Long-Term Impact of Territorial Division on Municipal Poverty[♦]

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Extended Abstract

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1. Introduction

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).

2. 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.

3. Empirical strategy

3.1. Geographic Discontinuous Regression (GIR)

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. The general regression equation can be described as:

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

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, $\boldsymbol{X}$ it is the vector of covariates mentioned above and ψ_d are the departmental fixed effects.

3.2. An experiment in territorial division as an instrumental variable

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.

Formally:

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

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*.

Formally, we express the first level as:

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

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 π_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.

4. Results

4.1. Geographic discontinuous regression

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.

Controlling for the third-degree polynomial of the distance to the boundary, we do 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.

4.1. Estimation with instrumental variables

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.

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.