Chapter 10
Concentration and Inequality Across Brazilian Regions

Carlos Roberto Azzoni

10.1 Introduction

Being a country with a large territory, it is expected that regional disparities would be pronounced in Brazil. There is a wide range of natural conditions, since the distance between its north and south extremes reaches 2,700 miles. Weather and natural conditions are varied, since 6 % of the area and 5.3 % of the population are located in the northern hemisphere, close to the equator line, while 7 % of the area and 14.5 % of the population are situated in the temperate zone, with occasional episodes of snow in the high mountains. The majority of population is located in the coast, while 20 % is located in in-land states. Different biomes, with at least ten different types of vegetation, a variety of soil types, and different landscapes compose the natural basis of the country.[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.

As one would expect, regional inequalities are important and persistent (Azzoni 2001; Baer 2001). As Table 10.1 indicates, the poor northeast region, encompassing nine states, 28 % of the population, and 18 % of the country's total area, accounted for 18 % of the national GDP in 1939; in 2009 that share had dropped to 13.5 %. On the other hand, the southeast region represented 63 % of the national GDP in 1939 and 56.3 % in 2009.

In general, it can be said that few changes have occurred in the relative positions of the two most populated regions, the poor Northeast and the rich Southeast. It is true that their combined share in population has dropped from 79.5 % in 1940 to 69 % in 2010 and their combined share in national GDP has also dropped. But the Southeast remained the richest and the Northeast remained the poorest. The most

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

C.R. Azzoni (✉)
University of Sao Paulo, Sao Paulo, Brazil
e-mail: cazzoni@usp.br

J.R. Cuadrado-Roura and P. Aroca (eds.), *Regional Problems and Policies in Latin America*, Advances in Spatial Science, DOI 10.1007/978-3-642-39674-8_10,

Table 10.1 Indicators of regional concentration

		Share in population		Share in national GDP				
	Share in area	1940	2010	1939	2009	2009		
				Total		Agric.	Mining	Manuf.
North	45.3	3.9	8.3	2.7	5.0	7.5	11.6	4.2
Northeast	18.3	35.0	27.8	16.9	13.5	18.5	9.1	9.6
Piauí St.	2.9	2.0	1.6	0.9	0.6	1.1	–	0.3
Southeast	10.9	44.5	42.1	63.0	56.3	28.7	75.0	60.6
S. Paulo St.	2.9	17.4	21.6	31.3	33.5	11.5	2.3	43.0
South	6.8	13.9	14.4	15.3	16.5	26.3	2.0	21.1
Mid-West	18.9	2.7	7.4	2.1	9.6	19.0	2.4	4.6

relevant changes in regional shares 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; in 2009 it hosted 11.6 % of the national mining production. 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 5.0 % in 2009, almost doubling its economic importance. 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 9.6 % in 2009.

Another way of looking at the process over time is to observe the changes in the center of gravity, defined as the average latitude and longitude of the state capital cities, weighted by the shares of the respective states in national GDP. As a simplification, it is assumed that the state's GDP takes place in the capital city of the state. This assumption is a good approximation for the majority of the states, since the areas around the capital cities tend to host most of the economic activity, especially in manufacturing and in the tertiary sector. The value obtained for a specific year, expressed in degrees of latitude and longitude, reflects both the geographical disposition of the capital cities and the state shares in national GDP, and it is not useful as an economic indicator. However, since the coordinates of the capital cities do not change over time, any movement in the gravity center is determined by changes in the economic importance of the states. Therefore, observing how the center of gravity moves over time indicates the economic forces pushing/pulling it, basically, the changing shares in the economic importance of the states in the national context.

Figure 10.1 exhibits the evolution of the center of gravity of the Brazilian economy over the period 1939 and 2009, covering a period of seven decades. Those were years presenting many important economic changes that could have

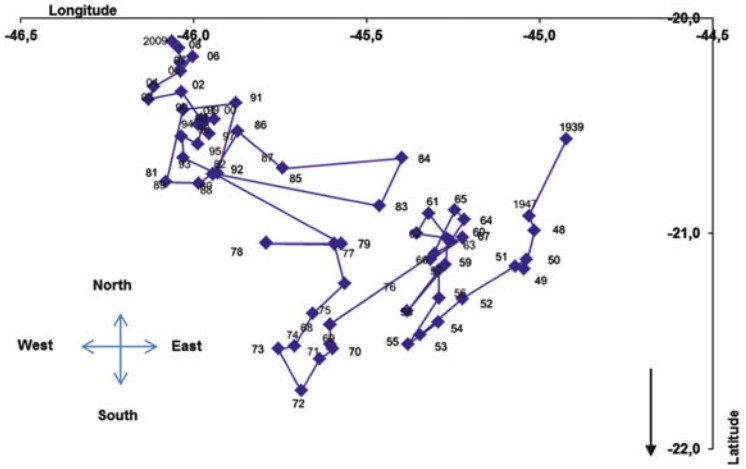

Fig. 10.1 Center of gravity of the Brazilian economy

led to modifications in the regional concentration in the country (Baer 2001). The World War II years were positive for the economy, since Brazil supplied raw materials for the allies. The following years were also positive, but the country burned all the international currency accumulated during the war, leading to a slow grow period in the early 1950s. National planning institutions were established in the second half of the 1950s and a concern about regional concentration was included in the planning toolkit. This period was followed by troubled times, with high inflation, political instability and, eventually, recession in the early 1960s. A military coup occurred in 1964 and important institutional modifications were implemented, leading to a boom period known as "the Brazilian miracle", which died off in 1973, along with the first international oil crisis. The mid 1970s were years of moderate growth and increasing inflation. This situation moved to the 1980s, which are known as the "lost decade", due to its low growth. The early 1990s continued in the low growth situation up to 1994, when inflation stabilization was finally achieved. Since the mid-1990s the country has grown steadily, although at a moderate pace. An important aspect is the opening-up of the economy from 1990 on, which took at least half a decade to mature and produce important results. The first decade of the twenty-first century presented much better years, with higher rates of GDP growth.

In spite of all those ups and downs, regional concentration remained almost the same. The poor northeast region, for which regional development instruments were developed and implemented, given its relevant share in population, possibly at a very high cost (Carvalho et al. 2006), lost participation, as presented before. It is clear that the booming years of the early 1950s and early 1970s brought the center of gravity to the strongest economies in the country, located in the southeast

Table 10.2 Indicators of regional inequality

	Per Capita GDP respective to the national average	
	1939	2009
North	0.75	0.63
Northeast	0.48	0.48
Piauí St.	*0.43*	0.33
Southeast	1.41	1.31
S. Paulo St.	*1.8*	1.55
South	1.11	1.14
Mid-West	0.7	1.32[a]

[a]The capital city, Brasília, established in 1961 in the region, presents the highest per capita income level in the country, 2.98 times the national average

region.[2] Years of economic difficulties tended to move it towards the northeast. After the mid-1980s, however, the center clearly moved towards the northwest. This can be explained by the development of high-performance agriculture in the mid-west, driven by government policies towards technological development in the sector, the establishment of the nation's capital in the core of the mid-west, the implementation of a free import zone in Manaus, in the core of the Amazon, the exploitation of mining activities in the state of Pará, in the North (bauxite, iron ore), as well as logging in that area.

Another way to look at the regional disparities is through the inequality in regional per capita income. Table 10.2 presents the relationship of the per capita income level in the regions in relation to the national average. The northeast 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. The per capita income level of the rich southeast region was 1.4 times the national average in 1939 (which includes that of the region) and dropped slightly to 1.31 times in 2009. The north region, in per capita terms, moved from 75 % of the national per capita income average in 1939 to 63 % in 2009, a movement that was caused by high population growth in the period, which more than doubled the regional share (from 3.9 % to 8.3 %). That is, the impressive increase in the regional share in GDP was out shadowed by the even more intensive growth in population. As for the mid-west, another gainer in terms of GDP, its per capita income level was 70 % of the national average in 1940 and moved to 32 % over the average in 2009. At present, Brasília shows the largest per capita income level of any large city in Brazil, almost three times the national average. As compared to the north region, the mid-west was able to gain both population and GDP, but the later was more intensive than the former, leading to an upgrade on the regional per capita income.

The above numbers are eloquent in showing both the impressive disparity levels and how little they have changed over seven decades. Recent changes, however, are calling the attention of researchers, since, for the first time over a sequence of years,

[2] Azzoni (1997) concluded that booming years tended to increased concentration, which was decreased subsequently.

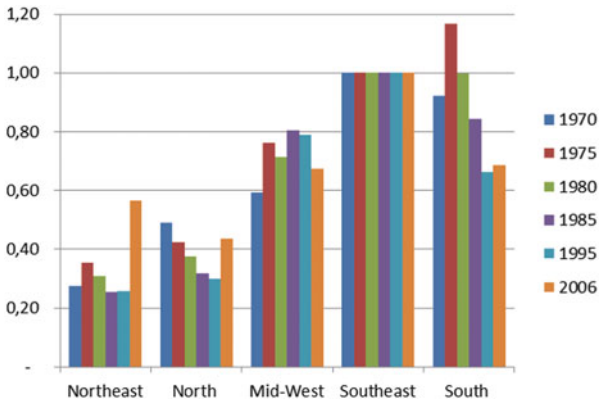

Fig. 10.2 Total factor productivity in Brazilian agriculture, 1970–2006 (Source: Vicente (2006, 2011))

inequality levels are decreasing. And this is not only for regional inequality, but also for personal income inequality, with the Gini coefficient dropping from 0.60 in 1997 to 0.51 in 2009, a movement that was accompanied by a decrease in the shares of poor and indigent people[3] (Barros et al. 2006; Ferreira et al. 2006; Hoffmann 2006; Soares 2006a, b; Neri 2010). As for regional inequality, as pointed out in Silveira-Neto and Azzoni (2011a, b), the numbers are also striking, since trends started to change in the late 1990s. The spatial Gini (across 27 states) and the standard deviation of the logarithm of per capita income, indicating sigma convergence, presented important decreasing trends. Employment in manufacturing shows similar behavior.

These new trends might raise some optimism about the future of regional concentration and regional inequality in the country. This paper sets to investigate some factors that could reinforce those trends, such as the recent levels and the evolution of productivity in the regions. It is well-established that human capital is a key aspect in regional development, and we will present some indicators in this area also. The paper has two sections besides this introduction and the concluding section. In Sect. 10.2 we present indicators of productivity across states, and in Sect. 10.3 we present higher education indicators. We set aside government influences, especially through interregional transfers, since we have a specific chapter to deal with them (Chapter 21st in this book).

10.2 Regional Productivity in Agriculture

Competitiveness differentials and their development over time are associated with regional disparities, especially with the regional concentration of production. By being more competitive, some regions tend to receive more investment and may

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

generate economies of agglomeration, which reinforce the initial level of competitiveness. Given their level of production and their importance for the competitiveness of the country, generally these regions are able to influence national policies and the regional allocation of public investment. These factors can consolidate or stimulate their competitive environment. This logic applies in general, but specially so in manufacturing, because of its greater potential geographical mobility and its sensitiveness to economies of agglomeration. But it also applies to primary and tertiary activities.

The goal of this section is to investigate productivity levels of agriculture in Brazilian regions and its evolution in recent years. Manufacturing and tertiary activities will be dealt with in subsequent sections.

Brazil has become an important food producer in the world in the last decades, thanks to government-led massive investments in research and technology. The evolution of total factor productivity for the country as a whole between 1970 and 2006 is impressive, as shown by Gasques et al. (2010). But this evolution was not homogeneous across regions, as the regional productivity differentials in agriculture calculated by Vicente (2006), presented in Fig. 10.2, indicate. Regional levels are expressed in relation to the southeast region, the one with the highest productivity level. The first thing that comes to sight are the low levels in the northeast and north regions. Not only that, but also these regions became progressively less competitive in the period, with an important inversion in 2006. The south region had comparable levels of productivity as the southeast up to 1980, but lost competiveness in the following periods. The uprising region is the mid-west, although in 1995 it was still 20 % below the southeastern level, and lost competitiveness in 2006.

The latest agricultural census was performed in 2006, from which two studies provide similar results. Vicente (2011) measures levels of total factor productivity and technical, allocative and economic efficiency in agricultural crop production at the state level, using a nonparametric frontier model (DEA). Imori (2011) uses stochastic production frontiers and inefficiency effects models at the municipal level. As the results in Table 10.3 indicate, the southeast region held its first place as the most productive in the country in 2006, followed more closely by the mid-west and south regions. Figure 10.3 reinforces this conclusion, at a finer geographical disaggregation.

In conclusion, the analysis of competitiveness in agriculture reveals that the southeast region holds the first position in the national ranking. The neighboring south and mid-west regions present the second best levels. Even considering that the southeast is basically the manufacturing core of the country, it is still responsible for 28.7 % of the national agricultural production (Table 10.1). It is followed by the south region, which held the second place until 1995. In more recent years, the downwards trend in this region, coupled with the upwards trend in the mid-west, made the latter to approach the former as the second most important region in agriculture in Brazil. This result is compatible with the changes in regional concentration presented in the introduction of this paper.

Table 10.3 Indicators of Competitiveness for Brazilian States, 2006

Region	State	Share in production	TFP	Efficiency		
				Technical	Allocative	Economic
Northeast	Alagoas	1.16	86.17	1.00	0.51	0.51
	Bahia	8.00	94.31	1.00	0.53	0.53
	Ceará	1.52	54.39	0.85	0.56	0.47
	Paraíba	0.89	87.26	1.00	0.65	0.65
	Pernambuco	1.83	83.74	1.00	0.49	0.49
	Piauí	0.63	33.23	0.43	0.58	0.25
	Rio Grande do Norte	0.41	61.74	0.81	0.56	0.45
	Sergipe	0.48	71.27	0.87	0.52	0.45
	Maranhão	1.29	43.71	0.69	0.52	0.36
	Region	**16.21**	**80.50**	**0.93**	**0.54**	**0.50**
North	Acre	0.17	69.97	1.00	0.54	0.54
	Amapá	0.02	53.40	0.92	0.49	0.45
	Amazonas	0.37	40.32	1.00	0.35	0.35
	Pará	1.00	39.37	0.63	0.54	0.33
	Roraima	0.10	80.08	1.00	0.90	0.90
	Rondônia	0.74	88.15	1.00	0.70	0.70
	Tocantins	0.59	75.91	1.00	0.51	0.51
	Region	**2.99**	**61.97**	**0.88**	**0.56**	**0.49**
Mid-West	Distrito Federal	0.16	97.98	0.98	0.63	0.62
	Goiás	5.54	108.03	1.00	0.88	0.88
	Mato Grosso	9.42	88.02	1.00	0.62	0.62
	Mato Grosso do Sul	2.97	97.32	1.00	0.62	0.62
	Region	**18.09**	**95.76**	**1.00**	**0.70**	**0.70**
Southeast	Minas Gerais	11.20	112.28	1.00	0.76	0.76
	Espírito Santo	1.60	86.18	1.00	0.49	0.49
	Rio de Janeiro	0.44	97.77	0.97	0.55	0.53
	São Paulo	21.46	162.65	1.00	1.00	1.00
	Region	**34.70**	**142.04**	**1.00**	**0.89**	**0.89**
South	Paraná	12.25	97.73	0.84	0.78	0.65
	Santa Catarina	4.14	111.43	1.00	0.78	0.78
	Rio Grande do Sul	11.62	92.26	1.00	0.75	0.75
	Region	**28.01**	**97.49**	**0.93**	**0.77**	**0.71**
Brazil		**171.99**	**100.00**	**0.91**	**0.61**	**0.55**

Source: Vicente (2011)

10.3 Manufacturing

Manufacturing is an interesting sector to analyze because it is the most potentially mobile in space, as compared to resource-oriented activities, such as agriculture and mining, and to the tertiary activities. While accounting for 22 % of GDP, Brazilian manufacturing accounts for almost 70 % of exports and one-third of total R&D investment. It also employs 26 % of Brazilian workforce and buys 40 % of its inputs from other sectors of the economy (CNI 2010).

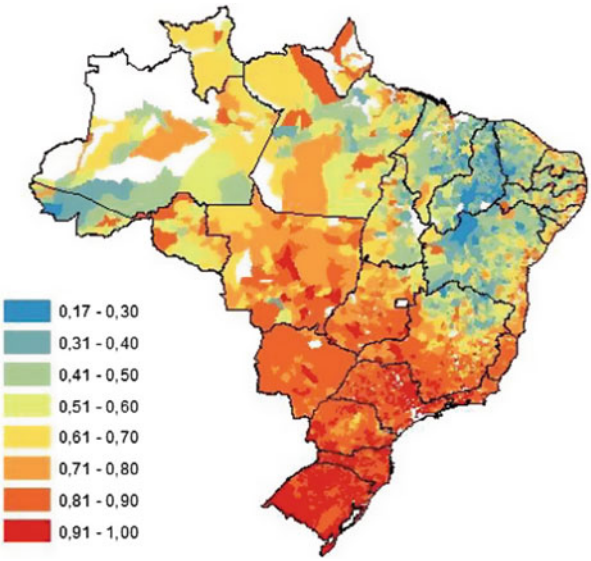

Fig. 10.3 Technical efficiency at the municipal level, 2009 (Source: Imori (2011))

Azzoni and Ferreira (1998) have computed indicators of relative profitability for the period 1970–1995. They are based on a comparison of efficiency wages, which consider both productivity and wage levels at the regional level. Their results are presented in Fig. 10.4. Due to data limitations, only five regional units are presented, with three states (São Paulo, Minas Gerais and Rio de Janeiro, all in the southeast region) and two regions (Northeast and South). The numbers indicate that the northeast region lost competitiveness over time, reaching 80 % of the national profitability level in 1995. The state of Rio de Janeiro also lost competitiveness. The south region was able to remain around the national average, but lost positions in more recent years. The most important state in manufacturing in the country, São Paulo, was able to remain above the national average all the time. Since the national average includes all states, it is right to say that the distance between São Paulo state and the remaining states is larger than in relation to the national average. Finally, Minas Gerais state presented an outstanding performance, due to the establishment of an important automobile plant (Fiat) in the mid-1970s, and its relevant metal-mechanic sector, which is related to the iron ore mines present in that state.

Schettini and Azzoni (2011) have computed efficiency indicators for states and regions. Figure 10.5 shows how concentrated the manufacturing production was in the country in 2006. Using data by the 137 meso regions from yearly manufacturing surveys, the authors were able to estimate stochastic frontiers, which allowed for the calculation of efficiency indicators. The focus was on the first years of the twenty-first century, given that important economic changes occurred in the country, associated with the opening up of the economy and the stabilization of prices from the mid-1990s on.

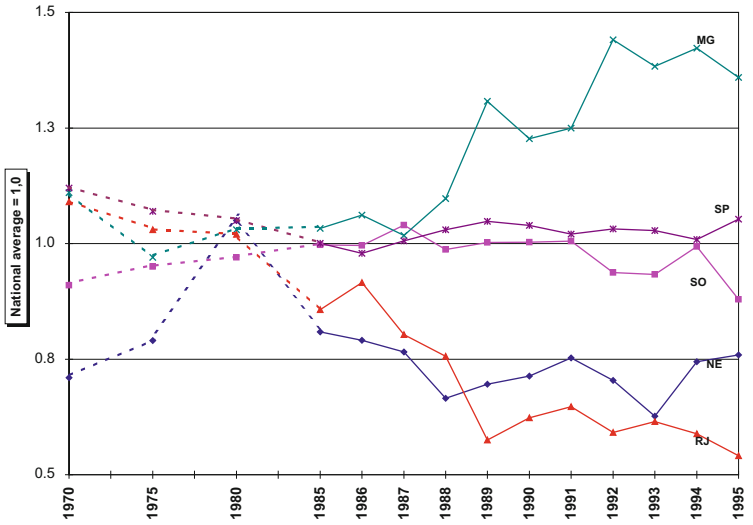

Fig. 10.4 Manufacturing profitability indicators for some Brazilian regions (Source: Azzoni and Ferreira (1998))

Their results in terms of levels are shown in the maps of Fig. 10.6. The numbers refer to the average of the period 2000–2006. Taken Sao Paulo Metropolitan area, the most important manufacturing center in the country, as a benchmark, only one region presents higher productivity. It is the "Extremo Oeste Baiano" meso region, a recent expansion area of grain production, hosting processing plants from the big international players in that activity. There are some few areas with the same level of productivity as São Paulo metropolitan area, basically in the mid-west and north regions, related to agribusiness, mining extraction and logging. Other than those, productivity is concentrated in the traditional manufacturing area of the country.

Another topic refers to the changes in productivity in this century. Figure 10.7 shows the rate of growth of productivity in the period 2000–2006. The national average growth was 3.9 % per year, but it ranged from −6.4 % to 7.6 %. As the figure shows, all states with negative productivity growth belong to the north and northeast regions. On the other extreme, the largest growth rates were from the north region (Amazonas) and the mid-west (Mato Grosso).

In Fig. 10.8 the possible existence of convergence across states is considered. The horizontal axis portrays the share of each state in national manufacturing; the vertical axis shows the rate of growth in productivity in the period. States with low participation in national production would have to present higher productivity growth to improve their situation over time. That is, the line relating these variables should be decreasing in order to indicate reduction of inequality. As it can be seen, that is not the case. Even if we did not formally test for the existence of divergence, it is clear from the picture that convergence in productivity is out of perspective.

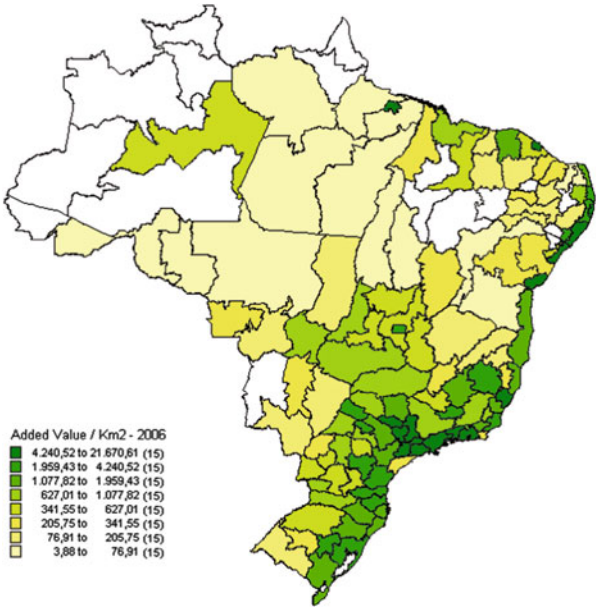

Fig. 10.5 Manufacturing value added by km^2, 2006

10.4 Tertiary Activities

Although typically tertiary activities are not considered in regional analyses and regional policies, it is important to consider their role in regional disparities. First of all, their quantitative role is too big to ignore: in Brazil, their share in GDP was 53 % in 1950 and 67 % in 2011. That is, more than two-thirds of GDP come from this sector; and its importance is increasing, as it happens everywhere in the world. Secondly, these are urban activities by nature, which adds another aspect to regional disparities: changes in the distribution of cities. The effects can be seen in Fig. 10.9, which portrays the changing shares of some important capital cities in their respective state's population. It seems clear that the capital cities in the most important areas of the country, in economic terms, have lost importance, due to an in-state decentralization process provided by the strength of their economic fabric (Panel a, in Fig. 10.9). At the same time, capital cities of peripheral states gained importance, possibly indicating a growing role in the economic system of the state (Panel b).

Considering these activities, Azzoni and Andrade (2005) analyzed the role of tertiary activities in regional inequality in Brazil in the period 1970–2001. They computed competitiveness indicators based on the limited information available. The authors concluded that the most important centers of Brazilian economy were either below average in terms of competitiveness or loosing competitiveness over time in commerce activities, but the same did not hold for services in general,

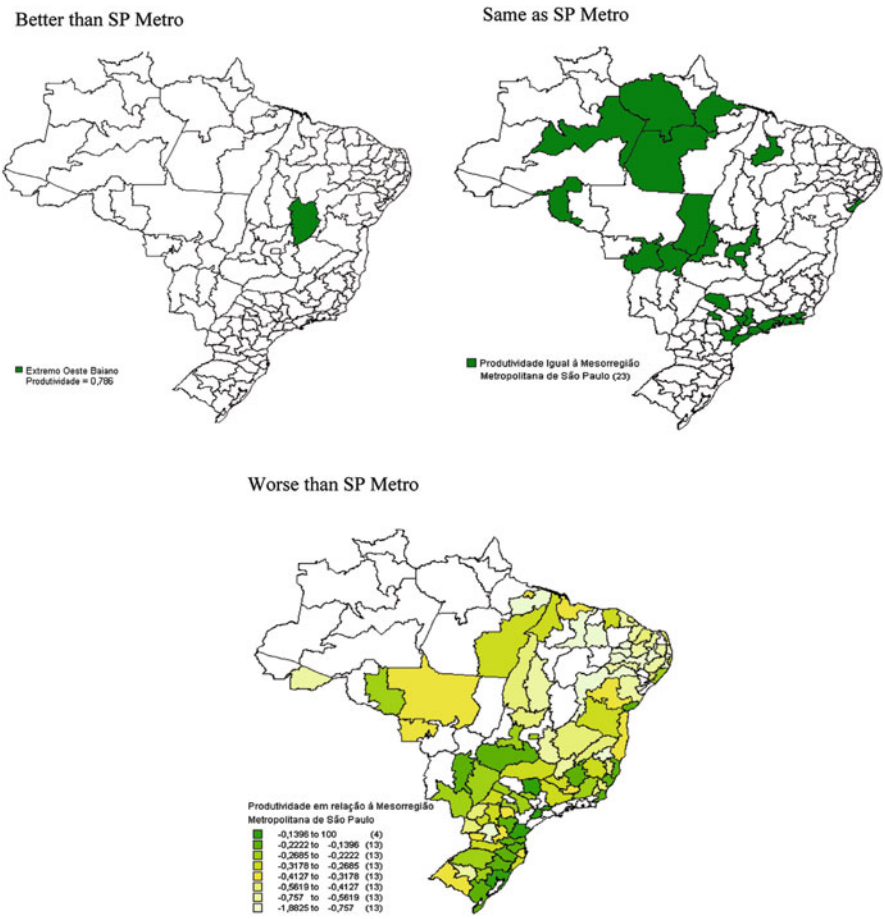

Fig. 10.6 Efficiency levels in comparison to São Paulo Metropolitan region, 2000–2006

as their results reproduced in Table 10.4 indicate. In this direction, Table 10.5 offers information on some sub-sectors within services. The results indicate that hotels and restaurants and real state presented a similar behavior as commerce, except for revenue/establishment, for which rich areas show increasing competitiveness. For transportation, São Paulo state presented improvements in revenue/worker and in revenue/establishment, as did the southeast region in this latter case. The really interesting modifications occurred in services to firms and miscellaneous, in which the rich areas moved from below to above average in revenue/wages, and increased their advantage in the other two indicators, with one exception only in the southeast region. These are more sophisticated sectors, for services to firms are related to outsourcing, consulting, etc., and miscellaneous tends to include new innovative activities not included in the previous classifications. Computing activities were only present in the surveys after the 1980 census, with only data for the late 1990s

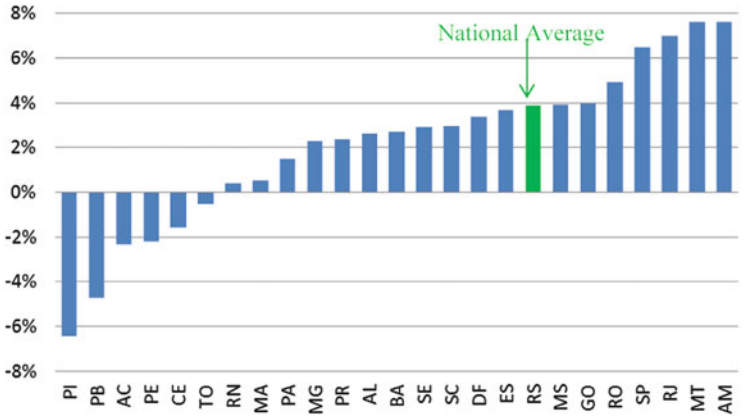

Fig. 10.7 Productivity growth across states, 2000–2006

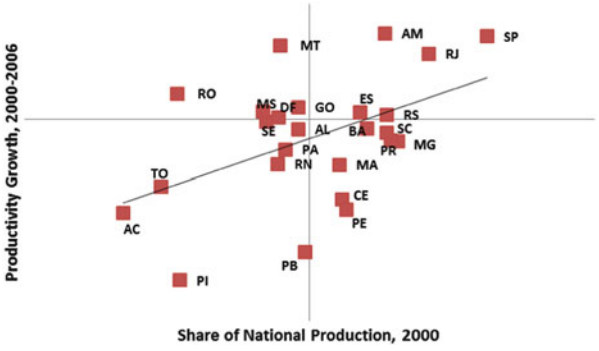

Fig. 10.8 Evolution of productivity across states, 2000–2006

available. The results indicate high competitiveness in all indicators for the richer areas, especially for the state of São Paulo. In the case of the mid-west region, results are biased by the presence of the federal government in Brasília, concentrating all data processing for federal activities in Brazil. It seems clear, thus, that in the most sophisticated sub-sectors within services, the rich regions are not only above average, but have increased their competitiveness over time.

Tertiary activities were disaggregated into 24 sub-sectors, and a spatial concentration index based on Devereux et. al. (2004) was calculated for each year. Results displayed in Fig. 10.10 indicate that, in general, sectors highly concentrated presented lower growth rates, with some exceptions, such as publicity, marketing and decoration. Over time, only six sectors increased spatial concentration as measured by employment: miscellaneous; security; communication; commercial representation, storage and agriculture; household services and travel agencies. The

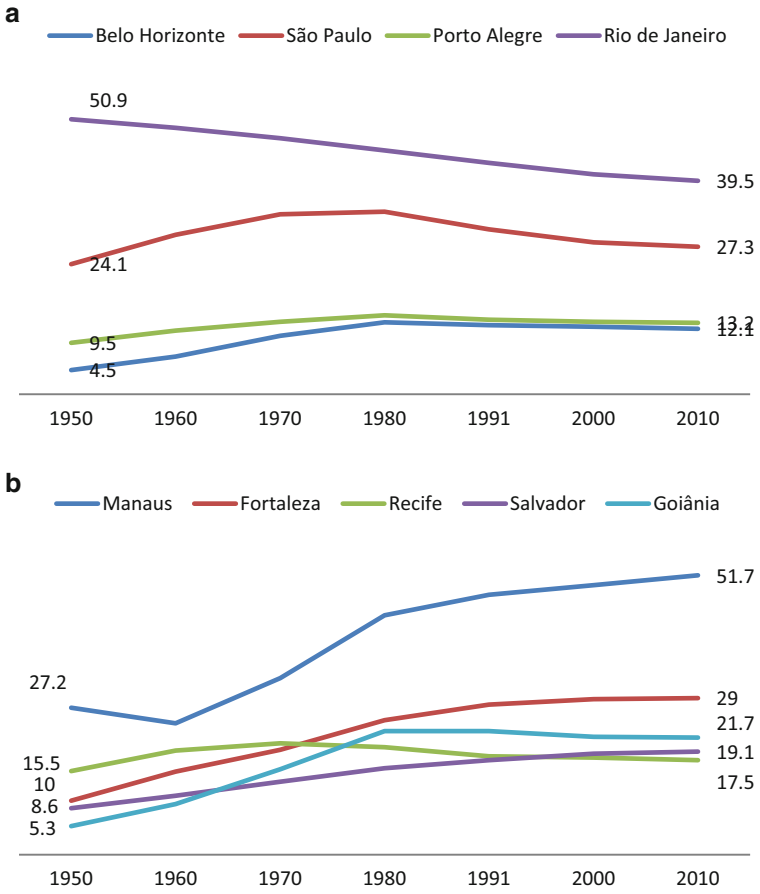

Fig. 10.9 Shares of capital cities in state's population (%) (**a**) Core states (**b**) Non-core states (Source: IBGE, Demographic Census, various years)

sectors for which increased concentration was the highest were household services and commercial representation, storage and agriculture. No statistically significant relationship between the two variables was found, that is, employment growth and end-of-period concentration do not seem to be associated.

The analysis of tertiary activities indicates that the rich areas are losing competitiveness in commerce and in traditional services, but are becoming more competitive in the modern sub-sectors within the tertiary, such as in services to firms, computing, etc. The analysis of growth and concentration revealed a great variety across sub-sectors, indicating that it is important to develop detailed analysis to come to relevant conclusions. As for spatial concentration, the majority of sub-sectors presented decreasing concentration in the period, although six sub-sectors presented increasing concentration. An income convergence analysis was performed, indicating that only a sub-set of sectors presented convergence. By

Table 10.4 Competitiveness indicator

	Commerce					
	Wholesale		Retail		Services	
	Late 1970s	Late 1990s	Late 1970s	Late 1990s	Late 1970s	Late 1990s
Revenue/wage bill						
North	1.03	1.36	1.20	1.27	1.04	1.09
Northeast	1.13	1.27	1.39	1.16	1.19	0.94
Southeast	0.99	0.89	0.92	0.93	0.97	1.01
South	1.01	1.09	0.99	1.05	0.92	0.98
Center-West	0.85	1.37	1.15	1.19	1.24	0.98
São Pauo State	0.95	0.83	0.94	0.88	0.86	1.02
Revenue/worker						
North	0.70	1.30	0.67	1.31	0.75	0.96
Northeast	0.65	0.89	0.57	0.88	0.57	0.68
Southeast	1.16	1.03	1.21	1.03	1.18	1.13
South	0.89	0.94	1.13	0.99	0.73	0.83
Center-West	0.74	1.09	0.99	1.01	1.10	0.83
São Pauo State	1.16	1.06	1.36	1.14	1.15	1.27
Revenue/establishment						
North	0.55	1.56	0.53	2.24	0.75	1.80
Northeast	0.36	0.96	0.38	0.78	0.39	0.92
Southeast	1.44	1.07	1.56	1.06	1.37	1.17
South	0.96	0.80	1.35	0.93	0.71	0.59
Center-West	0.75	1.31	1.00	1.18	1.12	0.93
São Pauo State	1.44	1.12	1.84	1.10	1.38	1.27
Brazil	1.00	1.00	1.00	1.00	1.00	1.00

Source: Azzoni and Andrade (2005)

correlating convergence with concentration and concentration changes, none, or very weak, association was found. The authors concluded that that there was no association between the increasing share of tertiary activities in GDP and spatial income inequality in the country in the period.

10.5 Conclusions

We have presented indicators of regional disparities for Brazil over the last seven decades. It was made clear that concentration and inequality are high and relatively stable over time. As for concentration, the important phenomena in terms of changing the long last distribution of activities are the growth in the north region, related to mining and logging, and in the mid-west region, related to agriculture and agribusiness. Therefore, the main changes are related to resource-oriented activities, led by, or associated to, governmental programs such as the establishment of a new capital city in the mid-west, the design and implementation of a free-import zone in the Amazon, the intense allocation of resources for technological

Table 10.5 Competitiveness indicators for services sub-sectors

	Hotels and restaurants		Real state		Transportation		Services to firms		Miscellaneous		Computing
	Late 1970s	Late 1990s	Late 1970s	Late 1990s	Late 1970s	Late 1990s	Late 1970s	Late 1990s	Late 1970s	Late 1990s	Late 1990s
Revenue/wage bill											
North	1.16	0.91	0.85	1.06	0.80	1.34	1.11	0.94	2.26	0.78	0.65
Northeast	1.49	0.99	1.01	0.96	0.93	0.98	1.64	0.95	1.48	0.84	0.70
Southeast	0.93	1.02	1.01	1.02	0.99	0.98	0.84	1.03	0.94	1.09	1.04
South	0.97	0.92	1.11	0.98	0.82	1.02	1.54	0.96	0.89	0.84	0.97
Center-West	1.16	1.04	0.83	1.07	1.34	1.19	1.34	0.83	1.27	0.85	1.06
São Pauo State	0.92	0.94	0.99	0.84	0.83	0.96	0.93	1.08	0.84	1.21	1.18
Revenue/worker											
North	0.93	0.88	0.31	0.82	0.75	1.18	1.07	0.72	0.97	0.73	0.71
Northeast	0.61	0.83	0.86	0.70	0.69	0.75	0.67	0.63	0.63	0.63	0.44
Southeast	1.21	1.11	1.08	1.09	1.11	1.08	1.07	1.14	1.18	1.25	1.20
South	0.86	0.82	0.89	0.94	0.59	0.90	1.11	0.86	0.96	0.66	0.69
Center-West	0.84	0.96	0.87	0.89	1.26	0.90	1.02	0.73	0.87	0.68	1.04
São Pauo State	1.31	1.15	1.10	0.95	0.97	1.18	1.18	1.31	1.21	1.65	1.51
Revenue/establishment											
North	1.16	1.76	1.06	1.07	1.05	2.24	1.11	1.38	1.01	0.87	3.86
Northeast	1.49	1.20	1.32	0.76	0.57	1.09	0.55	0.88	0.51	0.80	0.75
Southeast	0.93	1.06	1.00	1.15	1.26	1.29	1.20	1.16	1.27	1.32	1.05
South	0.97	0.68	0.85	0.75	0.42	0.50	0.97	0.60	1.02	0.50	0.56
Center-West	1.16	1.21	1.17	0.91	1.40	0.80	0.97	0.73	0.85	0.76	11.39
São Pauo State	0.92	1.02	0.94	1.05	1.12	1.27	1.24	1.29	1.33	1.78	1.14
Brazil	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: Azzoni and Andrade (2005)

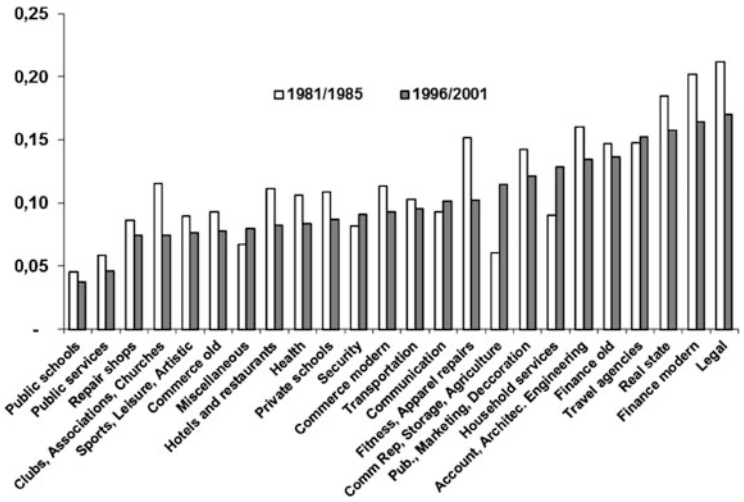

Fig. 10.10 Evolution of sectoral spatial concentration

improvement in agriculture – which made possible for the mid-west to become a bread-basket for the world.

However, even in agriculture the inequality in productivity levels are practically the same as it was in 1970, with the southeast region still leading in terms of competitiveness. As for the urban activities, with the exception of agribusiness activities in the mid-west, the situation in terms of competitiveness is also similar as it was in the past. No signs of regional convergence in productivity levels in manufacturing were found. On the contrary, indicators suggest that the industrial core of the country became even more competitive in the beginning of the twenty-first century. As for the tertiary activities, there are signs of de-concentration in the more traditional ones, such as commerce or basic services, whereas the more sophisticated services typically present a more concentrated pattern, both in levels and in growth.

Studies show that regional income inequality decreased in the last decade, but this is associated with government social programs, such as the appreciation of the minimum wage and the implementation of cash transfers to poor families, typically located in the poorer regions (Silveira-Neto and Azzoni 2011a, b). From the indicators presented in this chapter, it seems that there is a long way to go before the highly concentrated distribution of activities in the country could present significant changes. Even with all the changes that took place in the economy of the world and of the country over the last two decades, it seems that the centripetal forces are still surpassing the centrifugal influences of disagglomeration economies.

Acknowledgement I thank Prof. Eduardo Haddad, Department of Economics at the University of Sao Paulo, for his insightful comments.

References

Azzoni CR (1997) Concentração regional e dispersão das rendas per capita estaduais: análise a partir de séries históricas estaduais de PIB, 1939–1995. Estudos Econômicos. Instituto de Pesquisas Econômicas. v.27

Azzoni CR (2001) Economic growth and regional income inequality in Brazil. Ann Reg Sci 35:133–152

Azzoni CR, Andrade AS (2005) The tertiary sector and regional inequality in Brazil. Rég Dev 21:155–172

Azzoni CR, Ferreira DA (1998) Competitividade regional y reconcentración industrial: el futuro de las desigualdades regionales en Brasil. EURE (Santiago) XXIV(73):81–111, Santiago, Chile

Baer W (2001) The Brazilian economy: growth and development, 5th edn. Praeger Publishers, Westport, Connecticut and London

Barros R, Carvalho M, Franco S, Mendonça R (2006) Uma análise das principais causas da queda recente na desigualdade de renda brasileira. Econômica 8:117–147

Carvalho A, Lall SV, Timmins C (2006) Regional subsidies and industrial prospects of lagging regions. World Bank Policy Research working paper 3843, February 2006

Confederação Nacional da Indústria (CNI) (2010) A indústria e o Brasil: uma agenda para crescer mais e melhor. CNI, Brasília

Devereux M, Griffith R, Simpson H (2004) The geographic distribution of production activity in the U.K. Reg Sci Urban Econ 34:533–564

Ferreira F, Leite P, Litchieeld J, Ulyssea G (2006) Ascensão e queda da desigualdade de renda no Brasil, Econômica. Rio de Janeiro 8(1):147–171

Gasques JG, Bastos ET, Bachi MPR, Valdes C (2010) Produtividade total dos fatores e transformação da agricultura brasileira: análise de dados dos censos agropecuários. In XLVIII Congresso Brasileiro de Economia, Administração e Sociologia Rural. SOBER, Campo Grande

Hoffmann R (2006) Transferências de renda e a redução da desigualdade no Brasil e cinco regiões entre 1997 e 2004. Econômica 8(1):55–81

Imori D (2011) Eficiência produtiva da agropecuária familiar e patronal nas regiões brasileiras. MS thesis, Department of Economics, Universidade de São Paulo, Paris

Neri M (2010) The decade of falling income inequality and formal employment generation in Brazil, In OECD, Tackling inequalities in Brazil, China, India and South Africa: the role of labour market and social policies. OECD Publishing, Paris. pp 57–107

Schettini DD, Azzoni CR (2011) Diferenciais Regionais de Competitividade Industrial do Brasil no século 21, Prêmio CNI de Economia, 2°. Lugar, 2011

Silveira-Neto RM, Azzoni CR (2011a) Non-spatial government policies and regional income inequality in Brazil. Reg Stud 45:453–461

Silveira-Neto RM, Azzoni CR (2011b) Social policy as regional policy: Market and nonmarket factors determining regional inequality. J Reg Sci 52(3):433–450

Soares S (2006a) Distribuição de renda no Brasil de 1976 a 2004 com ênfase no período entre 2001 e 2004, vol 1166, Textos para discussão. IPEA, Brasília

Soares S (2006b) Análise de bem-estar e Decomposição por fatores da queda na desigualdade entre 1995 e 2004. Econômica 8(1):83–115

Vicente JR (2006) Comparação de produtividade agrícola entre as unidades da federação, 1970–1995. Agricultura em São Paulo 53(2):69–83

Vicente JR (2011) Produtividade total de fatores e eficiência no setor de lavouras da agricultura brasileira. Rev Econ Agronegócio 9(3):303–324