

# Long-Term Impact of Territorial Division on Municipal Poverty<sup>♦</sup>

Jaime Bonet-Morón <sup>\*</sup>, Jorge Guerra-España<sup>†</sup>, Jhorland Ayala-García<sup>‡</sup>

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## Abstract

In various regions around the world territorial reorganizations have been promoted through the division and creation of administrative units as mechanisms to improve local development and political representation. This study evaluates the long-term consequences of regional separations in Colombia by comparing municipalities that remained in their original regions with those that joined newly created ones. Using historical data on territorial divisions throughout the twentieth century, we implement a geographic regression discontinuity design that uses each municipality's distance to the separation boundary as the assignment variable, and construct instrumental variables based on the arbitrary and short-lived variation introduced by the redefinition of departmental capitals in 1908. This approach allows us to estimate the impact of administrative separation on current development indicators such as multidimensional poverty and unmet basic needs. The results show no significant long-term effects of separation on municipal development.

**JEL Classification:** P25, H63, H72, D72

**Keywords:** territorial separation, autonomy, poverty, geographic regression discontinuity, instrumental variables.

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<sup>\*</sup> Director of the Center for Regional Economic Studies (CEER), Banco de la República, Cartagena.  
Email: jbonetmo@banrep.gov.co

<sup>†</sup> Consultant in the Fiscal Division at the Inter-American Development Bank (IDB), Washington, D.C.  
Email: ja.guerrae@uniandes.edu.co

<sup>‡</sup> Economist from the CEER, Banco de la República, Cartagena. Email: jayalaga@banrep.gov.co

## 1. Introduction

From time to time, proposals arise in Colombia that seek the creation of new departments or municipalities. Among the most recent are the proposal to create the departments "Surcaribe" with 28 municipalities and "Pacific Coast" with 14 municipalities. In both cases, these are regions with unfavorable socioeconomic conditions that could easily place them as the two departments with the highest poverty in the country. However, these initiatives generally ignore the potential challenges and impacts that this greater autonomy, the result of territorial division, may have on economic development in the long term. This study contributes to the discussion on the potential effects of the creation of new departments and new subnational administrative entities.

This paper assesses the potential impact of the territorial separation of Colombian departments on the poverty of Colombian municipalities in the long term. The poverty rates of the municipalities that remained in the new territorial entities are compared with those that remained in the department of origin to assess whether the separation had any effect on the level of economic development in the long term. To this end, data from the National Population and Housing Census of the National Administrative Department of Statistics (DANE) for 2018 are used, from which two measures of poverty are obtained: (i) the Unsatisfied Basic Needs Index (UBN) and (ii) the Multidimensional Poverty Index (MPI).

To identify the effects of territorial separations, the analysis combines a geographic discontinuous regression (GDR) design (based on the distance of each municipality from the historical boundary of separation) with instrumental variables derived from the arbitrary administrative reorganization in 1908 during the government of Rafael Reyes, which introduced an exogenous and temporally limited variation in the departmental configuration in the face of subsequent separations.

The results do not show a significant impact of territorial separations on current levels of development. In some cases, the effect is statistically significant, their magnitudes are small and lack economic relevance. These findings remain robust to different specifications, including variations in the geographical adjustment function of the GDR, variations in the distance to the boundary and in the face of different functional forms of the instruments used.

The impact of territorial division on economic growth and development has been addressed from various theoretical and empirical frameworks. A first block of literature relates to the optimal size of countries. From a theoretical perspective, Alesina (2003) and Alesina *et al.* (2005) analyze whether the size of countries influences economic growth. His model posits that territorial structures depend on the balance between the benefits of large jurisdictions and the costs of population heterogeneity. Large countries can benefit from economies of scale in the provision of infrastructure, defense, and basic services, as well as from a greater capacity to develop diverse economic sectors and sustain a large domestic market (Alesina, 2003; Alesina *et al.*, 2005). However, these benefits can be affected by difficulties in governance: the larger and more heterogeneous a country is, the more ethnic, linguistic, cultural, and political differences can arise, which can increase the likelihood of territorial fragmentation (Alesina, 2003; Bonnet-Pineau & Vandermotten, 2016).

On the other hand, Alesina *et al.* (2005) and Congdon-Fors (2013) argue that small countries can be viable if they have access to international markets. In addition, less demographic heterogeneity and administrative concentration facilitate governance, allowing greater efficiency in public management (Congdon-Fors, 2013). However, these countries are more vulnerable to foreign aggression and need to enter a military coalition that provides security, which generates an increase in defense spending (Alesina, 2003).

The relationship between the economic development of countries and their size is not clear. However, Alesina (2005) mentions that the five largest countries by population are not the richest, while some of the countries with the highest GDP per capita, such as Singapore, are small. This suggests that the size of countries is endogenous and that their economic performance depends on factors such as trade, globalization, and economic integration (Alesina, 2005). Congdon-Fors (2013) reinforces this idea by arguing that small countries can perform better economically in a globalized world, as long as they maintain strong institutions, social cohesion, and are open to international trade.

Historical evidence shows us that the process of territorial division has also depended on factors such as the geopolitical context. Carter and Goemans (2011) argue that international borders are not drawn arbitrarily, but that some are usually based on administrative boundaries that were taken from former multinational states. Examples of this are the

dissolution of states such as the Soviet Union, Yugoslavia, Czechoslovakia and Russia, where fragmentation was linked to conflicts (Alesina and Spolaore, 1997; Carter & Goemans, 2011; Bonnet-Pineau & Vandermotten, 2016). Subsequently, the territorial reconfiguration of European states after World War II contributed to the increase in the number of countries in the world and an expansion of world trade (Congdon-Fors, 2013; Bonnet-Pineau & Vandermotten, 2016). This historical context has led the existing literature to rethink the benefits and costs of territorial division, generating some unknowns about the importance of maintaining the size of a country for its economic growth or resorting to secession (Alesina & Spolaore, 1997; Alesina, 2003, Alesina *et al.*, 2005).

Another focus in the literature has to do with the impact that decentralization can have on territorial division. Some regions tend to seek greater autonomy when their preferences do not coincide with those of the central government, which tends to encourage territorial fragmentation (Alesina and Spolaore, 1997; Castells, 2014). To this end, some authors suggest that decentralization can be an alternative to avoid internal tensions, improve administrative efficiency, and allow regions with significant differences to obtain greater autonomy without the need for separation (Alesina, 2003). However, there are risks of poorly designed decentralization, mainly the concentration of resources and the deepening of regional disparities.

For example, Montero (2005) studies decentralization in Spain and concludes that, although it has allowed for better service provision, it has also exacerbated territorial inequalities between autonomous communities. Similarly, Membrado (2013) analyses the Valencian Community and points out that the concentration of resources in provincial capitals has weakened development in other areas, evidencing the undesired effects of poorly designed decentralization. In the case of Catalonia, Castells (2014) argues that fiscal decentralization has generated inequalities in the distribution of resources and that, if the region opted for independence, it would face great risks, especially in access to markets and funds from the European Union. Herrera and Pino (2023) provide empirical evidence on the effects of the subdivision of the territory into three regions of Chile, where the creation of new regions improved some productive sectors, but did not significantly reduce inequality in income distribution.

Similarly, Fitriani *et al.* (2010) examine decentralization in Indonesia after the fall of the Soeharto regime and conclude that the creation of new governments had ambiguous impacts on levels of corruption and bureaucratic rents. According to their study, this territorial expansion was motivated more by political interests than by economic needs, resulting in an increase in public spending without significant improvements in government efficiency. Otiman *et al.* (2013) reinforce this idea by showing that regionalization in Romania has not followed adequate historical and economic criteria, instead of improving decentralization and regional development, it has generated inefficiencies in the allocation of resources.

For the Colombian case, Faguet and Sánchez (2008) and Elacqua *et al.* (2021) analyze the effects of decentralization on public education outcomes. Faguet and Sánchez (2008) compare the Colombian case with Bolivia and find that decentralization seems to have modified public investment patterns, shifting resources to primary social services. These countries improved educational outcomes, and more children went to school. For their part, Elacqua *et al.* (2021) show that municipalities that were "certified" to autonomously provide education services managed to improve teacher quality and student outcomes. Bonet (2006) finds that decentralization perpetuated disparities in education and health coverage in Colombia. The author also points out that there is a great inequality in the per capita tax revenues of territorial entities, which implies that they assume the responsibility of providing services under vastly different conditions. Ramírez *et al.* (2017) studies decentralization as an instrument for poverty reduction and found that municipalities with greater autonomy and capacity to increase their own locally collected taxes are more successful in reducing poverty.

In addition, there is a literature that studies the historical persistence of regional inequalities. Based on the seminal work of Acemoglu, Johnson, and Robinson (2002), which associated long-term development with the institutions that were established in the colonial period, García-Jimeno (2005) found evidence of the institutional persistence of *encomienda*, slavery, and state capacity in several current socioeconomic outcomes. Bonet and Meisel (2006) also identified an influence of the colonial legacy on the current differences in departmental incomes. However, for these authors it is not clear whether the effect occurs via institutions or human capital. Acemoglu, García-Jimeno, and Robinson (2012) point out that the historical presence of slavery is associated with an increase in poverty and a reduction in

school enrollment, vaccination coverage, and the provision of public goods. Meisel (2014) indicates that those places that were prosperous around 1500 are still so today, and vice versa. For this author, these results show that the long-term influences of geography on regional economic disparities within a country are not negligible.

Faguet, Martajira, and Sánchez (2024) show that Colombian municipalities with encomiendas in 1560 enjoy better results today in multiple dimensions of development than those without. These studies show the persistence of regional inequalities in Colombia in the long term. Research has not limited itself to the Colombian case, Dell (2011) shows that the areas of Peru and Bolivia where the colonial Mita system was implemented have higher levels of poverty, lower schooling, and less access to basic services, compared to the regions that were left out of this system.

## **2. History of territorial division in Colombia**

Since 1886, Colombia has undergone several transformations in its territorial division. This section briefly describes the evolution of the main milestones that marked the territorial division of the intermediate level of government, explaining the motivations that drove the creation of the different departments, intendencies and commissioners. In addition, changes in the number of municipalities are reviewed based on data from population censuses carried out in the country.

The political-administrative organization of the Colombian territory has been a dynamic process, influenced by political, economic, and social factors. During the nineteenth century, after independence from Spain, there were numerous attempts to organize the Colombian State. This was reflected in the existence of eight political constitutions between 1811 and 1886, which meant that each constitutional framework had an average duration of close to 10 years. This situation changed with the Political Constitution of 1886, which remained in force until 1991, although with different reforms throughout that period.

### **2.1. First stage: 1886-1904**

The Political Constitution of 1886 replaced the federal model created in 1863 with a centralized State, where the nine former Sovereign States became departments dependent on the National Government: Antioquia, Bolívar, Boyacá, Cauca, Cundinamarca, Magdalena, Panama, Santander, and Tolima. However, due to the complexity of the Colombian territory,

figures such as Intendancies and Police Stations were established to administer remote and difficult to access regions. Article 5 of the Constitution of 1886 established three conditions for the creation of new departments: (i) That the new Department have at least two hundred thousand people; (ii) That the person or persons from whom it is segregated each have a population of at least two hundred and fifty thousand inhabitants; and (iii) That the creation be decreed by a law approved in two successive ordinary legislatures.

This stage was altered by three important changes: (i) The creation of the intendancy of La Guajira in 1898; (ii) The separation of Panama in 1903; and (iii) The foundation of the department of Nariño in 1904, initiating what would be the division of the department of Cauca, the largest territorial entity in the country that significantly reduced its extension throughout the twentieth century. In these first years there were no major changes and the nine departments were maintained because of the independence of Panama and the constitution of Nariño. The novelty was the first municipality created: La Guajira.

## **2.2. Second stage: 1905-1908**

This period was marked by profound changes in territorial division. Following the Thousand Days War, President Rafael Reyes (1904–1908) convened a National Constituent and Legislative Assembly, which was not elected by popular vote. Under this framework, several laws and decrees were issued to modify the territorial organization. Legislative Act 3 of 1905 gave the government the power to modify the territorial division, suppressing Article 5 of the Constitution of 1886 that regulated the creation of new departments. This reform also allowed for the creation and segregation of municipal districts within existing departments. By eliminating the requirements established in the 1886 Constitution, the Executive could ignore the oppositions of the regional centers of power (Quinche Castaño, 2011, 2016). As a result, President Rafael Reyes gained the ability to reorganize the territory at his discretion, which facilitated the division of the country into thirty-four departments in 1908.

At first, the Reyes government issued Law 17 of 1905 that created new territorial entities. In article 15, this Law authorized the National Government to create new Provinces and to modify or suppress existing ones. It delegated to the Executive "the transformation of the political-administrative map of the country, reaffirming the power of the national government

over the organization of the territory and, consequently, over the distribution of political and economic power between the center and the regions" (Quinche Castaño, 2011, 2016, p. 71).

This is how several departments were created in 1905. Initially, Law 17 of April 11 established three departments: (i) Galán, with San Gil capital, detached from Santander; (ii) Atlántico, with Barranquilla as its capital, segregated from Bolívar; and (iii) Caldas, with the capital Manizales, formed between the departments of Antioquia and Cauca. Subsequently, Law 46 of April 29 of 1905 constituted three more departments: (i) Huila, whose capital is Neiva, and was detached from Tolima; (ii) Quesada, with Zipaquirá capital, which was formed from Cundinamarca; and (iii) Tundama, with Santa Rosa de Viterbo as its capital, Segregated Boyacá. In addition, by Decree 177 of 1905, the following intendencies were created: (i) Alto Caquetá, separated from Cauca, with Florencia as its capital; (ii) Putumayo, with Mocoa as its capital, segregated from Cauca; and (iii) Meta, with Orocué capital, reorganized from the territory of San Martín that belonged to Cundinamarca. Finally, Law 17 of 1905 constituted the Capital District from the municipality of Bogotá, which belonged to Cundinamarca.

Three years later, in 1908, there was a great wave of territorial division with the creation of 34 departments: Tumaco, Túquerres, Pasto, Popayán, Cali, Buga, Cartago, Manizales, Sonsón, Antioquia, Medellín, Jericó, Neiva, Garzón, Ibagué, Honda, Facatativá, Girardot, Zipaquirá, Chiquinquirá, Tunja, Santa Rosa, Vélez, San Gil, Bucaramanga, Cúcuta, Barranquilla, Cartagena, Mompós, Sincelejo, Santa Marta, Riohacha and Quibdó<sup>1</sup>.

### **2.3. Third stage: 1909-1910**

In these years, the changes introduced during the Reyes government were reversed. In 1909, the National Congress issued Law 65 of 1909, which came into force in 1910. This law reestablished the previous territorial organization and eliminated most of the departments created in 1908, in order to guarantee a more efficient administration (Quinche Castaño, 2011). In this way, the departments in force in 1905 were reestablished: Antioquia, Bolívar, Boyacá, Cauca, Cundinamarca, Magdalena, Nariño, Santander, and Tolima. In addition,

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<sup>1</sup> In Law 1 of 1908 the department of Panama still appears.

according to paragraph 2 of Article 1 of the mentioned law, the intendancies were as follows: The territories of San Martín and Casanare, Caquetá, Guajira, and Chocó, which would be administered directly by the National Government.

The conditions required for the creation of new departments or the subsistence of those that were suppressed by Law 65 of December 14, 1909 were the following (Decree 340 of 1910): (i) The application had to be supported by three-quarters of the members of the municipal councils of the section aspiring to the rank of department; (ii) The number of inhabitants could not be less than 150,000; (iii) The effective annual budget would have to be greater than \$150,000 in gold; and (iv) The department or departments from which the new section was segregated would not be in inferior demographic and fiscal conditions than the one that was planned to be created.

Under these new rules, three new departments were established: (i) Valle del Cauca, which resulted from the aggregation of the extinct departments of Cali, Cartago and Buga (Decree No. 340 of April 16, 1910); (ii) Norte de Santander, detached from Santander and formed by all the municipalities that made up the three provinces of Cúcuta, Ocaña and Pamplona (Law 25 of July 14, 1910); and (iii) Atlántico, segregated from Bolívar and composed of the districts that formed the provinces of Barranquilla and Sabanalarga (Law 21 of July 14, 1910). Likewise, the departments of Caldas and Huila managed to meet the requirements demanded by law and remained subsisting, preserving the same territorial limits that they had previously. These departments were promoted by the political and business groups of these territories that came with an important economic boost. In addition, in this period the special Police Station of Vaupés was also created, which was separated from Caquetá (Decree 1131 of 1910).

#### **2.4. Fourth stage: 1911-1946**

During these decades there were no major changes in the political-administrative division of Colombia. It was a period characterized by stability in the formation of departments, although some intendancies and police stations were created. For example, in 1913 the Municipality of Vichada was constituted from the disaggregation of the Municipality of Meta.

## **2.5. Fifth stage: 1947–1990**

In this period, several departments were created. In most cases the new territorial entities complained about the abandonment of the departmental governments to which they belonged at that time, or clamored for greater autonomy and participation in the National Congress. These arguments were very similar to those recently invoked by those in favour of the creation of the "Surcaribe" or "Pacific Coast" departments. The first department constituted was Chocó in 1947, which was preceded by social movements that demanded the change of intendancy to department with the purpose of achieving greater autonomy in the management of their territory and having political representation in parliament (Bonet-Morón et al., 2018).

The next department created was Córdoba in 1952. According to Kerguelén (2023), the explanatory memorandum of the bill that promoted the creation of this department argued that it was necessary to promote the economic development of the territory, whose progress was scarce considering its economic potential, and, in addition, the attention paid by the departmental government to the southern half of Bolívar was insufficient. Then, in 1954, through Decree 3640 of 1954, Bogotá was organized as a special district, not subject to the ordinary municipal regime. The municipalities of Engativá, Fontibón, Suba, Usme, Usaquén and Bosa were annexed to this (Díaz, 2005).

With the department of Meta, a situation similar to that of Chocó arose, since the intendancy, which had been created in 1905 when it separated from Cundinamarca, became a department in 1959. Among the arguments put forward for its creation was the need to strengthen the presence of the State in the Eastern Plains. Its consolidation as an autonomous entity was supported by its population and economic growth, as well as by the demands for political and administrative representation expressed by its regional leaders (Jara Moreno, 2007).

During this fifth stage, there was a second period of departmentalization in the sixties, when five new departments were constituted. The process began with the transformation of the intendancy into the department of La Guajira in 1964. According to Orozco et al. (2025), the founding of the department of La Guajira required a long discussion in the National Congress because it did not meet some of the requirements contemplated by the law for the creation of departments, especially population. Therefore, it was necessary to conduct a long exception procedure justified by the fact that in previous years the same had been done with the

departments of Chocó and Meta. Here again the main objective was to achieve greater autonomy and political representation.

In 1966, three new departments were created: Quindío and Risaralda, separate from the department of Caldas, and Sucre, from the department of Bolívar. According to Rodríguez (2006), the separation of the first two was the product of concerns that had been nurtured since the beginning of the century, since several municipalities protested against Manizale's centralism. For their part, Aguilera-Díaz and Reina-Aranza (2021) point out that there were three factors behind the creation of the department of Sucre: (i) the historical neglect and lack of public investment; (ii) the aspiration of local political groups to reach higher-level scenarios; and (iii) the desire of some national politicians who sought to weaken Bolívar's powerful political groups.

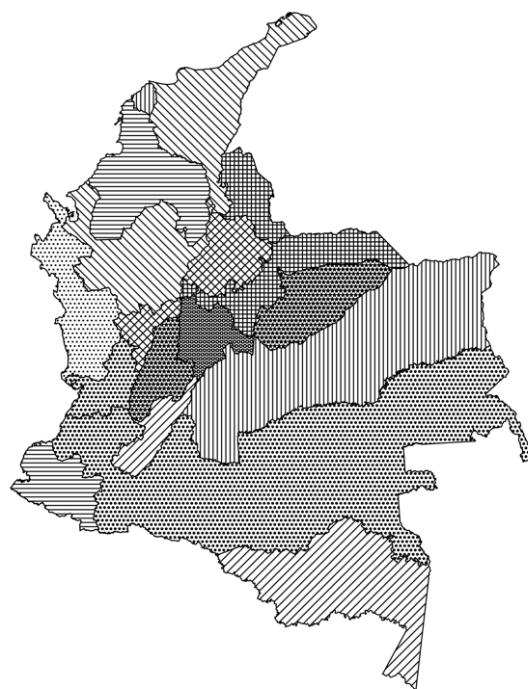
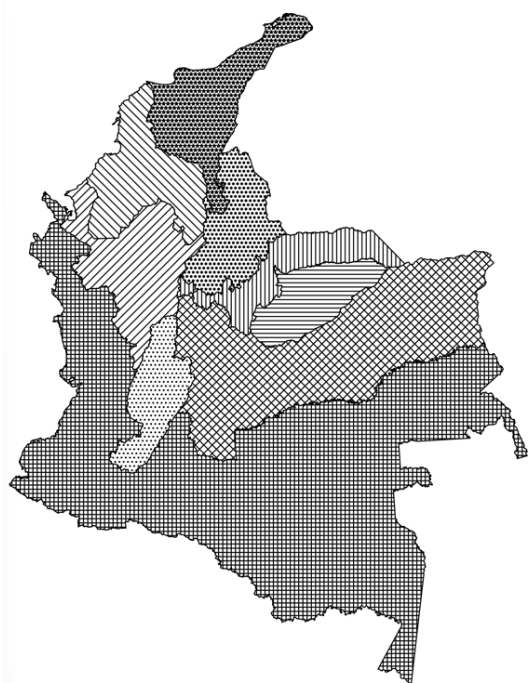
Finally, the department of Cesar was the last created during the 60s, in 1967. Two main elements motivated this new division: (i) the emergence of a strong economic group in this territory as a result of the boom in cotton cultivation in those years; and (ii) complaints about low public investment by the government of the department of Magdalena, from where it was segregated (Bonet-Morón and Aguilera-Díaz, 2018).

This period ended with the elevation of the Municipality of Caquetá to a department, by means of Law 78 of December 29, 1981. This territory underwent various changes throughout the twentieth century. It was initially separated from Cauca as the Intendancy of "Alto Caquetá" in 1905. The following year, 1906, it was eliminated and reincorporated into the department of Nariño. Then, in 1909, it was re-established by Law 65 of that year. Subsequently, it was instituted as a commissary in 1912 and in 1950 it was elevated to Intendancy. Finally, in 1981, it was transformed into a Department by the Law 78 of December 29 of that year.

**Figure 1. Evolution of territorial division in Colombia, 1886 - 2000**

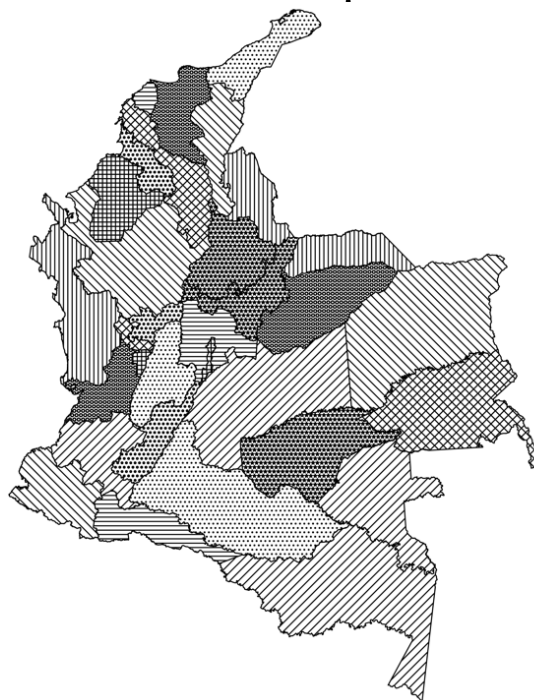
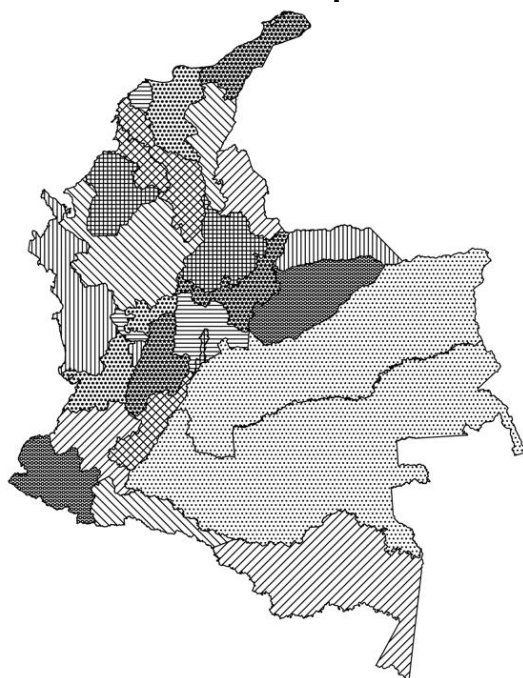
**1886: 9 departments**

**1931: 18 departments**



**A. 1931: 18 departments**

**B. 1991: 32 departments**



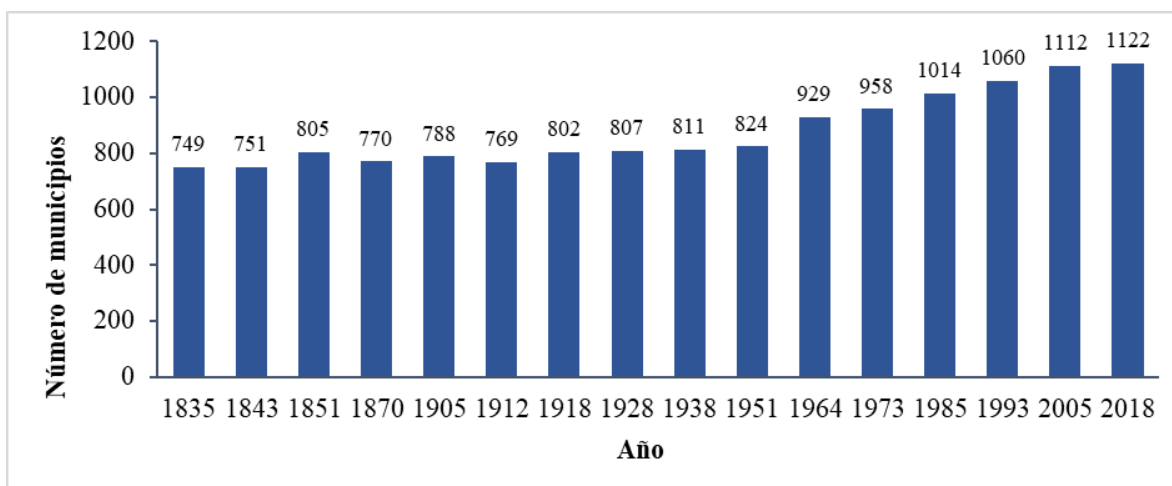
Source: The authors.

## 2.6. Sixth stage: 1991-2018

This period began with the issuance of the Political Constitution of 1991, where the existing departments were defined at the time and the old intendencies and police stations, today known as New Departments (Amazonas, Arauca, Casanare, Guainía, Guaviare, Putumayo, San Andrés and Providencia, Vaupés, and Vichada), were also elevated to this category, recognizing ethnic and territorial diversity as a fundamental principle in the organization of the country. Figure 1 shows four maps of the territorial division between 1886 and 1991. From Panel A to Panel D, it can be seen how the territorial division was progressively expanded, from the north to the southeast of the country, reflecting the growth in the number of departments, from the initial 9 in 1886 to 32 departments in 1991.

In addition, the constitutional norm defined municipalities, districts and indigenous territories as territorial entities. In the years following the Political Constitution of 1991, regulatory laws were issued to establish, among other aspects, the organization, competencies, functions, and requirements for its creation of each territorial entity. A phenomenon that occurred after the issuance of the constitution was the increase in the number of municipalities, which increased from 1060 in 1985 to 1112 in 2005 (Figure 2).

**Figure 2. Number of municipalities in Colombia by census, 1835-2018**



Source: Population censuses, authors' calculations.

The vast majority were motivated by having access to the greater transfers established by the 1991 Constitution, which led townships that were part of a municipality to request their elevation to a municipality to receive resources. This forced an increase in the requirements for the formation of municipalities through Law 1551 of 2012. A similar situation arose with the districts, which also increased and required new regulations (Law 1617 of 2013).

### **3. Data**

To evaluate long-term development, we used two variables: (i) the Unsatisfied Basic Needs Index (UBN) and (ii) the Multidimensional Poverty Index (MPI) for 2018 produced by DANE, both at the municipal level. The UBN reflects the proportion of the population living in poverty according to basic structural deficiencies, such as critical overcrowding, inadequate provision of health services, inadequate housing, high economic dependency, and school absenteeism. It is an indicator focused on the material and housing conditions of the home.

For its part, the MPI complements this perspective by intersecting deprivations in multiple dimensions of well-being through a composite index that considers education, health, work, and access to public services together. Unlike the UBN, the MPI makes it possible to identify households in poverty that lack a certain threshold of access to different indicators. Both indices offer different but complementary views on the living conditions of the population.

As control variables, we only consider geographical and climatic factors, since any socioeconomic indicator measured after the creation of a new department could be influenced by the creation of this one and, therefore, would introduce endogeneity to the estimate. In particular, we used three measures of distance. The first is the Euclidean distance between each municipality and the capital of the former department; This variable includes historical accessibility to the administration, markets and infrastructure that depended on that original headquarters. The second is the distance to the capital of the new department, which describes the effective accessibility after separation.

The other geographic controls include topographic and climatic features that can affect long-term development (Dell, 2010; Dell, Jones, & Olken, 2014; Albalade, Bel, & Mazaira-Font, 2022). The average altitude of the municipality is used, calculated from data from the *Shuttle*

*Radar Topography Mission* (SRTM) developed by NASA and NGA (NASA & NGA, 2000), with a spatial resolution of 30 arcseconds (equivalent to approximately 1 km<sup>2</sup>). From this same source, the weighted slope is derived, which captures the geomorphological constraints to urban development and connectivity. Likewise, climatic variables such as the average annual temperature (in degrees Celsius), wind speed (in meters per second) and accumulated precipitation (in millimeters per year) are included, all calculated in a weighted way on the area of the municipality using grids of equivalent resolution.

The above data come from Fick and Hijmans (2017), specifically from the WorldClim 2.1 database, and correspond to climate averages for the period between 1970 and 2000. We assume that, although these variables were collected after territorial separations, they are not affected by them. In addition, we start from the premise that the structural differences between the different regions of the country have remained relatively stable over time and, therefore, reflect conditions like those existing at the time the separations occurred.

Finally, the definition of the separations of the departments was based on the historical review included in section 2. Appendix 1 includes the maps of the 23 separations throughout the twentieth century, showing the Euclidean distances of the municipalities to the separation border. The distances and the rest of the Geographic Information Systems (GIS) processing were calculated through the Geopandas Python library. Below, we mention several considerations for the processing of the data.

First, a municipality may be involved in a department that suffered multiple separations over time, such as Cauca. Thus, in the first separation, the municipalities that remain in the original department are in the control group and those that move to a new department are treated. If the initial department subsequently suffers a new separation, it will be divided again between controls and treaties. In this sense, we only keep the municipalities that: (i) were always controls; that is, that remained in their departments of origin ( $C \rightarrow C$ ); (ii) they were always treated ( $T \rightarrow T$ ); that is, they separated one or more times from the department of origin; and (iii) those who went from being controls to being treated ( $C \rightarrow T$ ). We excluded those who went from being treated to controls ( $T \rightarrow C$ ). The reason is because municipalities that later suffered new separations experienced more complex or potentially negative institutional trajectories, which can introduce selection or survival bias in favor of treatment.

For example, the department of La Guajira was separated from Magdalena in 1964. In this first separation, the municipalities of the department of La Guajira can be understood as treated and those that continued to belong to the Magdalena as controls. Then, in 1967, the department of Cesar was separated from Magdalena, the latter suffering a new division. In this sense, the municipalities that remain in the department of Magdalena continue to be controls ( $C \rightarrow C$ ), while those of Cesar go from being controls to being treated ( $C \rightarrow T$ ), and those of La Guajira continue to be treated ( $T \rightarrow T$ ).

In this sense, including only the  $C \rightarrow C$ ,  $T \rightarrow T$  and  $C \rightarrow T$  groups may favor the hypothesis that separating from a department has positive effects on development.  $C \rightarrow C$  municipalities represent a clean and stable comparison group, never exposed to territorial divisions, which makes them a good counterfactual.  $T \rightarrow T$  municipalities also have a clear track record: they were separated at some point and remained within the new department, so they can be interpreted as being treated on a continuous basis. In the case of  $C \rightarrow T$ , the treatment is unidirectional and is clearly defined as the transition from an original department to a new one, without subsequent reversals or divisions. Together, these three groups allow treatment to be viewed as the act of separating once (or more) and staying separate, which reduces ambiguities in the coding of treatment and tends to highlight positive effects.

**Table 1. Descriptive statistics according to distance bands around borders**

|                                 | (1) Less than 100km from the border |          |            | (2) Less than 75km from the border |          |            |
|---------------------------------|-------------------------------------|----------|------------|------------------------------------|----------|------------|
|                                 | Treated                             | Controls | EE         | Treated                            | Controls | EE         |
| <i>A. Distances</i>             |                                     |          |            |                                    |          |            |
| Distance from capital of origin | 89.46                               | 161.67   | [4.98]***  | 91.71                              | 147.21   | [5.15]***  |
| Detached capital distance       | 140.13                              | 77.08    | [4.63]***  | 127.95                             | 71.95    | [4.61]***  |
| <i>B. GIS Measurements</i>      |                                     |          |            |                                    |          |            |
| Wind speed (m/s)                | 1.29                                | 1.53     | [0.05]***  | 1.31                               | 1.57     | [0.05]***  |
| Temperature (C°)                | 19.85                               | 22.21    | [0.35]***  | 19.77                              | 22.51    | [0.38]***  |
| Rainfall (mm)                   | 1,856                               | 2,094    | [66.05]*** | 1,838                              | 2,033    | [67.54]*** |
| Height (masl)                   | 1,508                               | 1,012    | [62.48]*** | 1,515                              | 965      | [68.34]*** |
| Slope (%)                       | 12.07                               | 10.00    | [0.52]***  | 12.38                              | 10.32    | [0.6]***   |
| Observations                    | 1095                                |          |            | 863                                |          |            |
|                                 | (3) Less than 50km from the border  |          |            | (4) Less than 25km from the border |          |            |
|                                 | Treated                             | Controls | EE         | Treated                            | Controls | EE         |
| <i>A. Distances</i>             |                                     |          |            |                                    |          |            |
| Distance from capital of origin | 97.82                               | 132.57   | [5.6]***   | 111.95                             | 118.35   | [8.01]     |
| Detached capital distance       | 117.8                               | 67.96    | [4.58]***  | 105.85                             | 72.78    | [6.65]***  |
| <i>B. GIS Measurements</i>      |                                     |          |            |                                    |          |            |
| Wind speed (m/s)                | 1.34                                | 1.62     | [0.06]***  | 1.38                               | 1.57     | [0.08]**   |
| Temperature (C°)                | 20                                  | 22.83    | [0.45]***  | 20.99                              | 22.08    | [0.66]*    |
| Rainfall (mm)                   | 1,849                               | 1,951    | [67.84]    | 1,905                              | 1,916    | [84.36]    |
| Height (masl)                   | 1,468                               | 915      | [79.21]*** | 1,277                              | 1,069    | [115.58]*  |
| Slope (%)                       | 13.11                               | 10.13    | [0.72]***  | 12.51                              | 11.42    | [1.07]     |
| Observations                    | 608                                 |          |            | 298                                |          |            |

Source: Authors' estimates with data from DANE (2018), SRTM (NASA & NGA, 2000), Fick and Hijmans (2017) and WorldClim 2.1.

#### 4. Empirical strategy

This section presents the methodological approach used to identify the causal effect of departmental separations on long-term development outcomes. The strategy combines two complementary approaches: a GDR, which exploits the spatial nature of the borders created by separations, and a design of instrumental variables based on Reyes' administrative reorganization in 1908, introducing exogenous historical variation in the configuration of departmental capitals.

##### 4.1. Geographic Discontinuous Regression

This paper follows the geographic discontinuous regression (GIR) methodology, considering that the nature of the separations of departments and municipalities is inherently spatial. GDR-based designs have been used to study the effect of historical facts on current outcomes, as in Dell (2010) and Spruk and Kovac (2020). It has recently been used to analyze urbanization trends (Liu et al., 2019), electoral behavior (Keele & Titiunik, 2017; Keele, Titiunik & Zubizarreta, 2014) and agricultural economics (Salazar et. al, 2016). According to this methodology, the boundaries generated from the creation of the departments are a function of latitude and longitude. Therefore, it is natural to think of a GDR design where the polynomial function does not depend on a one-dimensional measurement as an assignment variable but on latitude and longitude. The general regression equation can be described as:

$$y_{id} = \alpha + \tau Split_{id} + f(location) + \mathbf{X}'_i \beta + \psi_d + e_{id} \quad (1)$$

In this case,  $y_{id}$  it is the long-term development variable of interest in the municipality  $i$  of the department  $d$ ,  $Split_{id}$  is an indicator equal to 1 if the municipality became part of another department at some point in the twentieth century.  $f(\blacksquare)$  refers to the RD polynomial that considers the different specifications of the geographical location. The different forms are detailed below. Finally,  $\mathbf{X}$  it is the vector of covariates mentioned above and  $\psi_d$  are the departmental fixed effects.

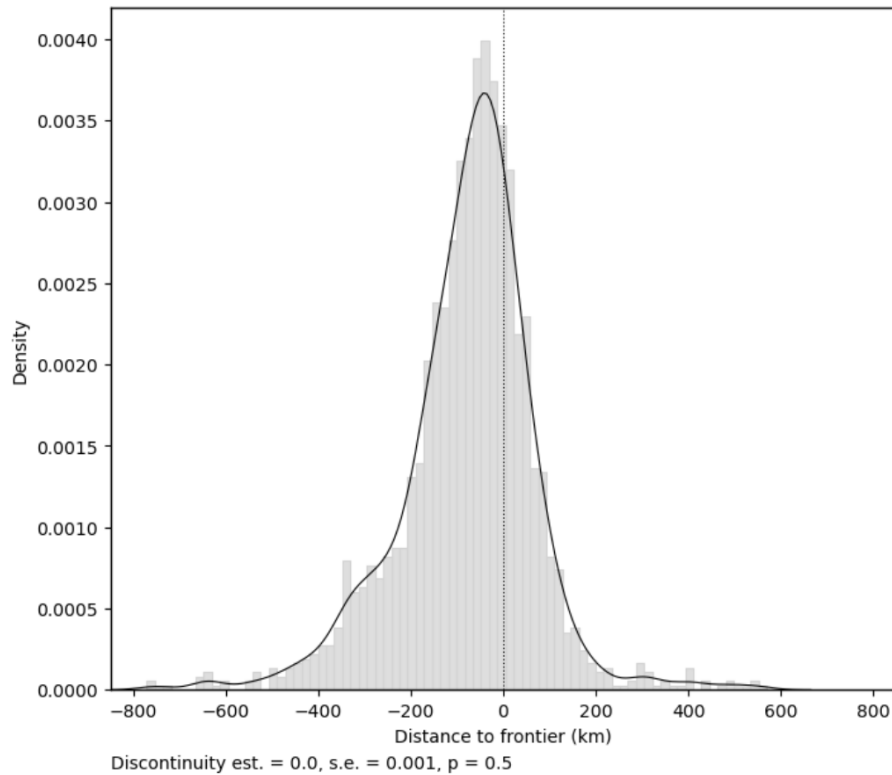
In this case, the GDR methodology requires the same standard identification assumptions as the DR. First, that all covariates must vary smoothly within the boundaries of the boundaries created from the separations. If we denote  $x$  and  $y$  as longitude and latitude respectively, it would formally mean that  $E[Y_{id}|x, y]$  is continuous at the threshold of discontinuity. Intuitively, it is required that

the municipalities that have remained right on one side of the border of the original department are a plausible counterfactual to the municipalities that were located right next to the detached or created department, so close to each other, as if they had been left on one side or the other for random reasons.

To evaluate this assumption, the covariates of geographical distances mentioned above around the municipalities that remained in the departments (controls) and those that moved to new departments (treaties) are analyzed. Table 1 shows four groups of columns where the group of treated and control municipalities are compared, according to the distance within which they are located around the border created, that is, the one that divides the new department from the initial one. The first group of columns refers to the distance of 100 kilometers and the subsequent ones to 75, 50 and 25 kilometers. In general, statistically significant differences are found for all the covariates considered, although with few relevant differences in levels such as wind speed, temperature, precipitation and slope. However, as the proximity to the border (25km, column 4) becomes more strict, the differences in several of the covariates cease to be statistically significant and those that are have little difference in levels, such as temperature (approximately 1C°), wind speed (0.2 m/s) and altitude (200 m/sl). These findings are consistent with the graphs in Annex 2, where it is evident that the geographic and climatic covariates present mild behaviors on both sides of the distance to the border.

Another important assumption required is the non-manipulation of the allocation variable when determining treatment, i.e. that the fact that a municipality has remained in the original department or has passed to a detached department has not been strategically determined based on its exact geographical position with respect to the separation border. In this case, although latitude and longitude cannot be used directly as assignment variables because they do not accurately capture the spatial relationship with respect to the separation boundary, since the same coordinate may correspond to different administrative or geographical contexts depending on the orientation of the boundary, the closest Euclidean distance to the new boundary is considered as a feasible option to evaluate the assumption, for it remains continuous and exogenously determined. The territorial division occurred by political and administrative criteria at the departmental level, and not by discretionary decisions made in the municipality.

**Figure 3. Euclidean distance distribution to the border and McCrary's test.**



Source: The authors.

Figure 3 shows the distribution of the municipalities according to their Euclidean distance from the new departmental border, measured in kilometers. Visually, there is no evidence of anomalous accumulation of municipalities near the border or of abrupt drops on either side of the threshold. The distribution seems continuous, which is consistent with the hypothesis that the fact that departmental separations in Colombia throughout the twentieth century were exogenous processes driven from higher levels of the State, by decisions of Congress, political-administrative reconfigurations, and regional pressures, and not by a strategic reallocation of municipalities based on precise geographical characteristics or decisions at the local level.

To validate this graphic impression, the test proposed by McCrary (2008) is implemented, which formally evaluates the existence of discontinuities in the density of the allocation variable at the threshold. The estimated discontinuity was indistinguishable from zero, with a p-value of 0.50, indicating that the null hypothesis of continuity cannot be rejected. In other words, there is no statistically significant evidence of manipulation around the border.

Finally, a fundamental issue in our empirical design is the choice of functional form,  $f(\blacksquare)$ , which captures the relationship between geography and developmental variables. The reference strategy adopts a polynomial of the third degree in latitude and longitude: a sufficiently rich parameterization to allow the estimated surface to be flexed, accommodating curvatures and interaction effects between both coordinates. Moreover, this choice dialogues well with visual intuition: when the adjusted values are plotted on a map, the discontinuity generated by the political boundary emerges sharply in the  $f(\blacksquare)$  *x-y-result space*, analogous to the standard graph of a *one-dimensional* RD. However, this same flexibility raises two methodological caveats. On the one hand, it requires a database dense enough in the vicinity of the border to accurately estimate all the terms of the polynomial; on the other, it multiplies the degrees of freedom just where we are interested in avoiding an overadjustment that confuses noise with signal.

To rule out that our conclusions rest on a single specification, we subject the model to a battery of robustness exercises that enlarge and narrow the lens through which we look at geography. First, we simplify and complicate the polynomial in latitude and longitude (we estimate linear, quadratic, and fourth-degree versions) and verify that the coefficient of the separation indicator maintains similar sign and magnitude. Then, we project the two-dimensional space onto a single axis: the Euclidean distance to the boundary (the same used in the previous assumption). With this we sacrifice part of the spatial detail, but we gain parsimony and numerical stability; We test first, second, and fourth-degree polynomials at that distance and observe how the principal estimator evolves. Next, we allow the slope of the distance to differ on either side of the boundary by a linear interaction between the distance and the treatment variable, with the intention of detecting possible divergent gradients that a symmetric polynomial could hide.

#### **4.2. An experiment in territorial division as an instrumental variable**

In relation to what is described in the historical section, the period of the government of Rafael Reyes (1904–1909) introduced an unprecedented administrative reorganization that temporarily redefined the territorial structure of the country. This reorganization was driven by the need to strengthen central power and control over the territories after the Thousand Days War and the separation of Panama. Reyes' intervention, under the slogan of "peace, concord and national

reconstruction", and the leadership of his Minister of Government, Marceliano Vargas, led to the creation of new departments and the reconfiguration of existing ones (Quinche Castaño, 2011).

In 1905, the government approved Law 17, which allowed the creation of departments such as Caldas, Atlántico and Huila. Three years later, on August 5, 1908, Law 1 was enacted, which together with Decree 863, divided the country into 34 new departments under the idea of invigorating them economically and facilitating public management. The National Government assumed the assets and liabilities of the extinct departments, and their revenues were transferred to the National Treasury. The governors and departmental employees would be appointed by the Central Government, with salaries set by it. The municipalities of the new departments would receive the properties and revenues corresponding to the extinct entities, and the Executive would have the power to carry out public works in municipalities with deficient incomes. In addition, the Law granted full powers to the Executive to regulate its application, resolve doubts in its execution and modify the boundaries of departments and municipalities. He could also change capitals, reduce excessive divisions, and suspend the creation of new departments.

According to Article 24 of Law 1, it would enter into force on January 1, 1909 in order to allow the preparation and transition to the new administrative order. In this way, in the previous months the Government could define the political representation of the new entities, assign their attributions and competencies, and establish their fiscal and budgetary regime, in addition to organizing the judicial and military division, the postal and telegraph services, and in general, everything related to the administrative and operational structure of the new departments (Quinche, 2011). Despite the ambitious initiative to reconfigure the map of the country, its validity would be very short. The Law coincided with the end of Reyes' five-year term, further contributing to the perception of instability with which the administration came.

In fact, in the Reyes government itself, the process of regression began: several decrees issued in the following days reduced the scope of the initial proposal of the Law. On the one hand, Decree 916 of August 31, 1908 introduced significant adjustments to the territorial reorganization: it replaced some departments with others, suppressed two of them and reassigned several municipalities between different jurisdictions. Subsequently, Decrees 995 and 1181 continued with the incorporation of new municipalities and with additional modifications to the interdepartmental

boundaries. Finally, Decree 577 of June 6 of 1909 made the last modifications to the political-administrative map, suppressing the departments of Ipiales and Tumaco, whose territories were reincorporated into that of Pasto, leaving 26 departments as results.

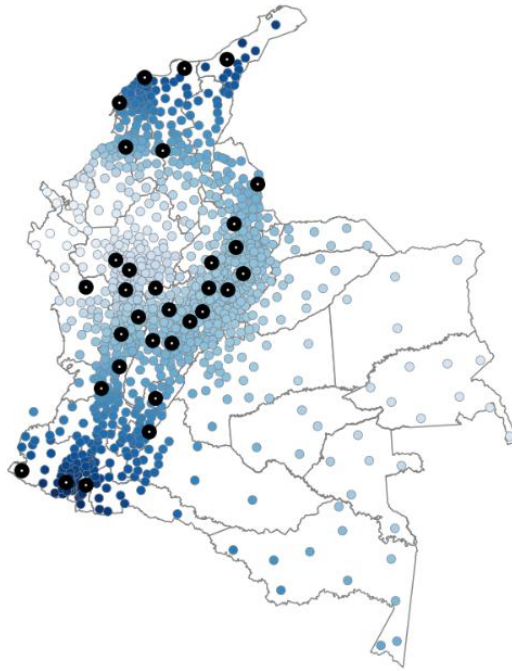
At the beginning of June 1909, legislative elections were held and, after their conclusion, the new Congress was installed on July 20 of the same year, which meant the definitive departure of Rafael Reyes from power. In his place, Jorge Holguín temporarily took over, who held the presidency for a few months, until he was succeeded by Ramón González Valencia, driven by the strong republican opposition that sought to dismantle the authoritarian regime of the Quinquennium. González Valencia completed the constitutional period until August 7, 1910. One of the first acts of the new Congress was the approval of Law 65 of 1909, through which the territorial division existing in 1905 was reestablished, reducing the country again to ten departments. Although the territorial reform promoted by Reyes did not have sustained or profound effects, it can be seen as an experiment, motivating the use of reform as an instrumental variable. Thus, the event can be used as an exogenous variation in relation to the separations that occurred 40 years later.

The logic of our instrumental variable is to measure the degree of geographical dispersion with respect to the departmental capitals of 1908. Municipalities with low standard deviation values were located in intermediate or equidistant areas between several capitals, so they would have been exposed to more diffuse institutional influence and, consequently, to greater administrative instability. On the other hand, a high standard deviation reflects the predominant proximity to a single capital, indicating a more defined and stable administrative centrality. Formally:

$$Z_i = \sqrt{\frac{1}{K} \sum_{j=1}^{J=34} (d_{i,c_j} - \bar{d}_i)^2} \quad (2)$$

Where,  $d_{i,c_j}$  represents the linear distance between the municipality  $i$  and each of the departmental capitals  $c_j$  in place in 1908. The term  $\bar{d}_i$  corresponds to the average distance from the municipality  $i$  with respect to all capitals  $J$ .

**Figure 4. Standard deviation of the distances to the capitals of Law 1 of 1908**



Source: Authors' estimate based on information from Law 1 of 1908.

In this case, the instrument seeks to quantify the propensity for post-1910 separations derived from the relative position of municipalities vis-à-vis historical departmental capitals. In other words, the most excluded or peripheral regions, either because they were far from administrative centers or because their departments lacked effective capital, tended over time to develop greater political and economic incentives to demand territorial autonomy. These zones, located on the margins of administrative influence, constitute the spaces where the reorganization of 1908 left a legacy of incomplete decentralization and aspirations for self-government, which later translated into a greater propensity for separation processes during the fifth stage. A visualization of the instrument is presented in Figure 4. The black dots indicate the thirty-four departmental capitals established by the decrees of 1908.

The pattern observed in indicates a clear territorial differentiation: the lowest values of standard deviation (light blues) are concentrated in the center of the country, particularly in the axis between Cundinamarca, Boyacá, Tolima and Antioquia, where the municipalities were relatively equidistant from several capitals, reflecting a greater institutional density and administrative overlap. In contrast, the highest values (dark blues) are located towards the peripheral strips of the southwest,

northeast and north of the country, especially in the current regions of Chocó, Cesar, La Guajira, Meta and Caquetá, areas historically more isolated from the centers of political decision-making. This pattern is consistent with the instrumental hypothesis: the municipalities furthest away or with the least administrative centrality were precisely those where, decades later, greater pressures emerged for the creation and separation of new departments.

The first assumption of this methodology is based on the exogeneity of the 1908 separations. Grounds for compliance with the assumption in four arguments. First, its experimental nature: in a span of a few months, successive deletions, additions and rectifications of borders were chained, which reveals trial and error rather than technical planning; as Londoño (1967) summarizes: "More than ten decrees were issued making numerous changes, which immediately gave the impression that the fundamental law had been carried out in a hasty and unconsulted manner". Second, its validity was ephemeral, of less than six months between the entry into force of Law 1 (January 1, 1909) and the last modifications under Decree 577 of June 6, 1909, coinciding with the departure of Reyes. In these months, it is highly unlikely that the new departmental structures were able to consolidate local institutions, establish fiscal management mechanisms or exercise effective authority over the newly reassigned municipalities, which reinforces the idea that the episode was merely transitory and experimental, without the possibility of generating long-term economic or political effects.

Third, the drawing of borders and assignment of borders were made without a clear criterion. The rules of the game were repeatedly modified and there were adjustments due to fiscal unviability; in fact, the suppression of Ipiales and Tumaco showed that "they were left without sufficient resources to meet their expenses" (Decree 577 of 1909), which is why they were incorporated into Pasto. Finally, the separations on which the exogenous variation will be used correspond to the nine departments created during the fifth stage, between 1947 and 1981. This introduces a minimum time gap of 40 years between the enactment of Law 1 of 1908 and the first effective separation, and up to 73 years if the last one is considered (Caquetá, in 1981). Given this interval, it is implausible that an episode of less than six months, of an experimental nature and without consistent criteria, could have directly influenced the economic or institutional development of the regions through channels other than the historical propensity for territorial separation. In other

words, the reorganization of 1908 can be considered exogenous with respect to contemporary conditions, operating only as a temporary administrative shock that reconfigured, in an arbitrary and transitory way, the relationship between the municipalities and their centers of departmental power.

The second assumption is that of relevance, which is fulfilled to the extent that the reorganization of 1908 introduced a substantial change in the distribution of capitals and in the administrative structure of the country. Indeed, even though the reform was experimental in nature, the reassignment of jurisdictions and the creation or elimination of departmental capitals altered the institutional trajectories of the regions, affecting the likelihood that certain areas would develop political identities or claims to autonomy in the decades that followed.

In fact, in some regions the reversal of the reforms provoked immediate reaction from local elites, who sought to maintain the newly acquired autonomy. From several of the cities that had been erected as departmental capitals (Manizales, Neiva, Barranquilla or Cali) mobilizations led by their political and economic leaders arose to preserve the existence and administrative independence of the departments created during the Quinquennium.

These regional pressures reflect that the reorganization of 1908, although ephemeral, left persistent political traces and aspirations for autonomy, which later facilitated the definitive consolidation of some of these territories, such as Caldas, Huila, Atlántico, Valle and Norte de Santander, the only cases in which the initial reorganization managed to translate into new lasting entities. As Quinche (2011) mentions: "The Reyes government had managed to draw the guidelines that, with advances and setbacks, largely defined the physiognomy that the political-administrative map of Colombia would have throughout the twentieth century."

Once the instruments have been defined and explained, we could describe the equation of the first level as the relationship between the separation variable and the instruments derived from the reorganization of 1908, controlling for geographical and climatic characteristics. This estimate seeks to capture the historical and exogenous component of the probability of departmental separation. Formally, we express the first level as:

$$\text{Split}_{id} = \pi_0 + \pi_1 Z_i + \mathbf{X}_i' \gamma + \mu_d + \varepsilon_{id} \quad (4)$$

where  $Z$  corresponds to the instrument defined above. The rest of the variables correspond to the same as described in equation (1). According to the hypotheses presented, it is expected  $\pi_1$  to have a positive sign, since a lower administrative centrality must have increased the probability of subsequent separation, reflecting a higher degree of institutional isolation and demand for territorial autonomy. Finally, the equation of the second level would be the same as equation (1), except that there would be no geographical adjustment function and the separation would be predicted from the first level described above.

In addition, the municipalities departments that were separated after 1910, that is, during the fifth stage, are taken as treaties: Chocó (1947, from Cauca); Córdoba (1952, by Bolívar); Meta (1959, from Cundinamarca); La Guajira (1964, from Magdalena); Sucre (1966, by Bolívar); Quindío (1966, from Caldas); Risaralda (1966, from Caldas); Cesar (1967, from Magdalena); and Caquetá (1981, Cauca). As a control group, the municipalities belonging to Antioquia, Boyacá, Santander and Tolima were selected, departments that made up the original structure defined by the Constitution of 1886 and that did not suffer subsequent territorial divisions. The choice of these cases meets two essential conditions: (i) none of the departments dealt with separated from them, for example, Caldas is not included because Quindío and Risaralda were separated from it, and (ii) the last division into the control departments occurred more than forty years before the separations considered, thus guaranteeing stable and comparable administrative trajectories. In this case, the estimator is interpreted as a mean local treatment effect (LATE), since it identifies the causal impact only for those municipalities whose probability of separation changed due to the exogenous variation generated by the geographical instrument.

## **5. Results**

### **5.1. Geographic discontinuous regression**

The impact of territorial separation or division is estimated by means of several specifications that consider different forms of geographical controls. This in order to evaluate how robust the results found are and avoid bias in the estimation. The objective is to evaluate whether the territorial separation had any effect on the poverty of the municipalities that remained in the new territorial entities years after their division, considering that it was not a decision of the municipal

administrations and, therefore, can be treated as a random experiment for the affected municipalities.

Table 2 shows the results of our estimates of the impact of territorial division on poverty in the long term in Colombian municipalities. As noted above, poverty is measured by the UBN and MPI, while separations are analyzed as events regardless of the year in which they occurred. Different bands are considered that represent the distance to the border between two departments after their division: 15, 25, 30 and 50 km. In this case, the optimal bandwidth was 15 km. Panel A presents the results for the model in which it is controlled by the polynomial of the third degree in latitude and longitude. In this specification, the separation of departments does not show consistent negative effects between the different bandwidths. In the case of the UBN, some negative effects are observed for the 15, 30 and 50 km bands. However, despite being statistically significant, the marginal effects are economically small, because if the mean of UBN is approximately 24 and the change is -0.22, this is approximately -0.92%.

In the case of the MPI, there is no statistically significant effect when we are located in the most restricted windows, which show more comparable results between treated and non-treated municipalities. And when some effect is found on the MPI, this effect is even economically lower than that obtained for the UBN, as it does not exceed 0.2%. For example, if we take the effect of the separation on the MPI with a 50 km band, which is 0.11 points over the MPI, we find that a municipality located at the average of 42.7 points in the MPI would go to a MPI of 42.59, which is a negligible reduction in the poverty index.

Panel B of Table 2 shows the impact of separation, controlling for the third-degree polynomial of the distance to the boundary. This specification does not find a significant effect on either of the two measures of poverty considered. This suggests that the functional form of geographic control could affect the statistical significance of the results or, in other words, that the impact of separation may depend on the functional form considered in the estimation. To do this, we consider different functional forms in robustness exercises that are presented in Table 3. Panel I of Table 3 shows the results of the estimates considering different functional forms in latitude and longitude, while panel II considers alternatives for distance to the border.

First, panel I – A shows the result for the estimation of the linear polynomial in latitude and longitude, where it is not possible to show statistically significant effects at 5% in either of the bands for both poverty measurements. In addition, when some significant effect is found at 10%, it is positive, although economically speaking they are not relevant increases in poverty levels. Secondly, panel I – B considers the polynomial of the second degree in latitude and longitude, showing null effects in the strictest bands, being only statistically significant for the 50 km band, although with economically irrelevant values. Finally, the last specification proposed in panel I – C shows the polynomial of fourth degree in latitude and longitude with slight, although statistically significant effects on the UBN, but null on the MPI.

**Table 2. Baseline Results: RGD**

|                                                                 | Dependent variable      |                     |                   |                     |                                |                    |                  |                   |
|-----------------------------------------------------------------|-------------------------|---------------------|-------------------|---------------------|--------------------------------|--------------------|------------------|-------------------|
|                                                                 | Unsatisfied Basic Needs |                     |                   |                     | Multidimensional Poverty Index |                    |                  |                   |
| Kilometers around the border                                    | 50 km                   | 30 km               | 25 km             | 15 km               | 50 km                          | 30 km              | 25 km            | 15 km             |
| <i>A. Third-degree polynomial in Latitude and longitude</i>     |                         |                     |                   |                     |                                |                    |                  |                   |
| Split                                                           | -0.120***<br>[0.029]    | -0.126**<br>[0.051] | -0.049<br>[0.069] | -0.222**<br>[0.112] | -0.115***<br>[0.031]           | -0.098*<br>[0.052] | 0.020<br>[0.067] | -0.082<br>[0.111] |
| R <sup>2</sup>                                                  | 0.428                   | 0.42                | 0.432             | 0.487               | 0.312                          | 0.315              | 0.339            | 0.393             |
| <i>B. Third-degree polynomial in the Distance to the border</i> |                         |                     |                   |                     |                                |                    |                  |                   |
| Split                                                           | 0.028<br>[0.030]        | 0.051<br>[0.057]    | 0.026<br>[0.077]  | 0.152<br>[0.156]    | 0.020<br>[0.029]               | 0.049<br>[0.054]   | 0.016<br>[0.070] | 0.211<br>[0.141]  |
| R <sup>2</sup>                                                  | 0.120                   | 0.108               | 0.101             | 0.040               | 0.108                          | 0.083              | 0.081            | 0.05              |
| Variable Dependent Mean                                         | 23.4                    | 24.3                | 24.8              | 24.5                | 42.7                           | 44.4               | 44.9             | 44.9              |
| Geo-controls                                                    | Yes                     | Yes                 | Yes               | Yes                 | Yes                            | Yes                | Yes              | Yes               |
| Region Fixed Effects                                            | Yes                     | Yes                 | Yes               | Yes                 | Yes                            | Yes                | Yes              | Yes               |
| Observations                                                    | 608                     | 366                 | 298               | 186                 | 608                            | 366                | 298              | 186               |

Source: Authors' estimates.

On the other hand, panel II – A considers the linear control of the distance to the boundary, while panel II – B includes the polynomial of the second degree and panel II – C that of the fourth degree. In all cases, there is no statistically significant relationship between territorial separation and poverty in the long term, reinforcing the null impact observed when controlling for latitude and longitude. Panel II – D shows the effect of territorial separation when the linear polynomial interacts with the distance to the border, evidencing a null effect of separation on poverty regardless of its form of measurement.

When visually analyzing the linear adjustments (Figure 5), it can be seen that there are no evident discontinuities around the departmental border. In the case of both the UBN (left panel) and the MPI (right panel), trends on both sides of the threshold are continuous and maintain similar slopes, indicating the absence of significant jumps in poverty levels. These results are consistent with the findings reported in Tables 2 and 3.

**Table 3. Results by varying the forms geographical functions the baseline**

|                                                                        | Dependent variable      |                    |                   |                     |                                |                   |                   |                   |
|------------------------------------------------------------------------|-------------------------|--------------------|-------------------|---------------------|--------------------------------|-------------------|-------------------|-------------------|
|                                                                        | Unsatisfied Basic Needs |                    |                   |                     | Multidimensional Poverty Index |                   |                   |                   |
|                                                                        | 50 km                   | 30 km              | 25 km             | 15 km               | 50 km                          | 30 km             | 25 km             | 15 km             |
| Kilometers around the border                                           |                         |                    |                   |                     |                                |                   |                   |                   |
| <i>Panel I. Alternative functional forms in latitude and longitude</i> |                         |                    |                   |                     |                                |                   |                   |                   |
| <i>A. Linear polynomial in latitude and longitude</i>                  |                         |                    |                   |                     |                                |                   |                   |                   |
| Split                                                                  | 0.031<br>[0.028]        | 0.034<br>[0.049]   | 0.107*<br>[0.065] | -0.072<br>[0.121]   | 0.008<br>[0.030]               | 0.014<br>[0.050]  | 0.109*<br>[0.064] | 0.029<br>[0.121]  |
| R <sup>2</sup>                                                         | 0.254                   | 0.263              | 0.284             | 0.258               | 0.130                          | 0.134             | 0.146             | 0.111             |
| <i>B. Polynomial of the second degree in latitude and longitude</i>    |                         |                    |                   |                     |                                |                   |                   |                   |
| Split                                                                  | -0.070**<br>[0.029]     | -0.073<br>[0.050]  | -0.002<br>[0.065] | -0.137<br>[0.119]   | -0.077**<br>[0.032]            | -0.070<br>[0.052] | 0.029<br>[0.065]  | -0.020<br>[0.121] |
| R <sup>2</sup>                                                         | 0.342                   | 0.351              | 0.370             | 0.373               | 0.201                          | 0.201             | 0.215             | 0.218             |
| <i>C. Polynomial of the fourth degree in latitude and longitude</i>    |                         |                    |                   |                     |                                |                   |                   |                   |
| Split                                                                  | -0.105***<br>[0.028]    | -.105**<br>[0.052] | -0.018<br>[0.070] | -0.249**<br>[0.112] | -0.095***<br>[0.031]           | -0.068<br>[0.054] | 0.051<br>[0.067]  | -0.113<br>[0.108] |
| R <sup>2</sup>                                                         | 0.460                   | 0.440              | 0.455             | 0.521               | 0.341                          | 0.340             | 0.381             | 0.469             |
| Observations                                                           | 608                     | 366                | 298               | 186                 | 608                            | 366               | 298               | 186               |

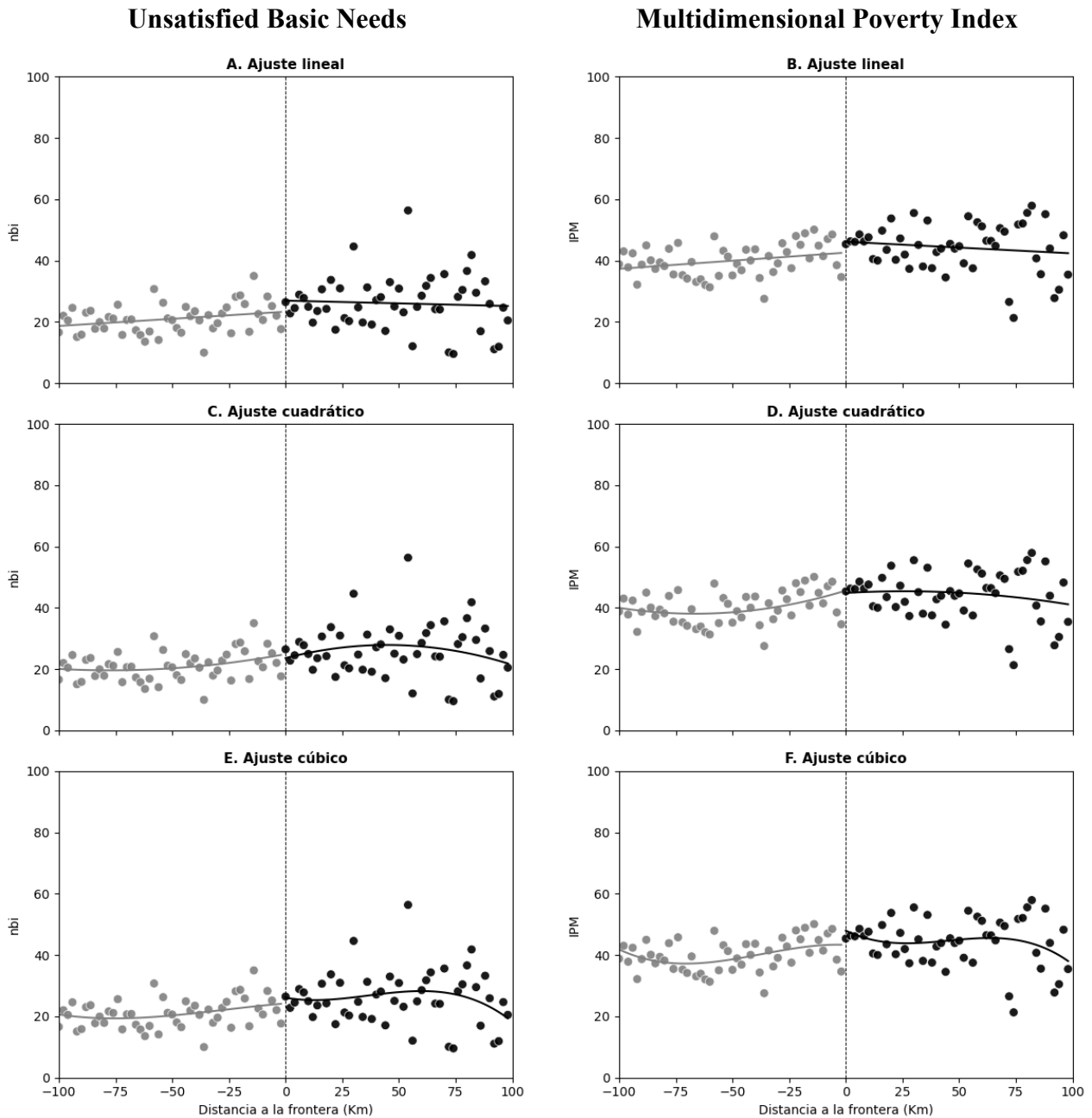
Source: Authors' estimates.

**Table 3. Results by varying the geographical functional forms the baseline (continued)**

| Kilometers around the border                                              | Dependent variable      |                  |                  |                   |                                |                  |                  |                  |
|---------------------------------------------------------------------------|-------------------------|------------------|------------------|-------------------|--------------------------------|------------------|------------------|------------------|
|                                                                           | Unsatisfied Basic Needs |                  |                  |                   | Multidimensional Poverty Index |                  |                  |                  |
|                                                                           | 50 km                   | 30 km            | 25 km            | 15 km             | 50 km                          | 30 km            | 25 km            | 15 km            |
| <i>Panel II. Alternative functional forms at distance from the border</i> |                         |                  |                  |                   |                                |                  |                  |                  |
| <i>A. Linear polynomial at the distance to the boundary</i>               |                         |                  |                  |                   |                                |                  |                  |                  |
| Split                                                                     | 0.018<br>[0.015]        | 0.018<br>[0.027] | 0.049<br>[0.036] | 0.012<br>[0.068]  | 0.006<br>[0.015]               | 0.007<br>[0.026] | 0.051<br>[0.033] | 0.040<br>[0.062] |
| R <sup>2</sup>                                                            | 0.115                   | 0.103            | 0.101            | 0.035             | 0.088                          | 0.074            | 0.079            | 0.036            |
| <i>B. Second-degree polynomial at the distance to the border</i>          |                         |                  |                  |                   |                                |                  |                  |                  |
| Split                                                                     | 0.017<br>[0.015]        | 0.013<br>[0.027] | 0.047<br>[0.037] | 0.014<br>[0.069]  | 0.003<br>[0.015]               | 0.001<br>[0.026] | 0.048<br>[0.034] | 0.047<br>[0.063] |
| R <sup>2</sup>                                                            | 0.120                   | 0.106            | 0.101            | 0.035             | 0.108                          | 0.080            | 0.080            | 0.041            |
| <i>C. Fourth-degree polynomial at the distance to the border</i>          |                         |                  |                  |                   |                                |                  |                  |                  |
| Split                                                                     | 0.025<br>[0.030]        | 0.058<br>[0.057] | 0.042<br>[0.079] | 0.200<br>[0.160]  | 0.003<br>[0.015]               | 0.001<br>[0.026] | 0.048<br>[0.034] | 0.047<br>[0.063] |
| R <sup>2</sup>                                                            | 0.120                   | 0.111            | 0.104            | 0.050             | 0.108                          | 0.080            | 0.080            | 0.041            |
| <i>D. Linear polynomial interacted at the distance to the boundary</i>    |                         |                  |                  |                   |                                |                  |                  |                  |
| Split                                                                     | 0.056**<br>[0.026]      | 0.055<br>[0.050] | 0.044<br>[0.072] | -0.069<br>[0.157] | 0.003<br>[0.015]               | 0.001<br>[0.026] | 0.048<br>[0.034] | 0.047<br>[0.063] |
| R <sup>2</sup>                                                            | 0.120                   | 0.105            | 0.101            | 0.036             | 0.108                          | 0.080            | 0.080            | 0.041            |
| Observations                                                              | 608                     | 366              | 298              | 186               | 608                            | 366              | 298              | 186              |

Source: Authors' estimates.

**Figure 5. Graphical results on linear specification**



Source: Authors' estimates.

Note: The Figure shows the relationship between the distance to the departmental border and poverty levels, measured through the UBN and the MPI. The municipalities located to the right of the threshold correspond to those that became part of a new department, while those on the left remained in the original department.

## 5.2. Estimation with instrumental variables

Table 4 presents the results of strategy IV to estimate the effect of Separation on two poverty indicators: UBN and MPI, in a sample of 561 units with geographic controls and fixed effects by region. OLS estimates suggest a negative correlation between *Separation* and poverty:  $-0.840$  for UBN and  $-2.205$  for MPI. However, the standard errors (1.366 and 1.559) indicate that these coefficients are not statistically significant. Although the negative sign could be interpreted as that greater separation reduces poverty, this reading is misleading: the lack of precision and the possibility of endogeneity, due to reverse causality or omission of correlated factors, make the result unreliable.

**Table 4. Baseline Outcomes: Instrumental Variables**

| A. OLS                   | Dependent            |                     |
|--------------------------|----------------------|---------------------|
|                          | UBN                  | MPI                 |
| Split                    | -0.840***<br>[1.366] | -2.205<br>[1.559]   |
| R <sup>2</sup>           | 0.59                 | 0.37                |
| B. 2SLS                  | Split                |                     |
| First level              |                      |                     |
| D.E. Distance to capital |                      | 0.007***<br>[0.000] |
| F Crag Donald            |                      | 151.1               |
| F Kleibergen-Paap        |                      | 121.5               |
|                          | UBN                  | MPI                 |
| Second level             |                      |                     |
| Separation               | 5.562<br>[4.001]     | 3.724<br>[3.733]    |
| R <sup>2</sup>           | 0.57                 | 0.32                |
| Dependent Variable Mean  | 21.5                 | 41.1                |
| Geo-controls             | Yes                  | Yes                 |
| Region Fixed Effects     | Yes                  | Yes                 |
| Observations             | 561                  | 561                 |

Source: Authors' estimates.

The instrument, the standard deviation of the distance to capitals, strongly predicts the endogenous variable *Split*. The coefficient of the first stage indicates that for each additional kilometer in the standard deviation, the probability of separation increases by approximately 0.007 percentage points, reflecting a clear and robust relationship between the instrument and the endogenous variable. This strength is confirmed by the relevant statistics: *Cragg–Donald*  $F = 151.1$  and *Kleibergen–Paap*  $F = 121.5$ , both well above the conventional threshold of 10. These values rule out weak instrument problems and support the mechanical validity of the IV approach, ensuring that the variation used to identify the causal effect comes from a sufficiently powerful source.

In the second stage, the results show a substantial change with respect to the OLS estimate: the Separation coefficient becomes positive, with values of 5.562 for UBN and 3.724 for MPI, although these effects are not statistically significant. This change of sign from the negative association observed in OLS suggests that the naïve estimate was biased downwards, probably due to unobserved factors that correlate with separation and poverty, such as institutional or historical characteristics. In other words, once endogeneity has been corrected, the evidence suggests that territorial separation did not have significant effects on poverty in the long term.

Table 5 shows the results of additional estimates by changing the definition of our instrument. Two measures of deviations are proposed: mean absolute deviation and quartile deviation. The results in both cases are similar to those obtained in Table 4.

| Table 5. Results by varying instrument function forms |                     |                  |                     |                   |
|-------------------------------------------------------|---------------------|------------------|---------------------|-------------------|
| Dependent: Split                                      |                     |                  |                     |                   |
| 2SLS                                                  | Mean absolute       |                  | Quartile            |                   |
| First stage                                           |                     |                  |                     |                   |
| Deviation Measurement                                 | 0.008***<br>[0.000] |                  | 0.002***<br>[0.000] |                   |
| F Crag Donald                                         | 144.4               |                  | 72.2                |                   |
| F Kleibergen-Paap                                     | 116.6               |                  | 61.1                |                   |
|                                                       | UBN                 | MPI              | UBN                 | MPI               |
| Second stage                                          |                     |                  |                     |                   |
| Separation                                            | 3.992<br>[4.066]    | 2.265<br>[3.800] | 2.048<br>[4.845]    | -1.368<br>[4.818] |

|                         |      |      |      |      |
|-------------------------|------|------|------|------|
| R <sup>2</sup>          | 0.58 | 0.36 | 0.58 | 0.37 |
| Dependent Variable Mean | 21.5 | 41.1 | 21.5 | 41.1 |
| Geo-controls            | Yes  | Yes  | Yes  | Yes  |
| Region Fixed Effects    | Yes  | Yes  | Yes  | Yes  |
| Observations            | 561  | 561  | 561  | 561  |

Source: Authors' estimates.

## 6. Conclusions

The results of the analysis suggest that territorial separation in Colombia has not had a representative impact on municipal poverty in the long term. Although some statistically significant effects are identified in certain specifications, these are marginal from an economic point of view. For example, a reduction of 0.92% in the UBN or 0.2% in the MPI does not represent a substantial change in the living conditions of the population affected by territorial division.

One of the main strengths of the study is the use of a geographic discontinuous regression design, which allows estimating causal effects under the assumption of similarity between municipalities near the separation border. However, the results show that statistical significance varies according to the functional form used to control for geography, suggesting some sensitivity of the model to technical specifications. This raises the need to interpret the findings with caution and consider robustness as a key criterion in the evaluation of territorial policies.

Robustness tests, which include different functional forms in latitude and longitude as well as distance from the border, reinforce the conclusion that there is no consistent negative relationship between territorial separation and poverty levels. Even when significant effects are found, they are not systematic or replicable in all specifications, which weakens the hypothesis that the creation of new territorial entities has generated sustained improvements or deterioration in the economic well-being of the municipalities.

On the other hand, estimates with instrumental variables confirm a null relationship between territorial separation and poverty in the long term. Additional estimates with alternative instrument definitions reinforce the qualitative stability of the findings, providing confidence in the direction of effect. Overall, the evidence indicates that territorial separation did not generate significant impacts on poverty in the long term.

These findings have important implications for public policymaking. In contexts where decentralization or the creation of new administrative entities is promoted as a strategy to improve local development, the results suggest that such measures, by themselves, do not guarantee improvements in poverty indicators. Other factors, such as institutional capacity, sustained public investment or citizen participation, are likely to play a more decisive role in development outcomes.

Moreover, the fact that territorial separation was not a decision of municipal governments allows it to be treated as a quasi-random experiment. This strengthens the internal validity of the study, but also underlines that the observed effects are not mediated by local strategic decisions, which could explain the absence of significant impacts. In other words, the simple administrative reassignment does not seem to have substantially altered the development trajectories of the municipalities.

One possible explanation for these findings is that the creation of new departments did not imply profound changes in administrative management at the municipal level, which is where many of the local public policy decisions are made. If the operational structure and institutional capacity of the municipalities remained intact, it is reasonable to expect that the effects of the new departmental jurisdiction would have been limited. In addition, municipalities located on both sides of departmental borders continued to face similar regional dynamics, such as armed conflict, dependence on extractive economies, and geographic isolation. These shared conditions may have diluted any differential impact that territorial separation may have generated, maintaining similar development trajectories between treated and untreated municipalities.

Another relevant factor is the persistence of structural conditions of poverty and social exclusion in many of the municipalities analyzed. These conditions, which pre-existed the territorial division, were not substantially modified by the new administrative organization. In the absence of specific interventions aimed at overcoming these barriers, simple jurisdictional reassignment does not seem to have been sufficient to generate sustained improvements in poverty indicators.

Likewise, the resources transferred by the central government to the municipalities did not change significantly after the territorial division. If the levels of public investment and fiscal transfers remained constant, the new departmental configuration would not have generated comparative

advantages for the municipalities integrated into the new territorial entities, cancelling out any potential effect on local development. In the same way, national decentralization processes, fiscal reforms and other macroeconomic shocks affected all municipalities in the country in a generalized way, so that the differences observed respond more to common dynamics than to the effects of departmental separation. If there is any differential impact, it would be marginal and would tend to be diluted by restricting the analysis to municipalities near the border.

Finally, the creation of new departments could have generated greater institutional fragmentation without solving the problems of inter-municipal coordination. Instead of improving efficiency in the provision of public goods, this fragmentation could have introduced new administrative challenges, reducing the State's capacity to respond and limiting the expected positive impact of territorial reorganization.

Finally, this study contributes to the debate on the limits of territorial reorganization as a public policy tool. While there may be political or identity reasons for promoting new divisions, the results presented here indicate that, from a poverty reduction perspective, their effectiveness is limited. In addition, the results reinforce the persistence of regional inequalities in Colombia found in previous studies, since the poverty indicators of the municipalities in 2018 remain unchanged despite changes in the political and administrative organization. These social conditions could be associated with established colonial institutions such as slavery or the *encomienda*. Future studies could explore this relationship, as well as other variables of interest such as the quality of local government, public investment or political participation, to offer a more comprehensive view of the impact of these reforms.

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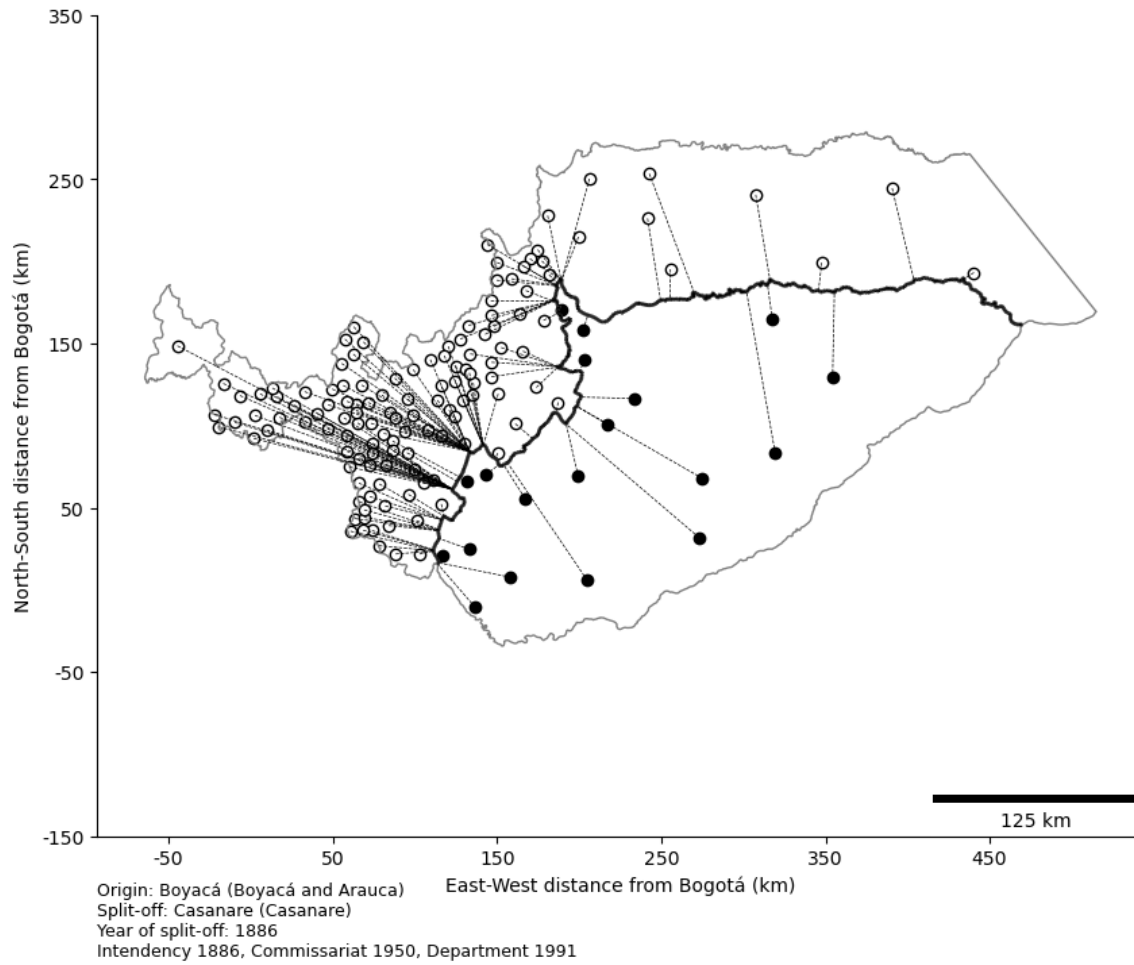
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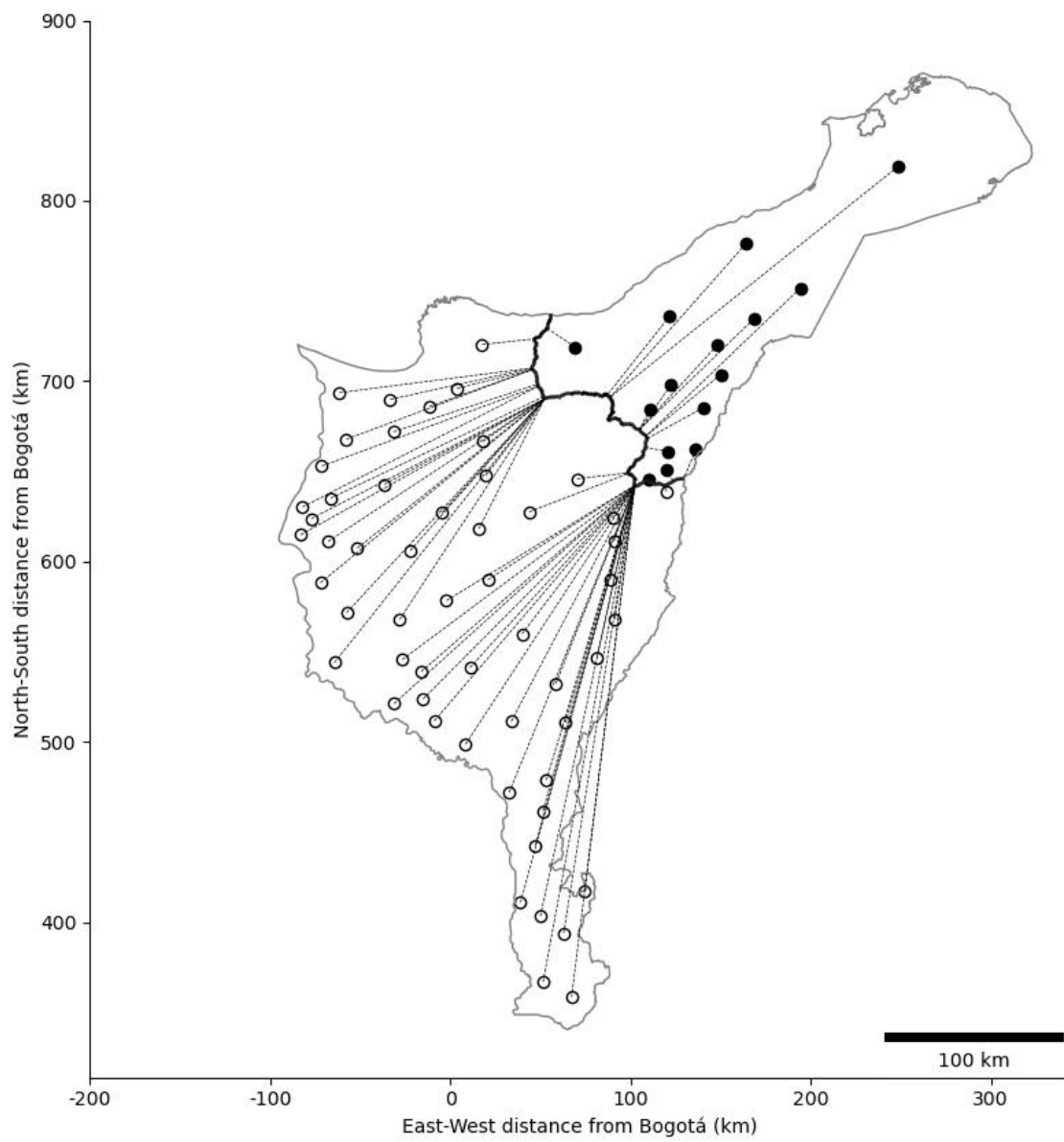
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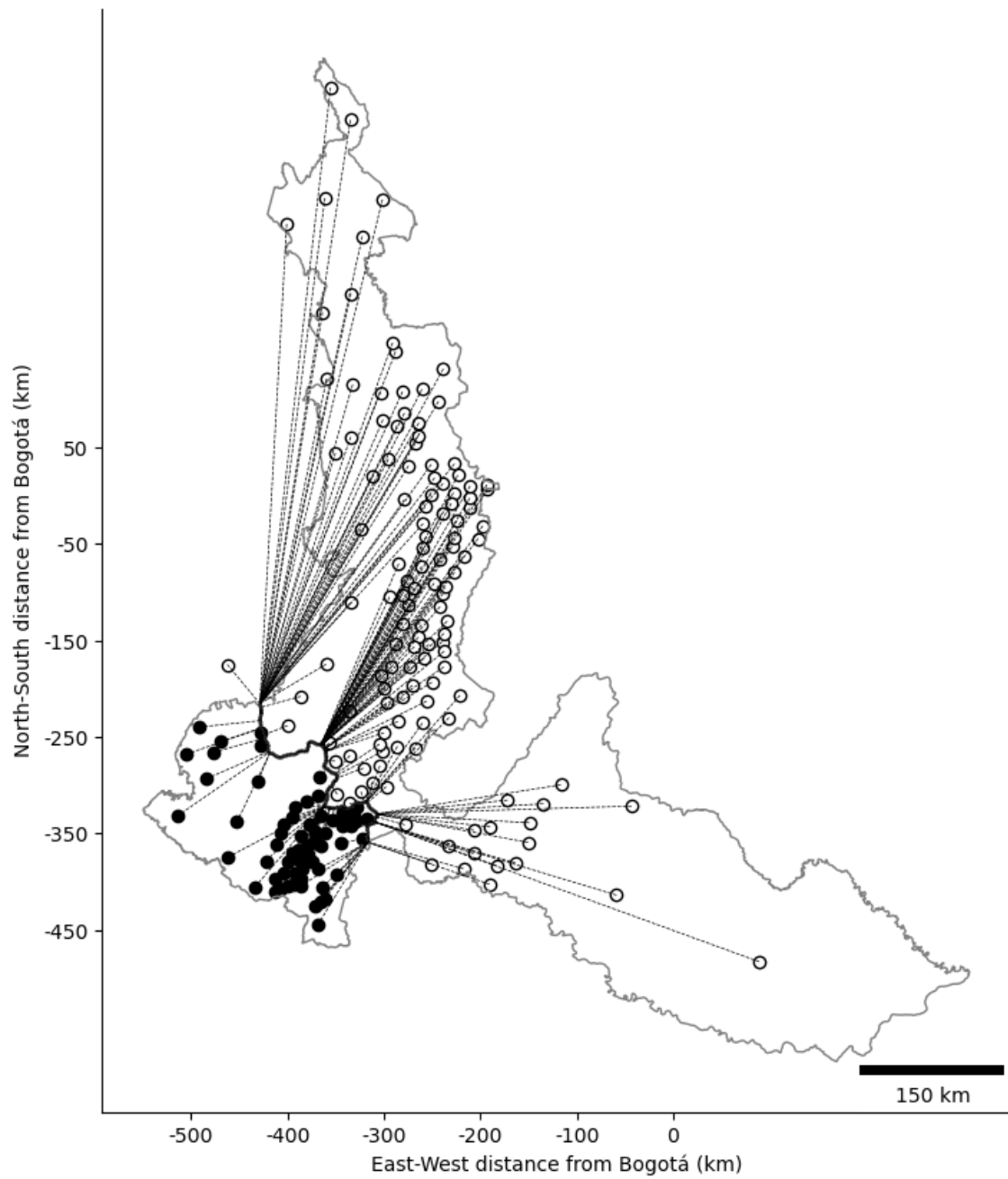
## Appendices

### Annex 1. Maps of the separations and linear distances of municipalities to borders (selected)

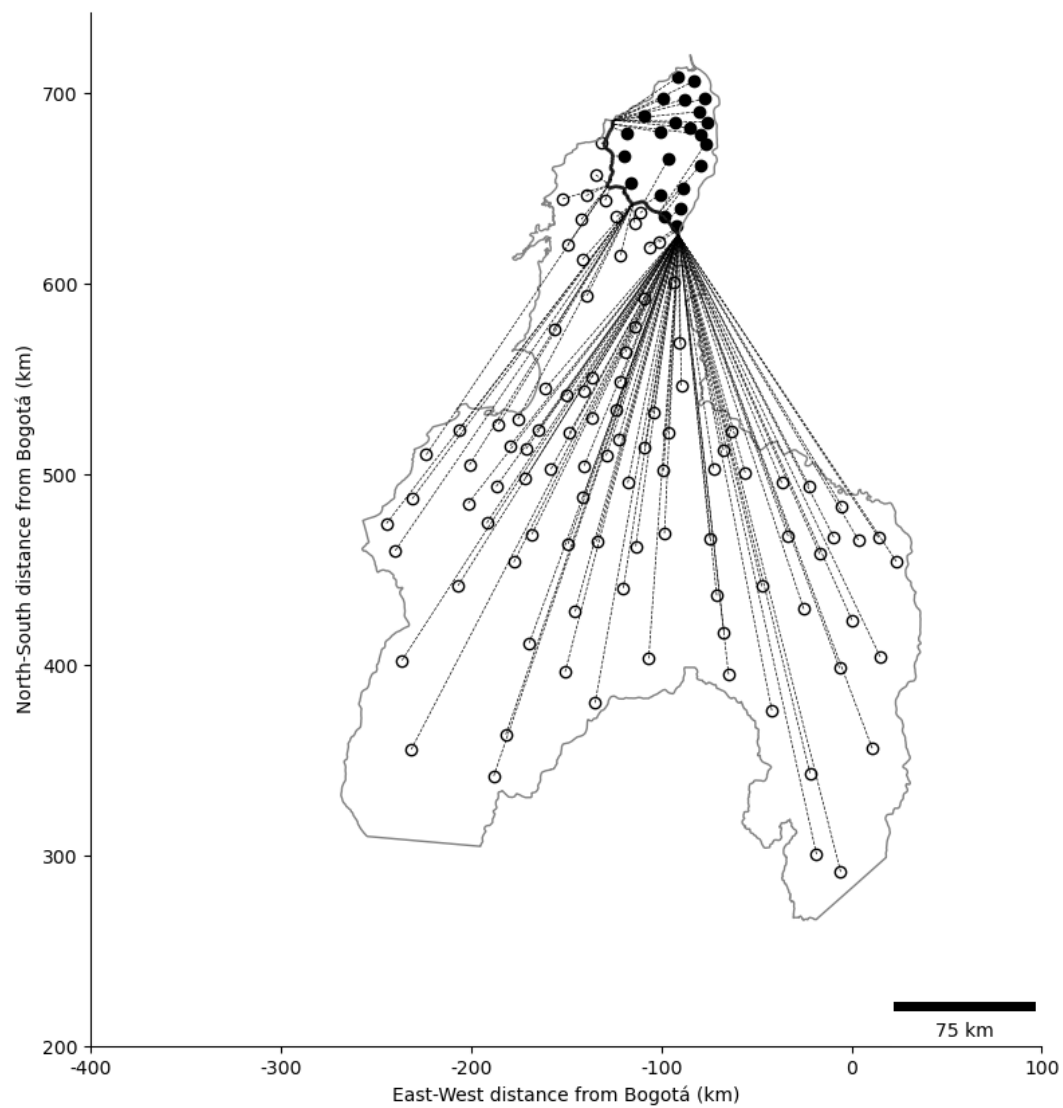




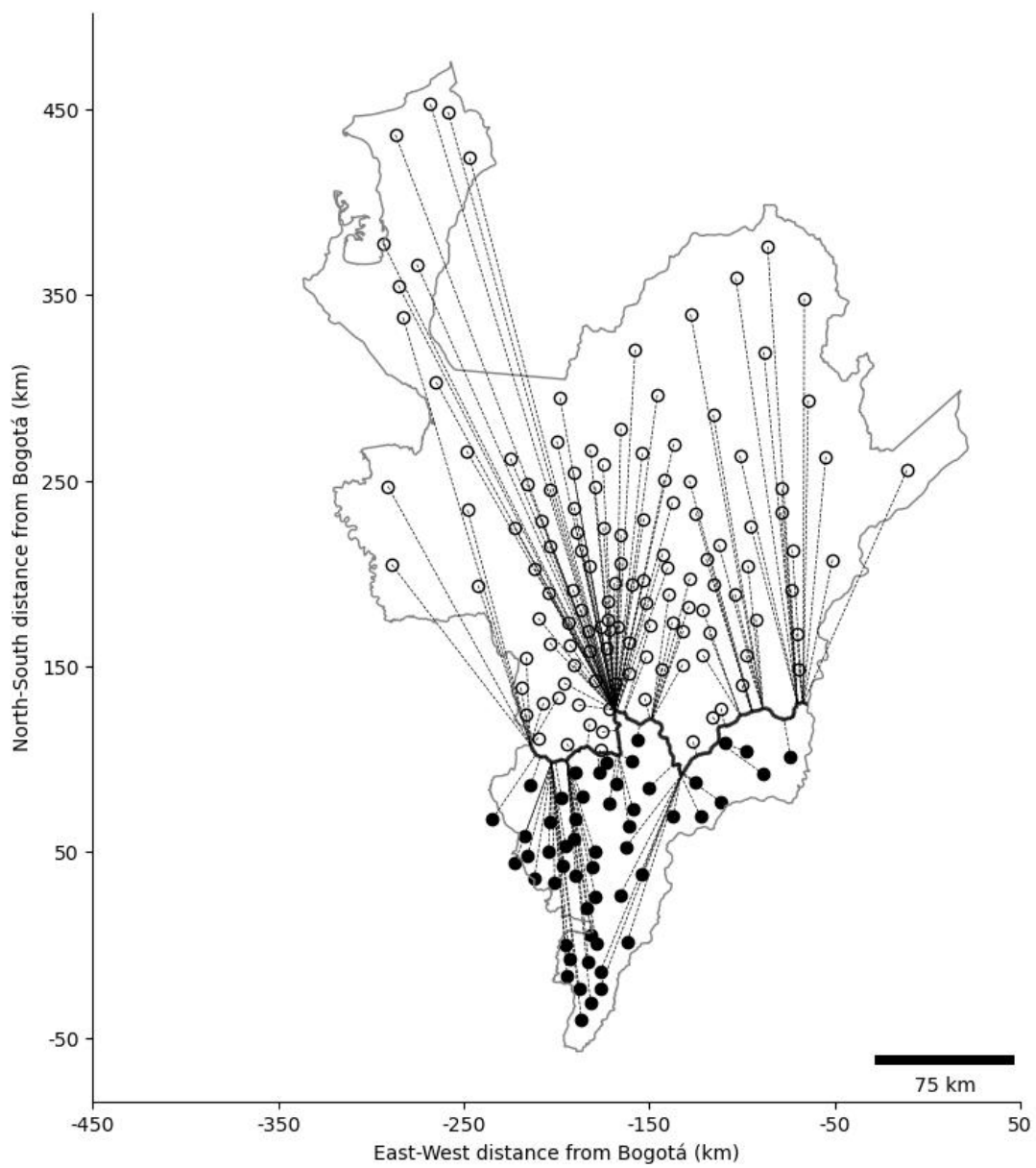
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 Split-off: La Guajira (La Guajira)  
 Year of split-off: 1898  
 Intendency 1898, Commissariat 1911, Department 1964



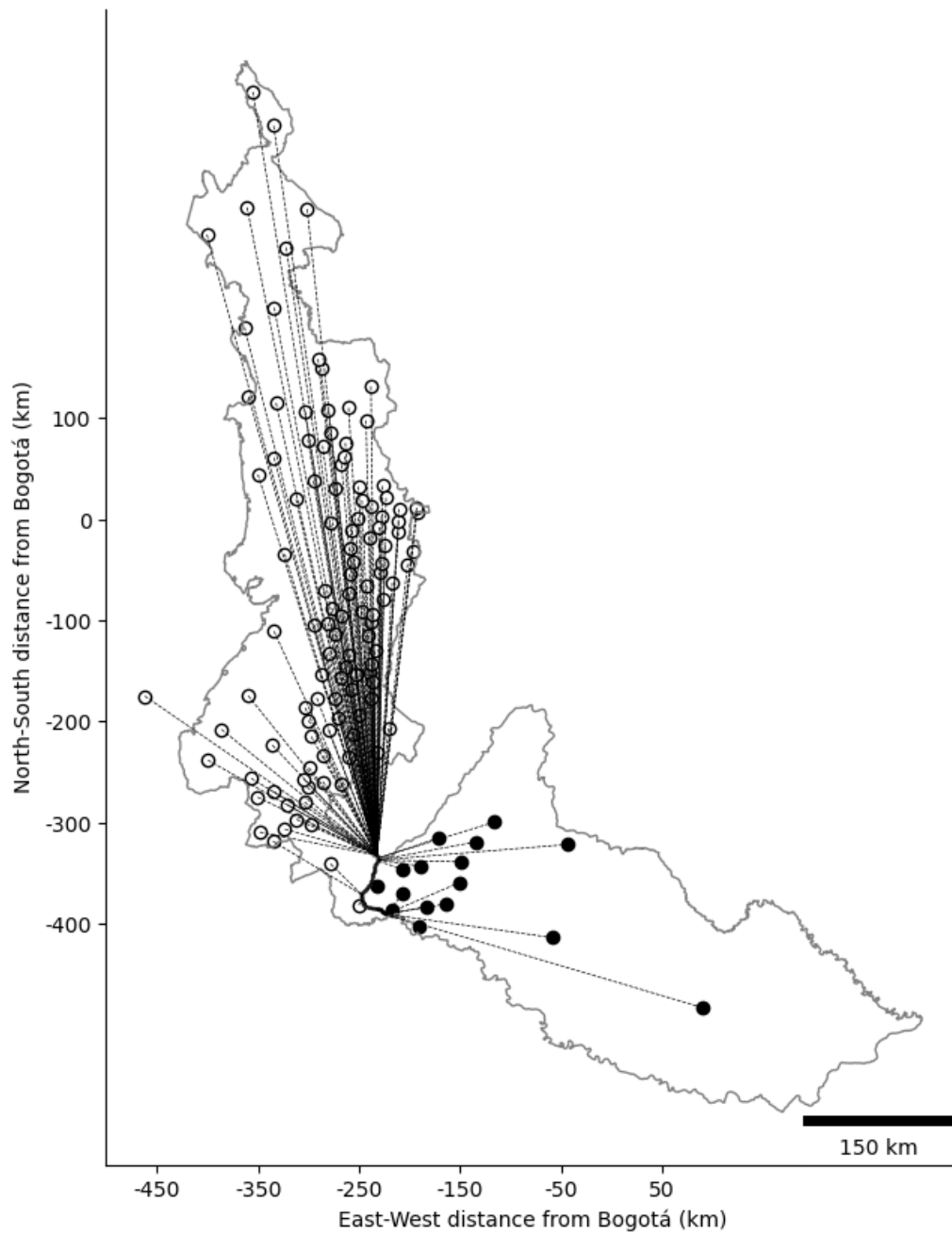
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 Split-off: Nariño (Nariño)  
 Year of split-off: 1904  
 Department 1904



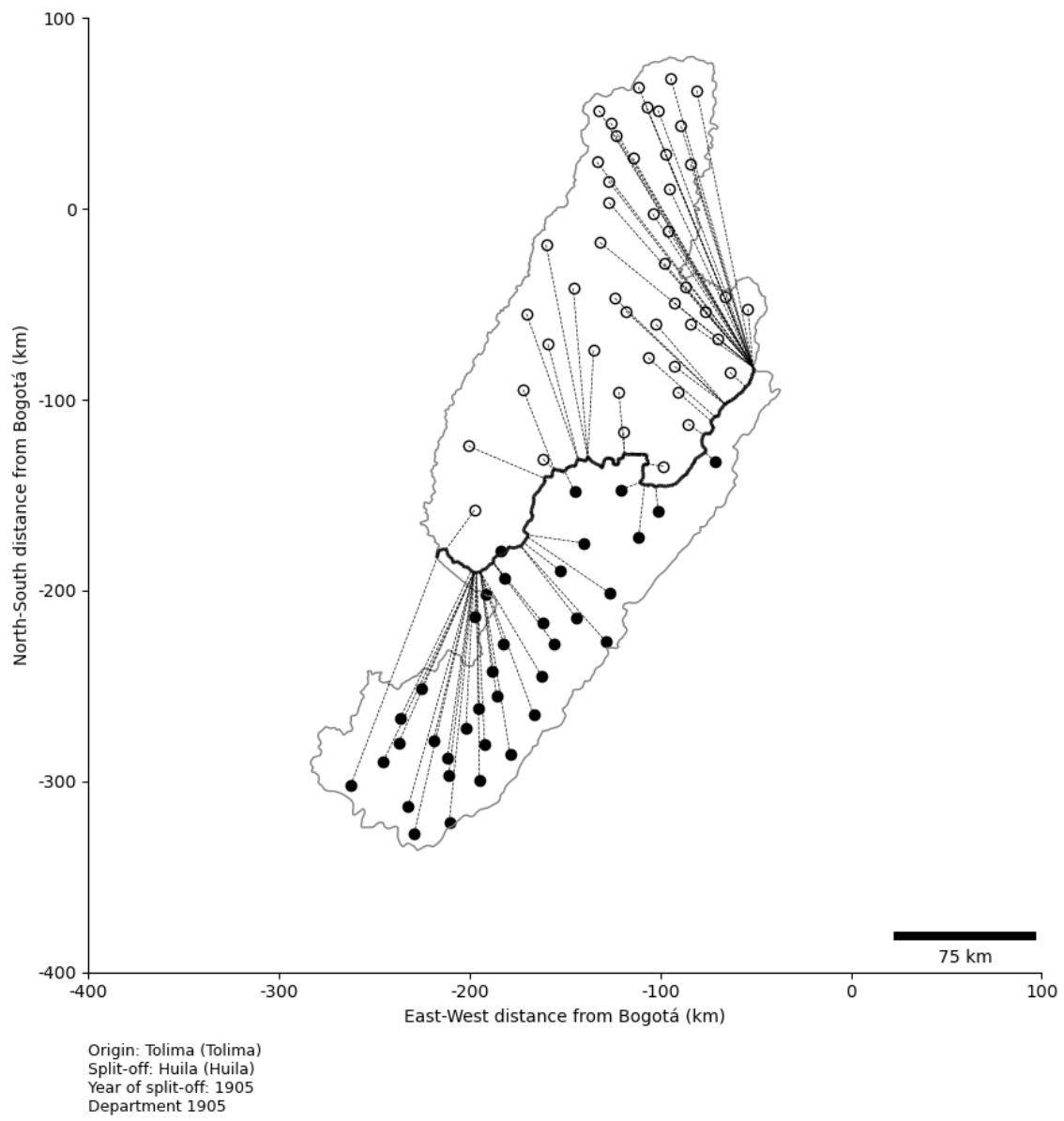
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 Split-off: Atlántico (Atlántico)  
 Year of split-off: 1905  
 Department 1905

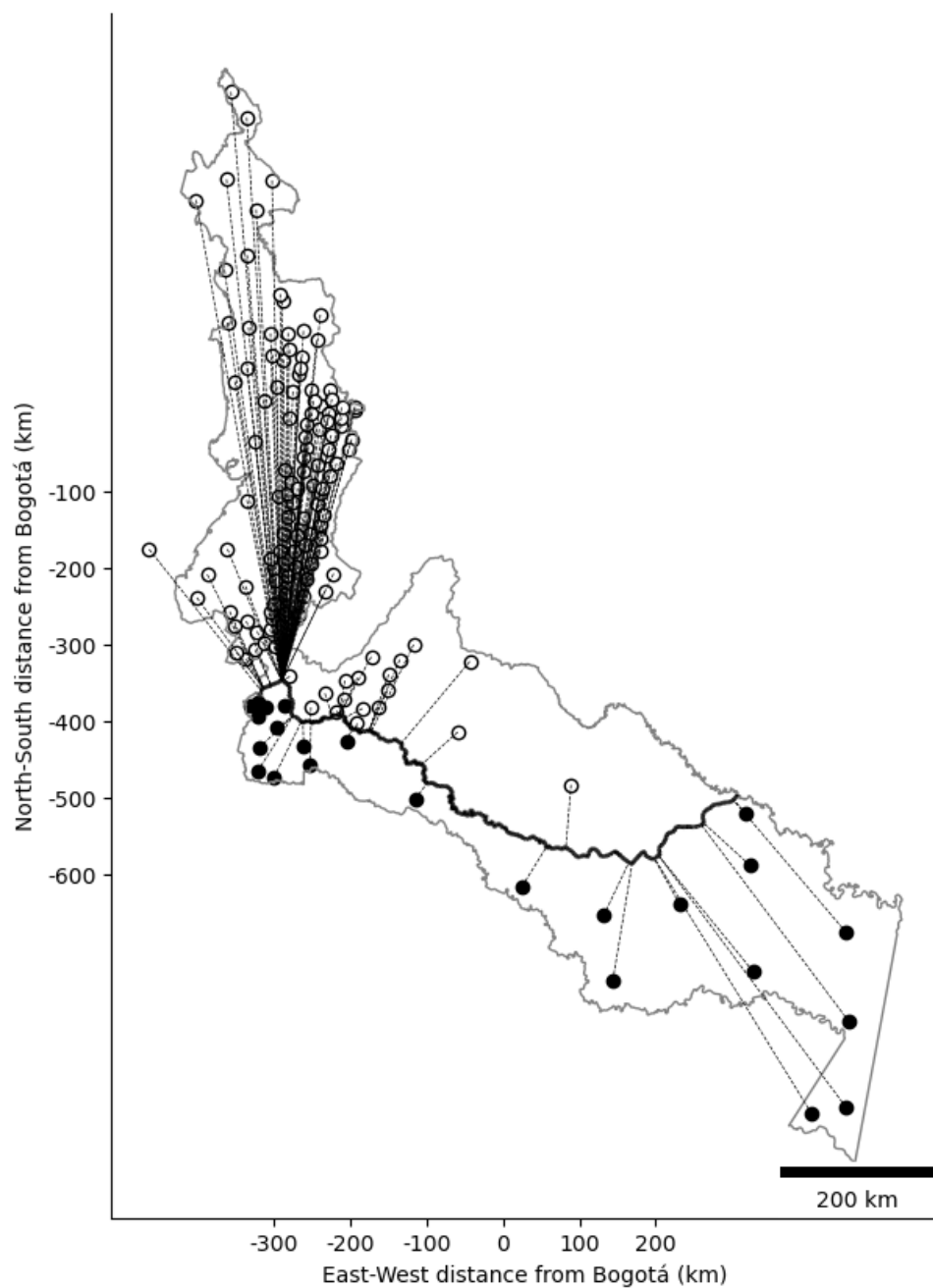


Origin: Antioquia (Antioquia)  
 Split-off: Caldas (Caldas, Quindío and Risaralda)  
 Year of split-off: 1905  
 Department 1905

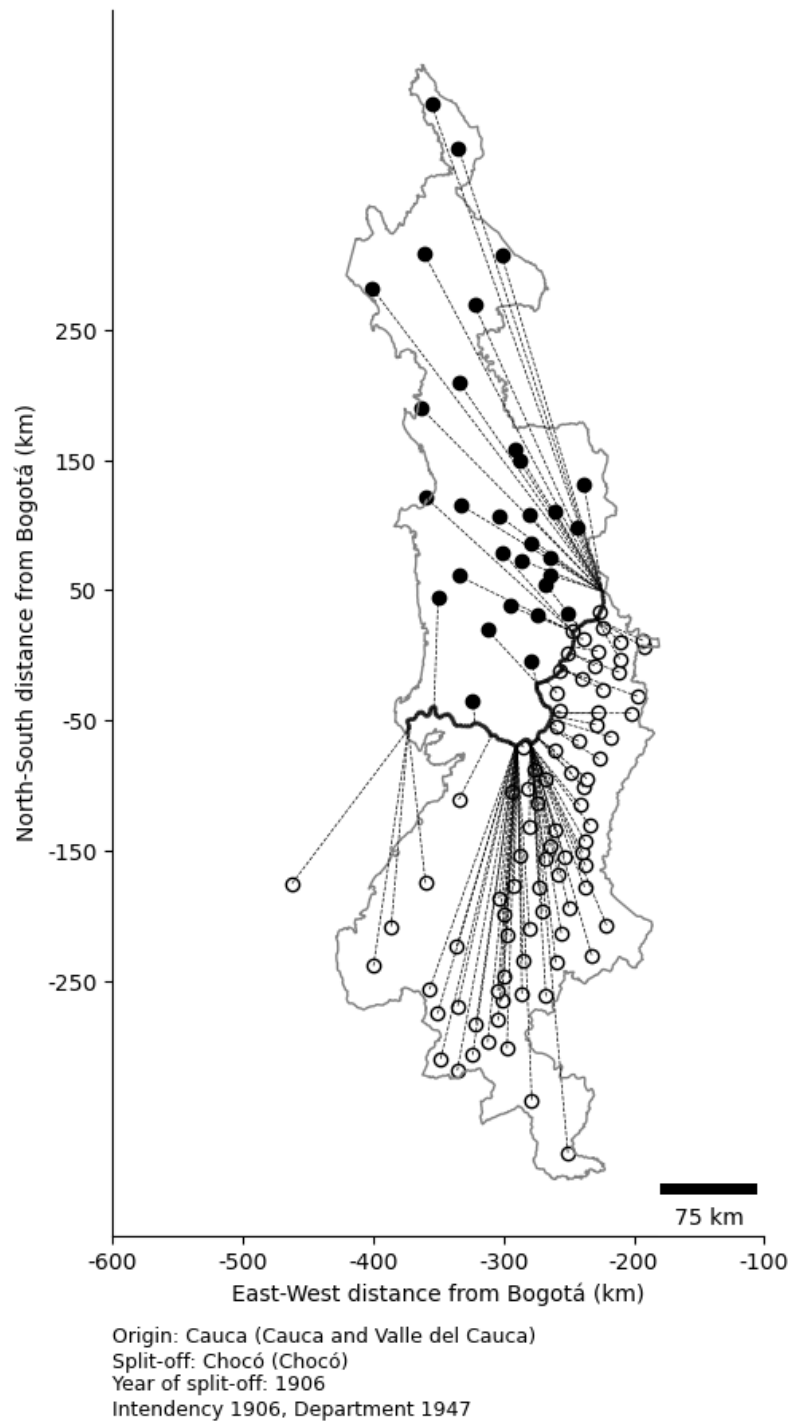


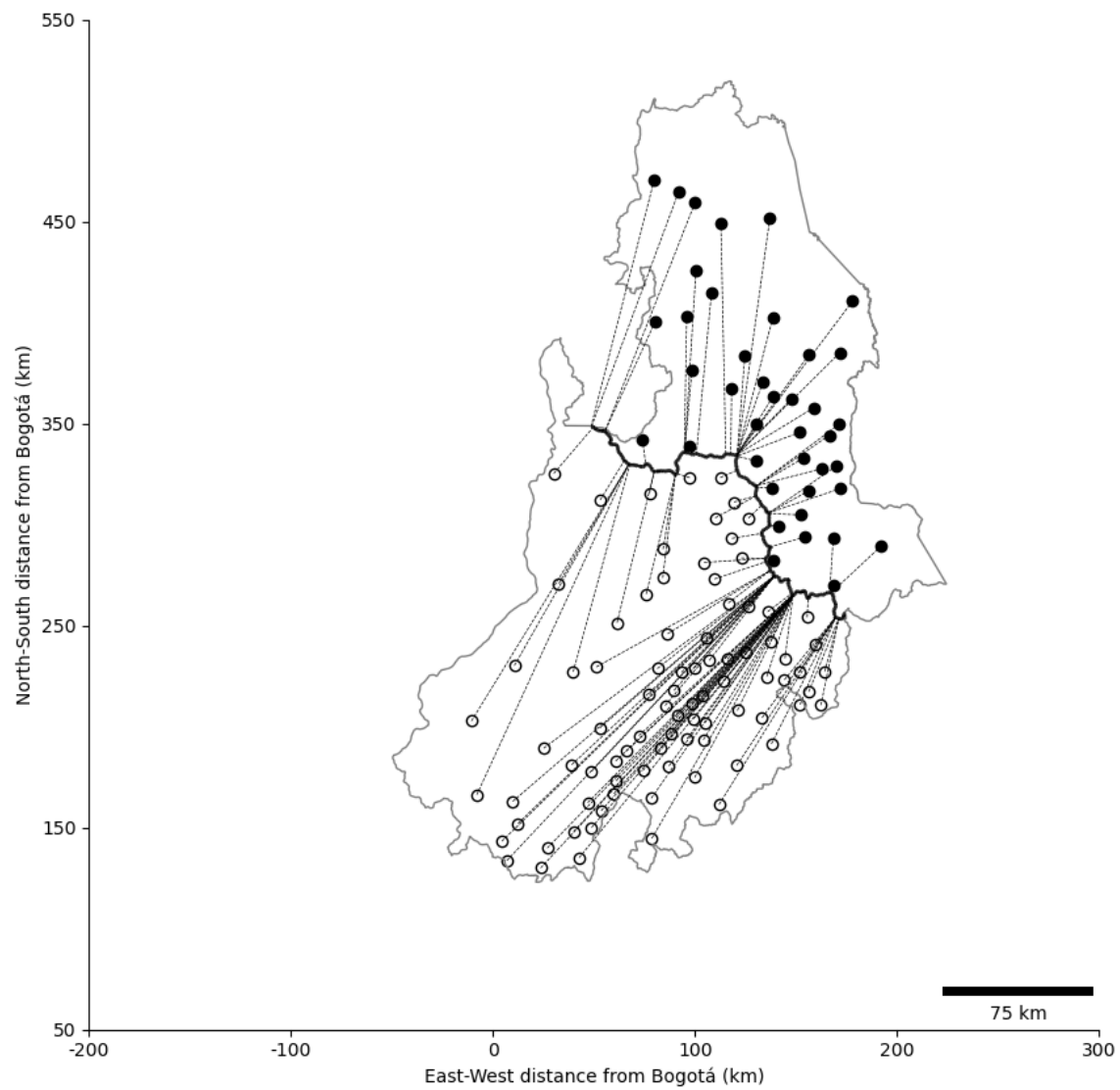
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 Split-off: Caquetá (Caquetá)  
 Year of split-off: 1905  
 Intendency 1905, Commissariat 1912, Department 1981



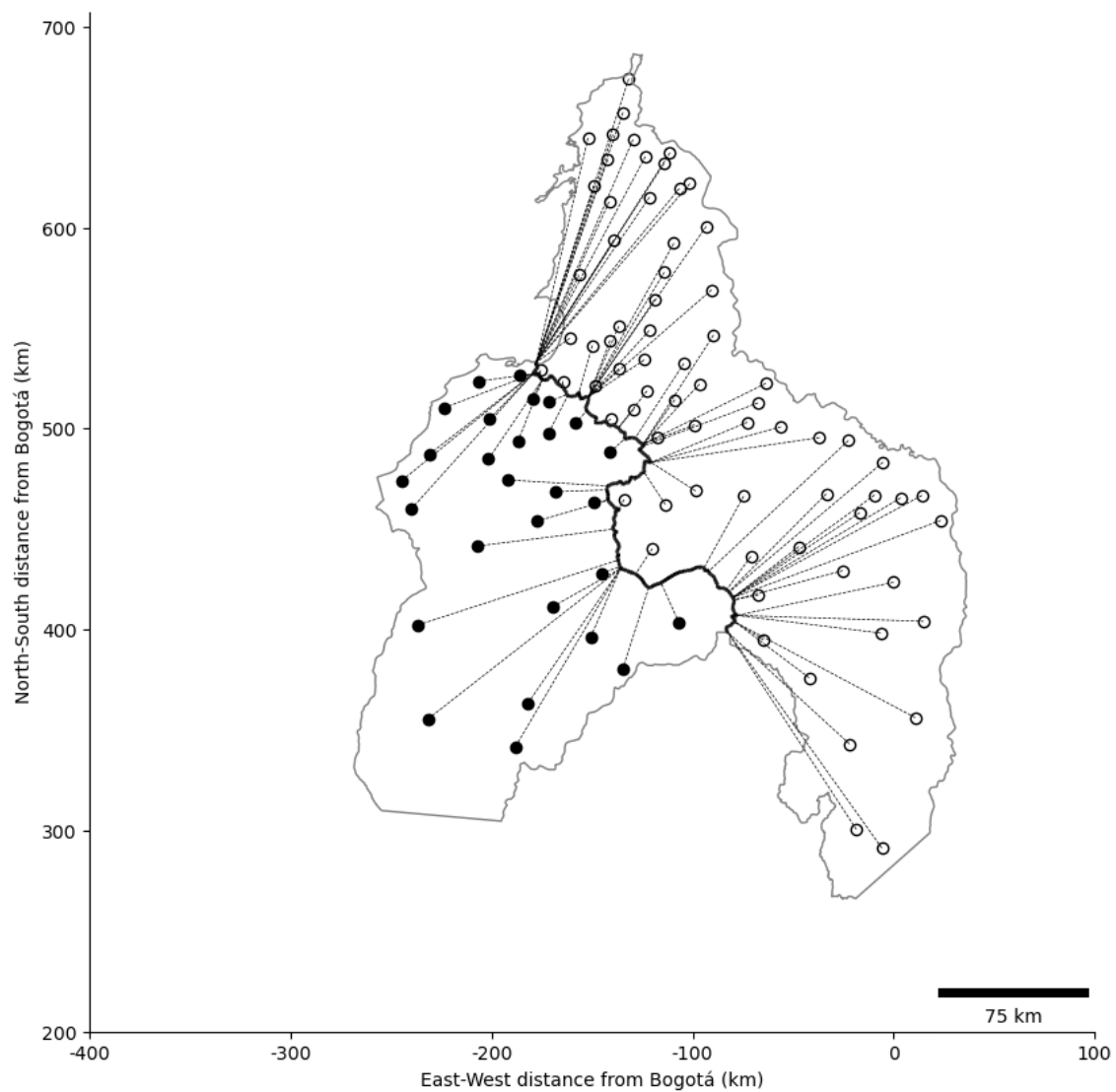


Origin: Caquetá (Caquetá, Cauca, Chocó and Valle del Cauca)  
 Split-off: Putumayo (Putumayo and Amazonas)  
 Year of split-off: 1905  
 Intendency 1905, Commissariat 1912, Department 1991

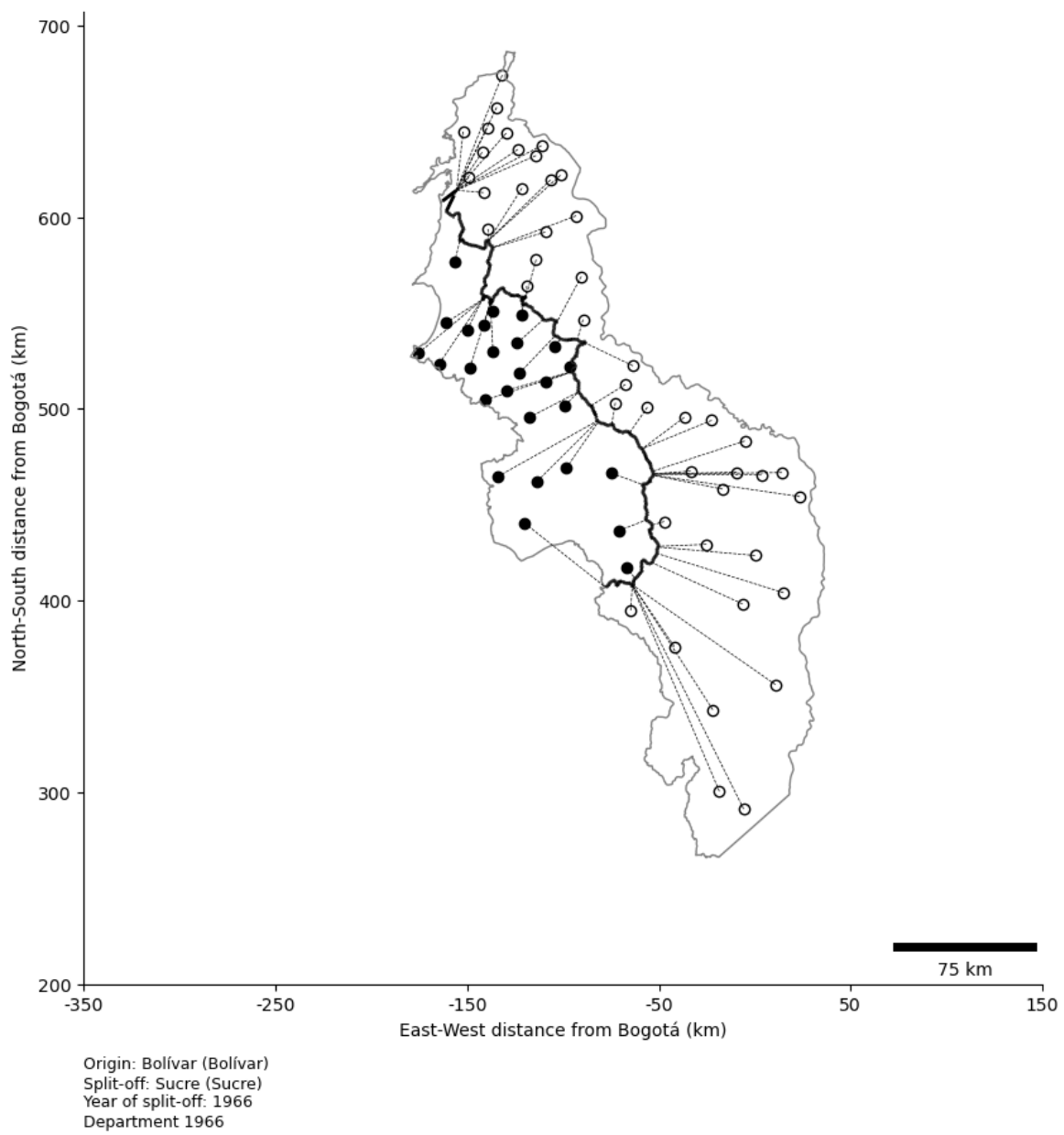


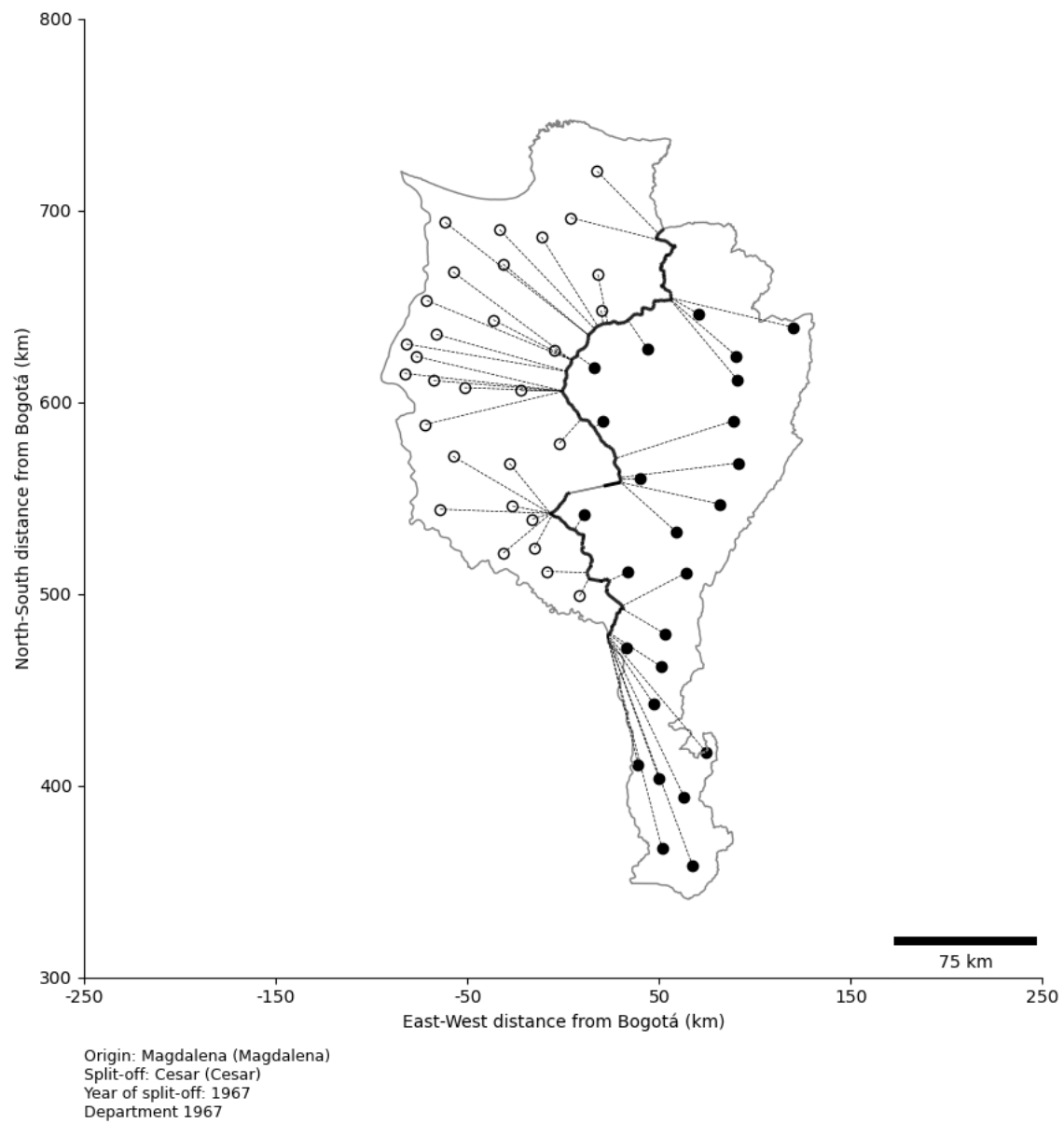


Origin: Santander (Santander)  
 Split-off: Norte de Santander (Norte de Santander)  
 Year of split-off: 1910  
 Department 1910

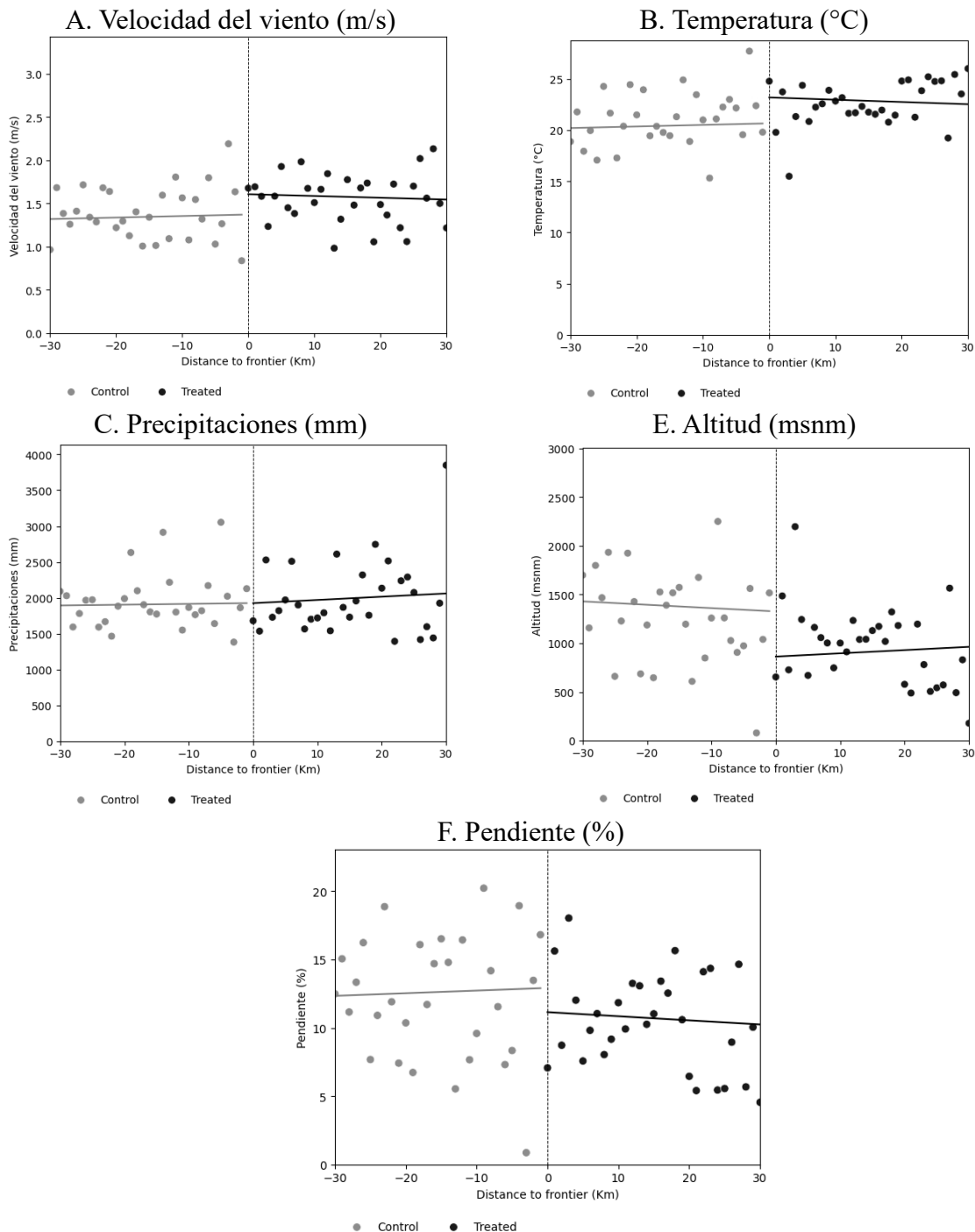


Origin: Bolívar (Bolívar and Sucre)  
 Split-off: Córdoba (Córdoba)  
 Year of split-off: 1952  
 Department 1952





## Anexo 2. Comportamiento de las principales covariables alrededor de la distancia a la frontera



Nota: El panel presenta las regresiones de las principales variables de control sobre la variable de distancia. El gráfico muestra los promedios locales de los resultados en intervalos del 2km, representados frente al margen de distancia a la frontera.

