# Measuring the Contribution of Social Policies to Regional Inequality Dynamic in Brazil

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Abstract

We decompose the recent changes in regional inequality in Brazil into its components, highlighting the role of spatially blind social programs. We aggregate personal income micro data to the state level, differentiating 9 income sources, and assess the role of these components in the observed changes in regional inequality indicators. The main results indicate that the largest part of the recent reduction in regional inequality in Brazil is related to the dynamics in the market-related labor income, with manufacturing and services favoring inequality reduction. Labor income in agriculture, retirement and pensions, and property rents and other sources favored concentration. The social programs Bolsa Família and Benefícios de Prestação Continuada are responsible for more than 24% of the reduction in inequality, although they account for less than 1.7% of the disposable household income. Such positive impact on regional concentration is impressive, since the goals of the programs are clearly non-spatial.

**Key words**: regional inequality; social programs; inequality decomposition

JEL classification: R13; R28

## 1. Introduction

Regional disparities, involving both regional concentration and regional inequality, tend to be highly persistent over time (Azzoni, 2001; Velez et al., 2004; World Bank, 2005; Milanovic, 2005, Rey and Janikas, 2005; Heidenreich and Wunder, 2008; Candelaria et al., 2009; Monastério, 2010). Different governments had to deal with them whenever these became important enough to be introduced into the political agenda, designing regional policies to tackle the problem, as in the integration of European countries into the EU. The outcomes of those initiatives present mixed results depending on the time frame and on the situation considered, as demonstrated in Shankar and Shah (2003). In Developing Countries, few cases of success can be cited, since the forces in favor of concentration are usually stronger, especially with the increase in international interactions brought about by globalization (Ferreira, 2004; Wade, 2004; Thomas, 2009).

On the other hand, with the loss of importance of the Washington Consensus ideas in many dimensions, concerns about decaying social conditions, especially in Developing Countries, have paved the way for the introduction of social policies on a large scale. Not that this sort of policies were absent in the past, since in many cases different alternatives were implemented. However, those were usually low-scale compensatory measures for well-defined social or geographical groups. The scenario nowadays consists of programs designed to tackle poverty in a broader way than in the past, as can be observed, among other cases, in Mexico, Chile, Nicaragua, Honduras, and our case study, Brazil. Many assessments of these social programs have been performed, but with little consideration for their regional impacts (Skouflas and McClafferty, 2001; Rawlings and Rubio, 2005; Lindert et al., 2007; Soares et al., 2007; Tavares et al., 2009). We set for appraising these aspects in this study.

Brazil is an interesting case in that matter for several reasons. Firstly, being a country with a large area makes it a potential candidate for the presence of regional disparities. In fact, the area of the country is 85% that of Europe and larger than that of the Continental US. The territory spreads over 2,700 miles, both east-west and north-south. The latter direction is very important for it allows for the diversification of weather and natural conditions: two out of 27 states are located in the equatorial area of the northern hemisphere (6% of the area and 5.3% of the population); three are situated in the temperate zone, with occasional episodes of snow in the high

mountains (7% of the area and 14.5% of the population); 17 are located in the coast (60% of the population); and 20% of the population is located in in-land states. Different biomes are present in the country, with at least 10 different types of vegetation, a variety of soil types, and different landscapes[1]. The largest part of the population and production is located in the southeast region, which accounts for only 11% of the area and 43% of the population.

Secondly, Brazil shows regional inequalities that are pronounced and persistent (Azzoni, 2001; Baer, 2001; Velez et al., 2004). The poor northeast region, encompassing 9 states, 28% of the population, and 18% of the country's total area, accounted for almost 17% of the national GDP in 1939; in 2006 that share had dropped to 13.1%. The region was never able to achieve a per capita income level higher than half the national average, in spite of massive out-migration movements, especially in the 1960s and 1970s. It is interesting to note that the strongest efforts of the national government in designing regional policies were related to that region. As the above numbers reveal, these policies produced quite weak results. At the other extreme, the southeast region, which covers only 10.9% of the total area and 42.6% of the population in 2007, represented 63% of the national GDP in 1939, with the figure dropping to 56.8% in 2006; its per capita income level was 1.4 times the national average in 1939 (which includes that of the region) and dropped slightly to 1.33 times in 2006.

The most relevant changes in regional shares in the period are related to the rise of the north and mid-west regions. In the first case, natural resources played an important role, for the region is rich in minerals and timber, whose extraction started during the period. Also, a free import zone was established in the city of Manaus, which boosted the growth of that area, especially in the 1970s and 1980s, when import tariffs in the country were still very high. The north region moved from a share of 2.7% in the national GDP in 1939 to 5.1% in 2006, almost doubling its economic importance. In per capita terms, however, it moved from 80% of the national per capita income average in 1939 to 60% in 2006, a movement that was caused by high population growth in the period, which more than doubled the regional share (3.5% to 7.6%).

[1] http://www.ibge.gov.br/home/geociencias/cartogramas/ctb.html).

The mid-western region benefited from the transfer of the national capital to the newly built city of Brasilia in 1961, which nowadays is a metropolitan area with over 2.5 million inhabitants. Another decisive factor was the technological development in agriculture promoted by government-funded agricultural research, which made the region the most important producer of grains, cotton, and ranching products in the country. The share of that region in the national GDP moved from 2.1% in 1940 to 8.7% in 2006. Its per capita income level was 70% of the national average in 1940 and moved to 23% over the average in 2006. At present, Brasília shows the largest per capita income level of any large city in Brazil.

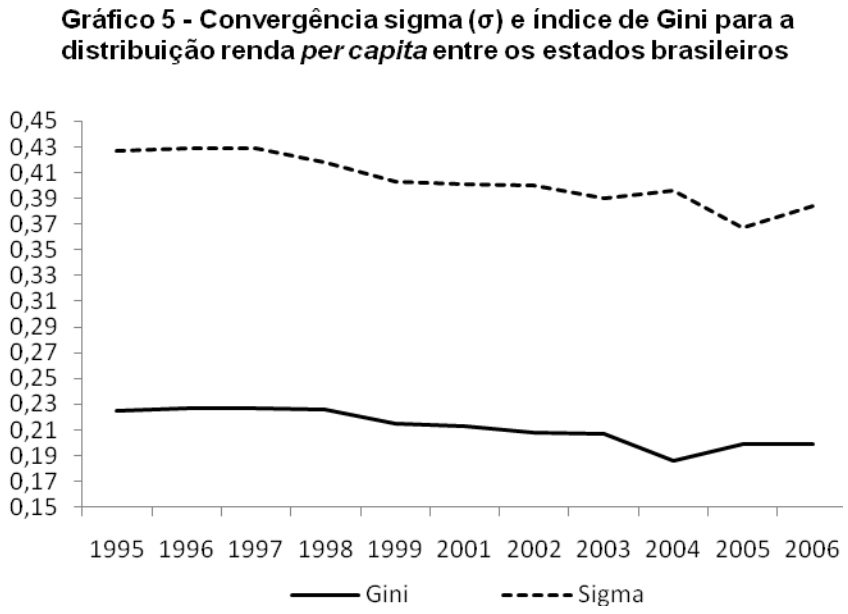
The above-mentioned two aspects already make Brazil an interesting case study, but the recent change in regional disparities adds a thrilling dimension to the case. At a broader level, recent changes in personal income inequality are also interesting. Starting from one of the highest inequality levels in income distribution in the world, with a Gini of 60.0 in 1997, personal income inequality has dropped steadily in recent years, reaching a Gini of 55.3 in 2007: an impressive drop for such a short period of time! The share of poor people in the population dropped from 42.3% in 1999 to 30.8% in 2007; the share of indigents dropped from 20.8% in 1996 to 11.8% in 2007[2]. There is a lot of discussion on the causes of such drastic changes in stable or rising multiple-decade trends, but both market and non-market forces are definitely at play (Barros et al., 2006; Ferreira et al., 2006; Hoffmann, 2006; Soares, 2006a and 2006b; Neri, 2010). Barros et al. (2006) find that changes in the distribution of labor income explain less than half of the drop in inequality, although this source of income accounts for over three quarters of total income, and this results from better distribution of worker qualifications and job quality. They estimate that more than one third of the reduction in inequality is attributed to the evolution of non-labor income (retirement and pension payments, rents, dividends and interests, and government transfers) in spite of its low share in total income.

From the regional point of view, the numbers are also striking. After many decades of quite stable inequality indicators, trends started to change in the late 1990s. Figure 1 portrays the evolution of two regional inequality indicators across the 27 Brazilian states: the spatial Gini and the standard deviation of the logarithm of per capita income, indicating what is known in the literature as the sigma convergence. Similar

[2] http://www.ipea.gov.br/082/08201002.jsp?ttCD_CHAVE=3128

decreasing trends can be observed in both indicators from the later part of the 1990s: the Gini decreased by 10% and the sigma by 11.6%.

Figure 1 – Regional inequality in per capita income across 27 states

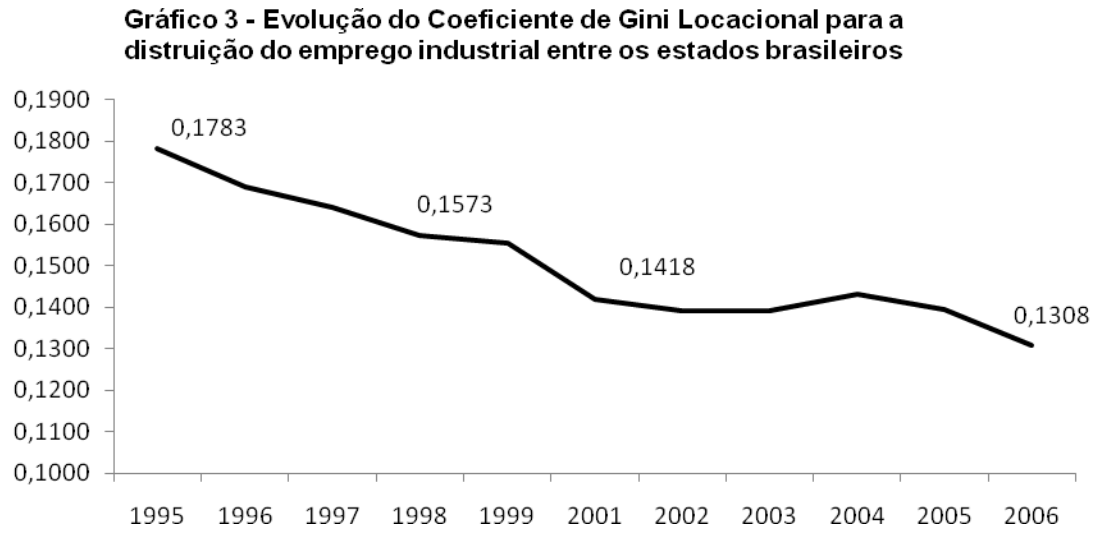



Source: PNAD micro data

A similar situation is observed in the manufacturing sector. During the period 1995-2006, the 13 poorest states increased their share in national employment in manufacturing from 21.6% to 24.6%; the share of the states in the northeast and north regions (excluding the state of Amazonas, where the free import zone is located) moved from 21.7% to 24.8%. Figure 2 exhibits the evolution of the spatial Gini for employment in manufacturing across the 27 states, which shows an almost monotonic decrease. Over the whole period, a total reduction of 26.6% is observed. This is accompanied by improvements in labor income, since the rich states of Sao Paulo, Rio de Janeiro, Santa Catarina, and the Federal District (Brasilia) presented relative reductions in per capita labor income as compared to the national average (the only other losers are 3 small states in the border areas of the Amazon region and the small state of Paraíba in the northeast region). The per capita labor income in manufacturing in São Paulo state was 2.8 times the national average in 1995 and dropped to 2.3 times in 2006; in the very poor state of Maranhão, in the northeast, it moved from 31.5% to 65.5% of the national average. In the northeast region as a whole, it moved from 48% to 61%, while in the southeast region, it started at 154% and finished at 146% of the

national average. The Gini coefficient for per capita labor income in manufacturing across the 27 states dropped by 21.1% (0.326 in 1995 and 0.257 in 2006).

Figure 2 –Manufacturing employment regional Gini




Source: PNAD micro data

The observation of decreases in regional inequality both in global per capita income and manufacturing labor income, together with the decomposition of the evolution of personal income inequality presented by Barros et al. (2006), Ferreira et al. (2006), Hoffmann (2006), and Soares (2006a, 2006b), suggests that both market-related factors and non-market factors might be at play in the processes behind the recent reduction in regional disparities. In this paper we make an effort to disentangle the components of such changes, highlighting the role of spatially blind social programs, such as the ones implemented by the Brazilian government in recent years.

We aggregate the personal income micro data to the state level, differentiating 9 income sources, with the objective of assessing the role of these components in the observed changes in regional inequality indicators. The paper is organized into 4 sections, besides this introduction. In section 2 a brief discussion of the evolution of income sources is presented, introducing the general features of the two income transfer programs. Section 3 presents the decomposition of income inequality and the estimated elasticities of inequality to income sources. In section 4 we assess the importance of each income source in the change in inequality in the period. The final section presents the conclusions of the study.

## 2. Income sources: market and non-market

The Bolsa Família (BF) program consists of cash transferences to families below the official indigence or poverty lines. In 2006 the value transferred monthly to each family was R$ 100 or R$ 50 (poverty and indigence lines, respectively), plus R$ 15 per child under the age of 14 (limited to 3), conditional to some obligations related to child education and health. The per capita value received in 2006 by families in the 10 poorest states was almost double the amount received by those in the 10 richest states. The per capita monthly value received by all families in the poor state of Maranhão was R$ 6,70; for the state of São Paulo, it was only R$ 1,40.

The Benefícios de Prestação Continuada (BPC) program provides an unconditional monthly transference equivalent to one minimum wage (R$ 350 in 2006) to elderly people or handicapped persons in families with per capita income levels below one fourth of the minimum wage. In 2006, 12.6% of the population received money from BPC: 26.7% in the poor northeast region and only 5.9% in the rich southeast region. Considering the entire population, the average per capita values for the two poorest states of Maranhão and Piauí were R$ 3,70 and R$ 3,00, respectively; for São Paulo and Santa Catarina states, the values were only R$ 1,10 and R$ 0.62, respectively.

Based on the yearly household survey PNAD[3] developed by IBGE, the official Brazilian statistics office, the total income of occupied employed persons was split into 9 different sources, following the procedure for aggregating the micro data on individuals into state and national totals proposed by Soares et al. (2007). We split total income into two broad categories: labor related and non-labor related. The first category is then split into four sectors of activity: primary (agriculture, forestry, and ranching), secondary (manufacturing), tertiary (commerce and services), and the public sector (government). Five sources of non-labor related income are considered: retirement payments and pensions, property rents and other income, capital income (interests and dividends), and the two government social programs – BF and BPC.

Table 1 informs about the shares of the five macro regions in each income source as well as in population. It makes clear that the poor northeast and north regions receive a proportionally larger share of cash transferences; the rich southeast region accounts for almost 53% of income from all sources but gets only one fourth of transferences.

[3] PNAD – Pesquisa Nacional por Amostras de Domicílios (National Survey on Samples of Households) http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2008/default.shtm

The last two columns show the shares of the income sources in the national disposable income in 1995 and 2006. The share of labor-related income is the largest in both years but dropped from 83% in 1995 to 77.2% in 2006, while the combined share of retirement and pensions, property rent, and profits and dividends increased from 17% to 21.4%, led by the sharp increase in the share of retirement and pensions (from 13.7% to 17.8%). This increase is related to the growing group of retirees belonging to the large contingents of workers successively introduced into the formal labor market after the mid-1960s. Government transference programs were not present in 1995 and their share in 2006 was 1.7%, which is small when compared to the other income sources, but is impressive as a massive social program.

These different income sources present distinct regional concentration profiles, as can be seen in the charts in Figure 3. Their horizontal axes portray the ratio of the per capita income value (all sources) in each state to the national per capita income level (equal to 1). The vertical axes show the same relative-to-the-average variable for income from the different sources. Each state appears as a point, and its position indicates its situation in relation to the average of both variables. States with larger participation in the respective income source as compared to income as a whole are positioned northwest of the 45-degree line; states with lower shares in the respective income source than in income as a whole are positioned southeast of the 45-degree line.

Considering the three broad production sectors, it is clear that manufacturing and the tertiary basically have similar spatial distributions as global per capita income. This is expected, given that they account for more than two thirds of total income. Agriculture income, as well as labor income from government activities, shows more dispersion. As for non-labor related income sources, retirement and pensions, and interests and dividends also have similar regional distributions as per capita income as a whole; property rents and donations follow the same pattern but with a larger dispersion. Finally, the two government cash transference programs (two graphs on the bottom right) clearly favor states with lower per capita income.

The above information prepares the terrain for the assessment of the roles of the different income sources in shaping recent regional concentration changes. They provide a sharp picture of the situation in the end year of the period considered, but they give little information on the evolution of such profiles and how the compounded

effect of changing shares and changing concentration profiles result in the final inequality changes. The next section deals with these problems.

## 3. Decomposing inequality into different income sources

In a previous study, we made a first attempt to analyze the components associated with the decrease in regional inequality in the country. We decomposed inequality in a slightly different way, since the income sources were defined differently. No differentiation was made among productive sectors or to government; in terms of social programs, only Bolsa Família was considered (Silveira-Neto and Azzoni, 2010). As in that study, we apply the decomposition procedure proposed by Shorrocks (1982).

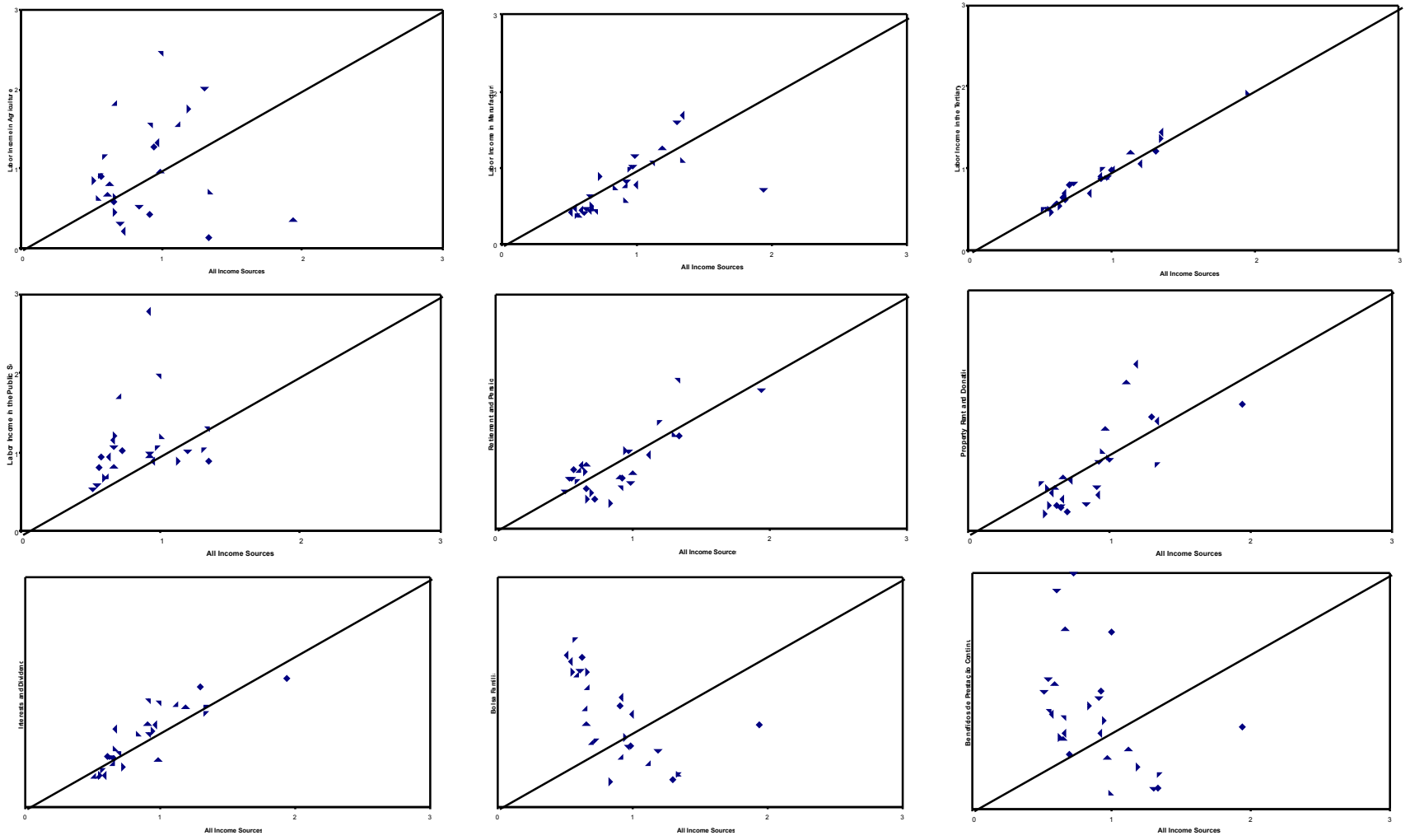
When the total income in each geographical unit is the sum of the individual sources, the Gini coefficient and the generalized entropy measures can be decomposed in a way to reflect the contribution of each different source to the general inequality level.

Table 1 – Regional and income source shares

| | | Regional Shares, 2006 | | | | | | National Source Shares | |
|---|---|---|---|---|---|---|---|---|---|
| | | North | Northeast | Southeast | South | Mid-West | Total | 1995 | 2006 |
| Labor | Agriculture | 3.8 | 24.0 | 32.8 | 25.8 | 13.6 | 100.0 | 8.0 | 6.0 |
| | Manufacturing | 4.5 | 12.2 | 58.9 | 18.8 | 5.6 | 100.0 | 16.0 | 14.6 |
| | Tertiary | 4.8 | 15.2 | 54.6 | 17.1 | 8.2 | 100.0 | 48.3 | 44.9 |
| | Government | 8.4 | 20.2 | 42.2 | 14.5 | 14.7 | 100.0 | 11.0 | 11.7 |
| Non-labor | Retirement + pensions | 3.0 | 18.6 | 54.9 | 17.5 | 6.0 | 100.0 | 13.7 | 17.8 |
| | Property rent + other | 3.2 | 12.3 | 50.4 | 27.6 | 6.6 | 100.0 | 0.7 | 0.9 |
| | Interests and dividends | 4.4 | 14.1 | 52.0 | 20.5 | 9.1 | 100.0 | 2.4 | 2.5 |
| | Government programs | | | | | | | | |
| | Bolsa Família | 7.2 | 51.5 | 24.1 | 8.8 | 8.4 | 100.0 | 0.0 | 1.0 |
| | BPC | 10.3 | 45.9 | 25.1 | 8.3 | 10.4 | 100.0 | 0.0 | 0.7 |
| | All Sources | 4.7 | 16.5 | 52.9 | 17.8 | 8.1 | 100.0 | 100.0 | 100.0 |
| | Population | 6.4 | 28.3 | 43.1 | 14.9 | 7.3 | 100.0 | | |

Source: calculated by the authors from PNAD micro data

Figure 3 – Spatial concentration of different income sources in relation to income from all sources



In that case, the Gini coefficient can be written as $G = \sum_{f=1}^{N} \alpha_f C_f$, in which $N$ is the number of income sources, $\alpha_f$ is the share of source *f*, and $C_f$ is the concentration coefficient for source *f*. $C_f$ is obtained from the concentration curve, which shows how the accumulated proportion of source *f* varies as the states are introduced in increasing order of per capita income. Naming the area between the concentration curve and the *x*-axis as $\beta_f$, the ratio or concentration coefficient is obtained by $C_f = 1 - 2.\beta_f$. It is possible to show that $-1 < C_f < 1$.

The variation in the Gini coefficient between two moments in time, t and t+1, can be decomposed as

$$\Delta G = \sum_{f=1}^{N} \left(\overline{C}_f - \overline{G}\right)\Delta\alpha_f + \sum_{f=1}^{N} \overline{\alpha}_f \Delta C_f \text{ , with } \overline{G} = \frac{1}{2}\left(G_t + G_{t-1}\right) \qquad (1)$$

The first term of ΔG is the participation effect, reflecting the increasing or decreasing importance of each income source during the period, at the average concentration levels. An increase (decrease) in the share of an income source with above-average concentration level will cause an increase (decrease) in the resulting concentration. The second term is the concentration effect and indicates the impact of changing concentration levels within the income source on constant income source shares. Although similar decompositions can be applied to different generalized entropy measures, our analysis will concentrate on the Gini coefficient, since it is the most frequently used.

Going back to Table 1, it is worth noting that public administration was the only source among the labor-related income sources to increase its participation, while the 3 aggregate private production sectors lost participation (from 72.3% to 65.5%). Columns A and B in Table 2 present the concentration coefficients of each income source in the end years. In 1995 only agriculture and retirement and pensions were less concentrated than the average (concentration coefficients lower than the global Gini); manufacturing was the sector with the largest contribution to the increase in regional concentration. In 2006, the government transfer programs joined agriculture and retirement and pensions in the group of income sources that contributed to the reduction of regional inequality.

Introducing these numbers into the equation $G = \sum_{f=1}^{N} \alpha_f C_f$ allows for the computation of the contribution of each source to the concentration in each year. The results are displayed in columns C and D in Table 2. The labor-related income sources accounted for 86% of regional inequality in 1995 and 81% in 2006 (sums of the first four lines of columns C and D); the private production sectors accounted for 72.5% and 68.4%. This change is explained mainly by the declining importance of manufacturing and the tertiary; agriculture contributed to reducing inequality in 1995 but in 2006 contributed otherwise. It is worth noting the increasing pro-concentration importance of retirements and pensions, and the equalizing influence of the government transfer programs, which were responsible for a reduction of 1.5 in the global Gini.

The indicators presented above already give a good idea of the importance of the changes in the share and concentration of the different income sources in the changes in regional income inequality in the period. However, they do not inform, for example, if a 10% increase in the share of Bolsa Família will have the same effect as a 10% increase in the share of retirement and pensions. In order to come up with a solution to this problem, we apply to the Gini coefficient a decomposition procedure presented by Leman and Yitzhaki (1985).

Let $y_s$ indicate the total income in a state, which is the sum of the N sources in each state; F indicates the cumulative function of the distribution of such income, $y_f$ is the amount of income originated in source *f*, and $F_k$ is the cumulative function of income source *k*. The Gini coefficient can be obtained by:

$$G = \sum_{f=1}^{N} R_f G_f S_f \qquad (2)$$

Where $R_f = cov(y_f, F)/cov(y_f, F_f)$; $S_f = \bar{y}_f/\bar{y}$ is the ratio of the average income of source *f* to the average income from all sources, $G_f$ is the Gini coefficient of income source *f*, *cov*($y_f$,*F*) is the covariance between the income from source *f* and the cumulative income function, and *cov* ($y_f$, $F_f$) is the covariance between the income from source *f* and the cumulative function of the income from this source. The Gini coefficient thus becomes an aggregation of the Ginis of individual income sources, weighted by their shares and by $R_f$, which indicates a sort of correlation among the income sources and total income. If one specific income source has the same value in all states, then $R_f = 0$, meaning that the income source does not contribute to the Gini

coefficient. Positive (negative) values of $R_f$ indicate that income source *f* contributes to the increase (decrease) of the calculated Gini coefficient. The contribution increases with its own Gini coefficient and the share of the income source in total income.

A useful advantage of using the decomposition expressed in (2) is that it allows for the calculation of the elasticity of the global Gini relative to variations in income sources. Leman and Yitzhaki (1985) show that the percent impact on the global Gini of a percent change in income source *f*, $e_f$, is given by the difference between the share of the global Gini explained by that specific income source and its share in total income, that is,

$$\frac{\partial G / \partial e_f}{G} = \frac{(S_f G_f R_f)}{G} - S_f \qquad (3)$$

Columns E and F in Table 2 show the estimated elasticities for the end years of the period. The negative signs for agriculture, retirement and pensions, and the government transfer programs indicate that they favor the reduction in inequality. In 2006, an increase of 10% in the labor income in agriculture was associated with a decrease of 0.31% in the regional inequality of per capita income. The same interpretation applies to the other sources. In terms of intensity, agriculture is the source with the largest contribution to the reduction of inequality, although its importance declined between the two years. Manufacturing was the income source with the largest contribution to inequality in 1995, followed by the tertiary sector; they changed positions in 2006, both with less intensity. Property rent, and interests and dividends contributed to the concentration in both years, even more so in 2006, but the elasticity values are low as compared to the other sources. The government transfer programs combined beat agriculture in terms of elasticity (0.32): an increase of 10% in the Bolsa Família transfers alone, representing approximately 0.1% of total income, is associated with a decrease of 0.2% in the regional inequality of per capita income. In order to have a dimension of the importance of this variation, it corresponds to 16.6% of the annual variation in the Gini coefficient.

## 4. Change decomposition

The final contribution of each income source to the change in inequality in the period is the combined result of changes in participation and changes in concentration. For example, manufacturing income lost importance, but at the same time it became less

concentrated. On the other hand, retirement and pensions increased its share and became more concentrated. Equation (1) allows for assessing the importance of changes in the share and concentration of each income source in the changes in the Gini coefficient.

The results, shown in columns G, H, and I in Table 2, indicate that the concentration effect accounts for 86% of the total change, leaving only 14% for the participation effect. That means that the inequality change experienced in the period is more related to the way income is regionally distributed within each income source than to changes in the importance of these sources. This is exemplified by the fact that the largest concentration effects are observed in manufacturing and in the tertiary sector. The participation effect is also positive for these two sectors, reflecting their important role in explaining the changes in regional income inequality in the country in the period. However, their concentration profiles are more important that their changing shares, meaning that the changing regional distribution of these activities is the most relevant aspect to take into consideration.

Column I indicates that labor-related income sources account for 81% of the change in the geographical Gini coefficient (sum of the first 4 lines) in spite of the important negative contribution of agriculture, while non-labor related sources explain only 19%, almost all of which is related to the two government income transference programs. Retirement and pensions, and property rent and other contributed to decreasing the regional concentration. Adding up the role of the government as a sector (30.8%), in which payment to public servants dominates, and the two social programs (14.8% + 8.9%), the public sector contributes 54.5% to the total reduction in the geographical Gini coefficient. Considering only those sources that contributed to the reduction in inequality, the public sector accounted for 37.5% (54.5% over 145.2%). These numbers highlight the relevance of public policy in shaping the recent regional inequality changes in the country.

**Table 2 - Results**

| | Income source | Concentration Coefficient | | Importance for regional inequality (%) | | Elasticity of regional inequality to income source | | Effects composing the change in regional inequality between 1995 and 2006 (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1995 | 2006 | 1995 | 2006 | 1995 | 2006 | Concentration Effect | Participation Effect | Total |
| | | (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) | (I) |
| Labor | Agriculture | -0.0331 | 0.0932 | -1.2 | 2.9 | -0.092 | -0.031 | -32.3 | -12.9 | -45.2 |
| | Manufacturing | 0.2959 | 0.2290 | 21.4 | 17.2 | 0.055 | 0.027 | 37.6 | 2.8 | 40.4 |
| | Tertiary | 0.2398 | 0.2089 | 52.3 | 48.3 | 0.041 | 0.034 | 52.9 | 2.1 | 55.0 |
| | Government | 0.2811 | 0.2048 | 13.9 | 12.4 | 0.029 | 0.006 | 31.7 | -1 | 30,8 |
| Non-labor | Retirement + pensions | 0.1645 | 0.1827 | 10,1 | 16.7 | -0.036 | -0.011 | -10.5 | 5.1 | -5,4 |
| | Property rent + other | 0.2760 | 0.2887 | 0.9 | 1.3 | 0.002 | 0.004 | -0.4 | -0.4 | -0.8 |
| | Interests and dividends | 0.2338 | 0.2162 | 2.5 | 2.8 | 0.001 | 0.003 | 1.6 | -0.1 | 1,5 |
| | **Social Programs** | | | | | | | | | |
| | Bolsa Família | - | -0.1997 | 0 | -1.0 | - | -0.02 | 3.6 | 11.2 | 14,8 |
| | BPC | - | -0.1500 | 0 | -0.5 | - | -0.012 | 1.9 | 7 | 8,9 |
| Global | | 0.2214 | 0.1942 | 100 | 100 | | | 86,1 | 13.9 | 100 |

Source: calculated by the authors from PNAD micro data

## 5. Conclusions

The main results of this study indicate that the largest part of the recent reduction in regional inequality in Brazil is related to the dynamics in the market-related labor income, with manufacturing and services favoring deconcentration. Labor income in agriculture, retirement and pensions, and property rents and other sources favored concentration. The social programs Bolsa Família and Benefícios de Prestação Continuada implemented in the first decade of this century played an important role in the decline in regional income inequality: as a whole, they are responsible for more than 24% of the reduction in inequality, although they account for less than 1.7% of the disposable household income. This results from their clearly pro-deconcentration profiles as compared to the other sources, both labor and non-labor. Such positive impact on regional concentration is impressive, since the goals of the programs are clearly non-spatial.

While recognizing the important role of the social programs in regional inequality reduction, it is important to stress that market-related labor income also played a vital role. This is shown both by the changes in the shares of different sources and, most importantly, by important concentration changes within the sources. This could be the result of regionally explicit polices, such as the ones promoted by individual states in relation to manufacturing, as analyzed by Manoel et al. (2009). Thus, it seems that market forces are reinforcing the social policy-related deconcentration effects, leading to the observed reduction in regional inequality.

Comparing the results of these social programs with those of previous regional development promotion schemes, it is quite clear that this social policy is the most effective form of regional policy ever implemented in the country (Azzoni, 2008; Silveira-Neto and Azzoni, 2010). It is apparent that the government acts in conflicting ways though, since its role as an employer promotes regional concentration, although marginally. Its payments of retirement and pensions also go in that direction, although little can be done to change that, since the present payments are related to labor market factors occurring with a time lag of at least 30 years. However, its minimum wage policy has an effect in this matter, since retirement and pension values are somehow indexed to the minimum wage. As shown in Silveira-Neto and Azzoni (2010), this has a positive effect in raising real income as a whole and favors regional deconcentration.

Just as many questions related to the long-run social effects of these cash transference programs are raised, so too with their long-run regional effects. Of course, it is too early to

make a thorough appraisal since the programs are in their infancy, and their impacts could be spread over an unknown time span. Azzoni et al. (2009), using a multi-regional social accounting matrix framework, have shown that the potential impacts on the productive sector favor the poorer states. Since the transferences boost the local demand of poor people, there is a short-term increase in the demand for wage goods, which will be supplied initially by the presently regionally located producers. If this increase in demand is sustained over a long enough period of time, threshold profitability levels for local suppliers can be reached, and a change in the geography of production could be attained. This would reinforce the effects of state-level industrialization promotion mechanisms, which are already presenting positive effects (Manoel et al., 2009). As a result, sizeable modifications in production concentration could take place.

For this to happen, other effects of the transfer programs should be observed. The challenge of turning the short-term effects into sustainable social and regional changes lies on the maintenance of the programs with their present intensity and on the qualification of the human capital to take the next step out of the social programs. Education and health conditionalities are good first steps, but mere increases in access to schooling will probably not do the job. Also, it does not seem reasonable to believe that increasing the production of wage goods can pull out a region from stagnation and transform it into a competitive and dynamic area. As shown in Schettini (2010), the observed levels of efficiency in manufacturing in the poor regions are far below those in the rich regions. Thus, there is a long way to go until poor regions can be competitive at their present conditions

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