Non-spatial government policies and regional income inequality in Brazil[*]

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Abstract

The work uses both macro and micro data to analyze the forces explaining the recent reduction in Brazilian regional *per capita* income inequality. The results point out that both labor productivity convergence and government non-spatial policies, mainly minimum wage changes and income transference programs, do have a role in explaining regional inequality reduction during the period. More specifically, it is shown that income transferences and the minimum-wage growth explain, respectively, 17.4% and 21% of Brazilian regional *per capita* income inequality reduction between 1995 and 2005.

Key-words: convergence; labor productivity; income transferences; minimum-wage; spatial effects of non-spatial policies

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1. Introduction

Brazilian income inequality is one of the highest in the world (Baer 2007), but it is becoming consistently less concentrated in the last fifteen years, as revealed by Barros et al. (2006), Ferreira et al. (2006), Hoffmann (2006), and Soares (2006a, 2006b). This less concentrated income distribution has an important spatial dimension: *per capita* income of poor states has been growing at a higher rate than that of the richer ones. Since 1995, seven out of the nine states in the poor Northeastern region have presented higher growth rates of *per capita* income than the richest state of São Paulo. This observed diminution in income inequality in Brazil, and among Brazilian states in particular, has attracted attention of many researchers, since the country's regional inequalities are among the largest in the world (Shankar and Shah, 2003) and had been persistent until the mid-1990s (Azzoni, 2001). More recently, Silveira-Neto and Azzoni (2006) have shown that this persistence is related to spatial delimited shocks. Menezes et al. (2006) have demonstrated that, although there has been regional income convergence among the older cohorts, there has been regional divergence among young cohorts, which could explain the inexistence of regional income convergence in the 1980s and 1990s. Menezes and Azzoni (2006) have shown that both supply-side and demand-side aspects play a role in the dynamics of regional income inequality in Brazil.

This recent regional income inequality dynamic would be compatible with the convergence property of the neoclassical growth model: the higher marginal productivity of capital in poorer states implies a higher rate of accumulation and growth, leading to convergence in labor productivity among regions. However, other factors should be considered, because there were at least three general important phenomena that potentially favored poorer states recently. First, the rate of inflation decreased substantially; secondly, there was a significant real growth of the Brazilian minimum wage; finally, government programs involving income transferences to poor people increased significantly. As poor Brazilian states present proportionally more poor people, these three factors might have favored them.

The objective of this work is to determine what forces explain regional *per capita* income inequality reduction in Brazil from 1995 to 2005, establishing the role of such factors. The next section presents some evidence on the spatial effects of non-spatial government policies. In Section 3 we use both macro and micro data to investigate labor productivity convergence and its links to regional income inequality. In Section 4 we estimate the role of government income transferences and the real increase in the minimum wage. The conclusions are presented in Section 5.

2. Potential regional impacts of non-spatial government policies

At least three important events for the subject of this study were present in the Brazilian economic environment since 1995, implying possible important spatial or regional differentiated impacts. First and most basically, the period is marked as one of low inflation by Brazilian standards: after many decades with high numbers, inflation rate decreased from more than 30% per month in 1993 to less than 5% per year in 2005 (Baer, 2007). Since high inflation affects proportionally more poor individuals, and there are proportionally more poor individuals in poor states, inflation reduction has a potential for causing regional differentiated effects. Second, due to government ruling, the national minimum wage, in real terms, grew 42% in the period, while per capita household income grew by a modest 0.9%. Again, there is a potential spatial for a regional differentiated impact here, since the population of poor states is more dependent on this baseline salary. The last, and probably clearer, effect comes from the non-intentional spatial bias of government income transference initiatives, mainly the Bolsa Família[1] program. As the Northeast region has absolutely and proportionally more poor people than any other region, its states benefited from this source of income (Azzoni et al., 2007). These three potential spatially differentiated impacts come from general or individual-focused policies, a situation very different from the traditional spatially-oriented regional policies implemented in the past, with very limited success.

Table 1 presents information on regional labor markets and social conditions that are useful to understand the potential regionally differentiated impacts of these policies. The poorest Northeast region presented more than 60% of its labor force in the informal sector in 2005, while the richest Southeast and South regions presented the majority of their labor force in the formal sector. The numbers in Table 1 also indicate that workers in poorer regions are much more dependent on minimum wage. The Northeast region also presented the largest share of households eligible to access the income transfer programs.

<< Table 1 >>

[1] "*Bolsa Família*" provides direct income transfers to households with per capita income below one-half of the minimum wage. The program started in the 90s, but was intensified after 2002, when 0.45% of national GDP, 0.82% of national disposable income, and 13.4% for the poorest income bracket were distributed in each year, on average.

Figure 1 shows the evolution of per capita income in selected states and of the minimum wage. The trajectories of the poor states of Maranhão and Piauí are very close to that of minimum wage, but that is not the case for the rich states of São Paulo and Rio de Janeiro. For a real minimum wage growth of 41% from 1995 to 2005, *per capita* income growth rates of the poorest states of Maranhão and Piauí were 11.7% and 32.8%, respectively. These rates were negative for the rich states of São Paulo (-6.5%) and Rio de Janeiro (-0.5%).

<< Figure 1 >>

Figure 2 presents the regional distribution of the money value of transfers from the Bolsa Família Program in 2005. Since the states are displayed in increasing order of per capita income, it can be seen that not only more resources have been directed to poor states, but also the 15 states receiving more federal government transferences (in *per capita* terms) are located in the two poorest geographic regions, Northeast and North. The Northeast region, which represented only 28% of population and 15% of national GDP, received almost 52% of Bolsa Família resources in 2005. However, the Southeast region, which was responsible for 42% of Brazilian population and 55% of GDP, received only 24% of the resources.

<< Figure 2 >>

3. Changes in regional income inequality in Brazil, 1995-2005

3.1 Traditional convergence tests

Although it is not entirely possible to isolate the effects of labor productivity and minimum wage or income transferences on the dynamic of regional inequality by using traditional convergence tests, two reasons justify their consideration here. First, contrary to the majority of traditional inequality measures, they are theoretically well established, i.e., they can be derived, for example, from the neoclassical growth model. Additionally, by considering both labor productivity and *per capita* income, they provide a kind of necessary condition for establishing the importance of labor productivity convergence in regional *per capita* income inequality reduction.

Table 2 shows the estimates of β-convergence obtained by regressing states *per capita* income growth or labor productivity growth on their initial levels. We estimate expression (1), in which $y_{T\,i}$ and y_{0i} are labor productivity or *per capita* income in state *i*, in the final and initial years, respectively, T is the time interval, α and β are parameters, and ε_i is an error term.

$$\frac{\ln\left(y_{T_i}\right) - \ln\left(y_{0i}\right)}{T} = \alpha + \beta \ln\left(y_{0_i}\right) + \varepsilon_i \qquad (1)$$

Four dependent per capita variables are used: valued added, production, income, and labor income. The dynamics of the first two are fundamentally and theoretically linked to the neoclassical convergence growth model and reflect economic factors. They are less influenced by government policies, although the economic system is obviously influenced by such policies[2]. The two income-based measures can better inform about the influence of non-spatial government policies on regional inequality reduction. By

[2] An example is through induced spending.

considering independently labor income, it is possible to analyze the effects of government income transference programs.

The most important qualitative point to highlight in the results shown in Table 2 is that, as it can be noted by the negative and statistically significant values of the β coefficients, regional inequality reduction is observed in all variables, i.e., per capita income in poor states tends to grow faster than in rich states. Thus, the results do not depend on the measures of product or income used, confirming the results first pointed out in Silveira-Neto and Azzoni (2005). This conclusion is the first indicator that it is not possible to attribute entirely the observed regional per capita income inequality reduction in Brazil during the period to non-spatial government policies. In other words, the evidence suggests that labor productivity convergence plays a role in explaining Brazilian regional inequality dynamic. Consistent with this perspective, the highest determination coefficient (R^2) is found in the labor productivity regression (I).

But there are important quantitative differences across the regressions. First, the convergence coefficients are larger for income (regressions III to VI) than for production (regressions I and II), meaning that the convergence process was stronger for income than for production. The highest speed of convergence is found for *per capita* income: 3.7% of the gap between current *per capita* income and its steady-state value vanishes in one year[3]. The speed of convergence is much lower for labor productivity (1.6%) and *per capita* GDP (1%). This evidence suggests that non-spatial government policies which affect income might be in action. When we use labor income (regressions V and VI), we partially control for the influence of government income transferences. In this case also a

[3] This follows from the neoclassical growth model. It is possible to derive an specific version of equation (1) with $\beta = \left[\left(1 - e^{-\lambda T}\right) / T\right]$, where λ is the speed of convergence.

large speed of convergence is obtained (3%)[4], which is consistent with a potential role for minimum wage changes in regional convergence.

<< Table 2 >>

A second and more technical point to highlight is the implication derived from the results of the spatial diagnosis tests and spatial error regressions. Spatial correlation is detected only for *per capita* income regressions, which, again, is consistent with spatially differentiated impacts of non-spatial government policies. Moran's I statistic for OLS residuals, a general spatial correlation statistic, is only significant for *per capita* income. The results of the two other tests, *error* robust Lagrange multiplier and *lag spatial* robust Lagrange multiplier, indicate rejection of the null hypotheses of no spatial correlation for both *per capita* income and *per capita* labor income, against the alternative hypothesis of a spatial error regression model. In the same way, we do not reject the same null hypotheses against the alternative hypothesis of a lag spatial model[5]. It should be noted that both estimates of the spatial error model obtained by maximum-likelihood generate a larger convergence coefficient.

As it is now well known, the β-convergence test does not say much about other moments of the *per capita* income distribution, since it deals with the mean relationship between initial levels and growth for a set of geographic units. In particular,

[4] Barro and Sala-I-Martin (1995) found a speed of convergence near 2% for US states.

[5] The spatial error model assumes the following specification: $g_y = \alpha + \beta \ln y_0 + \psi W\varepsilon + \mu$, where g_y is the growth of *per capita* income, ψ is a spatial parameter to be estimated, *W* is the assumed spatial matrix of distances, and μ is an i.i.d. error component. The lag spatial regression model assumes spatial correlation in the dependent variable, i.e., $g_y = \alpha + \beta \ln y_0 + \rho W g_y + \nu$, where ρ is the spatial parameter to be estimated and ν is an i.i.d. error component. The first spatial specification, which is associated to omitted spatial correlated variables, implies that the OLS estimator is not efficient; the second specification has a more serious consequence to OLS estimator: it becomes biased and inconsistent. See Anselin (1988) for more details.

it is possible that the variance of the *per capita* income distribution might grow even when there is β-convergence. Figure 3 presents the σ-convergence test, i.e., the evolution of the standard-deviation for the distributions of the four income measures we have considered. Regional inequality levels are higher for production variables than for income. This can be potentially explained both by income transferences and by the difficulties in measuring capital incomes from household surveys[6]. The second and most important point to highlight is that all four measures indicate σ-convergence. It is possible to note that the strongest reduction occurred in labor productivity, which, once more, indicates that regional labor productivity convergence has a role to play. But we also observe that regional *per capita* income inequality reduction is stronger than regional *per capita* labor income, which is also consistent with government income transferences strengthening the regional convergence process.

<< Figure 3 >>

3.2 Evidence from traditional inequality measures

The robustness of the above results is also tested by traditional inequality measures used in micro data analysis, which allows for the decomposition of inequality changes into different sources. Figure 4 deals with *per capita* income: Gini and Theil coefficients, and the ratio of the average income of the 20% richest to the 20% poorest states. Regional *per capita* income inequality reduction in Brazil since 1995 is clear, particularly when measured by the 20% richest/20% poorest ratio. The evolution of the Gini coefficient is quite similar to the evolution of the standard deviation: Gini decreased

[6] The hypothesis is that richer states present a higher level of capital income than poorer states.

by 11% in the period and the standard deviation decreased by 10%. It is reasonable to say that measuring the evolution of Brazilian regional income inequality in the period using the traditional Gini coefficient is a very good approximation to the σ-convergence test. Therefore, the decomposition to be developed in the next section will concentrate on Gini coefficients.

<< Figure 4 >>

4. Decomposing the changes in regional income inequality

Since individuals have different sources of income, the level of regional income disparity among regions depends both on how the different sources of income are distributed among the regions and on the relative importance of each source in total income. The evolution of regional disparities is influenced both by changes in the level of regional concentration within each source of income and by changes in their participation in total income. The next sub-sections decompose the Gini coefficient, highlighting, for each income source, two potential dynamic effects: concentration and participation.

4.1 Decomposing inequality measures

As recently pointed out by Hoffmann (2004), based on Shorrocks (1982), if individuals present different sources of income, some inequality measures can be expressed as the sum of the inequality indicators for each source multiplied by the correspondent participation in total income. In the case of the Gini coefficient (G), we can write:

$$G = \sum_{i=1}^{n} \alpha_i C_i \tag{2}$$

where, n is the number of different income sources, α_i is the participation of source i on total income, and C_i is a measure of how concentrated the distribution of this specific income is. This concentration coefficient can be obtained from a concentration curve, which shows, for any given income source, how the accumulated proportion of income source i is related to the population accumulated proportion, when individuals are ranked according to total income. More specifically, the concentration coefficient is:

$$C_i = 1 - 2.\beta_i \tag{3}$$

with β_i indicating the area between the concentration curve of income source i and the horizontal axis. If income source i is entirely allocated to the poorest individuals (regions), C_i = -1, because β_i = 1. If income source i is totally directed to the richest individuals (regions), C_i = 1, because β_i = 0. Thus, this coefficient is limited to the interval [-1;1], which differs from the [0;1] Gini coefficient interval because the concentration curve is a non-decreasing curve, while Lorenz' is an increasing curve.

Gini coefficients for different moments in time can be defined as:

$$G_{t-1} = \sum_{i=1}^{n} \alpha_{it-1} C_{it-1} \quad \text{and} \quad G_t = \sum_{i=1}^{n} \alpha_{it} C_{it} \tag{4}$$

Thus, changes over time can be written as:

$$\Delta G = \sum_{i=1}^{n} \left(\overline{C}_i \Delta\alpha_i + \overline{\alpha}_i \Delta C_i \right), \text{ where } \overline{C}_i = \frac{1}{2}\left(C_{it} + C_{it-1}\right), \text{ and } \overline{\alpha}_i = \frac{1}{2}\left(\alpha_{it} + \alpha_{it-1}\right) \tag{5}$$

After some manipulation, this last expression can be arranged to show the influence of (i) changes in income sources, (ii) changes in the concentration within these sources (concentration-effect), and (iii) variations in the participation in total income (participation-effect). Formally, it is expressed as

$$\Delta G = \sum_{i=1}^{n} \left(\overline{C}_i - \overline{G} \right) \Delta \alpha_i + \sum_{i=1}^{n} \overline{\alpha}_i \Delta C_i \text{ , where } \overline{G} = \frac{1}{2}\left(G_t + G_{t-1} \right). \qquad (6)$$

The first right-hand side term of equation (6) represents the participation effect. Increases in the share of income source *i* in total income help to lower the Gini coefficient only if the distribution of this income source is less concentrated than total income distribution. The second right-hand side term shows that a reduction in concentration in income source *i* led to a reduction in total income inequality. The higher the share of income source *i*, the stronger this effect is.

4.2 Income transferences and regional income inequality

The data source for the analysis that follows is PNAD **-** (Pesquisa Nacional por Amotra de Domicílio), an annual survey developed by the Brazilian statistics office, IBGE[7]. The survey allows for the identification of four different sources of income: (i) labor income, (ii) social security and pensions, (iii) interests, dividends and other incomes and (iv) rent revenues and donations[8]. The evolution of labor income includes that of minimum wage. Since the minimum wage is a *numeraire* to some transference programs, the potential effects of the evolution of this baseline wage also influence the shares of social security and pensions. Finally, the share of "interests, dividends and transferences" includes Bolsa Família, the most important government income transference program[9].

[7] www.ibge.gov.br
[8] Similar sources were used by Kakwani et al. (2006), Hoffmann (2006) and Soares (2006).
[9] Unfortunately, it is not possible to further disaggregate this source of income among its components (interests, dividends, and transferences).

Table 3 presents the evolution of the shares of these income sources. Labor income lost importance, since it represented over 80% of total income in 1995, and only 76% in 2005. Social security and pensions increased from 14.2% to 19.7%. Interests, dividends and transferences moved from 0.9% to 1.8% of total income, but this change occurred mainly from 2001 onwards. This is consistent with the growth of governmental income transferences in that sub-period, especially after 2003, coinciding with the change in the intensity of the Bolsa Família program.

<< Table 3 >>

Table 4 shows the evolution of regional concentration within each income source. In the beginning of the period, labor income, “rents and donations” and, mainly, “interests, dividends and transferences”, were more concentrated than total income, and “social security and pensions” were less concentrated. As can be observed in Figure 5, the evolution of regional concentration of labor income follows closely the evolution of regional inequality in total income, which is to be expected, given the large share of this source. The figure also shows the impressive decrease in the regional concentration of “interests, dividends and transferences”, with the coefficient becoming almost zero in 2003, and negative in 2004 and 2005. This indicates a distribution biased towards poor states, coinciding with the implementation of the Bolsa Família program.

<< Table 4 >>

<< Figure 5 >>

Tables 5 and 6 present a breakdown of variations in the Gini coefficients. It is possible to observe that all sources of income have contributed to the general decrease in concentration, since all total influences are negative. The general concentration effect is larger than the participation effect. Different from the other sources, the concentration effect of social security and pensions acts to augment regional income inequality in both sub-periods shown in the tables. The reduction in regional inequality is stronger in the second sub-period, which is mainly influenced by the concentration effect of “interests, dividends and transferences”. It is interesting to note that social security and pensions did not favor regional inequality reduction between 2001 and 2005 as they had done in the previous period.

<< Table 5 >>

<< Table 6 >>

Considering the period as a whole, the concentration effect is always responsible for more than 84% of the reduction in the Gini indicator. The two most important income sources in explaining the Gini decrease are labor income, which explains more than 75%, and “interests, dividends and transferences”, which are responsible for over 17%. For these two components, both the concentration effect and the participation effect favor regional inequality reduction, with the former showing the strongest impacts[10]. The role of “interests, dividends and transferences” in the reduction of regional inequality is more important in the second sub-period, when it was responsible for almost one-fourth of the reduction in the Gini index. Labor income, and “interests, dividends and transferences” are responsible for more than 99% of the Gini reduction.

[10] Note that, different from “interests, dividends and transferences”, which presented a larger participation in total income, the positive contribution of the participation effect of labor income is explained by the reduction in its participation in total income.

4.3 Minimum wage and regional income inequality

The above evidence indicates that both labor productivity convergence and government income transferences played important roles in explaining the reduction in regional *per capita* income inequality in Brazil recently, with the most important role belonging to the first factor. However, this last statement has to be reconsidered, because the evolution of labor income includes the effects of minimum wage policy, which, as was shown, favored the poorest states.

Since the data available do not permit the disaggregation of labor income, we use an indirect way to establish the role of changes in minimum wage on regional income inequality. We take the evolution of labor income of workers who received up to one minimum wage and discount the evolution of the minimum wage, thus producing an adjusted labor income. We then calculate the evolution of the concentration coefficient for this adjusted labor income, which shows the dynamic of concentration of labor income distribution among states, controlling for the influence of the real growth of the minimum wage.

Figure 6 presents the evolution of the concentration coefficient for both observed and adjusted labor income. Although the trajectories are similar, the adjusted *per capita* labor income coefficient shows higher levels of concentration and lower reduction during the period: the labor income concentration coefficient decreased by 10.5% and the adjusted labor income concentration coefficient decreased by 7.4%. It seems, thus, that the real appreciation of the minimum wage contributed to regional income inequality reduction.

<< Figure 6 >>

Although the difference in the trajectories shown in Figure 7 suggests that the evolution of minimum wage is not quantitatively important, the numbers in Table 7 indicate that this is far from being the case. They show that 21.5% of the reduction in the Gini coefficient can be attributed to minimum wage, since it is responsible for almost 30% of the concentration effect, which accounts for 75.9% of the reduction in the Gini, and labor income participation is always above 75%.

<< Table 7 >>

5. Conclusion

This work presented evidence that permits a better understanding of the forces behind Brazilian regional *per capita* inequality reduction after 1995. It highlighted the roles of regional labor productivity convergence and non-spatial government policies, mainly minimum wage appreciation and government income transferences to the poor.

The results pointed out that there was regional labor productivity convergence from 1995 to 2005. Thus, Brazilian regional *per capita* income inequality reduction has an economic component, and cannot be attributed solely to governmental non-spatial policies. By decomposing changes in the Gini coefficients according to different sources of income, it was shown that income transference programs did play an important role, being responsible for 17.4% of the reduction in regional *per capita* income inequality. This percentage increased to almost 25% from 2001 to 2005, when these programs were intensified. Reductions in labor income regional inequality, which included both the effects of labor productivity convergence and changes in real minimum wages, were responsible for almost 76% of regional inequality reduction. From this contribution, it was estimated that 21.5 % can be attributed to the real growth of the minimum wage.

In conclusion, both economic factors and non-spatially oriented governmental programs were in action in Brazil in recent years. Considering the joint effect of minimum wage and federal income transferences in the reduction of regional inequality, the influence of the total non-spatially oriented government policy on Brazilian regional *per capita* income inequality reduction was almost 40% (17.4% from income transferences and 21.5% from minimum wage).

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Table 1 – Regional differences in social and labor market conditions, 2005.

	Degree of Informality (share of total labor force)	Share of population with labor income lower than the minimum wage	Share of population with *per capita* household income lower than ½ minimum wage
North	59.3	47.0	53.0
Northeast	61.4	63.4	69.0
Southeast	44.8	26.9	33.2
South	43.4	31.8	32.2
Center-West	49.5	32.6	35.9
Brazil	50.5	39.5	44.8

Source: Authors' calculation from PNAD micro data. The degree of informality includes employed without formal contract, self-employment, and labor in activities for self-consumption or in building for own-use.

Table 2 – Convergence regressions

Dependent variable is growth of per capita values between 1995 and 2005

	Labor productivity	*Per capita* GDP	*Per capita* income		*Per capita* labor income	
	(I)	(II)	(III)	(IV)	(V)	(VI)
constant	0.159*	0.103*	0.142*	0.314*	0.103*	0.236*
	(0.046)	(0.034)	(0.054)	(0.112)	(0.051)	(0.112)
Ln y_0	-0.016*	-0.010*	-0.024*	-0.038*	-0.020*	-0.030*
	(0.005)	(0.004)	(0.009)	(0.013)	(0.009)	(0.014)
Spatial error coefficient	-	-	-	0.576*	-	0.436
				(0.207)		(0.256)
R^2	0.2394	0.1516	0.1934	-	0.1509	-
N. of observations	27	27	27	27	27	27
Spatial diagnostic tests						
Moran's I	1.038	1.020	2.359*	-	1.743	-
Error robust Lagrange multiplier	1.297	0.004	4.917*	-	4.571*	-
Lag spatial robust Lagrange multiplier	1.036	0.006	3.492	-	3.774	-

Sources: authors' estimative using data from PNAD and from Regional Accounts, both from IBGE. White robust heterocestadicity standard-error in parenthesis; the symbols * indicate statistic significance at 5%. Columns (I), (II), (III) and (IV) use OLS and columns (IV) and (VI) were generated by using the maximum-likelihood estimator. A contiguity matrix for spatial correlation tests and regressions is used.

Table 3 – Participation (α_i) of different sources of income (%)

	1995	1996	1997	1998	1999	2001	2002	2003	2004	2005
Labor income	82.1	81.7	81.5	79.4	78.5	78.0	77.4	76.7	76.5	76.0
Social security and pensions	14.2	14.5	15.2	16.6	17.8	18.5	18.6	19.8	19.4	19.7
Interests, dividends and transferences	0.9	0.9	0.6	0.9	0.8	0.9	1.3	1.0	1.6	1.8
Rents and donations	2.8	2.9	2.7	3.1	2.9	2.6	2.7	2.5	2.5	2.5
Total	100	100	100	100	100	100	100	100	100	100

Source: author calculations using PNAD micro data

Table 4 – Regional concentration coefficients and Gini indexes.

	1995	1996	1997	1998	1999	2001	2002	2003	2004	2005
Labor income	0.2349	0.2340	0.2364	0.2307	0.2221	0.2239	0.2206	0.2203	0.1892	0.2103
Social security and pensions	0.1560	0.1705	0.1814	0.1906	0.1800	0.1667	0.1538	0.1653	0.1943	0.1701
Interests, dividends and transferences	0.2914	0.2791	0.2413	0.3143	0.2587	0.1605	0.2316	0.0433	-0.0713	-0.0100
Rents and donations	0.2648	0.2743	0.2036	0.2572	0.2323	0.2201	0.2145	0.2060	0.1930	0.2124
Total (Gini)	0.2250	0.2264	0.2272	0.2256	0.2153	0.2126	0.2081	0.2072	0.1861	0.1985

Source: authors' calculations using PNAD micro data. Concentration Coefficients are obtained using equation (2).

Table 5 – Breakdown of Gini coefficient change (ΔG) - Distribution of *per capita* income of Brazilian states.

	Total income	Labor income	Social security and pensions	Interests, dividends and transferences	Rents and donations
1995-2005					
Concentration-effect	-0.0225	-0.0195	0.0024	-0.0040	-0.0001
Participation-effect	-0.0040	-0.0007	-0.0027	-0.0006	-0.0014
Total contribution	-0.0265	-0.0201	-0.0003	-0.0046	-0.0015
1995-2001					
Concentration-effect	-0.0095	-0.0088	0.0018	-0.0012	0.0000
Participation-effect	-0.0029	-0.0004	-0.0025	0.0000	-0.0012
Total contribution	-0.0124	-0.0093	-0.0007	-0.0012	-0.0012
2001-2005					
Concentration-effect	-0.0123	-0.0105	0.0006	-0.0023	0.0000
Participation-effect	-0.0018	-0.0002	-0.0005	-0.0011	-0.0002
Total contribution	-0.0141	-0.0107	0.0002	-0.0034	-0.0002

Source: authors' calculations using PNAD micro data. For each source of income, the composition-effect and the concentration-effect were obtained using, respectively, $\left(\overline{C}_i - \overline{G}\right)\Delta\alpha_i$ and $\overline{\alpha}_i \Delta C_i$.

Table 6 – Breakdown of changes in the Gini coefficient (ΔG) of *per capita* income of Brazilian states (% of ΔG).

	Total income	Labor income	Social security and pensions	Interests, dividends and transferences	Rents and donations
1995-2005					
Concentration-effect	84.7	73.4	-9.0	15.1	5.3
Participation-effect	15.3	2.5	10.1	2.4	0.0
Total contribution	100.0	75.9	1.1	17.4	5.3
1995-2001					
Concentration-effect	76.3	71.1	-14.1	9.5	9.8
Participation-effect	23.7	3.5	19.8	0.0	0.0
Total contribution	100.0	74.6	5.7	9.5	9.8
2001-2005					
Concentration-effect	87.3	74.2	-4.6	16.2	1.4
Participation-effect	12.7	1.6	3.2	7.8	0.0
Total contribution	100.0	75.8	-1.3	24.0	1.4

Source: authors' calculations using PNAD micro data. For each source of income, the composition-effect and the concentration-effect were obtained using, respectively, $\left(\overline{C_i} - \overline{G}\right)\Delta\alpha_i / \Delta G$ and $\overline{\alpha}_i \Delta C_i / \Delta G$.

Table 7 – Minimum wage participation in labor income concentration-effect and influence on Gini indices variation (%)

	Labor income Concentration effect	Total Gini variation
Other labor market influences	70.6	54.4
Minimum wage influence	29.4	21.5
Total labor income concentration effect	100	75.9

Source: authors' calculations using PNAD micro data.

Figure 1 - Comparing income in poor and rich states

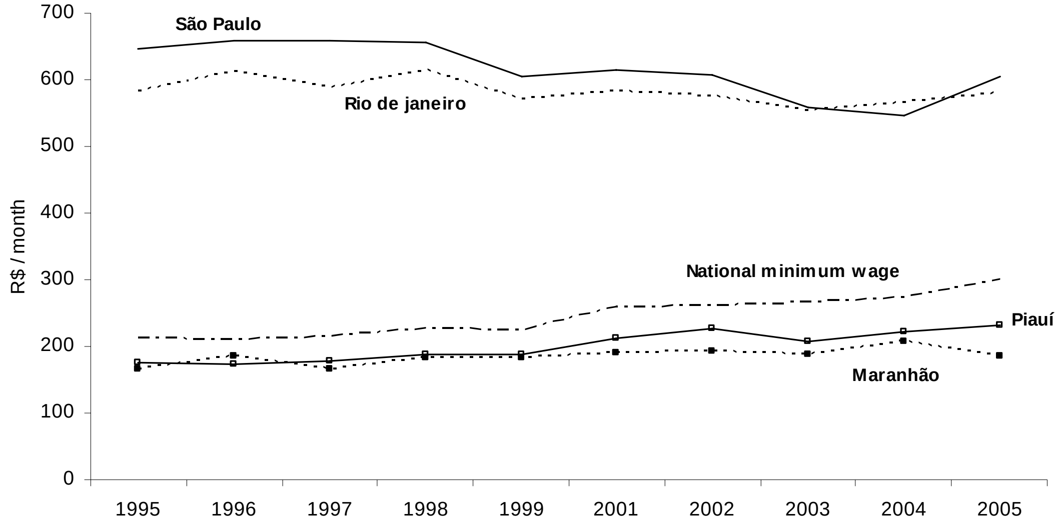

Figure 2 - *Per capita* value of government tranferences, 2005

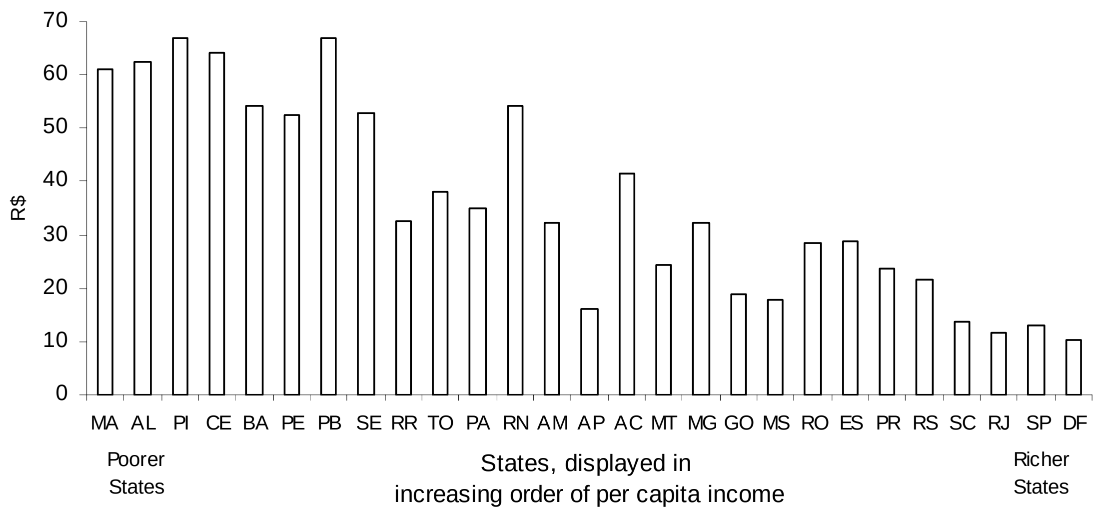

Figure 3 - Evolution of regional inequality (standard-deviation of logarithm)

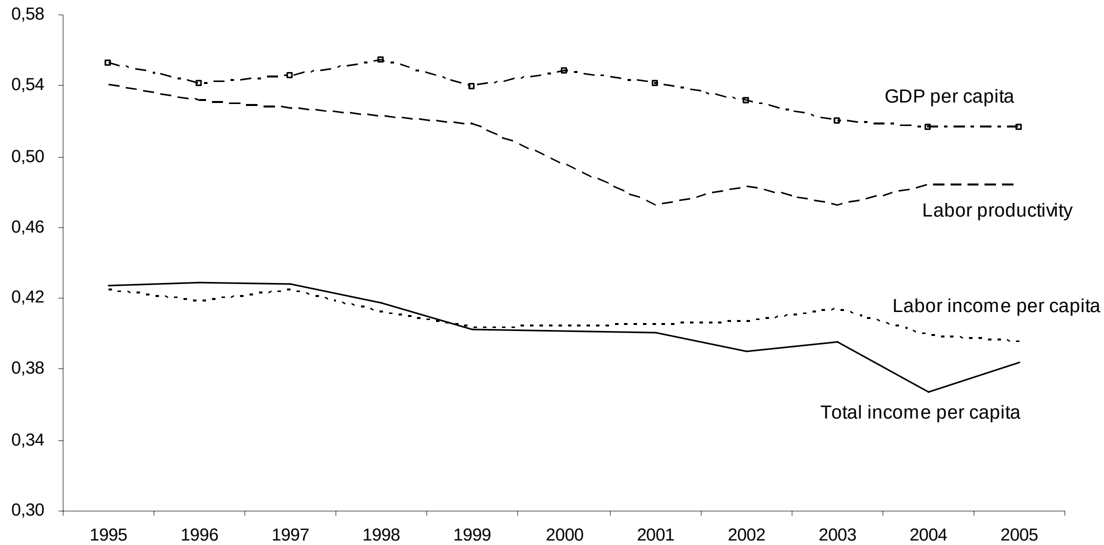

Figure 4 - Evolution of regional *per capita* income inequality

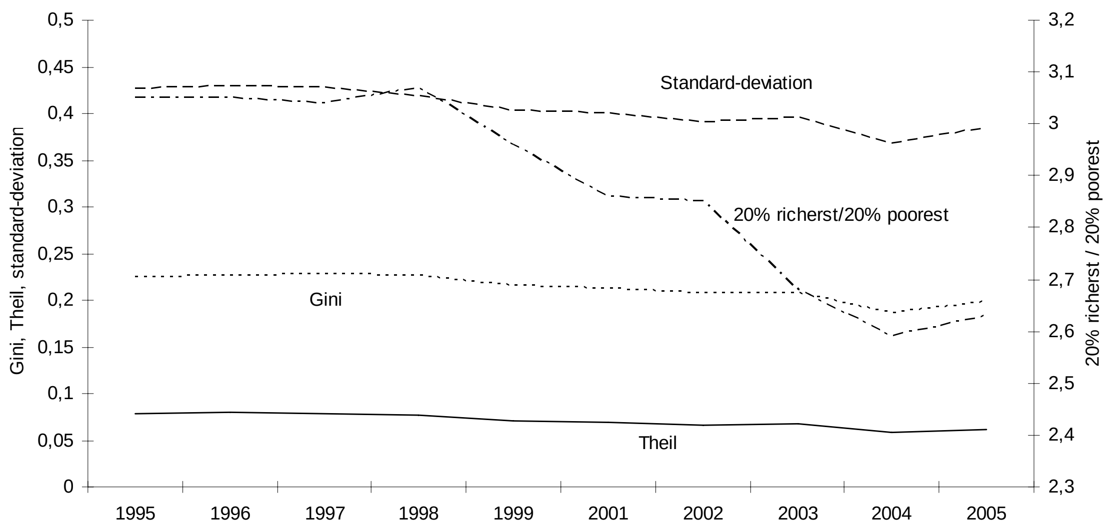

Figure 5 - Evolution of Gini and concentration coefficients

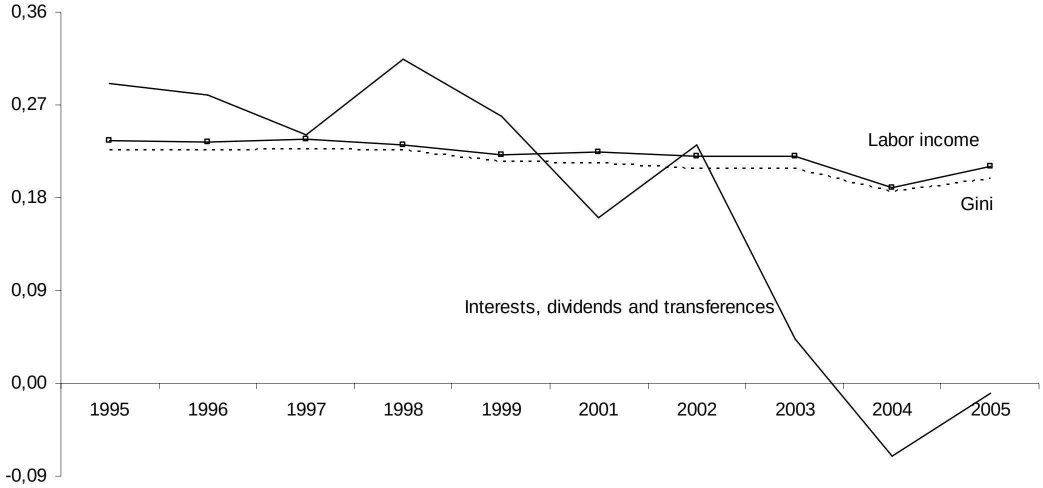

Figure 6 - Evolution of concentration coefficient