

Chapter 9

Regional Inequalities and Regional Policies in Colombia: The Experience of the Last Two Decades

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Colombia has one of the worst income distributions in the world. This finding is a matter of concern since abundant empirical evidence at the international level shows a negative relationship between economic growth and inequality (Deininger and Squire 1996; Alesina and Rodrick 1994; Bertola 1993; Engermann and Sokoloff 2002). In Colombia large differences in the distribution of income have become worrisome. For the last three decades inequality has increased and the most impoverished areas, such as the Caribbean and Pacific coasts, continue to lag behind. What is observed in the Colombian context is an increasing territorial polarization. Moreover, several key economic policies seem to have worsened the situation of economic imbalances in this respect.

Regional income convergence matters because it is related to inequalities in income distribution and to economic welfare. Having an unequal income distribution is an issue that should warrant special attention, more so when polarization trends are evident. This is the case of Colombia in recent decades. In this country, inequalities have been persistent during the last two decades and with them the economic growth and welfare of the population may have been negatively affected. Furthermore, the most impoverished areas, such as the Caribbean and Pacific coasts, have not received special policy support from the central government. Besides this situation, the capital city has reached an unprecedented importance in the national economy. For all these reasons, Colombia is an interesting case to study from a local perspective to delve into the specificities of the Colombian regions and the economic policies needed for the reduction of the disparities.

This paper seeks to review the economic growth and the evolution of inequalities during the last two decades in Colombia (1990–2010). Employing the last two censuses (1993 and 2005) we evaluate the spatial distribution of poverty and its persistence over time.

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The main regional policy that the Colombian government has implemented in the last decades, fiscal decentralization, is discussed. This policy has not resulted in a reduction of regional economic disparities. On the contrary, it seems that the majority of the resources transferred from the central government have ended up helping the most prosperous regions.

The first section presents a review of the theoretical issues that help understand the evolution of regional disparities and economic growth. In the second section we focus on the Colombian case with respect to the factors associated to inequalities and regional imbalances. We highlight the role of the central government in terms of the regional policies and the limited success that has achieved in this matter. It is stressed that previous National Development Plans have focused on sectorial strategies rather than regional ones. The third section presents the spatial aspects related to poverty and inequalities. The fourth section reviews the way resources from the central government have been allocated among administrative units. The fifth section presents an analysis of the convergence hypothesis during the last two decades. Finally, the seventh section offers some concluding remarks.

9.1 Theoretical Perspectives on Economic Growth and Regional Imbalances

Economists have long recognized that knowledge spillovers are one of the main sources of economic growth (Marshall 1920). According to this framework growth in some sectors or geographic areas is explained by the externalities they receive from knowledge created in other sectors (Romer 1986; Lucas 1988). When sectors grow because of knowledge that they did not create, but rather that they “borrowed” from other sectors of the economy it is said that the knowledge spills over. Inspired by these ideas, there has been much work in the empirical literature on the determinants of the growth in cities (Glaeser et al. 1992, 1995; Ades and Glaeser 1995; Black and Henderson 1999). These theoretical frameworks have highlighted knowledge spillovers as important elements of economic growth, especially in urban environments where, as opposed to the rural areas, ideas may flow quickly due to the intensity of interactions between people. The literature on agglomeration economies pioneered by Marshall (1920) provided an explanation for why firms are located in urban areas: the search for positive externalities in the form of knowledge spillovers from other firms. In this sense Marshall mentions that:

When an industry has thus chosen a locality for itself, it is likely to stay there long: so great are the advantages which people following the same skilled trade get from near neighborhood to one another. The mysteries of the trade become no mysteries; but are as it were in the air. (Marshall 1920, p. 225).

Jacobs (1969) has been recognized for having started the discussion of why cities provide an environment that facilitates the interchange of ideas and thus, knowledge spillovers and externalities. More specifically, the recent literature studying

the determinants of innovative outputs refers to the effects of industrial specialization as Marshall externalities and industrial diversity as Jacobs externalities (Paci and Usai 1999; Ejermeo 2005).

In the same framework of Jacobs' (1969), Glaeser et al. (1992) put stress on the sources of technological spillovers and their effect on city growth. This new growth theory is relevant for the study of factors which make cities prosper, and is particularly important to understand the growth of the main Colombian cities, especially Bogota, which has become an enormous economy in comparison with the rest of the urban areas.

Studies based on the new economic geography, with its emphasis on scale economies, have influenced the recent literature on the determinants of economic growth (Krugman 1991). In particular, Krugman has shown that the interaction between economies of scale and externalities can lead to the agglomeration of economic activity (Krugman 1999). This agglomeration in turn strengthens urban concentration as this phenomenon may act in a virtuous cycle.

Other theoretical proposals which enrich the growing body of literature on the determinants of city growth have been made by Vernon Henderson, Andrei Shleifer, and Edward L. Glaeser (1992, 1995). The study by Ades and Glaeser (1995) explores why some cities grow and become excessively large by pointing to two elements, namely trade and circuses. In the case of urban growth in Colombia, these elements can be understood as opportunities and amenities. People migrate to the main cities in search of job opportunities, education and improved welfare conditions. Ades and Glaeser's (1995) study shows some of the pulling forces that lead to such concentrations such as the population of Buenos Aires, with 35 % of Argentina's total. Along the same lines, 10 % of the Japanese population lives in Tokyo, 25 % of the population in Mexico is concentrated in Mexico City, among other examples.

The study by Ades and Glaeser (1995) also highlights some prominent themes. The biggest cities tend to be the country's capital. The authors also stress the importance of the links to natural resources. The higher the share of labor force outside agriculture, the more labor not tied to natural resources, and hence, more people will choose to live in the main urban areas.

From a policy perspective, Krugman and Livas (1996) argue that protectionism will foster urban concentration due to the fact that higher import taxes negatively affect imports and therefore local industries (and thus workers) will locate in big cities in order to supply national markets. In this respect, Colombia has been no exception. For instance, the import-substitution-industrialization (ISI) policies during the 1950s mainly benefited the central areas of the country, especially those that had accumulated physical capital with the coffee export profits, i.e. the so called coffee belt (Antioquia, Caldas, Risaralda and Quindío). This was not the case for regions such as the Caribbean Coast that did not benefit from ISI policies and, on the contrary, due to the geographical advantage of its localization near the coast, would have benefited from an export led growth policy. The latter was not part of the core coffee producing areas located around Antioquia, Caldas, Quindío, Risaralda, and the northern part of Valle del Cauca.

The growth of the central government has also been an important source of imbalances in regional growth in Colombia. During the first half of the twentieth century government expenditures reached an average of 5 % of the Colombian GDP; by the decade of the 1990s it had surpassed 20 % (Junguito and Rincón 2004). This tremendous growth has mainly benefited Bogota, as this city employs the vast majority of public officials, and attracts the majority of the firms that engage in contracts with the public sector, especially with the central government (Bonet 2003).

Political factors also contribute to territorial economic imbalances. For instance, factors related to democracy and civil rights have various effects on population concentration. It has been argued that governments protect civil rights for people living in the main urban concentrations, as they are the ones that determine the results of elections (Ades and Glaeser 1995). This becomes a pulling factor towards the cities for people in the hinterland.

Following previous theoretical propositions, in the Colombian literature there have been studies linking regional development and the convergence hypothesis. For instance, Cárdenas (2005) argued that although between 1970 and 2002 economic growth permitted a small reduction in regional income disparities, since the ratio between the per capita GDP of Bogota and that one of Chocó declined, this was not reflected in the quality of life for people with lower incomes.

In 2006, CEGA (Center for Livestock and Agricultural Studies) published the series for income, consumption, and savings for Bogota and the states that existed before the Constitution of 1991. This allowed the analysis of the income of those states. Up to that moment, research was carried out using state GDP, which distorted the information for the mining regions, among other problems. Bonet and Meisel (2006) tested the convergence hypothesis using the dataset produced by CEGA. Their findings point to a polarization process between Bogotá and the rest of the country. Using stochastic kernel functions the authors show a highly persistent pattern of disparities, as the ranking, in terms of the per capita income, remains unaltered during the three decades analyzed.

Gaviria and Gelves (2009) also provide evidence of the highly persistent patterns of income inequalities. The authors also use kernel functions to represent these patterns, but using a long run view covering various population censuses starting from the beginning of the twentieth century.

Galvis and Meisel (2010a) discuss two dimensions of economic disparities, time and space. The authors show that poverty is clustered in space and that this clustering remains through time, which constitutes evidence of the highly persistent pattern of disparities in the country and the existence of spatial poverty traps in Colombia. As the economic literature has pointed out, these poverty traps are characterized by low-income equilibriums (Azariadis 2006). From a policy perspective it is necessary to think about the presence of an external authority that provides a “big push” to the impoverished areas to help them get out of the poverty trap (Rosenstein-Rodan 1943; Sachs 2005).

9.2 Factors Associated to Growth and Disparities in Colombia

In countries like Colombia, the spectacular population growth of Bogota, is a matter of concern.¹ In fact, Colombia is going through a process of urban polarization in which economic disparities between the main cities have been increasing (Galvis and Meisel 2001). In this context, Colombia seems to be an example of what Krugman and Livas (Krugman and Livas 1996) said about the consequences of trade policies followed by developing countries to promote import substitution industrialization: the growth of a huge metropolis (which very often is also the capital).

This phenomenon is known as urban primacy, and it appears when the principal city is oversized in relation to the rest of the cities. The latter begin to depend economically on the main city, since the most important economic opportunities are concentrated there. The same can be said about investment and infrastructure which strengthens the capacity to undertake projects and establish new companies, and the investment in social and cultural capital coming from private resources, as well as the resources from the central government. Thus, middle sized cities turn into net ejectors of population onto the principal city, which has the largest market and, therefore, the greatest capacity to obtain economies of scale. Facilities and urban infrastructure such as better schools or subsidies also play the role of “welfare magnets” which attract people. This phenomenon has also been observed for international migrants to the US, who are attracted by welfare programs (Borjas 1999).

The abrupt topography seems to have played an important role on the spatial distribution of population in Colombia. This factor made land communication relatively deficient between intermediate cities and Bogota and that was one of the reasons why urban primacy was not observed earlier (Gouëset 1988). A similar case occurs in Peru, where the geography seems to provide physical barriers that make it more difficult for people to migrate. Furthermore, high transportation costs as well as ethnic fragmentation are also found to represent impediments for poor households to relocate in more prosperous areas (De Vreyer et al. 2009).

The localization patterns of the population in Colombia were characterized by the presence of several relatively balanced growth poles. This was explained in the past by the country’s topography. When the Andes mountain range enters Colombia through the south-west region it breaks up into three mountain ranges from which the Central Region emerges, with Bogota as the principal urban center; the Pacific Region, with Cali as the principal urban center; the coffee zone, with Medellin; and the Caribbean Coast, with Barranquilla, as the principal city of the region (See Fig. 9.1).

¹This section is based on the paper by Galvis and Meisel (2009). Parts of it are reproduced here with permission from the editor of the journal *Foreign Affairs- Latinoamérica*.

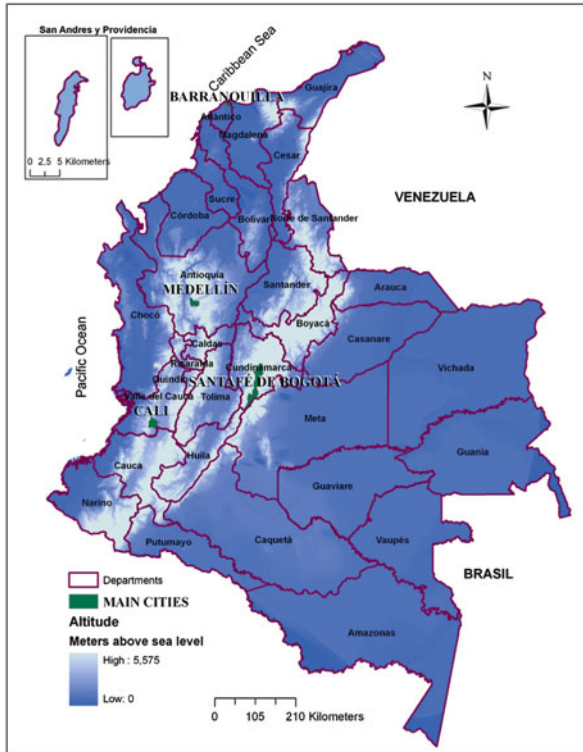


Fig. 9.1 Colombia: states and main cities (Source: Prepared by the authors based on the map database of the Agustín Codazzi Geographical Institute (IGAC))

9.2.1 Path Dependence

At the beginning of the twentieth century Bogotá was the only city with more than 50,000 inhabitants, and the other municipalities were small and heavily dependent on agriculture, i.e., on immobile natural resources. With the industrialization of the mid-twentieth century, major cities were consolidated as an urban network, with each one becoming a nodal point in their respective regions. However, due to the stagnation experienced by Barranquilla since the 1950s (Posada and Meisel 1993), the main urban network was consolidated around the triangle Bogotá-Medellin-Cali. A couple of decades later Bogotá began to consolidate itself as the main urban area in a scheme of urban primacy. For example, in the 1973 Census, its population exceeded the sum of the following three main cities. By 2010 the population of Bogotá represented 16.2 % of the country's total.

The importance of Barranquilla in the national context rested on that the fact that, despite being distant from other cities, it was connected to the Magdalena River, the primary mean of transporting merchandise and people from the Caribbean Coast to the interior of the country. However, following the opening of the

Panama Canal in 1914, it was easier to reach the interior cities through the Pacific Ocean. This, together with the large investments in roads and railways that occurred at the beginning of the century, allowed the central region to become well connected with the Pacific Coast.² As a result, the comparative advantage held by Barranquilla as a seaport connecting the center of the country with the rest of the world disappeared, and this role was taken by the port of Buenaventura.

As a result of the redefinition of road infrastructure and the growing importance of coffee in the national economy, the coffee belt became a center of development which concentrated a large portion of the country's population. In addition to the above, the country entered a period of import substitution policy. This policy favored some parts of the country, especially the industrial cities of the interior, and generated a process of concentration of wealth in those areas. The latter was the result of low import taxes on industrial raw materials, even with negative rates in real terms, which for other regions such as the Caribbean coast, was not as beneficial as it was for the regions where the industry was located.

The growing importance of the capital is more notable if one examines the participation of Bogota in the national GDP. While in 1960 Bogota contributed with 14 % of the GDP, this percentage increased to 22.6 % in 1995. It is estimated that in 2010 this percentage rose to 26 %.³

Further explanations for the regional imbalances in the economic growth of Colombia were studied by Galvis and Meisel (2001). The authors employ a series of variables to explain the economic growth of Colombian cities. The study concludes that the results obtained for urban income are consistent with the research of Paul Krugman and Edward Glaeser on regional economics, who emphasized the role of scale economies and knowledge spillovers to understand the growth of cities, rather than with the research of Jeffrey Sachs, which gives special importance to the role of physical geography. On the whole, the variables that stimulate economic growth also constitute pulling factors for population growth and Bogota has the best, or near the best conditions in terms of those "luring" factors.

Geographic variables may explain localization of people in the country from a historical perspective. Bogota is located along the Andean mountains and presents an average temperature of 65°, soil in the surroundings is fertile, and the main endowments in terms of infrastructure are located around it. For the latter situation there is also a historical explanation that goes back to the conquest period as the majority of indigenous population was concentrated around the Andean mountains (Zambrano 1997). Later the income generated by coffee growers was used for investments in communications and infrastructure along the Andean ranges. Thus, there is a sort of path-dependence through which the importance of geography in the more agrarian stages of development manifests itself in more recent periods and helps in the understanding of the localization of people in the territory.

² The infrastructure was built mainly with the resources obtained as an indemnity from the loss of Panama and with other resources coming from credits from US investors (Ramírez 1999).

³ Calculations based on National Department of Statistics, DANE.

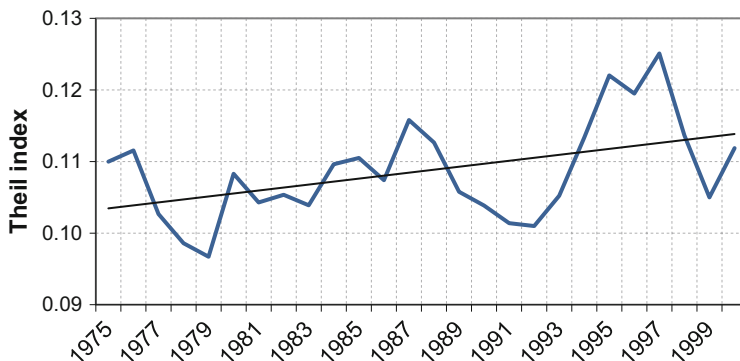


Fig. 9.2 Theil index of per capita income of the states, 1975–2000 (Source: Authors' estimates based on CEGA)

9.2.2 *Income Concentration*

The growing importance of Bogota in the national economy has been accompanied by an equal increase in regional disparities that is evident until the end of the decade of 1990. This can be seen in the concentration of income per capita in the states measured by the Theil index of concentration. This index is presented in Fig. 9.2, and evidences the polarization of income.⁴ It can be observed that disparities in per capita income in Colombia have increased. This has resulted in a series of spatial imbalances in the distribution of wealth in the country, and regions such as the Pacific and Caribbean coasts have lagged behind. These two regions contribute with about 50 % of the population with unmet basic needs (UBN⁵), in spite of contributing with only 30 % of the national population.

The contrast in poverty levels between Bogota and the coastal regions is evident. For instance, according to the census results of 2005 the percentage of people with UBN in the Pacific Coast was 47.9 %, and 45.4 % on the Caribbean coast, while in Bogota that percentage was 9.16 %.⁶ Moreover, the UBN index of the states along the so called “golden triangle” reached 15 % in 2005. This pattern provides evidence to posit that in Colombia the phenomenon of poverty has a spatial counterpart: the core of the country accumulates wealth while in the periphery the opposite occurs.

⁴ Calculations were made until 2000, the latest date for which data is published for per capita income by CEGA.

⁵ The UBN index is the percentage of households with deficiencies in at least one of the following characteristics: (1) quality of housing (2) public utilities (3) crowding (4) school attendance (5) dependency ratio.

⁶ The Pacific coast is the sum of the departments of Chocó, Nariño and Cauca, together with the municipality of Buenaventura.

In conclusion, the phenomenon of poverty and inequality is present and persistent. Unfortunately, recent national government policies have not had any component aimed at reducing regional imbalances. With the exception of the national development plan of 2010–2014, no explicit policy related to reducing regional economic disparities has been formulated. Moreover, it had already been noted by experts in fiscal policy, that in Colombia the system of allocation of resources from the Government Transfers (GT) and the revenues derived from the exploitation of non-renewable natural resource royalties (NRR) have no explicit mechanisms to compensate for existing regional imbalances (Alesina et al. 2000, p. 14).

9.2.3 Regional Labor Market Segmentation

From a neoclassical perspective, labor market integration can be achieved through labor mobility. Under this view, if supply and demand are not in equilibrium the market will induce changes in prices of the commodity, in other words, wages will adjust to correct these disequilibria.

In a country like Colombia it would be expected that the adjustments occur via quantities i.e. through labor mobility as there is little chance for wages to fluctuate according to the market conditions, due to certain rigidities in the labor market (Echeverry and Santamaría 2005). Labor mobility constitutes, then, a very important element for understanding the dynamics of population and the adjustments of the labor market. What determines that mobility? Various factors are counted as determinants with wages being the one that exhibits an important weight. If labor were perfectly mobile we should observe an integrated national labor market and the equalization of wages across regions.

If we consider a representative market for any product, we could think of the integration in this market as the parity in the prices across regions. The same relationship may hold for the labor market if it is integrated. Why would there be differences in wages across regions? This question can be addressed in the framework of compensating wage differentials across labor markets in which these differentials reflect some desirable and non-desirable attributes associated with a given place of work or occupation. Those characteristics may generate some wage differentials as a form of compensation for the lack of amenities in certain jobs.

First, it is important to mention as background previous work, such as that of Galvis (2002) who used a gravity-type model to explain the interregional migration in Colombia. The author follows the framework employed by Aroca and Hewings (2002) to show that both the distance and the relative position of origin and destiny are important for migration flows. The study concluded that interregional mobility is of considerable importance and that economic conditions of destination and origin regions exert a significant influence on the migration flows. It was shown

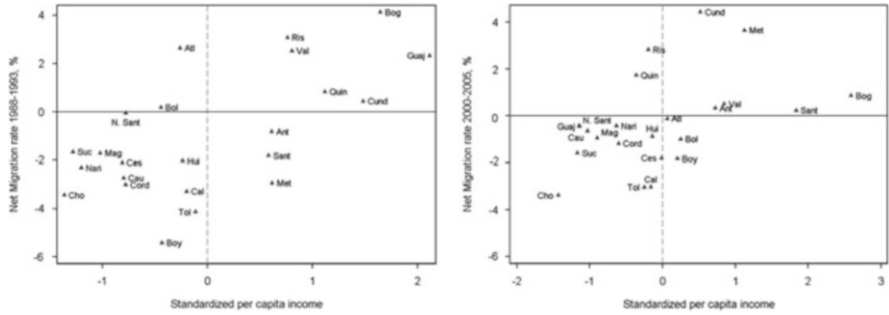


Fig. 9.3 Net migration rate and per capita average income 1988–1993 and 2000–2005 (Note: Vertical dashed line indicates the average per capita income. Net migration rates calculated with respect to the population in 1993 and 2005. Source: Authors’ calculations)

that, for relatively similar time periods, the net interregional migration rate in Colombia was of comparable magnitude to that experienced by countries such as Spain, Ireland, Japan, and the United States.

The question that follows is if the labor market is integrated, given that there is a significant amount of labor mobility. In this regard, previous studies like Nupia (1997) investigated integration in the labor market of the four main metropolitan areas and Jaramillo et al. (2001) used urban and rural wages for unskilled workers to study the same issue. According to the results integration of the labor market of unskilled workers holds for the areas around the core of the country.

Considering both unskilled and skilled workers Galvis (2011) show that, for instance, Bogota presents the highest magnitudes of wages followed by Cali and Medellin, and show a similar behavior. On the other hand, urban areas that behave very differently with respect to the rest of cities are Barranquilla and Pasto. The particularities that are observed in those two cities which may explain that difference are related to the fact that they are located in the periphery of the country. Because of that reason, the possibility of movements of labor from or to these markets is even more limited.

What makes the results of the imbalances more profound is the fact that the regions that present higher per capita income are the ones which have positive net migration rates (see Fig. 9.3). What is expected is that those departments with higher per capita income or per capita income above average (right of the dotted line in Fig. 9.3) attract immigrants. In Romero (2010) it is shown that in Colombia, internal migration has contributed to human capital concentration in the largest and wealthiest cities, as more qualified people migrate to the main cities. This supports the hypothesis that the population with more economic resources is the one who can afford mobility across regions. For poorer people it seems that the costs of migration would prevent them from moving to areas in which there are greater opportunities to achieve higher living standards.

9.3 Spatial Analysis of Poverty

This section discusses spatial autocorrelation indexes in order to assess whether poverty in Colombia is randomly distributed across its territory. The spatial autocorrelation analysis considers that all phenomena are interrelated in space, but those which are closer are more correlated than distant ones. The foundation of this statement derives from the first law of geography, or Tobler’s Law (1970). In this way, for spatial econometric analysis it is of relevance to evaluate statistically the existence of similar values in a variable, occurring in near spaces. Pearson’s correlation coefficient does not account for similarities in close spaces between the variables that are geo-referenced, i.e., that have a reference to where the phenomenon occurs in space. In this case the Moran’s I is used. This index parts from the definition of correlation coefficient, but adds the location of the observations in the space by including an array of spatial weights, W_{ij} , as follows:

$$I = \frac{N}{S_0} \frac{\sum_i \sum_j W_{ij} Z_i Z_j}{\sum_i Z_i^2}$$

where $Z_i = X - \bar{X}$, i.e. X is in terms of deviations from its mean and $S_0 = \sum_i \sum_j W_{ij}$. The term $W_{ij} Z_i$ is known as the spatial lag of Z . W_{ij} matrix allows us to identify the “neighbors” of the observations in Z . Based on the “first law of geography” the definition of the neighbors is achieved by building W_{ij} as a binary array whose cells are equal to one if observations i and j are neighbors and zero otherwise. Different criteria are used to restrict the neighbors such as contiguity criteria, distance weights, or the K-nearest neighbors.

For the calculation of Moran’s I the covariance of Z with its spatial lag divided by the variance of Z is used. This can be obtained from the regression of the variable WZ with Z (Anselin 1996). Thus, if the sign of Moran’s I is positive, it is said that there is a positive spatial autocorrelation in the Z variable, i.e., similar values occur in nearby locations.

Global Moran’s I is useful to detect a general pattern of clustering. However, when it comes to local analysis the Moran’s I index can be used to explore clusters. In this case the analysis is done by means of the Local Indicators of Spatial Association, LISA, which allows for the detection of patterns of spatial autocorrelation in small areas of the region of study (Anselin 1995). For this analysis if Z is set to be a variable resulting from the demeaned X variable, $Z_i = X_i - \bar{X}$, the LISA indicators, I_i , can be built in the following fashion:

$$I_i = \frac{Z_i}{m_2} \sum_j w_{ij} Z_j$$

Where: $m_2 = \sum_i Z_i^2$, which is equal to the variance of the Z variable.

The objective of this analysis is to find matching high values of a variable in a spatial location i as well as in neighboring observations j . This case corresponds to the High-High clusters. Low values in I surrounded also by low values, would correspond to the Low-Low. High-Low and Low-High combinations are also feasible and they would correspond with cases of local outliers. These cases are also of interest as they may indicate a phenomenon of resiliency in the sense that a poor area remains poor without experiencing spillovers to foster wealth coming from the prosperous places in the surroundings.

The inference, the same way as for the Moran's I , is performed by Monte Carlo simulations building a distribution of I_i , to serve as a reference to determine if clusters are statistically significant.

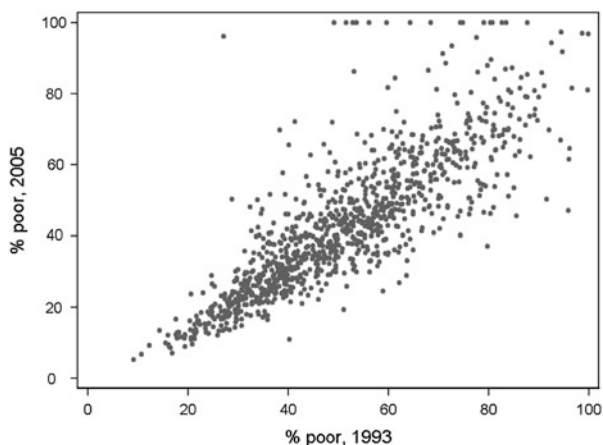
9.3.1 *Spatial Poverty Traps*

Regional economic disparities in Colombia have persisted over time (Bonet and Meisel 1999). This, however, is not a unique characteristic of Colombia, as it has been documented in the literature on economic development in other countries (Sawhill 1988; Morrill and Wohlenberg 1971; Levernier et al. 2000; Blanden and Gibbons 2006). Among the explanations for the persistence of economic disadvantage of some regions there is one that is related to "poverty traps", where the disadvantage maybe the result of conditions that lead to a vicious circle and a perverse equilibrium (Azariadis 2006). For instance, in the case of individuals low-income parents are not able to provide high-quality education for their children, who will in turn, have few opportunities to reach high income levels, thus maintaining the vicious circle. To bring these people to a sustained growth path, it is required that external forces provide some minimum level of wealth or human capital to exit the vicious circle.

Often the conditions that give rise to objective conditions of poverty are confined to specific geographical areas, where neighborhood effects are magnified (Durlauff 2006; Sampson et al. 2002). In these spaces the adverse consequences of poverty reinforce each other and thus there will be persistence of the unfavorable conditions. For example, poor local economies may have low quality of education that remains static for years, which implies a reproduction of poverty across generations (Bénabou 1996; Durlauff 1996). On the other hand, high income regions can invest in education, in order to provide better opportunities for their inhabitants. This process would imply not only persistence of disparities, but also the polarization of regional economic growth.

In this regard, fiscal decentralization processes may contribute to an increase in regional disparities, as documented in the case of developing countries (Rodríguez-Pose and Ezcurra 2010). This result may be related to differences in the ability of local authorities to lobby for resources from the central government, financial constraints, and differences in the quality of institutions that affect the efficiency with which regions use their resources.

Fig. 9.4 Persistence of poverty among municipalities, 1993–2005 (Source: Authors' estimates based on DANE)



In Colombia, in the early 1990s decentralization policies, which were strengthened after the 1991 Constitution, promoted a system in which sub national units, such as municipalities and states, obtained resources from the national budget through transfers of the central government. One of the objectives of the fiscal decentralization was to reduce regional economic disparities. This objective, however, has not been achieved. Rather, the evidence shows that after the early 1990s there has been an increase in regional economic disparities.

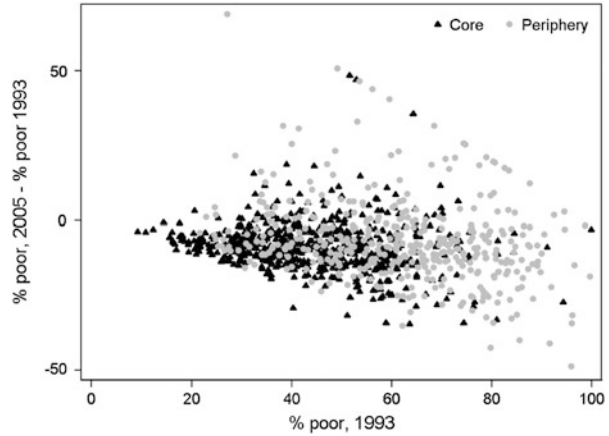
Following Sampson and Morenoff (2006) study of durable inequality the persistence in poverty may be analyzed by means of a plot displaying poverty rates⁷ based on in the last two Census, i.e., 1993 and 2005, as displayed in Fig. 9.4. There is a correlation of 0.87, between poverty rates in the municipalities in 1993 and 2005. This means that municipalities with high poverty rates in 1993 remain in poverty in 2005. The same correlation calculated between 1985 and 1993 yields a magnitude of 0.80, which is lower than the 0.87 found for 1993–2005 period, in spite of being calculated for a shorter period.⁸ This means that the persistence of poverty rates increased after the decade of 1990.

To analyze the change in poverty rather than in its levels, it is important to see how the change in poverty is related to the initial conditions, and trying to understand whether the municipalities that increased their level of poverty between 1993 and 2005 “were those that were already very poor or those that were in the transition toward becoming poor” (Sampson and Morenoff 2006, p. 182). For that matter, Fig. 9.5 plots the poverty levels in 1993 against the “gains” in poverty from 1993 to 2005. In the figure we display the municipalities split into two categories:

⁷ Poverty rates are measured as the percentage of population with unmet basic needs, UBN, (NBI for its Spanish acronym).

⁸ Both correlation coefficients are statistically significant even at 1 %, using Bonferroni-adjusted significance levels.

Fig. 9.5 Initial conditions and change in poverty levels, 1993–2005 (Source: Authors' estimates based on DANE)



the core municipalities and the peripheral ones, according to the *c* classification by Galvis and Meisel (2010b).

Figure 9.5 shows that most of the municipalities in the core present low poverty rates as opposed to the peripheral ones which are concentrated beyond the 50 % threshold. Furthermore, the municipalities with mayor decreases in poverty rates were the peripheral ones. This suggests that the poverty patterns and their dynamics have a spatial counterpart, which can be tested by estimating the equation relating poverty rates in 1993, UBN_{1993} , to those in 2005, UBN_{2005} , in the following fashion:

$$UBN_{2005} = \beta_0 + \beta_1 UBN_{1993} + \varepsilon$$

In this case the residual change scores, denoted by ε , reflect the variation in poverty rates that are unaccounted for in the initial conditions. If only path dependence matters, the residual change would not have a spatial pattern, as the current level of poverty rates would be explained mainly by past poverty rates. To test for spatial dependence in the change scores, we use Moran's *I* test for regression residuals (Cliff and Ord 1981) as displayed in Table 9.1.

According to the results, the Moran's *I* is positive and statistically significant, which means that there is positive spatial autocorrelation in the residual change scores. This, in turn, provides evidence to suggest that the residual change scores are spatially clustered and, thus, the factors that explain current poverty levels, beyond past poverty rates, have a spatial dependence. To put this results into context we can refer to Durlauf (2006), who proposes that "poverty traps are nothing more than socioeconomic environments in which persistency in economic status is arbitrarily long" (p. 143). Spatial poverty traps, thus, may be defined as socioeconomic environments circumscribed in a given space that imply persistence in economic status. This may be precisely the explanation behind the results portrayed in Table 9.1. In other words, to understand the paths of poverty change in the municipalities of Colombia, it is necessary to make reference to spatial

Table 9.1 Regression of persistency in poverty rates

Dependent variable: UBN2005	Coefficients
UBN1993	0.8895*** (0.0175)
Constant	-2.5655*** (0.9814)
N	1,064
Adj. R-squared	0.71
Moran's I for regression residuals	0.1368***
Expected value	-0.0014
Std. Error	0.0176
Moran's I statistic standard deviate	7.8535***
Note: *** $p < 0.001$. Standard Errors in parentheses	
Source: Authors' estimates	

poverty traps as one of the main factors explaining the trajectories towards improving or reinforcing poverty and regional inequality.

9.3.2 Government Transfers and Decentralization Policies

The central government funds subnational units through participation in the national budget, also known as government transfers, GT. Besides the latter, royalties derived from the exploitation of non-renewable natural resources (NRR) are also transferred to territorial units. These funds originating from NRR were initially used by municipalities to finance basic needs programs.

It was expected that with the decentralization of fiscal resources, there would be an impulse to the strengthening of human capital and a reduction of inequalities in available incomes of local government. Nonetheless, it has been noted that in Colombia the clusters of municipalities where there are large amounts of per capita GT and NRR, do not coincide with clusters of poverty. Figure 9.6 shows an estimate of spatial clusters of poverty and transfers (GT plus NRR).

Clusters were identified based on local indicators of spatial association, LISA. The dark shaded areas correspond to municipalities with high values that are surrounded by municipalities with similar values, called high-high clusters. Consequently the low-low clusters, correspond to municipalities with low levels in the measured variable as well as its neighbors.

From this analysis we would expect that the high-high clusters in terms of UBN, correspond with areas of higher per capita transfers or high-high clusters. This is not the case and in fact, Panel A in Fig. 9.6 shows that a large fraction of municipalities with high levels of UBN, are surrounded by municipalities in the same condition without a level of national government transfers corresponding to the situation of poverty (they are located in clusters of low amounts of transfers, represented by gray areas). This happens in the southern part of the departments of the Caribbean

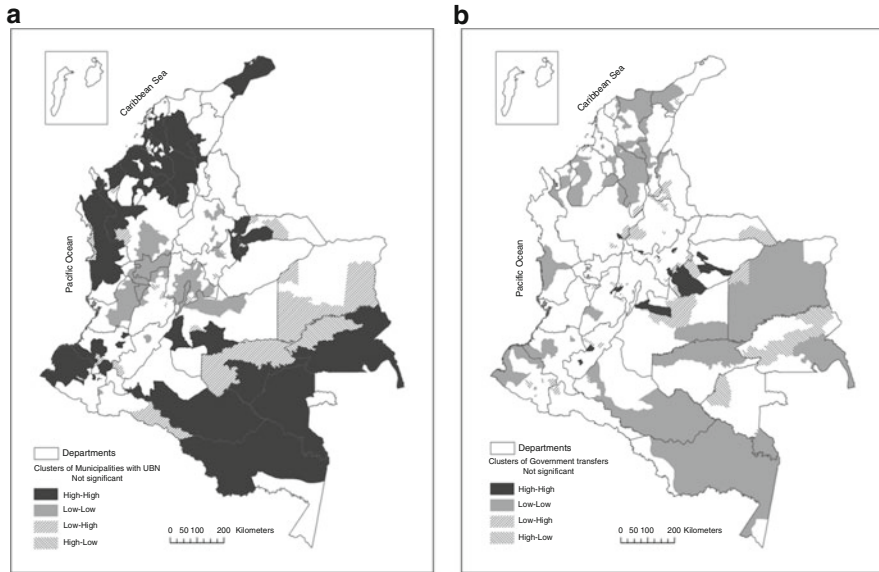


Fig. 9.6 Poverty clusters and transfers from the National Government. (a) Clusters of municipalities with UBN, 2005. (b) Clusters based on transfers (GT + NRR, 1996–1999) (Source: Prepared by the authors based on the National Administrative Department of Statistics (DANE), the National Planning Department (DNP) and the map database of the Agustín Codazzi Geographical Institute (IGAC))

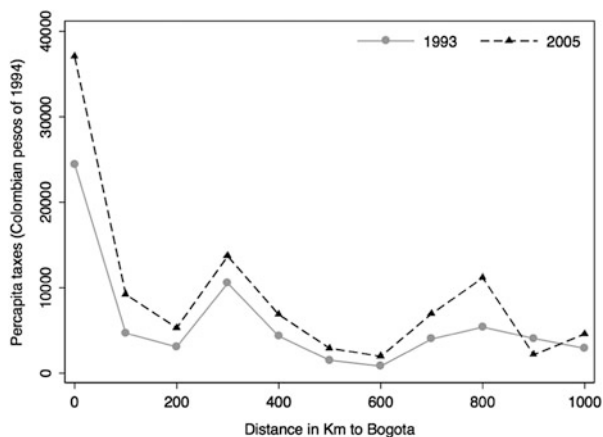
Coast, and in some towns on the Pacific Coast, and in several municipalities in the eastern part of the country. Similar results were found for the UBN index for 1993, especially in the Caribbean Coast.

9.3.3 Trade Policy and Economic Geography

Trade liberalization can have an effect on the concentration of economic activity and thereby influence regional disparities. The effects of such policies depend on the relative accessibility to the domestic and the external markets, and how the regions are integrated via the transportation network. For instance, after NAFTA, manufacturing wages in the Mexico-US border increased relative to the existing ones in Mexico City. Specifically a 10 % increase in distance from the US border implied a decrease in the relative wage of 1.9 % (Hanson 1996). Relocation of manufacturing towards the border region was also documented after Mexico joined the NAFTA (Hanson 2004).

Regarding trade policy, it was expected that greater trade liberalization in Colombia in the early 1990s would help reduce regional disparities. The mechanism through which it would act to improve the living conditions in the coastal

Fig. 9.7 Relationship between per capita taxes in retail and manufacturing and distance to Bogota (Note: Per capita taxes correspond to those collected from manufacturing and retail industries. Source: Prepared by the authors based on the National Planning Department (DNP))



economies relied on the location on shipping areas. This would, in turn, create jobs and wealth in those areas, among the most economically depressed in Colombia. However, the opposite has occurred and it seems that the effects of trade liberalization account for an increase in the size of the economy in the core of the country, specifically in Bogota (Fernández 1998). As a consequence of this, the highest concentration of companies in the capital and other areas with relatively high wealth may have increased regional disparities. This seems to be the case portrayed in Fig. 9.7, where we show a negative relation between the distance, in kilometers, to Bogota and the per capita taxes collected from manufacturing and retail. What is more interesting is that this negative relation strengthened from 1993 to 2005. The latter result shows that, more than a decade after trade liberalization, more income is generated in neighboring areas of Bogota than in cities near the seaports.

This last result could be expected, according to the approach of the so-called New Economic Geography, NEG. According to Paul Krugman, one would expect that in an economy with high transportation costs such as the Colombian, the concentration of economic activity would be localized in the center and not in the periphery.

The result expected from trade liberalization was that the Colombian economy would resemble an economy such as the US, which is more open to trade and, as a stylized fact, shows a great proportion of populous and wealthy cities and counties around the borders and in the seaports. In Colombia, however this has not occurred as it is shown in Fig. 9.8. This figure portrays the share of population in 1993 and 2005 living near the coastlines at different buffers of distance. It is shown in Panel A that the closer one gets to the coastline, the higher the share of population with UBN (i.e. under poverty conditions). On the other hand, in Panel B it is observed that as one approaches the coastline the share of population decreases. What is more surprising is that the average poverty rates near the coastline have increased from 1993 to 2005, even though the share of population has remained practically unchanged around those areas.

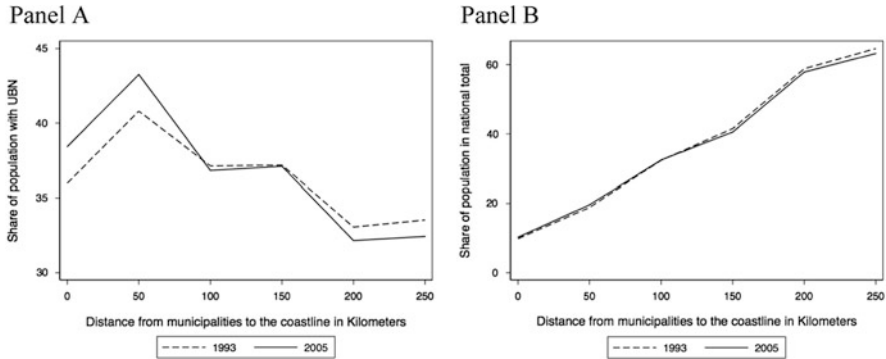


Fig. 9.8 Relation between distance to the coastline and the share of total population and population with UBN, 1993–2005 (Source: Prepared by the authors based on the National Administrative Department of Statistics (DANE))

9.4 Regressive Economic Policies

It would seem that the policies of the Colombian National Government follow a spatially regressive structure in which more transfers are allocated to more prosperous regions. This is evident when considering the relationship of departmental per capita GDP, as a measure of income, and the total transfers per poor people. This relation is presented in Fig. 9.9, showing that there is a positive association between the two. This result indicates a clearly regressive regional policy of fiscal transfers because the municipalities that have greater per capita wealth are receiving a greater portion of the resources transferred from the central government.

The latter results seem to justify the proposal of a regional policy that takes into account the elements of fairness. A recent report of the United Nations Development Program (UNDP 2007) estimates the Gini coefficient, and notes that in the global ranking of inequalities in income distribution Colombia (with a Gini coefficient of 0.586) is only exceeded by Haiti (0.592), Bolivia (0.601), Botswana (0.605), Central African Republic (0.613), Sierra Leone (0.629), Lesotho (0.632) and Namibia (0.743).

Economic and social policies should seek to reduce the gaps in income distribution which, as discussed above, have a strong regional component. That is, it requires a commitment from the National Government to be written into future development plans, taking into account these inequalities and identifying their causes in order to propose strategies to reduce them. In Colombia, perhaps because it was believed that the market would achieve a balance in regional income distribution, clear policies have not been formulated in this regard, with the exception of the latest National Development Plan 2010–2014. So far, the market has not eliminated regional economic disparities. For instance, in relation to the labor market, it is observed income differentials between regions do not tend to reduce over time. One explanation would be that this is the result of the most

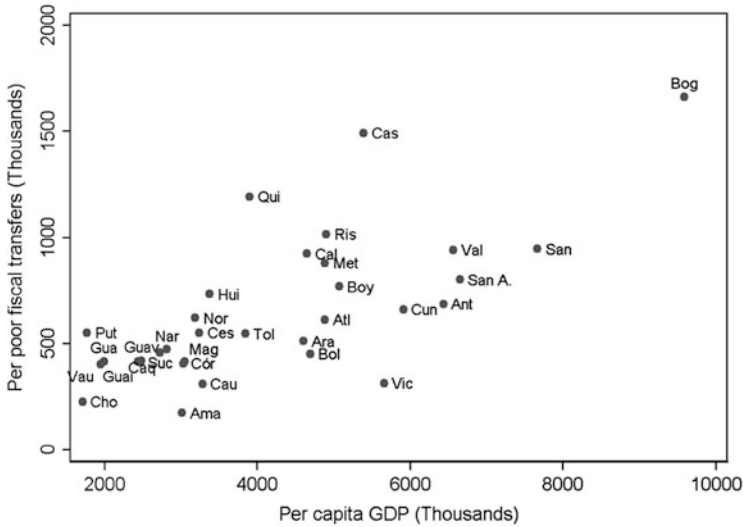


Fig. 9.9 Relation between total per poor transfers and the GDP per capita of the states (Average 2005–2007) (Note: Per capita fiscal revenues include Government Transfers, GT, plus non-renewable Natural Resources Royalties, NNR, sent to the states and municipalities. Source: Prepared by the authors based on the National Planning Department (DNP) and DANE, the National Administrative Department of Statistics)

qualified population groups moving to places where the income level is higher. This phenomenon has led to a larger gap in income generation among the territories of the country: those who are migrating are the most qualified people, and they migrate to areas with better income opportunities. This labor migration is causing that the most deprived areas lose human capital.

This migratory phenomenon in Colombia has been characterized by a concentration in Bogota, Cundinamarca, Valle, Antioquia and Atlántico. These territorial entities attracted over 50 % of the migration that occurred between 1988 and 1993 (Galvis 2002), according to the 1993 census and between the years 2000 and 2005, according to the 2005 census. Note that these are precisely the states where wealth is mostly concentrated.

9.5 Convergence Analysis

It has been argued that the reduction in disparities is supposed to help the country to achieve higher growth rates, as the reduction in inequalities is complementary to a more balanced growth (Lustig et al. 2002). Furthermore, the empirical literature has documented the existence of a negative relationship between inequality and growth (Deininger and Squire 1996; Alesina and Rodrik 1994; Bertola 1993; Engermann and Sokoloff 2002).

Inequalities between countries are found as a result of barriers to mobility. For instance, between countries it is less likely that factors move to places with higher returns until their relative supply becomes more balanced and income equalizes. On the other hand, within a country income disparities may arise as well but it is expected that these inequalities disappear faster than between countries, due to the higher mobility of labor and capital, which will lead to economic convergence. The latter may be studied by analyzing beta (conditional or non-conditional) or sigma convergence. Non conditional beta convergence exists when there is a negative relationship between the growth rates and the initial income. In this sense, the poorest regions, due to the higher returns to capital, will grow faster than the prosperous ones, experiencing a “catching up process” (Abramovitz 1986). Conditional beta convergence, on its part, occurs when this negative relation is found even if one controls for different attributes of the regions. On the other hand, sigma convergence refers to the reduction of disparities in income, measured through Theil’s entropy index, the variation coefficient, Gini coefficient, among others.

Previous studies in Colombia have analyzed economic growth and convergence, suggesting evidence both in favor and against the convergence hypothesis. These research lines began with the pioneering study of Cárdenas et al. (1993), which found evidence in favor of the convergence hypothesis over the 1950–1989 period. On the contrary, various recent studies unanimously rejected the idea that income is converging towards one equilibrium level. Each study used different sets of data or estimation methods which rejected the convergence hypothesis (Rocha and Vivas 1998; Bonet and Meisel 1999; Galvis and Meisel 2001; Bonet and Meisel 2006).

Recent evidence on the analysis of disparities still shows no clear pattern of convergence. For instance, González-Quintero (2011) analyzes the period 1975–2005 and finds evidence of conditional beta convergence in income, at a speed of 1.5 % per annum. However, and bearing in mind that beta convergence is a necessary but not sufficient condition for the sigma convergence, when analyzing the dynamics of the distribution using Markov chains, González-Quintero finds that the distribution is characterized by a persistent pattern and a polarization of income. His results show, for instance that for the different classes in which the income is categorized, in most of the cases the probability of a spatial unit to remain in the same category is more than 90 %. The latter is an indicator of the great persistence shown by the distribution of regional income in the country. Moreover, for those categories where the probability of remaining in the same position is below 90 %, it is more likely that the spatial units move to a position where they will be worse off than before, which for the lower income classes will imply the occurrence of a polarization pattern. The latter results contrast with the ones obtained by González-Ramírez (2011) for the period 1994–2009. From his study, González-Ramírez concludes that Colombia has been a successful case of convergence as he finds evidence of absolute beta convergence and sigma convergence. However, as we have discussed, the persistent patterns of polarization of regional income distribution found by González-Quintero (2011) do not seem to coincide with this conclusion.

Table 9.2 Regressions for per capita GDP absolute convergence, 1990–2010

	(a)	(b)	(c)
	1990–2000	2000–2010	1990–2010
α	0.036*	0.065***	0.045***
	(0.015)	(0.013)	(0.008)
β	0.019	0.025*	0.021**
	(0.011)	(0.01)	(0.007)
N	33	33	33
Speed of convergence	1.74	2.26	1.74
Half-life (years)	36	27	33

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Calculations of the authors

9.5.1 Beta Convergence

The analysis of beta convergence is done following the approach proposed by Barro and Sala-I-Martin (1991):

$$\frac{1}{T} \text{Log} \left(\frac{y_{it}}{y_{i, t-T}} \right) = a - [\text{Log}(y_{i, t-T})] \left(1 - e^{-\beta T} \right) \left(\frac{1}{T} \right),$$

Where y_{it} and $y_{i, t-T}$ are the per capita income at time t and at the beginning of the period analyzed, respectively.

Estimation of the convergence equation indicates we can reject the hypothesis that there is no absolute convergence for the period 2000–2010, but not for 1990–2000. The speed of convergence, λ , is calculated using $\lambda = \text{Ln}(1 + \beta * T)/T$. For the first period λ reaches a magnitude of 2.52 %, and for second period λ is about 2.32 % per annum. For the combined periods λ is 1.93 % per annum. With those results, the time that it takes to reduce the initial spread by half, i.e. the half-life, is near three decades (Table 9.2).

As it has been stated, beta convergence is a necessary but not a sufficient condition for the reduction of disparities among regions or spatial units (Barro and Sala-I-Martin 1992). For this reason, complementary to the results found for beta convergence, we need to analyze the dynamics of the reduction of disparities by means of sigma convergence, which is of greater interest as it provides evidence of whether per capita income is becoming more equitable across spatial units (Quah 1993; Friedman 1992).

9.5.2 Sigma Convergence

Regarding sigma convergence we found that the coefficient of variation shows that up to 1999 inequalities increased. Later on, there was a decrease in the coefficient (Fig. 9.10). This result is confirmed by the weighted coefficient of variation

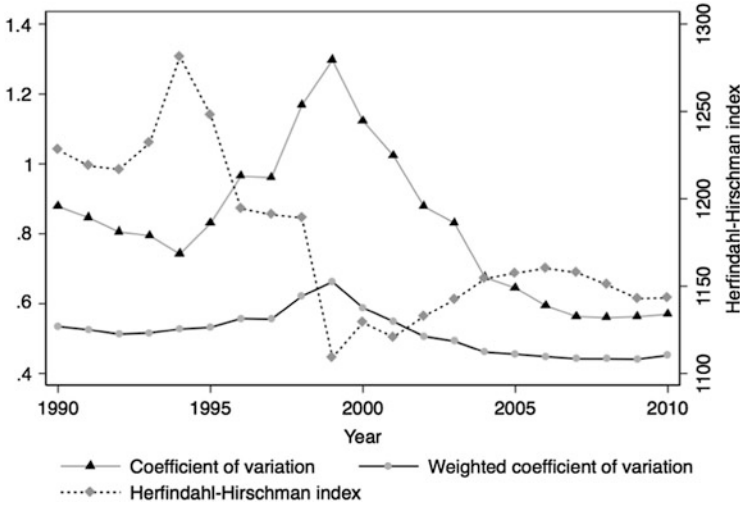


Fig. 9.10 Sigma convergence (Source: calculations of the authors)

(weighted by population share). It is observed that both coefficients show a first period of increase in inequalities followed by a period of improvement.

The spatial concentration of income is measured by the Herfindahl-Hirschman index. This index shows a different pattern since the concentration increases until 1994, from which it follows a period of decrease in spatial concentration until 1999. The spatial de-concentration trend breaks up from the year 2000 onwards. These results coincide with the ones presented by González-Arbeláez (2006) during the period 1990–2004.

It is worth mentioning that most of the previous evidence shown for this index in Colombia reports values near 1,000 or above (Bonet and Meisel 1999; Galvis and Meisel 2001; González-Arbeláez 2006). Moreover, if the Herfindahl-Hirschman coefficient were calculated for a full equidistribution for the 33 states the value obtained would be 303.03, a magnitude very close to the value of 325.7 presented by González-Ramírez.

Up to this point the evidence is non-conclusive regarding regional income concentration. Another common method to evaluate sigma convergence is to analyze the standard deviation of the logarithm of per capita income, v :

$$v = \sqrt{\frac{1}{n} \sum_{i=1}^n \left[\text{Log} \left(\frac{y_i}{y^*} \right) \right]^2}, \text{Log}(y^*) = \frac{1}{n} \sum_{i=1}^n \text{Log} y_i$$

As it is shown in the Fig. 9.11, this index shows a similar pattern as the one displayed by the variation coefficient.⁹

⁹This is not always the case, as documented by Dalgaard and Vastrup (2001).

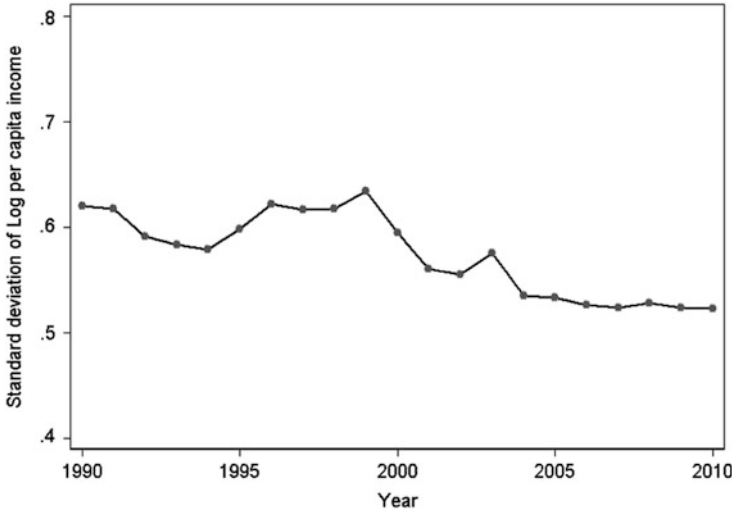


Fig. 9.11 Standard deviation of log per capita income (Source: Calculations of the authors)

Even though the coefficient exhibits a decreasing trend, is this enough evidence to conclude that disparities are decreasing? Note that the upward or downward trend exhibited by the coefficient may be an artifact of the scale. In fact, in order to verify whether there has been effectively a reduction in disparities we follow the work by Carree and Klomp (1997), who test the null hypothesis that variance of the initial year σ_{1t} , is equal to the variance in the ending year, σ_{2t}^2 , i.e. the null hypothesis of no sigma convergence $H_0: \sigma_1^2 = \sigma_2^2 = \sigma^2$. We use the T_2 statistics proposed by Carree and Klomp (1997) that follows a $\chi^2(1)$ distribution.¹⁰ The results show that the test for comparison of variances between 1990 and 2000, 2000–2010, and 1990–2010, do not allow us to reject the null hypothesis, as all values of the T_2 are below the threshold of $\chi^2(1) = 3.84$. This means that the variances are equal to each other for the three comparison periods, which in turn implies that disparities have not changed between the years 1990 and 2010 Table 9.3.

In sum, it is not plausible to conclude that Colombia is a successful story of convergence as the evidence is mixed. In fact, it is more plausible to suggest that there are convergence clubs for which the inequalities within groups decrease, and the inequalities between them increase. If that is the case, what may be happening is that the convergence clubs tend to separate from each other, showing a trend towards polarization.

¹⁰ The T_2 -statistic is expressed as $T_2 = (N - 2.5) * \ln \left[1 + \frac{1}{4} \frac{(\sigma_1^2 - \sigma_2^2)^2}{\sigma_1^2 \sigma_2^2 - \sigma_{1T}^2} \right]$, where σ_{1T} is the covariance between per capita income at time 1 and time T.

Table 9.3 Tests for equality of income variance, 1990–2010

Variable	N	Mean	Std. Dev.	Covariance	T ₂
Log(per capita income 1990)	33	15.36	0.62		
Log(per capita income 2000)	33	15.45	0.59		
Combined				0.3174	0.20
Log(per capita income 2000)	33	15.45	0.59		
Log(per capita income 2010)	33	15.73	0.52		
Combined				0.2742	2.23
Log(per capita income 1990)	33	15.36	0.62		
Log(per capita income 2010)	33	15.73	0.52		
Combined				0.2532	2.22

Note: Calculations based on log of per capita income (Constant pesos of 2005). T₂ follows a χ^2 distribution with one degree of freedom which implies a critical value of $\chi^2(1) = 3.84$

Source: Calculations of the authors

9.6 Concluding Remarks

This document has pointed out critical issues regarding regional inequalities in Colombia. It has been shown that regional economic disparities have been increasing over the last decades. Moreover, the regional policies that the government has implemented in order to help in this matter do not seem to be successful in achieving this objective. On the contrary, government transfers have benefited mainly the most prosperous regions, as there is a positive correlation between per capita income and per capita transfers from the central government. From another perspective if the regions with the high poverty levels are compared to the places where the main government transfers are allocated, it is found that lagging regions are not the ones receiving the highest flows of resources from the central government. This is clearly a regressive policy that has not favored the impoverished areas which are mainly rural and located in the periphery of the country.

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