during part of this research.

between 1960 and 1970 and Gibbon (1978, 1979) to study mobility at the top of the distribution between 1970 and 1975. Beginning in the 1990s, research on the rich in Brazil boomed, using both survey and tax data (Albuquerque, 1994; Castro, 2014; Dedecca, 2014; Ferreira, 2001; Medeiros, 2004, 2005; Medeiros, Souza, & Castro, 2014a, 2014b, 2015a; Medeiros et al., 2015b; Medeiros, Souza, & Castro, 2015c; Souza, 2014; Torche & Costa-Ribeiro, 2012).

In fact, there are estimates of inequality in Brazil before the 1920's. Inferring from very scarce data, Buesco (1979) suggests inequality was already high in the year 1600: the top 0.2% of the economically active population concentrated 11% of all monetary incomes. Based on different sources and extrapolating data from three regions to the entire country, Bértola, Castelnovo, Rodríguez and Willebald (2010) found high levels of inequality in Brazil in 1872, increasing slightly in 1920. Nevertheless, none of these estimates is directly comparable to ours.

Data and methods

Our analysis relies on two series of top incomes shares. The shorter series covers the period from 2006 to 2012 using data from Castro (2014) and Medeiros, Souza and Castro (2015a). This series was combined with survey data using the methodology of Medeiros, Souza and Castro (2015b) to estimate a “corrected” Gini coefficient, that is, the Gini coefficient correcting for the well-known underestimation of top incomes in the survey data. However, Medeiros et al presented results only for the years 2006, 2009 and 2012. We employ the same methodology to calculate the corrected Gini coefficient for every year between 2006 and 2012, thus expanding the original analysis.

The longer series covers the period from 1928 to 2012, refining and updating the estimates provided by Souza (2014). Some methodological aspects of this series deserve further comment. First, unlike the shorter

series, this longer series concerns only gross taxable incomes, which are a subset of total incomes. Roughly speaking, the Brazilian personal income tax system was quite comprehensive in the 1930's and 1940's, but the scope of non-taxable incomes increased over time. On average, gross taxable incomes account for 60%-65% of all reported incomes in tax returns since the 1970's. Non-taxable incomes consist mostly of some types of capital and property incomes, and are heavily concentrated at the top of the distribution. Thus, our estimates provide only a lower bound for top income shares. Moreover, by comparing with total income data for the period after 1974, we know that the trends of taxable incomes do not match closely that of top incomes. For example, the decrease in inequality between 1974 and 1984 observed in taxable incomes is not observed in total incomes (Souza, 2014).

Second, there were extensive adjustments to the original tabulations published by the *Receita Federal do Brasil* and its predecessors. From 1928 to 1943 and in 1966, the raw data generally covers only the richest areas of Brazil and required extrapolation. Until 1963, the tabulations report only net taxable income, which required the full (1928-1949) or partial (1950-1963) imputation of itemized deductions. The tabulations for 1963 and 1964 did not report the number of tax returns by income brackets, which were estimated based on data for the closest years. Until 1968, the income brackets are ranked by net taxable incomes and, from 1969 onwards, they are ranked by gross taxable incomes, and thus our series assumes there is no re-ranking due to tax deductions. The published statistics for 2007-2012 have very coarse income brackets, following the thresholds that determine marginal tax rates. We chose to use these tabulations instead of the ones used for the shorter 2006-2012 series to keep the ranking variable consistent: as stated above, the shorter series ranks tax returns by total incomes, but the official tabulations rank them by gross taxable incomes.

Third, the top 1% in the long-term series is defined as a fraction of the population aged 20 years and over. To maintain comparability with

previous studies, the shorter series uses a slightly different definition, that is, individuals aged 18 years and over. The income denominator needed to calculate the top 1% income share follows the preferred formula discussed by Medeiros, Souza and Castro (2015a) for the years 1995-2011. It is, on average, about 67% of Gross Domestic Product (GDP). Thus, for all the other years, the control for total income was set at this level. While this proportion is fairly stable between 1995 and 2011, it could be – and probably was – different in the earlier decades. This means that a revision of the denominator may change our results and conclusions. Most likely, inequality tends to be overestimated, particularly before the 1950s, as the income received by families was probably more than 67% of the GDP at that time. Also, note that this income denominator encompasses both gross taxable and non-taxable incomes, so, again, our estimates provide only a lower bound of inequality.

Finally, one should not read too much into year-to-year variations in top income shares as our series covers a period with enormous change in the economy, in the tax system and in the national accounts. In the last nine decades the country faced periods of recession and accelerated growth, hyperinflation and several changes of currency that affect differently GDP and incomes reported to tax authorities. The corporate and income tax went from almost zero percent to more than 5% of GDP, top personal income tax rates ranged from 10% in 1928 to 65% in 1962-1964 and then settled at 27.5% since 1998, and exemptions and deductions changed frequently. As in many other countries, there was not a proper system of national accounts before 1947, and GDP estimates are generally of lower quality before 1995. Therefore, our conclusions should be taken with a certain amount of reservation.

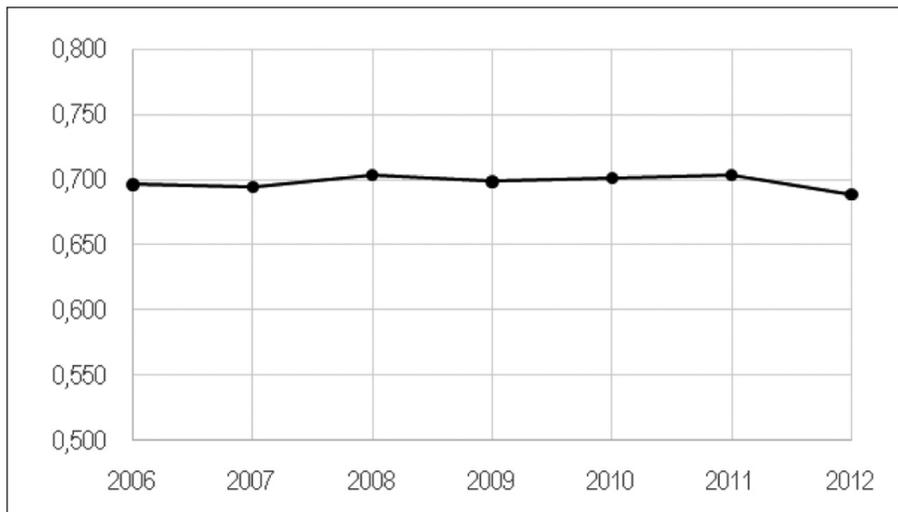
Influence of top income shares on total inequality

The top of the income distribution has a vast leverage over total inequality whenever income is extremely concentrated, as is the case

of Brazil. As the richest 10% consistently get between half and two thirds of all incomes since 1974 (Medeiros et al., 2015a; Souza, 2014), inequality within the bottom 90% of the population tends to have a weaker influence on overall inequality.

Top income shares are one among several indicators of relative inequality. They detect changes in inequality between income classes, but not within classes. However, by using the methodology of Medeiros, Souza and Castro (2015b) we combined tax and survey data and calculated Gini coefficients for each year between 2006 and 2012, which take into account inequality between and within classes. To maintain comparability with previous studies, we defined as adults those aged 18 or more years. Figure 1 presents the results.

Figure 1 – Gini coefficient for individual incomes – Brazil, 2006-2012



Source: calculations based on PNAD 2006-2012 IBGE, microdata, personal income tax returns, 2006-2012, RFB, tabulations.

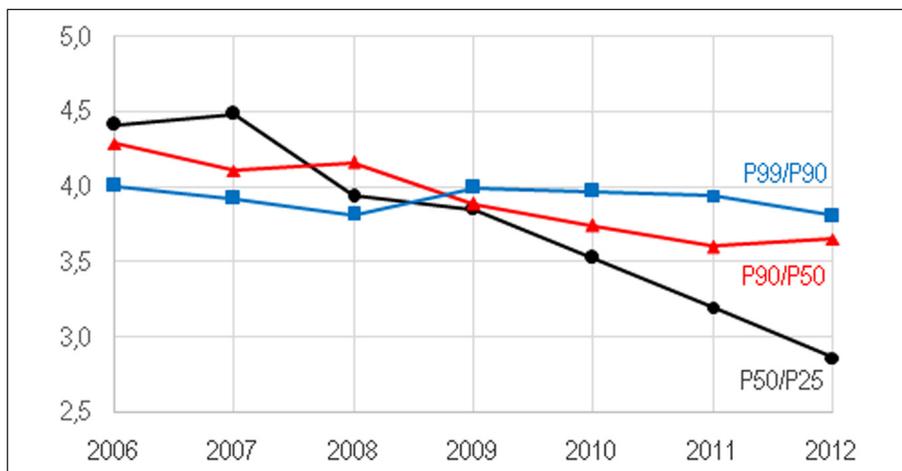
Note: the Gini coefficient relies on PNAD data for the bottom 90% of the distribution and on income tax data for the top 10%. Data for 2010 was calculated as the average for 2009 and 2011. Raw PNAD incomes were adjusted to yearly incomes. Population refers to individuals aged 18 and over.

Income inequality was stable between 2006 and 2012. Different from what sample survey data alone shows, there are no major changes in the Gini coefficient when tax and sample survey data are combined to form a complete distribution of incomes among adults. The reduction of inequality in the bottom of the distribution was offset by the slight rise in top income shares revealed by the tax data.

Even when one looks solely at survey data, most of the decline in inequality resulted from changes in the bottom half of the income distribution. The income share of the top 1% of adults in the Brazilian National Household Sample Survey (PNAD, in Portuguese) data dropped by less than one percentage point between 2006-2012. Likewise, as Figure 2 shows, the evolution of income ratios between percentiles differs across the income distribution: in 2006, the 50th/25th ratio was the highest of the three ratios, but it was 35% lower in 2012, whereas the 90th/50th and the 99th/90th ratios fell by only 15% and 5%, respectively. Consequently, this latter ratio became the highest of the three: in 2006, it was almost 10% lower than the 50th/25th ratio, but in 2012 it was already 33% higher. In fact, two-thirds of the decline of the log-ratio of the 99th to the 25th percentile results from less inequality in the bottom half of the income distribution.

Considering the PNAD data underestimates top income shares even when compared to other household surveys and that the distribution of household *per capita* income shows a similar trend, we can conclude that both survey and tax data evince remarkable stability at the top. In fact, it is logical to assume that inequality in Brazil has changed less than survey data alone suggests. Trends in top incomes seem to have mitigated changes in the lower half of the income distribution and apparently determined much of the evolution of income inequality in Brazilian recent history. Most likely, it has also driven inequality over the nine decades we analyze, as the evidence we have is that the concentration of incomes at the top has always been very high.

Figure 2 – Income ratios between selected percentiles – Brazil, 2006-2012



Source: authors' calculations based on PNAD microdata.

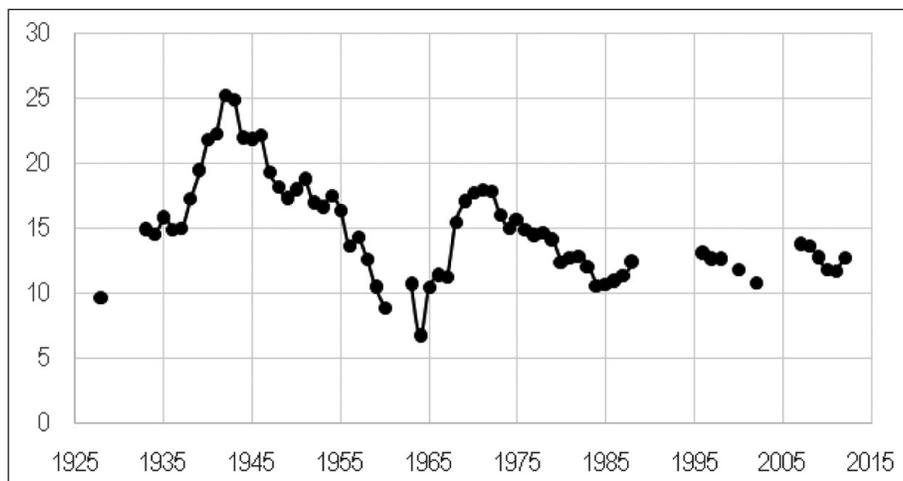
Note: Data for 2010 calculated as the average for 2009 and 2011. Raw PNAD incomes adjusted to reflect yearly incomes. The distribution refers to individual incomes for people aged 18 and over.

Top income shares in the long-run

Figure 3 shows the income share of the top 1% in Brazil over nine decades. It reflects only the gross taxable income (not total income) of the top 1% as a fraction of total household income (including non-taxable incomes), and thus underestimates total inequality. It also uses a fixed denominator of 67% of GDP that probably leads to a relative overestimation of inequality before the 1990s, particularly before 1950. The series begins in 1928 and ends in 2012, but there is data missing for some years. Overall, we have estimates for 66 of the 85 years in that time span (78%).

Due to the limitations of our data, we refrain from making causal imputations or drawing strong conclusions at the moment. The fact that the gross taxable and total income shares of the top 1% apparently diverge in the 1980's is of special concern (Souza, 2014). Nevertheless, a few facts can be identified.

Figure 3 – Top 1% income share (gross taxable income only) – Brazil 1927-2012



Source: Souza (2014) revised and updated with additional data. Tabulated data from Anuário Estatístico do Brasil, Anuário Econômico Fiscal, Grandes Números IRPF, Castro (2014) and several historical documents and reports from Receita Federal do Brasil and its predecessors.

First, inequality in Brazil has been very high during the nine decades since 1928. On average, about 15% of all income accrued to the top 1%. Their income share fluctuated between 10% and 20% most of the time. Yet, this is just a lower bound. At least since the 1970's about one-third of total income is non-taxable or taxed separately at preferential rates. It is then reasonable to conclude that actual levels of inequality are much higher and that the concentration of income at the top was persistent over the 20th century.

The concentration seems to be high even within the top 1%. Historically, after 1974, the top 0.1% of adults get between 8% and 15% of total income (Souza, 2014). Between 2006 and 2012, the top 1% had more income in total than the bottom half of the population combined (Medeiros et al., 2015a) and there is no reason to believe this was much different in previous decades.

Second, there are neither clear-cut secular patterns in inequality nor perfect constancy of top income shares. They seem to ebb and flow over time, often correlated to major political changes. As seen on Figure 3, the income share accruing to the top 1% increased between the late 1920's and early 1940s, and then declined continuously until 1964. Souza (2014) suspects the peak during World War II has to do with more stringent tax enforcement in the face of declining revenue from tariffs but believes the fall between 1945 and 1960 reflects real changes in the distribution of incomes. Historical analysis of the direct taxation during its implementation years suggest this was indeed the case (Brasil, 1966a; Brasil, 1966b; Nóbrega, 2014; Shoup, 1965). A similar trend was observed in Argentina (Alvaredo, 2010). This was, for many countries, a period of reduction in inequality (Atkinson & Piketty, 2007, 2010; Piketty, 2014).

The gross taxable income series reaches its lowest point in 1964, but that might be due to institutional disruption, as this was the year of the military coup that led to a three-decade-long dictatorship in Brazil. Either way, it marks a sharp reversal of trend, with top income shares rising very quickly until the early 1970's, when they reached about the same levels as in the early 1950's. Legislative and administrative changes notwithstanding, it is reasonable to conclude that the military dictatorship really did promote higher inequality in its earlier years. Census data for 1960 and 1970 also showed rapidly increasing inequality over the decade, which sparked a politically-charged controversy at the time.

Figure 3 suggests there was another decade-and-a-half long decline in inequality starting in the early 1970's, and not much change after the late 1980's. However, Souza (2014) shows a divergence between the series for gross taxable and total income from 1974 onwards, as the latter point towards stability in the late 1970's and rising top shares in the 1980's. All these fluctuations are observed using a fixed share of GDP as the denominator of top incomes shares. More precise denominators will probably reduce variation.

In summary, the lack of a clear-cut long-term pattern does not imply stability of top income shares, as is often assumed. For instance, in their outstanding effort to build a world inequality database from 1820-2000, Bourguignon and Morrison (2002) did not have a long term series on inequality in Latin America available and therefore had no choice other than assume inequality remained constant in the region between 1820 and 1950. Apparently, inequality was not constant, as our data suggests.

Conclusions

The high levels of income inequality in Brazil are a direct consequence of the concentration of income at the top level of society, that is, among the rich. Trends in inequality over time also depend crucially on the evolution of top income shares. Therefore, the evolution of top incomes over the last nine decades can tell much about the history of inequality in Brazil.

Our results are preliminary and may undergo some revision, particularly with respect of the denominators (share of GDP) used. Yet, the evidence we have is that inequality in Brazil has always been very high, though definitely not constant. There are no clear-cut secular trends towards either increasing or decreasing inequality, but top income shares have fluctuated sometimes in tandem with major political changes. The military coup of 1964, in particular, was followed by a rapid rise of the top 1% income share, reversing the previous trend. It is hard to discern any clear pattern over these nine decades, especially due to data limitations, as our long-runs series concerns only gross taxable incomes. Thus, our results should be interpreted with caution and provide only a lower bound for total inequality.

The importance of top income shares is highlighted by our analysis of the more recent years of 2006-2012. Once we combine survey and income tax data on total incomes, the decline in the Gini coefficient shown by surveys all but disappears. The income distribution in Brazil seems to be far more stable than previously thought.

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Received: September 28, 2014.

Accepted: December 12, 2014.