Essays on the Political Economy of Latin American Development

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Abstract

This dissertation consists of three independent chapters about the political economy of development in Latin America. The first chapter, entitled "Tied to the Land? Intergenerational Mobility and Agrarian Reform in Colombia", examines the intergenerational impacts of providing land to the rural poor. I use ID numbers to track applicants to the 1968 Colombian agrarian reform and their children in various administrative data. Exploiting discontinuities in the allocation of parcels, I find that the children of recipients exhibit higher intergenerational mobility. In contrast to the view that land would tie them to the countryside, today these children participate more in the modern economy. They have better living standards and are more likely to work in formal and high-skilled sectors. These findings appear driven by a relief of credit constraints that allowed recipients to migrate to urban centers and invest in the education of their children.

The second chapter, entitled "The Colonial State and Long-Run Development in Mexico", investigates the persistent effects of the colonial state (or *Real Audiencia*) in Mexico. In regions further away from its control, Spanish settlers faced weaker accountability to coerce native populations and extract natural resources. Using a spatial regression discontinuity design, I document that regions with weaker colonial state presence exhibit lower historical and contemporary economic prosperity.

After Independence, suggestive evidence indicates conflicts were more prevalent in these regions as the state struggled to monopolize violence. Meanwhile, communities (or *pueblos*) developed norms of parochial cooperation - higher in-group cooperation but lower trust towards the state. I argue this environment weakened property rights in the long-run.

The third chapter, entitled "Acting Like a State: Evidence from Colombian Paramilitarism" with María A. Bautista and James A. Robinson, studies early state formation in light of the experience of the Frente José Luis Zuluaga (FJLZ), a paramilitary group in the department of Antioquia, Colombia led by Luis Eduardo Zuluaga alias "McGuiver". Drawing from several data sources, including extensive fieldwork, we document how the empirical evidence about this group contradicts the most prominent theories on the origins and nature of the state. Amid the absense of the central state and their fight against guerrillas, the FJLZ tried to establish a monopoly of violence, enforced their own written legal system, raised taxes, and provided other public goods, including roads, electricity, schools and houses for the poor. They also had a bureaucratized non-clientelistic organization with functional specialization.

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Chapter 1

Tied to the Land? Intergenerational Mobility and Agrarian Reform in Colombia

1.1 Introduction

Improving economic mobility among the rural poor is a pressing challenge across the developing world. In the 20th century, providing land through agrarian reform was a central development strategy assisting this purpose. This policy is thought to have helped East Asian tigers drastically reduce extreme poverty but to have mostly failed in other latitudes (Dai and Tai, 1974). Its relevance continues into the present, as debates about implementing similar measures are recurrent in several developing countries, including South Africa, China, India and many Latin American countries (Narayan et al., 2018; World Bank, 2008, 2006). Yet, empirical evidence on whether land can expand economic opportunity remains remarkably scarce. This often leads to widespread controversy about the effectiveness of

agrarian reform, because it consumes significant resources and provokes political tensions in society.

A widely held view against providing land to rural families is that it often them ties to the countryside. Since at least the 1960s, leading development experts have been concerned that it can produce a mass of "poor farmers working their small parcels with hand tools" (Currie, 1961, p. 37). Agrarian reforms typically introduce prohibitions to sell or rent the land, which may discourage migration and curtail economic mobility. These possibly force recipient families to remain in the traditional agricultural sector instead of transitioning to more productive sectors (Banerjee and Newman, 1993; De Janvry et al., 2015). At the same time, however, advocates of reform have spoken about the need to create owners of land. With greater assets, the rural poor can obtain a permanent source of income. They can also secure more credit or insurance, which in turn will help them invest more effectively (Besley et al., 2012; Goldstein and Udry, 2008; De Soto et al., 1989). Thus, the children of recipients may have better education, improving their productivity (Banerjee et al., 2015, 2011, 2000; Deininger and Feder, 2001).

In this paper, I examine the intergenerational impacts of providing land to the rural poor through the lens of the 1968 Colombian agrarian reform. This is a challenging question to study, because historical information that tracks recipients of land across time and space is rare, and the allocation of land is not a random phenomenon. I overcome these issues by employing newly available archival records from the extinguished Colombian Institute for Agrarian Reform (or INCORA) in Bogotá to construct a dataset characterizing 2,178 applicants to the *Sharecroppers and Tenants Program* in 1968–1970. Using names and national identification numbers (IDs), I search birth certificates in notarial records to find the children of a quarter of applicants. I match this information with various

government administrative data from the 2000s to track 45% of (or 86% of living) recipients and non-recipients and 89% of the subsample of children. [1]

I estimate the causal impacts of providing land by exploiting a source of plausibly random variation that influenced the allocation of parcels. Aware of the high demand for land, the Colombian government designed a selection mechanism to benefit the most vulnerable families. After expropiations took place, poor farmers interested in the land were surveyed. A simple grading system combined data from several socioeconomic characteristics to assign them a score. Depending on geographic conditions, INCORA officials determined the number of parcels available for allocation. Only after having this information, officials set score thresholds, making applicant manipulation difficult. Applicants with scores above thresholds were eligible to receive a parcel intended to generate between two to three times the average annual income of a rural household, but with restrictions to sell it for ten years. My analysis, therefore, uses a regression discontinuity design to compare applicants who were just above and below a predicted score threshold but similar along many socioeconomic dimensions. [2]

I find that accessing land actually led recipients, and particularly their children, to participate *more* in the modern economy. Indeed, recipients experienced improved living standards; the baseline estimates document that households eligible to be allocated land between the years of 1968 and 1970 increased their wealth index in 2006 by 0.2 standard deviations relative to non-recipients. These effects

[1] This includes the following databases: Vital Statistics, Social Security, Social Benefits, Financial System, Civil Conflict, and Chambers of Commerce.

[2] As a validity check on the identification strategy, I further show that there is no selective sorting that could affect my outcomes of interest or consistently bias the findings. In Appendix A, I present evidence that results are highly robust to the selection of bandwidth and RD functional form.

are mainly explained by better housing conditions, one of the components of the wealth index. In 2010, they were marginally less likely to register for government poverty subsidies and 4 percentage points more likely to earn above minimum wages, relative to a sample mean of 3%. Although they were also marginally more successful in leaving agriculture, they were not necessarily more likely to enter the formal economy, which limited their use of financial markets. This suggests positive but modest developmental impacts.

I then look at intergenerational dynamics to understand whether these impacts persisted across generations or faded out. The children of recipients exhibited, on average, better living standards relative to those from non-recipients and their parents. In 2006, their household wealth index was 0.3 standard deviations higher. The effects are explained by various components of the index, including better housing conditions, asset property, and access to public services. In 2010, they were 24 percentage points more likely to enter the formal sector, relative to a sample mean of 39%, and 22 percentage points more likely to earn above minimum wages, compared to a base of 17%. They were also more likely to work in high-skilled sectors, work as formal entrepreneurs, contribute to Social Security, and use financial markets – an entire bundle of measures that form the nexus of modern economic life. As pre-treatment socioeconomic characteristics of applicants were balanced around the predicted score threshold, these findings are indicative of considerable upward economic mobility.

As previous estimates only report local treatment effects, I complement the analysis by studying intergenerational mobility among all applicants. While causal claims cannot be made with this exercise, it is still informative about economic mobility. I use wealth and years of schooling as outcome variables. Similar to Chetty et al. (2014), I rank applicants based on their outcome levels relative to

other applicants with children in the 1970s--1980s birth cohorts. I then rank the children of applicants based on their outcome levels relative to other children in the sample. I characterize intergenerational mobility for recipient and non-recipient families based on the slope of rank-rank relationships, which identify the correlation between children's and parents' positions in the outcome distributions.

These ranks are almost linear and highly robust to alternative specifications. Across all applicants, relative intergenerational mobility was low, but the children of recipients exhibited better rates. A 10-percentile point increase in recipients and non-recipients rank was associated with 4.8 and 6.0 percentile increases in their children's relative wealth rank, respectively. Similar results are reached when using education. I find that upward mobility for the children of non-recipients in the bottom quarter of the wealth distribution was 29; for children of recipients, it was 34, which rules out that effects are caused by worse outcomes for better-off rural families. In summary, these findings show that providing a father with a productive asset can significantly *improve* a family's well-being and change the intergenerational path of their children. They do not merely reveal persistence, but rather, show *amplifying* effects across generations.

After documenting intergenerational impacts, I draw on Colombian historical evidence to explore theoretical mechanisms. I focus on how land could have helped recipient families enter the modern economy (Harris and Todaro, 1970; Lewis, 1954). First, I look at geographic mobility. Using the regression discontinuity design, I compare the municipality where applicants lived in 1968–1970 to where they resided four decades later. In contrast to a widely held view that recipient families may have been tied to the land, I find they exhibited *higher* geographic mobility. Recipients were 20 percentage points more likely to have migrated, relative to a mean of 50%, and 11 percentage points more likely to have done

so to large urban centers, compared to a base of 19%. Likewise, their children were 27 percentage points more likely to have moved, relative to a mean of 70%. These children were also 22 percentage points more likely to have gone to big cities, compared to a base of 39%. In cities they presumably found new economic opportunities. To confirm migration is a prime mediating factor, I run the baseline estimations excluding urban migrants, and find that impacts disappear.

I also study whether land was used to invest in the education of children, who subsequently had the skills to enter the modern economy. In 2006, the children of recipients born after the reform had accumulated 1.5 more years of schooling on average, relative to a mean of 5.3. They were also 17 percentage points more likely to have finished primary school, compared to a base of 52%. Effects are attenuated if the whole sample of children is used in the analysis. Moreover, I also rule out alternative channels such as the civil conflict. [3] Consistent with a setting where an asset appears to have relieved credit constraints on urban migration costs and education, notarial records show that almost 30% of recipients formally sold their land within a few years of the reform. Presumably, even more did so through informal land markets.

Finally, I evaluate the cost-effectiveness of the policy, an important element when analyzing its convenience. I compare previous intergenerational benefits with the fiscal costs of the *Sharecroppers and Tenants Program* using a cost-benefit analysis. Historical data suggests that land redistribution cost the state 0.5% of GDP in 1970, a sizable effort equivalent to 7% of the national budget (Tamayo,

[3]Suggestive evidence indicates that migration may have also been mediated by the Colombian civil war but is unlikely to account for the main impacts of the reform. Recipients were marginally more prone to have been forcefully displaced from their plots in 1985-2000. This is consistent with accounts in the Colombian historiography documenting violence against small farmers (CNMH, 2016).

1970). However, only a bit less than twenty thousand rural families received land (INCORA, 1970). Using previous estimates, I predict the lifetime earnings for an average recipient child. I then calcute different net-present benefit scenarios per recipient family. While caution is warranted because calculations reported rely on several strong assumptions, estimates suggest providing land through agrarian reform was not cost-effective. The baseline fiscal investment made per recipient family had a rate of return of -80%, while the most favorable scenario still yields rates of -40%.

This paper contributes to a growing empirical literature on intergenerational mobility and the persistence of past shocks. Efforts to understand intergenerational mobility have mostly focused on the US and other developed nations (Black and Devereux, 2010; Chetty et al., 2014; Clark, 2014; Corak, 2013; Solon, 1999). Yet, economic mobility in developing countries remains an under-researched area, primarily due to data limitations and selection bias. In Colombia, as in much of the developing world, available studies underscore the persistence of low intergenerational mobility rates (Narayan et al., 2018; Montenegro and Meléndez, 2014; De Ferranti et al., 2004). Moreover, contrary to previous studies that document modest or nonexistent intergenerational impacts of shocks or lotteries, I uncover new findings on how transfering assets can alleviate poverty across generations (Bleakley and Ferrie, 2016; Cesarini et al., 2016; Sacerdote, 2005).

The paper also complements attempts to understand agrarian reforms and the development process. A majority of research efforts in social science focuses on the aggregate economic and political effects of these reforms, particularly in India and Latin America, finding mixed results (Montero, 2018; Besley et al., 2016; Dell, 2012; Banerjee et al., 2002; Besley and Burgess, 2000). This study takes a different approach and provides, to the best of my knowledge, the first micro-

level evidence about the long-run consequences for recipients of land. I can precisely investigate the channels of persistence and explore theories of migration and economic transformation (Harris and Todaro, 1970; Lewis, 1954). While this exercise is uninformative about general equilibrium shifts, it is not necessarily relevant in this context as the reform only affected a small number of rural families.

Overall, these findings have broad implications for development policy. If the reason that recipients benefit from accessing land is to sell it to relieve credit constraints, then policymakers can think of alternative policies that would subsidize these costs. Future research could shed light on whether, for example, other asset transfers or credit incentives, can be a more socially effective tool for raising the well-being of the rural poor than politically costly land redistribution. This paper is organized as follows. In the next section, I describe the Colombian agrarian reform in 1968. In section 1.3, I explain the data sources and the linkage methods and present the empirical strategy, providing evidence on its validity. In section 1.4, I present the main findings on intergenerational mobility. Section 1.5 explores the mechanisms behind the impacts of the reform. In section 1.6, I perform a cost-benefit analysis of the policy. Finally, section 1.7 concludes.

1.2 Historical Background

1.2.1 The Policy Debate

Just prior to the reform, Colombia had ended a decade-old civil war known as *La Violencia*, and the National Front, a political agreement to govern between the two traditional political parties, the Liberals and Conservatives, had come into effect. Heated public debates among policy makers called for a solution to the

"land problem" (Currie, 1951, 1961; Hirschman, 1962, 1967). Colombia suffered from a legacy of high rural poverty and inequality, which not only discouraged the productive use of land, but also incited social conflicts and violence in the countryside (Fals-Borda and Luna, 1962; LeGrand, 1988). A World Bank mission in 1950 concluded that there were too many landless peasants struggling in the mountains to achieve barely enough subsistence, while large landowners, many of them cattleranchers and in possesion of the best lands, were highly unproductive. It was estimated that around 50% of the private rural land was owned by the top 1% of landowners (Kalmanovitz and López, 2006; **?**). Furthermore, the smallest 10% of farms was twice as productive as the top decile (DANE, 1960). [4]

Policy makers were divided around potential solutions to transform the rural reality. Harvard professor and leading development expert, Albert Hirschman, suggested that providing land could facilitate a mass of productive farmers and improve their economic mobility. [5] Other defendants of this stance also argued that such a policy could appease civil unrest in the countryside at a time when revolutionary threats were looming (Karl, 2017; Fals-Borda, 1957). [6] In contrast, Lauchlin Currie, another former Harvard professor and advisor to US president Franklin Roosevelt during World War II, favored a radically different approach. He was afraid agrarian reform would produce "poor farmers working their small

[4]Other related problems described in the Currie Mission included technical and financial assistance, as well as the provision of rural public goods such as health, education, and transport services.

[5]Albert Hirschman spent much of his career studying Colombia. He served as a advisor to the National Planning Department (1952–1954) and was a private economic counselor (1954–1956). He was in favor of other complementary measures for solving the "land issue", including taxing unproductive land and updating the national cadastre.

[6]In many parts of the country, such as the departments of Tolima and Huila, redoubts of liberal guerrillas from the 1950s and newly created rebel groups (FARC, ELN, etc) threatened social order and increasingly attacked large landowners.

parcels with hand tools" (Currie, 1961, p. 37). Having led the World Bank mission, he determined that the best solution was to promote rural migration into the cities, freeing land to be cultivated by fewer and larger farms with more sophisticated techniques.

Both Hirschman and Currie saw the need for industrialization. They were inspired by Arthur Lewis's 1954 seminal theory of development with unlimited supplies of labor (Lewis, 1954). In the model, the traditional agricultural sector is typically characterized by an abundance of labor and a fixed amount of land. As a result, the agricultural sector has a quantity of peasants who do not contribute to agricultural output, since their marginal productivities are close to zero. On the other hand, the modern manufacturing sector is defined by higher wages relative to the subsistence sector, higher marginal productivity, and a demand for more workers. Thus, the central process of development consists of moving people from the traditional agrarian sector to the expanding modern manufacturing sector as the economy transforms. [7] A few years later, Harris and Todaro (1970) postulated that urban migration played a pitoval role in such a transition.

1.2.2 Overview of the Colombian Agrarian Reform

In 1961, after overcoming opposition from the landowning elite in Congress, Colombian president Alberto Lleras Camargo enacted an agrarian reform (Law 135) to raise the living standards in rural areas. It combined a traditional approach – initiated under the *Sharecroppers and Tenants Program* – whereby the government could expropiate land that was inadequately being exploited and transfer it to

[7] Numerous critics, however, have pointed out that the rigid assumptions in the Lewis model fail to capture the difficulties of structural transformation, such as the costs of migration or educational investment (Kirkpatrick and Barrientos, 2004).

sharecroppers, tenants, or smallholders, with a massive colonization program through the titling of *baldios* – or state-owned lands – to settlers at the frontier (INCORA, 1974). [8] However, experts cautioned that the reform would be difficult to roll out. The law created numerous, often complicated, and even contradictory legal procedures, in a country with precarious institutional capacity (Villamil-Chaux, 2015). President Lleras Camargo summed up his vision in a famous speech, where he proclamed that "more than a country of laborers, Colombia must be a country of owners" (Lleras-Restrepo, 1961, p. 41).

The initiative had the support of numerous politicians and civic organizations; [9] it also received help from other Latin American countries and even the United States through the Alliance for Progress. [10] In 1962, the government created the Colombian Institute for Agrarian Reform (INCORA) to centralize operations and granted it with considerable autonomy and relatively sizable human and financial resources. [11] Progress on the much anticipated land redistribution was hindered by a low pace of expropiations and administrative problems inside the agency, as the reform met fierce political resistence from landowners, who considered it

[8] In this paper, I concentrate on investigating the first program, although a second companion paper studies the titling of *baldios* at the agricultural frontier.

[9] See the ideological positions of different political movements, including those from opposition leaders, such as López Michelsen (MRL), Álvaro Gómez Hurtado (Conservative Party), and Diego Montana Cuellar (Communist Party), in Lleras-Restrepo (1961).

[10] In particular, the Kennedy administration, worried about the spread of communism in the region, provided financial and technical aid through USAID.

[11] INCORA delegated the execution of policies to its 8 territorial entities, each of which was responsible to the General Manager (INCORA, 1974). The agency also pioneered a variety of data systems to monitor the progress of its operations and determine resource allocation. It leased two mainframe computers (models IBM 360 and IBM 1620) from IBM, the first of its kind in the country (INCORA, 2002).

a threat to their power. [12] In 1966, newly elected liberal President Carlos Lleras Restrepo significantly expanded the *Sharecroppers and Tenants Program.* [13] Through Law 1 of 1968, he eased the legal requirements for acquiring land and regulated the conversion of sharecroppers and tenants into owners of Agricultural Family Units (or AFU) – or parcels intended to generate between two to three times the average annual household income of a rural family [14] (INCORA, 1971).

According to official projections, the agency made an estimated 9 million hectares of land available for redistribution. Nevertheless, with more than 800,000 landless farmers in the countryside, policy makers considered it "impossible to think about allocating a parcel of land to every rural family" (INCORA, 1970, p. 78). The government set the target to acquire 1 million hectares over a 20-year period and benefit almost 400,000 rural families. Thus, INCORA saw no other alternative but to establish a criteria that allowed to "quantify and classify by priorities the families subject to agrarian reform" (INCORA, 1970, p. 78). The agency designed a selection mechanism that used a scoring system to rank rural families interested in receiving land based on their socioeconomic conditions and prioritized the most vulnerable of them (Directives 1-23 of 1966). I further describe this mechanism in Section 1.2.3 and use it in the empirical strategy in Section 1.3.4.

[12]Historical evidence suggests landowners appealed to legal maneveurs and used political connections in the justice system to delay or stop expropiations (Fajardo, 1986; Palacios, 2011). More extreme methods included targeted violence against former tenants and sharecroppers. See, for example, important essays in CNMH, 2014 about emblematic cases in the Caribbean Coast and Antioquia.

[13]President Lleras Restrepo also promoted the creation of the National Peasant Association (or ANUC) to organize small farmers (Zamosc, 1978). The organization assembled one million members and played a crucial role in pressing for change through social protest.

[14]This amounted to USD 800 (or $15,000 Colombian pesos) in 1970.

The actions undertaken during these years considerably increased the reach of the reform and targeted the heart of the country, most notably the Andean regions (Antioquia, Cundinamarca, Tolima), southwestern regions (Nariño, Valle del Cauca, Cauca) and the Caribbean Coast (Magdalena, Bolivar, Cesar). Between 1968 and 1970, the government initiated more than twelve thousand expropiation processes, targeting 1/3 of the landholdings elegible for redistribution (see Figure 1.1). [15] Of these, half were found to be uncultivated or inefficently used. Nevertheless, only around 10% of these landholdings actually came into possesion of INCORA through the National Agrarian Fund. [16] Similarly, the agency only managed to title 389,630 hectares to 19,478 rural families, providing them with an average parcel of 20 hectares. [17] Consequently, the reform was considered a national failure after only accomplishing 5% of official targets at a considerable financial cost equilavent to 0.5% of GDP [18] (CNMH, 2016; INCORA, 1988); (Balcázar et al., 2001). While expectations were far from materializing, the results were not negligible, considering the tremendous administrative and legal difficulties to acquire land and transfer property rights to recipients.

At the end of 1970, an INCORA report vowed to not "capitulate to the pressure and inflexible position of the landowners, who [...] are determined to maintain the

[15] These included properties of over 100 hectares registered in the cadastre that were deemed ineficiently used by INCORA officials.

[16] Around 90% of expropiation processes were knocked down by local judges with political connections ot the landowing elite. Of these landholdings, 68% were farms of less than 60 hectares.

[17] The majority of acquired lands were reported to be of regular quality and lacked access to markets. INCORA often needed to invest in infrastructure and agricultutural adaptation before redistributing it back.

[18] This translated into USD 2,700 or ($50,000 Colombian pesos) per recipient in 1970. These costs included compensation and purchase from landowners, legal expenses, and agricultural investment requirements (Tamayo, 1970).

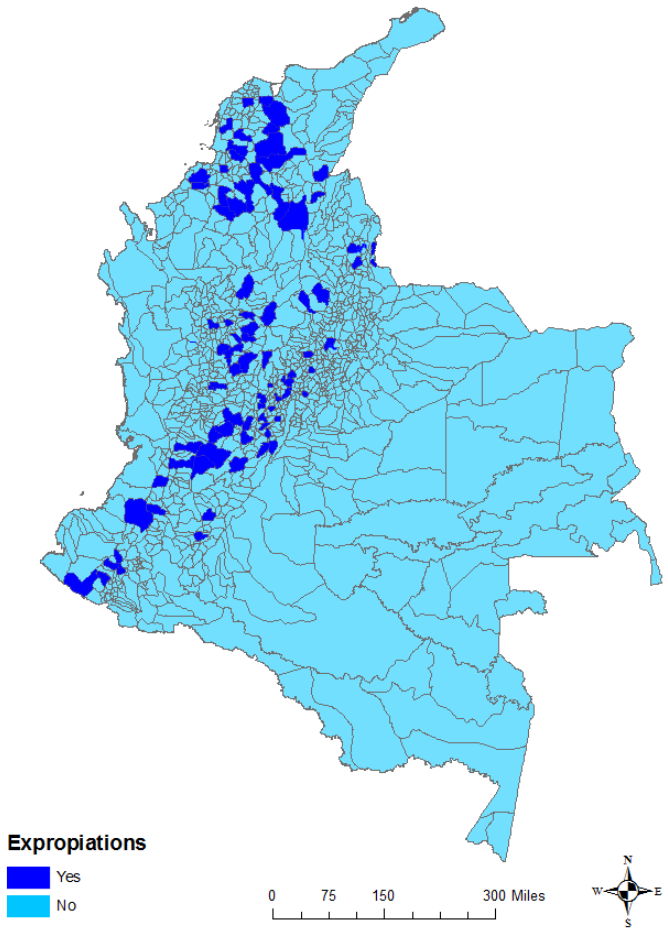


Figure 1.1: *Agrarian Reform Expropiations 1968-1972*

Notes: This map shows the geography of expropiations between 1968-1972. Municipalities in darker colour experienced at least one expropiation during agrarian reform. Most expropiations concentrated in the Andean and Caribbean regions. Source: INCORA.

status quo" (INCORA, 1970, p. 199). Yet, the decline of agrarian reform began when conservative Misael Pastrana was sworn in as president. The *Sharecroppers and Tenants Program* was notably underfinanced, and the agency concentrated its efforts on the titling program of *baldios* at the frontier, considered much more economical and politically viable (INCORA, 1974). In 1972, the Pastrana administration signed the *Pact of Chicoral* to stop expropiations and modify the purposes of Law 135. [19] A

[19]This pact was made in conjunction with representatives from the Liberal and Conservative parties and the landowing elite assembled in the municipality of Chicoral, Tolima.

few months later, the enacment of Law 4 of 1973 effectively ended attempts of the National Front to change the country's land structure through land redistribution (INCORA, 1974); Machado (2013); Palacios (2011). [20] As the General Manager of INCORA, Carlos Villamil-Chaux, concluded decades after: "the country was simply not ready for it". [21]

1.2.3 The Allocation of Land

During the Lleras Restrepo administration, the national goverment issued a series of decrees to regulate the process of expropiation and allocation of land (Decrees 2861 of 1996 and 719 of 1968). After INCORA opened an expropiation inquiry, agronomists and technicians were dispatched to evaluate whether a particular landholding was uncultivated or used unproductively according to the guidelines of Law 135. Their evaluation was based on key geographical and agronomical conditions. [22] The final report, called *informe de visita* (or visit report), was transmitted to the regional office of the agency. In conjunction with central authorities, the expropiation of a particular landholding was then recommended or rejected, and expropiated lands entered the National Agrarian Fund (NAF). [23] Landowners could appeal the decision before judicial authorities, who were then

[20] Law 4 of 1973 was not retroactive. As such, most expropiation processes that were initiated during the reform continued their course, but new processes were forbidden.

[21] Interview on December 4, 2017.

[22] For example: the level of agricultural production, soil quality, ruggedness, water, etc., the degree of market access, and the presence of sharecroppers or tenants.

[23] Law 35 established different modalities of land adquisition: expropiation, compensated expropiation, purchase, cession, and extinction of private domain. In the case of a purchase, negotiations with the owner were carried out to agree on a price and form of payment. Approximately 80% of the land that entered the program was purchased after cumbersome and often lengthy negotiations.

responsible for reviewing the case and confirming or reversing the initial decision, oftentimes instigating a power clash with the central government.

Once a landholding was cleared for redistribution, INCORA used a selection mechanism to allocate poor farmers into parcels (Directives 1-23 of 1966). Several steps were followed. First, the agency issued a statement informing the public about the decision. Then, authorities convened a local board of representatives elected among sharecroppers or tenants through voting procedures. The local board oversaw the selection process and helped officials. Next, they opened the registration of applicants interested in the land. Sharecroppers, tenants, and nearby landless farmers were eligible to apply. Once a list was compiled, officials and the local board surveyed applicants on their family characteristics, agricultural experience, assets, and income (*formulario de aplicación* or application form). The regional office of INCORA used a simple grading system to aggregate responses into a continuous score for each applicant and ranked them. As shown in Table 1.1, the grading system was designed to reward larger, mature, and poorer families, as well as more experienced sharecroppers and tenants.

Furthermore, using technical studies that measured agricultural capacity, the agency decided how to split the land into similar Agricultural Family Units (AFU). They were intended to generate between two to three times the average rural household income and varied considerably in size, reflecting the large variation of geographic and climatic conditions across the country. [24] Knowing the avaibility of land, officials then decided on a score threshold to select recipients. The threshold was different for each expropiation process because the number of applicants and the size of AFUs also varied (see Appendix A). It was equivalent to the minimum

[24] In my sample, they varied between 6 and 40 hectares.

Table 1.1: *INCORA Score System*

	Points
Family Age (in years):	
14-17	10
18-24	15
25-44	20
45-54	15
55-60	10
<14 or >60	3
Years of Agricultural Experience:	
Points per year	2
Assets (in pesos):	
0-5.000	20
5.001-10.000	15
10.001-20.000	10
20.001-30.000	5
>30.000	0
Housing Investments (in pesos):	
0-5.000	0
5.001-10.000	5
10.001-20.000	10
20.001-30.000	15
>30.000	20

Notes: This table presents the INCORA score system used to allocate land during agrarian reform. After an expropiation, applicants were surveyed and ranked. Points assigned in each category were aggregated into a continous score. Source: Directives INCORA.

score needed to fit into the last available parcel, conditional on the number of available AFUs. In order to prioritize the poorest families, implicitly only those above the score threshold were eligible to receive land. Meanwhile, those below were mandated to vacate the landholding. [25]

The final steps of the process involved registering parcels at a notary and formally transferring property rights to each recipient. According to archival records, the procedure was followed in the majority of cases. However, figures also reveal that not all of the potential recipients were actually allocated into parcels, suggesting possible corruption or administrative problems at later stages of the

[25]In the last years of the reform, the option to create a cooperative or community firm was also included (INCORA, 1971).

process. Upon receiving the UFA, most recipients also agreed to a specific set of conditions. For instance, they could not sell their land for at least 10 years without the approval of INCORA, a measure that was designed to incentivize their retention in rural areas. Moreover, they accepted the financial terms of the transfer, which in certain cases involved the payment of a loan at subsidized interest rates, and could not reapply to any agency program in the future. The government never tracked applicants over time, making it impossible to evalute the effects of the *Sharecroppers and Tenants Program* up to now.

1.3 Data and Empirical Strategy

1.3.1 Agrarian Reform Data

This study employs historical micro-level data constructed from the archives of the extinguished Colombian Institute for Agrarian Reform (or INCORA) in Bogotá, Colombia. The archives are managed by the National Land Agency (or ANT) and were salvaged in 2015 after the Colombian government centralized the organization of agrarian records. [26] They contain information about all INCORA operations between 1962 and 2002. Only 1/3 of the archives have been properly catalogued, including the majority of agrarian reform records from 1962 to 1993. [27] While difficult to quantify, historical and anecdotal evidence, including interviews with former INCORA and current ANT officials, suggests some agrarian reform

[26]The INCORA archives were previously scattered accross 16 different territorial entitites and are protected by legal reserve. They were accessed through a confidentiality agreement with the ANT.

[27]With the financial help of other institutions, the ANT has catalogued the majority of agrarian records from 1962 to 1993. The process has been delayed by a lack of funding sources and there remains much to be discovered.

records may have been lost, stolen, or burned during the past decades. As such, the information collected cannot be considered complete. To the best of my knowledge, however, there are no relevant complaints suggesting these episodes targeted certain files disproportionately more than others.

I gather information on 218 successful expropiation processes under the *Sharecroppers and Tenants Program* during 1968–1970. [28] Consistent with historical evidence, most of them were concentrated in the Caribbean Coast and the Andean departments of Antioquia, Cundinamarca, and Tolima (see Figure 1.1). The expropiation files contain legal documents and technical studies of each expropiation process, including the delimitation of Agricultural Family Units, and original surveys carried out by officials on applicant families. [29] The surveys contain information characterizing peasants' socio-economic conditions according to the questions designed by INCORA (see Appendix A). In particular, they register applicants' personal information, including their full name, ID number (or *cédula de ciudadania*), address, household members, occupation, working experience, wages, assets, types of crops grown, and in several cases, the scores assigned by INCORA officials to rank each family. Some of the expropiation files are written by hand, while others show the use of typewriters, but all are fairly consistent in the information reported. This data is crucial for reconstructing the scores, thresholds, and pre-treatment balance used in the empirical strategy.

After INCORA expropiated a landholding, officials allocated parcels and issued land titles to recipients. Nevertheless, this information is not found in the

[28] As mentioned in section 1.2, 90% of expropiation processes were discarded based on judicial sentences that struck down INCORA's operations, and only a handful of those were successfully redistributed to landless farmers.

[29] Information of applicants is included both in visit reports and application forms, and I use both to construct the dataset.

expropiation files, but rather in individual agrarian records. Thus, in order to identify which applicants were effectively allocated land and titled – that is, the treatment variable – I merge the previous data with micro-level land titles from the National Land Agency and notarial records from the Superintendence of Notaries and Registry (or *Superintendencia de Notariado y Registro*). Using all this information, I construct a novel dataset of 2,178 agrarian reform applicants, of which 36% were recipients. [30] These figures translate into around 10 applicants per process and an average AFU of 18 hectares allocated to recipients.

1.3.2 Linking Applicants and Children

Once I have the agrarian reform dataset, I use the names and national ID numbers of applicants to find their children at the National Identification Archive (ANI) of the National Registry of Civil Status (or *Registraduria Nacional del Estado Civil*). [31] This government agency is in charge of identification duties and vital statistics. It keeps track of all adult Colombians issued an official ID number, compiling relevant information such as birth and death certificates, voting registration, and biometric information. When a child was born, fathers were mandated by law to register the birth at a notary by filing a birth certificate. Historically, though, this norm was not usually followed by rural families residing at peripheral areas of the country, where notarial services were seldom offered and people instead registered new borns at churches. However, numerous expropiations ocurred in places near the center of the country, where presumably, a higher supply of notaries existed.

[30] Through out the process, I only take recipients of AFUs into account, and not those who created cooperative or community firms.

[31] While many surveys contained information on the children of applicants, they did not register their ID numbers, because they were minors.

I use birth certificates, which list both father names and their ID numbers, to track the descendants of applicants. Out of the 2,178 applicants in the agrarian reform database, I am able to identify the children for approximately 23% of them. This represents 1,094 children out of 493 applicants, or 2.2 children per applicant. In the process, I search for both names and adult ID numbers (or *cédulas de ciudadanía*) of the children. Unlike numerous studies on intergenerational mobility, I am able to track both sons and daughters. The subsample does not suffer from differential attrition among recipients and non-recipients, reassuring that results derived from its use have external validity. Furthermore, the probability of finding a child in notarial records is uncorrelated with the treatment variable or other pre-treatment characteristics from applicants (see Appendix A.2, Table A.4). Nonetheless, it represents applicants who, on average, resided closer to populated areas.

1.3.3 Contemporary Administrative Data

I combine diverse sources of outcome data to test the impacts of providing land. Using full names and ID numbers from applicant families and a simple phonetic algorithm, I merge the agrarian reform data with administrative information in the 2000s to measure living standards (see Appendix A.2.3 for a full explanation of the algorithm). [32] First, I use three components of Social Security records in 2010 from the Ministry of Health and Social Protection: Health Affiliations (or *RUAF-afilicaciones*), Vital Statistics (or *RUAF-nacimientos y defunciones*), and Social

[32] I unsuccesfully tried to find applicants and their children in the 1980s and 1990s, but the quality of administrative data made it an impossible endeavor. Before the 2000s, most micro-level records, such as population censuses or household surveys, were erased or lost at the statistical office (or *DANE*).

Table 1.2: *Applicants and Children in Contemporary Administrative Data*

Database	Name	Year Observed	Recipients	Non-Recipients	Difference	Standard Error
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Applicants						
Social Security	*RUAF*	2010	46.3	43.9	0.0237	(0.0222)
Formal Labor Market	*PILA*	2010	2.3	1.1	0.0122**	(0.00544)
Social Benefits	*SISBEN*	2006	33.6	33.5	-0.0316	(0.0319)
Financial System	*SuperFinanciera*	2010	11.9	10.9	0.0102*	(0.00595)
Business Records	*RUES*	2010	0.7	0.5	0.00223	(0.00195)
Panel B: Children						
Social Security	*RUAF*	2010	88.9	89.5	-0.00585	(0.0314)
Formal Labor Market	*PILA*	2010	23.6	15.5	0.0815**	(0.0388)
Social Benefits	*SISBEN*	2006	61.7	64.9	-0.0238	(0.0530)
Financial System	*SuperFinanciera*	2010	47.4	41.9	0.0556**	(0.0264)
Business Records	*RUES*	2010	12.2	8.5	0.0379*	(0.0217)

Notes: This table shows the linkage between agrarian reform data in 1968-1970 with contemporary administrative databases for applicants (Panel A) and their children (Panel B). Columns (1) and (2) indicate the official name of an administrative database, shown in rows, and the year in which it is observed. Coeficients in columns (3) and (4) show the matching rates in percentage terms, differentiating between recipients and non-recipients. The difference of these two columns is shown in column (5) and the standard error in column (6). The linked data of 45% of (or 87% of living) applicants and 89% of children in Social Security records are the baseline samples for regressions in Tables 4 (Columns 1-3), 5 and 8. The linked data of 33% of applicants and 63% of children in Social Benefits records are the baseline samples for regressions in Tables 4 (Columns 4-6), 6, 7 and 9. *** p<0.01, ** p<0.05, * p<0.1.

Security Contributions (or *PILA*) databases. [33] Together, these datasets encompass 90% of the population and register personal information regarding birth and death characteristics, the nature of employment and Social Security, formal wages, informality and occupation. While Social Security records contain most adults in the country, they do not systematically collect the same information for people in informal and formal sectors. Importantly, wages are not observed for those working in the informal sector. Altogether, in 2010, I am able to track roughly 46% of applicants (or 86% of living applicants) and 89% of the children in the subsample of applicants for which I found their children (see Table 1.2). I consider this my baseline dataset for the empirical analysis.

Second, I use Social Benefits records (or *SISBEN*) designed by the National Planning Department (or DNP) and implemented by municipal governments

[33]Records collect information after 2008 from all Colombians affiliated to Social Security and on birth and death certificates across the country.

in 2006. [34] The SISBEN has a dataset with national coverage that tracks the poverty and vulnerability conditions of over 30 million people (around 66% of the population) in need of receiving social benefits from the central government. It contains personal and household questions regarding education levels, housing conditions, public services, assets, and employment. While there have been critiques of *SISBEN*, overall, the evidence points to the source as being reasonable, if potentially noisy. I track a bit more than a third of applicants and almost two thirds of their children. I find no statistical evidence of differential attrition based on matching rates between recipients and non-recipients, a fact that I confirm using death certificates. Furthermore, I find no differential attrition between the children of recipients and those of non-recipients (see Table 1.2). I analyze the issue of differential attrition in detail and the implications it entails for the interpretation of the results in section 1.4, when I present the findings. [35]

Next, I use alternative administrative data about financial markets, entrepreneurship, and civil conflict. First, I use Financial and Business records from 2010 from the Superintendence of Finance (*SuperFinanciera*) and Chambers of Commerce (*RUES*). They store micro-level information regarding the nature of financial products (bank accounts, loans, etc.) and transactions made by individuals in the formal financial system and the creation of new firms. The datasets are considered high quality, but they exclude people who live in the informal economy. I also use the *Unique Registry of Victims* – administered by the Colombian Agency of Victims –

[34] The *SISBEN* tracks all Colombians who register to receive government poverty subsidies. The information collected is used by the government to prioritize and focus poverty subsidies. Although indicative of who seeks aid, it does not mean that all individuals in the dataset are poor or receive help.

[35] Datasets that are not balanced (*PILA*, *SuperFinanciera*, and *RUES*) are precisely used as outcome variables.

and death certificates that contain personal level information of people victimized in the midst of civil conflict. Most importantly, this database registers the date and place, and in the majority of cases, a description of events. Finally, using names and IDs, I web scrape information on criminal records from all applicant families at the prosecutors' offices and national police.

1.3.4 Empirical Strategy

A simple OLS estimation of the intergenerational impacts of providing land would most likely be biased, because recipients and non-recipients differed along a range of observable (and probably unobservable) characteristics. For example, recipients had, on average, more experience and smaller wages, and they were also younger. Thus, the most informative estimation approach is to use a local linear regression discontinuity design that exploits variation from discontinuities induced by the INCORA selection mechanism. The analysis compares applicants with predicted scores just above, or being eligible to become recipients of land, and below predicted thresholds who were very similar along other socioeconomic dimensions. Thresholds were defined as the minimum score able to fit into the last UFA for each expropiation process and rescaled around zero to make them and applicants comparable (see Appendix A.2).

Archival information shows the selection mechamism was usually carried out, but not always executed perfectly. In some instances, applicants unqualified for receiving a parcel were reported to have been allocated one and vice-versa. While this could reflect random errors, the most plausible explanation is the presence of administrative or corruption problems involving government officials at the end of the process. Moreover, information across expropiation files was not always

systematic, and predicted scores and thresholds must surely suffer from measurement error. Nevertheless, even if compliance was imperfect and measurement errors significant, the discontinuity generated by the selection mechanism at each threshold still induced a change in the probability of accessing land through agrarian reform. Therefore, applicants just above the predicted threshold serve as a reasonable counterfactual to those below it. The empirical specification used for applicants and children is as follows:

$$y_{i,e} = \gamma_1 d_{i,e} + \gamma_2 f_d(dist_{i,e}) + \gamma_3 d_{i,e} f_d(dist_{i,e}) + \alpha_l + X'_{i,e}\beta + \epsilon_{i,e} \tag{1.1}$$

where $y_{i,e}$ is a relevant outcome variable for applicant (or child of applicant) i in expropiation process e, and $d_{i,e}$ is an indicator variable equal to 1 if applicant i was elegible to become a recipient in expropiation process e. $f_d(dist_{i,e})$ is an RD polynomial in distance to the predicted score cutoff, $X_{i,e}$ is a set of covariates, α_e an expropiation process fixed-effect, and $\epsilon_{i,e}$ an error term that is normally and independently distributed. Robust standard errors are clustered at the applicant family level, since applicants are the treated unit, and children received treatment through their fathers. This RD specification estimates a local average treatment effect of the casual impact of accessing land on applicants (and children) who were inclined to become agrarian reform recipients because their predicted score was above the threshold in the selection mechanism. It is important to notice that this empirical exercise compares applicants and families within each expropiation process, and estimates are not influenced by applicants who would have been allocated land regardless, either because they were extremelly poor or capable of manipulating the system.

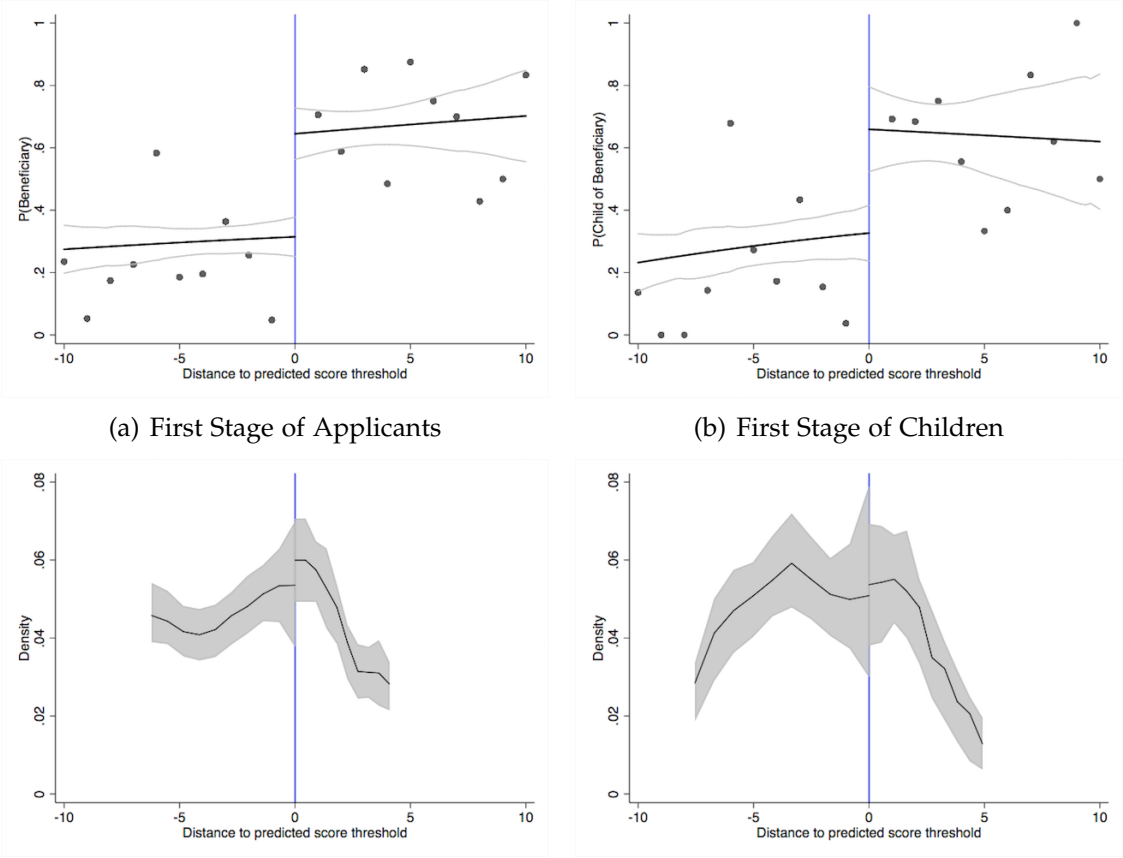
Now, following Calonico et al. (2014), the baseline specification for equation (1) uses a local linear RD specification estimated separately on each side of the cutoff.

Furthermore, the baseline bandwidth is the optimal bandwidth that minimizes the mean squared error of the point estimator. Appendix A provides robustness tests using different RD polynomials, kernel functions, and various sample bandwidths to address concerns that the estimation results are specific to the choice of RD polynomial or bandwidth. I also use alternative methods developed by Imbens and Kalyanaraman (2012) to demonstrate consistency in the results. The local linear RD setup requires the existence of a first stage and two identifying assumptions: 1) agrarian reform applicants must not have selectively sorted around the cut-off based on their pre-treatment characteristics; and 2) all factors besides being selected as a recipient using the INCORA score system must change smoothly at the threshold.

First Stage

I first examine the existence of a first stage. Figure 1.2a graphically looks at the relationship between being above the predicted INCORA score threshold and the likelihood of being allocated land. Each point in the figure represents the percentage of recipients within score bins. Dashed lines show 95% confidence intervals. A positive distance signifies that the applicant is above the threshold. The solid line plots predicted values from a local linear regression of being allocated land on a quadratic polynomial in the score, estimated separately on either side of the predicted threshold. Applicants with a score just above the predicted threshold are approximately 50% more likely to have been allocated land during the agrarian reform, and the F statistic hovers around 9–10, providing evidence of a strong first stage. Similarly, Figure 1.2b shows these results are extensive to the sample of children, although somewhat less powerful. While compliance with the reform

was far from perfect, the key issue for identification is the sharp discontinuous change in the probability of receiving of land near the threshold.



(a) First Stage of Applicants

(b) First Stage of Children

(c) McCrary Test of Applicants

(d) McCrary Test of Children

Figure 1.2: *First Stage and McCrary Test*

Notes: This figure graphically documents the first stage of the RD design. Panel (a) presents the estimated regression discontinuity plot on an indicator variable equal to 1 if an applicant was allocated land during the agrarian reform 1968-1970. Panel (b) presents the same regression on an indicator variable equal to 1 if a child had an applicant parent that was allocated land during the agrarian reform 1968-1970. The points represent the average value of the outcome variable in score bins. The regressions are estimated using local quadratic polynomials in the predicted INCORA score estimated separately on each side of the reform threshold and use an uniform kernel. Panels (c) and (d) implement the sorting test suggested by McCrary (2008) and plots the number of observations in each cumulative predicted INCORA score bins for applicants and children. The plotted regressions use the number of observations in each bin as the dependent variable on each side of the cut-off to test if there is a discontinuity in the density of applicants at the score cut-off. 95% confidence intervals around the estimated lines are shown in the shaded area. Source: INCORA.

Identifying Assumptions

Next, it would be problematic if applicants were consistently able to manipulate information or colluded with local selection boards to change their scores to place them just above the required threshold and these actions were correlated with their

characteristics. Some examples of these problems include if better-off applicants bribed or lied to officials, or, on the contrary, if authorities manipulated the system to benefit certain families. Ex-ante, it is unclear the actual sign and magnitude of the bias. In any case, this would require previous knowledge of INCORA's calculations about the size of AFUs and thresholds, which seems unlikely based on the available historiographical evidence. In order to check for the presence of selective sorting, I implement a McCrary test by collapsing the data into score-bins and using the number of observations within each bin as the dependent variable in equation (1). Figure 1.2c illustrates that there is no discontinuous change or bunching in the number of observations in each bin around the predicted threshold, suggesting that applicants, on average, were unable to manipulate their score to become recipients. In Figure 1.2d, this finding is extensive to the subsample of children and consistent with the version of then director general of INCORA, Carlos Villamil Chaux, who emphasized in an interview the professionalism of their work. [36]

Despite the lack of statistical evidence of selective sorting, it could still be the case that applicants with scores just above the threshold differed systematically in their characteristics (such as experience, income) from those just below. To test this, I examine whether key characteristics in 1968–1970 used to predict scores are balanced across the threshold using micro-level agrarian reform and vital statistics data, including information regarding age, education, working experience, crop cultivation, area, housing, and income. In particular, I estimate equation (1) for these socioeconomic characteristics and present the estimated coefficient of interest,$d_{i,l}$, for each of these variables in Table 1.3. There is no substantial jump at

[36]Interviewed on December 4, 2017.

Table 1.3: *Pre-Treatment Balance in 1968-1970*

	Age	Years of Schooling	Years of Agricultural Experience	Log(Wages)	Has House	Plot Area (in Hec)	Grows Cash Crops	Grows Staple Crops
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Applicants				
Recipient	-2.137	-0.125	1.134	-0.107	-0.0379	-0.222	0.0934	-0.0342
	(1.627)	(0.975)	(0.842)	(0.137)	(0.0265)	(0.296)	(0.142)	(0.0183)
Observations	410	401	410	462	540	540	462	462
Bandwidth	4.3	5.2	4.8	5.4	6.1	6.1	5.5	5.5
Mean Dep. Var.	24.8	2.06	7.0	2.3	0.17	2.1	0.43	0.80

Notes: This table documents pre-treatment balance among applicants within the optimal RD bandwidth. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the applicant. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. The RD regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). The outcome data source for column (1) is *RUAF*, column (2) is *SISBEN* and columns (3)-(8) is INCORA. For a description of dependent variables see Appendix A.2 Table A.9.

the threshold (see also in Appendix A.1.2 the reduced form plots). In the baseline estimates, there are no statistical differences within the optimal RD bandwith between recipients and non-recipients across all variables, providing evidence that the assumption of relevant factors varying smoothly at the threshold is reasonable.

1.4 Impacts on the Rural Poor

1.4.1 Living Standards

I now investigate how providing land impacted the lives of recipients and their children. I first look at the long-run effects of having been an agrarian reform recipient on living standard outcomes. Using Social Security records (*RUAF*) in 2010, I code life expectancy as the probability of being alive and other dummy variables measuring the likelihood that a person registers for goverment poverty subsidies and earns formal wages above the minimum wage. While I don't have information on household income or consumption, I use information from Social Benefits records (*SISBEN*) in 2006 on housing quality, access to public services

(electricity, running water, sewage), and quantity of assets to construct a wealth index. To address multiple hypothesis testing concerns – and also to show that effects are not driven by the coding of categorical questions into binary outcomes – I compute a summary measure created using principal component analysis (PCA) that combines information from all available welfare questions. PCA is described in detail in Appendix A.2.4. As people registered in the SISBEN are generally among the most vulnerable, estimates using this dataset are probably underestimated.

Table 1.4 reports results for applicants in Panel A and for their children in Panel B. I show RD linear estimations, specify the bandwith used, and include in all regressions a set of the following controls to improve precision: age, ethnicity, sex, and expropiation process fixed effects. Since treatment is at the individual level, I use robust standard errors clustered at applicant family level for applicants and their children. In Panel A, columns (1) to (3) illustrate that being a recipient incremented the wealth and housing indexes by 0.2 and 0.3 standard deviations, respectively. Estimates are significant at 5% confidence level. Meanwhile, the assets index and access to different to public services barely change and are statistically insignificant, suggesting the effects are mostly driven by the quality of housing. Column (4) documents that recipients of the reform are, on average, equally likely to be alive in 2010 than non-recipients. The coeficient is statistically insignificant, indicating similar attrition rates among applicants. Finally, columns (5) – (6) show that recipients were 9 percentage points less likely to register for government poverty subsidies and 4 percentage points less likely to have formal wages above the minimum wage. These results are qualitatively large compared to the sample means.

In Panel B, I explore the effects on the children of recipients. The sample size is considerably smaller because, as explained in section 1.3, I was unable

Table 1.4: *Living Standards*

	In 2006			In 2010		
	Wealth Index	Housing Index	Asset Index	Alive	Register for Poverty Subsidies	Above Minimum Wage
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Applicants					
Recipient	0.196**	0.298**	0.0172	0.0238	-0.0927	0.0429*
	(0.0999)	(0.124)	(0.239)	(0.0512)	(0.108)	(0.0252)
Observations	405	345	345	963	324	577
Bandwidth	7.0	5.3	5.3	5.0	4.0	7.2
Mean Dep. Var.	0	0	0	0.46	0.72	0.02
	Panel B: Children					
Recipient	0.319**	0.369***	0.232**	-0.0543	-0.215*	0.221**
	(0.151)	(0.108)	(0.109)	(0.0625)	(0.123)	(0.0868)
Observations	393	298	298	646	460	460
Bandwidth	6.4	4.1	4.1	6.2	4.2	4.6
Mean Dep. Var.	0	0	0	0.89	0.58	0.17

Notes: This table documents the intergenerational impacts of having received land in 1968-1970 on contemporary living standards using an RD design. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). The outcome data source for columns (1)-3 is *SISBEN* and for columns (4)-(6) is *RUAF*. For a description of each dependent variable see Appendix A.2 Table A.11. For a description of the construction of the wealth index see Appendix A.2 Table A.12.

to find the descendents for all applicants. I consider sons and daughters born after the reform and divide them into groups of adults (more than 18 years old) and young children (less than 18 years old, but older than 5 years), as applicants had children at different points in time between 1970 and 2000. Columns (1) to (3) document that in 2006, the children of recipients scored 0.32, 0.37, and 0.23 standard deviations higher on average on the wealth, housing, and assets indexes relative to those of non-beneficiares. They also had marginally better access to public services, including being 18 percentage points more likely to have running water, relative to a sample mean of 37%. Furthermore, in column (4), estimates show that the children of recipients were also equally likely to be alive in 2010, suggesting no differential attrition. Finally, they were 22 percentage points less

likely to demand government poverty subsidies, relative to a sample mean of 58%, and 22 percentage points, more likely to have been earning above minimum wages, compared to a base of 17%. [37] Estimates are statistically significant at the 1% and 5% confidence level. The magnitudes of coefficients are large relative to sample means and those of applicants, signaling substantial intergenerational impacts.

Across both applicants and children, RD estimates surpass a variety of robustness checks. Tables A.1 and A.2 document that the estimated impacts on living standards are robust to the choice of bandwidth, kernel function used to construct the local-polynomial estimator, and RD polynomial. I use bandwidths that are half and twice the size of the baseline optimal bandwidth according to Imbens & Kalyanaraman (2011) (the Calonico et al. (2014) bandwidth is nearly identical), different kernel functions (for example: triangular and epanechnikov), and quadratic and cubic polynomials, although certain specifications lack the proper sample power, and estimates can become incresingly noisy. Moreover, I run two placebo checks estimating regressions at two fictitious INCORA thresholds (plus and minus 10 points in distance from the actual predicted score threshold). Results in Appendix A also show that the effects described in the previous paragraphs emerge only at the particular predicted INCORA cutoff. In all regressions across the placebo checks, the coefficients remain statistically insignificant but sometimes change signs. [38]

[37] While rural wages in the informal sector are not observed, they often tend to be below the legal minimum wage.

[38] Estimates in Table 1.2 are much larger than the OLS estimates (see Appendix A, Table A.4). This could be the case of downward attenuation bias, or the OLS could be a biased estimate of an average treatment effect that is different from the local average treatment effect estimated by the RD.

1.4.2 Modern Economy

Next, I show that recipients, and in particular their children, not only exhibited better living standards, but also participated more in the modern economy. Measures of this include having better labor market conditions, working in high-skilled sectors, and having access to other private services in the formal economy, such as financial markets. Table 1.5 documents these effects using various sources. For those matched in Social Security records in 2010, I code various dummy variables measuring the likelihood of being unemployed (conditional on being able to work) and working in the formal sector, as well as the nature of employment and contributing to the Social Security system. I also use worker and sectoral (CIIU 2) employment codes to understand differences in labor mobility and the propensity to move out of agriculture. I complement this exercise with information from financial records (*Superfinanciera*) in 2010 and business records from the Chambers of Commerce. I code additional variables measuring the likelihood of having access to different financial services (bank accounts, credit cards, and loans) and starting a formal business or becoming entrepreneurs. As before, Panel A shows results for applicants, while Panel B does so for their children.

Table 1.5: *Modern Economy in 2010*

	Labor Markets			Financial Markets			Economic Activity			
	Works	Works in Formal Sector	Contributes to Social Security	Has Bank Account	Has Credit Card	Has Loan	Agriculture	Manufacturing	Services	Entrepreneurship
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Panel A: Applicants					
Recipient	-0.0143	0.118	0.0264	0.0672*	0.0171	0.0433	-0.152*	0.0108	0.154*	0.00585
	(0.0967)	(0.0833)	(0.0243)	(0.0388)	(0.0111)	(0.0492)	(0.0811)	(0.0138)	(0.0827)	(0.0111)
Observations	345	415	543	387	456	456	445	415	415	445
Bandwidth	5.8	4.2	6.4	4.2	5.5	5.5	5.2	5.3	5.2	6.4
Mean Dep. Var.	0.45	0.03	0.01	0.26	0.01	0.02	0.64	0.04	0.14	0.01
					Panel B: Children					
Recipient	-0.0422	0.245**	0.180**	0.157**	0.0390**	0.138**	0.0239	0.132**	-0.149	0.104**
	(0.111)	(0.111)	(0.0830)	(0.0684)	(0.0152)	(0.0565)	(0.101)	(0.0607)	(0.115)	(0.0467)
Observations	367	460	460	460	512	452	496	460	496	460
Bandwidth	5.1	4.2	4.2	5.2	6.5	5.5	5.4	4.4	5.4	4.5
Mean Dep. Var.	0.41	0.39	0.18	0.44	0.18	0.25	0.35	0.11	0.30	0.10

Notes: This table documents the intergenerational impacts of having received land in 1968-1970 on contemporary modern economy outcomes using an RD design. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). The outcome data source for columns (1)-(3) and (7)-(9) is *RUAF*, for (4)-(6) is *SuperFinanciera* and column (10) is *RUES*. For a description of each dependent variable see Appendix A.2 Table A.11.

Across developing countries, labor formality is a salient sign of transition to a modern economy. Informal employees tend to be paid lower wages, work in less productive activities, and are disproportionately located in rural areas. They also receive fewer benefits and legal protections. In Panel A, column (1) shows that recipients of the reform were not necessarily more likely to be working in 2010 than non-recipients. Columns (2) and (3) illustrate that they were marginally more likely to have done so in the formal sector and have contributed to Social Security, which includes both the subsidized poor population by the government and those who contribute to private insurers. The RD estimates are not statistically significant but are close to the 10% confidence level. While it may seem small, the effect is quite large relative to the sample mean of 3%, and relevant, as labor informality among the rural poor is generally widespread. This also indicates that recipients were marginally more likely to contribute to health care and retirement plans, as well.

Moreover, columns (7) to (10) suggest that living recipients were 15 percentage points less likely to have been employed in agriculture in 2010, relative to a sample mean of 64&, and 15 percentage points more likely to have been employed in services. Both results are significant at the 10% confidence level. Thus, in contrast to the view that land incentivizes the retention of people in traditional activities, where productivity is low, these estimates signal that recipients were, in fact, more keen to move out of agriculture on average. However, columns (4) to (6) illustrate no differential or largely marginal impacts of having been a recipient on access to formal financial markets, including having a bank account, credit card, or loans. A most plausible explanation is the overwhelming informality of the majority of applicants, which would have restricted their entry into the financial system. Across all specifiations, the results are conditioned by low variation in the data

but provide suggestive evidence that recipients were marginally more succesful than non-recipients to enter the modern economy, albeit still facing important constraints.

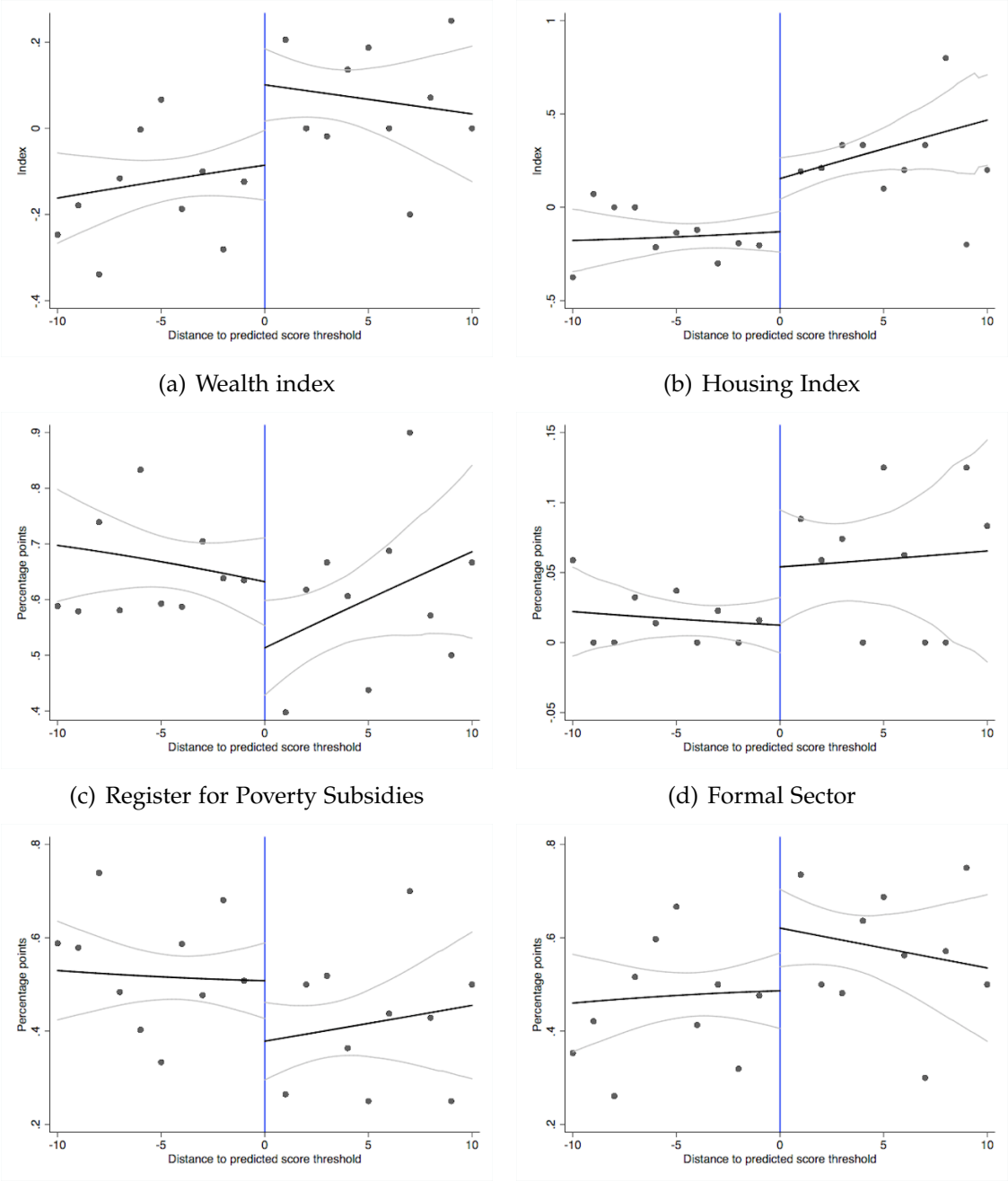
On the other hand, in Panel B, I look at the impacts on adult descendants of recipients. The children of recipients exhibited, on average, more signs of participation in the modern economy. This may be explained by the considerable expansion of Social Security and capital markets during the 1990s and 2000s, which, according to official figures, increased coverage to nearly 90% of the population. Major market reforms also helped to speed up structural transformation in the country, reducing the share of people employed in agriculture. However, consistent with results in the previous section, in columns (3) and (4) I find that in 2010, the children of recipients were, on average, 25 percentage points more likely to be working in the formal sector, relative to a mean of 39%, and 18 percentage points more likely to be contributing to Social Security, compared to a base of 18%. The RD estimates are statiscally significant at 5%, and again relatively large, when compared to sample means. Consequently, the children of recipients were also more likely to contribute to health care and retirement plans.

Furthermore, in 2010, being a child of a recipient increased the chances of using a bank account in 16 percentage points, having a credit card in 4 percentage points, and a consumer or micro loan approved in around 14 percentage points. All RD estimates are significant at the 5% or 10% confidence level. Likewise, there were no major impacts on additional financial products such as insurance or mortgages, indicating that the intergenerational impacts of the reform were limited to less-complex financial services. Partially overcoming credit constraints is a notable accomplishment. Crucially, too, the children of recipients were more likely to move out of agriculture and find jobs in high skilled sectors such as manufacturing. A

child of a recipient working in the formal sector was equally likely to be employed in agriculture (column 4) but 13 percentage points and 10 percentage points more likely to have been employed in manufacturing and become formal entrepreneurs (columns 5 and 6). These estimates are significant at the 5% confidence level. As complementary information, although not reported in the paper, there was no appreciable variation in the propensity to pay taxes, file patents, or export.

The empirical evidence presented in this section suggests substantial positive intergenerational impacts of land (see also the reduced forms for applicants in Figure 1.3 and children in Figure 1.4). They do not merely reveal persistence, but also amplifying effects across generations as the magnitudes of coefficients are notoriously larger for children relative to their parents. Given that pre-treatment characteristics are statistically balanced for applicants close to the RD threshold, the findings are indicative of considerable upward economic mobility of the children of recipients relative to those from non-recipients. Measures of this include better living standards, entry into the formal economy, employment in high-skilled sectors, access to formal financial markets, and entrepreneurship – an entire bundle of things that form the nexus of modern economic life.

At first sight, the results are consistent with older studies in economics using aggregate data on agrarian reform in India (Besley et al., 2016; Banerjee et al., 2002) but are particularly at odds with recent social science research in Latin America (Dell, 2012; Montero, 2018), which document adverse long-run effects of such policies in Mexico and El Salvador. Nervetheless, a key distinction with previous studies is the use of micro-level data, which allows me to examine direct impacts on recipient families as opposed to the whole economy. They are also hard to reconcile with recent studies that find nonexistent or marginal intergenerational impacts of wealth shocks, both in historical and contemporary settings (Bleakley



(a) Wealth index

(b) Housing Index

(c) Register for Poverty Subsidies

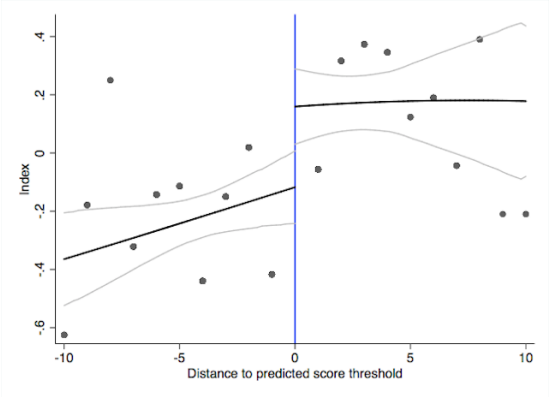
(d) Formal Sector

(e) Agriculture

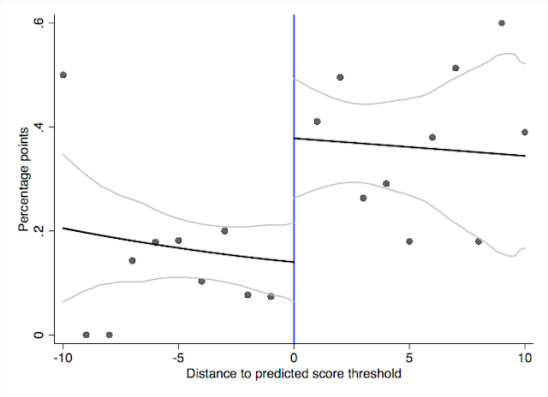
(f) Migration

Figure 1.3: *Reduced Forms for Applicants*

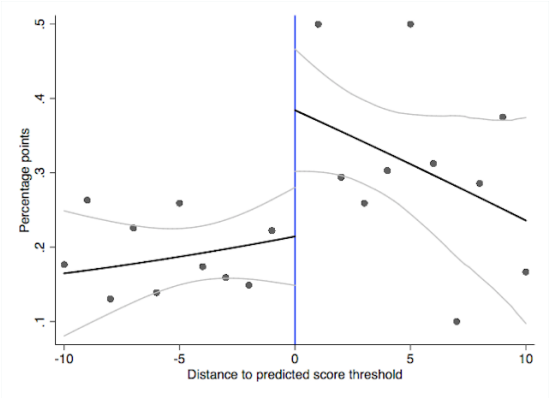
Notes: This figure graphically documents RD reduced forms for applicants on different outcome variables. It shows RD plots documenting the effect of being eligible to become a *Recipient* of land during the agrarian reform 1968-1970 for different outcome variables. Each point plots an average value within a bin. Discontinuity fixed effects have been partialled out. The solid line plots a local linear regression and dashed lines show 95% confidence intervals. Source: INCORA, *SISBEN*, *RUAF*.



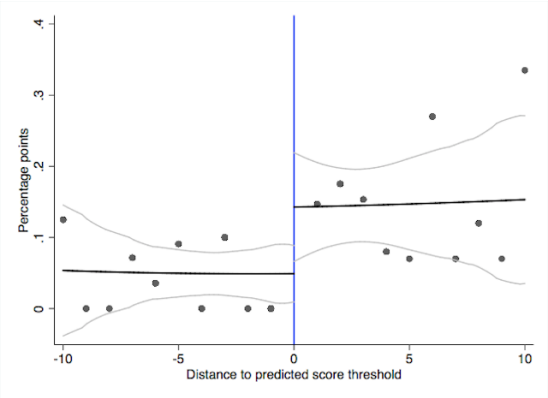
(a) Wealth Index



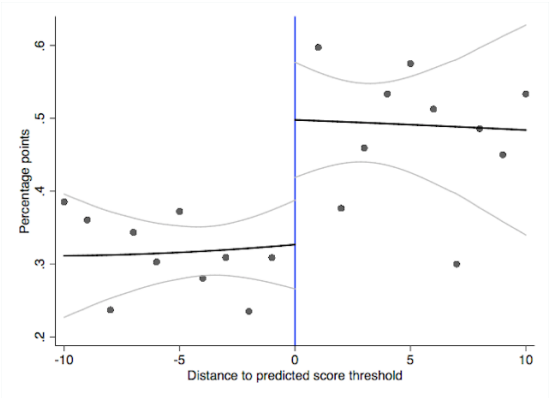
(b) Above Minimum Wages



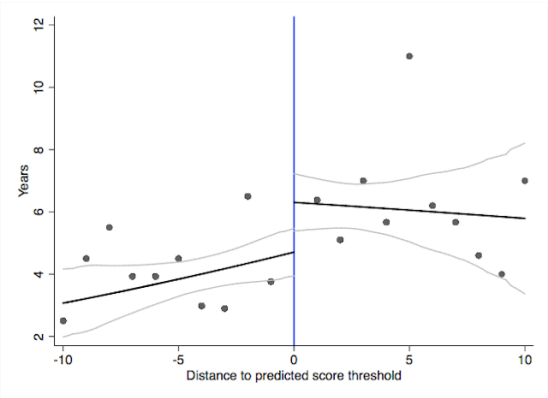
(c) Formal Sector



(d) Manufacturing



(e) Urban Migration



(f) Years of Schooling

Figure 1.4: *Reduced Forms for Children*

Notes: This figure graphically documents RD reduced forms for children on different outcome variables. It shows RD plots documenting the effect of being a child of an applicant eligible to become a *Recipient* of land during the agrarian reform 1968-1970 for different outcome variables. Each point plots an average value within a bin. Discontinuity fixed effects have been partialled out. The solid line plots a local linear regression and dashed lines show 95% confidence intervals. Source: INCORA, *SISBEN*, *RUAF*.

and Ferrie, 2016). In contrast, the findings suggest that productive assets can help alleviate poverty in the long-run. Finally, they complement a growing body of evidence on intergenerational mobility (Black and Devereux, 2010; Chetty et al., 2014; Clark, 2014; Corak, 2013; Solon, 1999).

1.4.3 Intergenerational Mobility

So far, I have shown that broading access to land through agrarian reform had significant positive impacts on recipients, and especially on children. However, these are local treatment effects and do not necessarily imply that the reform improved intergenerational mobility among all agrarian reform applicants. For instance, it could be that the children of non-recipients closed down economic advantages that existed between recipients and non-recipients relative to the children of recipients, yet they are still worse off in absolute terms. Or, it could also be the case that the children of recipients distanced themselves even further from those of non-recipients relative to their point of departure. Therefore, in this section, I analyze intergenerational mobility among all applicants to the reform.

I investigate two classes of mobility measures that capture different normative concepts: *relative* and *absolute* mobility (Chetty et al., 2014). The first, which has been the subject of most prior research on intergenerational mobility (Black and Devereux, 2010; Solon, 1999), focuses on the relative outcomes of children from different parental backgrounds. However, it may have ambiguous normative implications: for example, reflecting worse outcomes for better-off applicant families rather than better outcomes for the most vulnerable. Meanwhile, absolute upward mobility is valuable because it can measure the mean outcomes of children who grew up in poorer families. I estimate changes in mobility over time by examining

the joint distribution of fathers' and childrens' outcome ranks for children in the birth cohorts of the 1970s and 1980s. Crucially, father-child rank distributions are also more easily comparable between recipients and non-recipients. I focus on the rank-rank slope, which measures the association between a child's position in the outcome distribution and his parents' position in the distribution, and contrast these statistics with more traditional ways of measuring mobility: (i) the correlation coefficient between children's outcomes and fathers' outcomes; or (ii) the parent-child outcome elasticity ($\frac{dE[logY|X=x]}{glogx}$).

Furthermore, I use educational attainment, measured in years of schooling, and wealth indexes from SISBEN in 2006 as outcomes of interest. Both variables present advantages but also challenges. Education may be measured more precisely than wealth among the very poor, and it is less likely to be influenced by life-cycle bias, but social status is observed only in coarse bins. In the sample, a third of the fathers of children in 1970s and 1980s birth cohorts had zero years of education. Any latent differences in opportunity within the bottom third of the distribution are thus not observed. [39] Therefore, I calculate bounds on a range of social mobility statistics that take into account interval censoring in the parent education rank distribution. On the other hand, as wealth in measured at different ages for applicants and children, estimates can suffer from life-cycle bias.

Relative Mobility

I begin by calculating measures of relative mobility for recipients and non-recipients of agrarian reform. I rank the children of all applicants in the birth

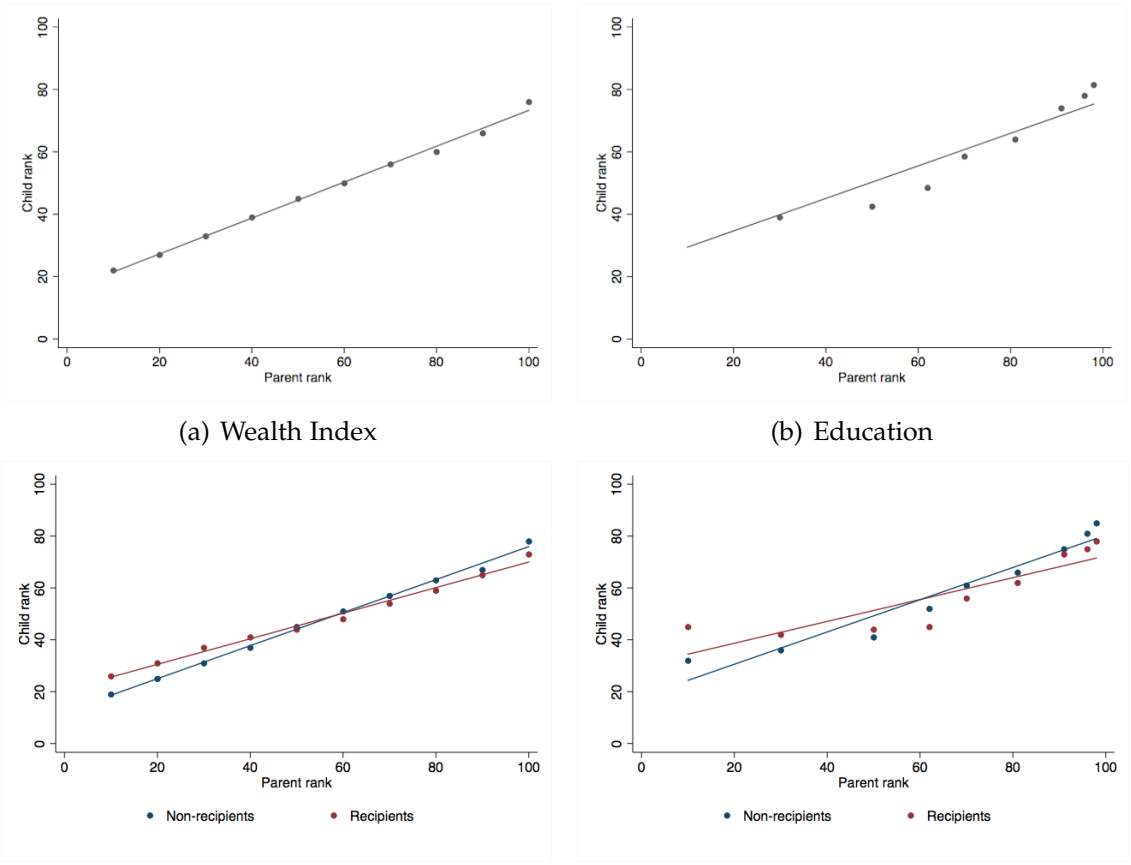
[39] Also, when ranks are coarsely observed, there is no established methodology for calculating measures that depend on observing fixed quantiles of the parent rank distribution, such as absolute upward mobility or quantile transition matrices.

cohorts of the 1970s and 1980s based on years of schooling and wealth relative to other children in the same birth cohorts. I then rank fathers of these children based on their years of schooling and wealth relative to other fathers with children in these birth cohorts. Define the children rank as c and the father rank as p. I characterize mobility based on the slope of the rank-rank relationships $Y^i(c) = E^i(p|c)$ for recipients and non-recipients $i \in [b, n]$, which identify the correlations between children's and father's positions in the wealth and education distributions. [40] The slopes measure differences in outcomes between children from top vs. bottom families among all applicants. The intercepts measure the expected rank for children from families at the bottom of the outcome distributions. Note that in this scenario, the comparison between fathers and children does not occur within groups, but across all applicants.

Figure 1.5 presents binned scatter plots of the wealth and education mean percentile rank of children c vs. their fathers' percentile rank p for three groups: Panel A is a pooling of all applicants, and Panel B presents recipients and non-recipients separately. Parent education is observed in nine bins, representing the highest year of schooling attained by each father, while parent wealth is seen in ten bins reflecting mean decile averages. For example, in Figures 5b and 5d, the bottom bin comprises around a third of fathers, all of whom report zero years of schooling. The points in the graphs show the mean child rank conditional on having a parent in a given bin, which is r_k. In the case of wealth, the conditional expectation of a child's rank given his fathers' rank (or CEF) in all cases is increasing and linear

[40] In the case of education, the expected child outcome in the k^{th} bin is defined as $r_k = E^i(p|c \in [c_k, c_{k+1}]) = \frac{1}{c_{k+1}-c_k} \int_{c_k}^{c_{k+1}} Y^i(c)dc$ where c_k and c^{k+1} define the bin boundaries. For the outer rank bins, $c_0 = 0$ and $c_{K+1} = 100$.

(see Figures 1.5a and 1.5c). In the case of education, the gradient is convex but approximates a linear relationship, as well (see Figures 1.5b and 1.5d). [41]



(a) Wealth Index (b) Education

(c) Wealth Index (d) Education

Figure 1.5: *Intergenerational Mobility*

Notes: This figure graphically documents the intergenerational mobility impacts of having received land in 1968-1970 among all applicants. It shows plots of child rank against parent rank using a wealth index and years of schooling in 2006 as outcomes of interest for all applicants (Figures 1.5a and 1.5b) and recipients and non-recipients separately (Figures 1.5c and 1.5d). Source: INCORA, *SISBEN*.

In Figures 1.5a and 1.5b, the gradient of the wealth and education CEFs that pool all applicants appears substantially high and indicative of low relative intergenerational mobility. A child's expected outcome rank is primarily determined by his or her parent's outcome rank. To confirm this, I estimate OLS regressions

[41] If the rank-rank gradient is understood as a linear approximation to a potentially nonlinear CEF, then many gradients can fit the underlying data equally well. In this scenario, however, linearity seems like a plausible assumption.

Table 1.6: *Intergenerational Mobility*

Child Outcome	Parent Outcome	All Applicants (1)	Recipients (2)	Non-recipients (3)
1. Wealth index	Wealth index	0.606***	0.519***	0.643***
		(0.0178)	(0.0128)	(0.0192)
2. Wealth rank	Wealth rank	0.576***	0.479**	0.605**
		(0.182)	(0.204)	(0.278)
3. Education	Education	0.557***	0.476***	0.623***
		(0.127)	(0.0978)	(0.106)
4. Education	Wealth rank	0.586***	0.557***	0.623***
		(0.0843)	(0.104)	(0.0929)

Notes: This table documents the intergenerational mobility impacts of having received land in 1968-1970 among all applicants. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in brackets. It uses a wealth index and years of schooling in 2006 as outcomes of interest. Each cell reports the coefficient from a univariate OLS regression of an outcome for children in the 1970s and 1980s cohort on a measure of their parents' outcomes, with standard errors in parentheses. All rows report estimates of slope coefficients from linear regressions of the child outcome on the parent outcome measure. The unit of observation is the rank in rows (2) and (4) and the individual in rows (1) and (3). Source: INCORA, *SISBEN*.

on the child outcome rank vs. father's outcome rank and parents and childrens' outcome correlations and report them in Table 1.6. Across all applicants, I find that a one percentage point (pp) increase in parent wealth rank is associated with a 0.56 pp increase in the child's mean wealth rank, as reported in column (1). Results are statistically significant at 1% and 5% confidence levels and fairly similar if I use parent and child wealth correlations. Moreover, if I look at education, an additional year of parental schooling is associated with 0.6 more years of child schooling, suggesting mobility estimates are consistent when using alternative outcomes and statistical methods. These findings are not surprising given pervasive rural poverty in the country and are similar to other mobility studies in developing countries and Colombia (Black and Devereux, 2010; Montenegro and Meléndez, 2014).

However, in Figures 1.5b and 1.5d, and once I differentiate between recipients and non-recipients, subtle but revealing patterns emerge. While the CEFs of recipients and non-recipients are askewed, the wealth and educational CEFs of the first are more flattened than those of the former. This probably indicates that,

comparing across the whole outcome distributions of applicants, the children of recipients enjoyed higher intergenerational mobility. In Table 1.6, columns (2) and (3) document that for recipients, a one percentage point (pp) increase in parent wealth rank is associated with a 0.48 pp increase in the child's mean wealth rank, while for non-recipients, this coefficient is 0.61. The difference in wealth rank-rank estimates between recipients and non-recipients is 0.13 pp. Analogous estimates are calculated using education data.

Absolute Mobility

The CEFs used in the previous section also allow me to calculate measures of absolute upward mobility. Increases in relative mobility could be undesirable if they are caused by worse outcomes for better-off applicants. In contrast, increases in absolute mobility at a given wealth or educational level, holding fixed absolute mobility at other wealth or educational levels, unambiguously increase welfare. Similar to (Chetty et al., 2014), I define absolute upward mobility as μ_{25} or the expected outcome of children born to applicants who occupy positions in the bottom quarter of the parent rank wealth distribution. I also look at the least educated applicants, precisely those who had zero years of schooling in the education distribution and were presumably illiterate. This framework allows me to consider, for example, the possibility that a child born at the 10th percentile of the education distribution has a different expected outcome from a child born at the 30th percentile.

When using data on all applicants, I find that this statistic is mechanically related to the rank-rank slope and does not provide any additional information about mobility. However, when studying groups of recipients and non-recipients, I find that a child's rank in the outcome distributions are effectively absolute

Table 1.7: *Transitional Matrices*

(a) Wealth

Parent Quintile	Child Quintile 1	2	3	4	5
	Non-recipients				
1	45	24	16	12	3
2	22	40	22	14	2
3	17	22	34	16	9
4	8	15	18	39	20
5	4	8	16	24	48
	Recipients				
1	40	23	18	13	6
2	19	37	23	14	7
3	15	20	37	16	12
4	5	14	20	38	23
5	5	10	16	25	44

(b) Education

	Child Education Level None	Some Primary	Primary	Middle	High School	Technical	College
	Non-recipients						
	(7%)	(27%)	(26%)	(12%)	(21%)	(6%)	(0%)
None (38%)	10	34	22	12	16	5	0
Some primary (46%)	7	29	24	11	23	6	1
Primary (15%)	0	5	44	15	28	8	0
Middle (1%)	0	0	0	34	33	33	0
	Recipients						
	(8%)	(16%)	(32%)	(18%)	(21%)	(4%)	(1%)
None (24%)	7	18	33	13	24	4	0
Some primary (47%)	9	24	36	13	11	5	2
Primary (23%)	0	9	30	38	33	0	0
Middle (5%)	0	0	10	40	30	20	0

Notes: These tables show wealth (Table 9a) and education (Table 9b) intergenerational transition matrices for applicants and children, differentiating between recipient and non-recipient families. Each cell reports the percentage of children in the outcome level given by the column conditional on having parents in the outcome level given by the row for children in the 1970s and 1980s birth cohorts. Source: INCORA, *SISBEN*.

outcomes. Upward wealth mobility for non-recipients in μ_{25} is 29, while for recipients, it is 34. Moreover, other measures of upward mobility exhibit similar between group variation. Table 1.7 presents quintile transition matrices for the two groups: the probability that a child of group i is in quintile m of the child outcome

distribution conditional on his parent being in quintile n of the parent outcome distribution. For instance, the probability that a child of a non-recipient reaches the top quintile of the wealth distribution conditional on having fathers in the bottom quintile is 3% compared to the same probability for the child of a recipient, which is 6%. [42] The reader can construct additional measures of mobility beyond those considered here.

Fortunately, I find that the patterns of between group variation in absolute and relative intergenerational mobility are very similar using alternative measures. Overall, these results provide further evidence that productive assets can be a tool for alleviating poverty. However, caution should be exerted when drawing conclusions. Statistics were calculated among applicants and not across the whole sample of people registered in SISBEN, and estimates are mostly likely underestimated, as they do not consider better-off applicants, who presumably did not register for government poverty subsidies. Similarly, the intergenerational mobility impacts of the reform are still far from average wealth and education levels in the country observed for cohorts born in the 1970s and 1980s. In 2006, government statistics revealed that average wealth and education levels were almost twice than those from the children of recipients. [43]

1.5 Mechanisms

The past findings raise the intriguing question of why receiving land through agrarian reform would have had such intergenerational impacts on the rural poor.

[42] It is useful to analyze multiple measures of mobility, because these depend upon one's normative objective (Fields and Ok, 1999).

[43] Considering the whole sample of *SISBEN*, average years of schooling for the same cohorts was 9 years, while the wealth index was 30 vs. 14.

Past reforms often included prohibitions on sale and other restrictions, including in the Colombian context, which might well be expected to have decreased economic mobility. The country also faced major societal upheavals in the following decades, including the Colombian Civil War, urbanization, and the implementation of market and social reforms. Understanding the channels of persistence is crucial, because they can lead to very different policy conclusions about the convenience of land redistribution. In this section, I draw from historical evidence in the Colombian historiography (Fajardo, 1979; Fals-Borda and Luna, 1962; Kalmanovitz and López, 2006; Karl, 2017; Palacios, 2011) to explore theoretical mechanisms discussed in section 1.2 – many of which were used by defendants and critics of the reform in the 1960s – that could help elucidate why recipients, and particularly their children, fared much better in life.

1.5.1 Geographic Mobility

Development economists agree that an integral part of the development process consists of moving people from a traditional-informal sector to a modern-formal sector as the economy transforms, and they also emphasize the importance of rural-urban migration (Harris and Todaro, 1970; Lewis, 1954). According to Colombian historiography, the second half of the 20th century was a period of rapid urbanization (Kalmanovitz and López, 2006; Karl, 2017; Palacios, 2011). Therefore, I examine geographic mobility as a prime candidate linking applicants of agrarian reform to their development paths. Specifically, I use Social Security records to calculate different measures of migration by comparing the municipality where rural families applied for land in 1968–1970 with the municipality where

applicants and their children reported to be residing in 2010. [44] I code dummy variables reflecting the likelihood of migrating and disentangle specific migration to large cities, small cities, and other rural places.

Table 1.8 documents the impacts of receiving land on geographic mobility forty years after the reform took place. Panel A reports outcomes for applicants, while Panel B shows outcomes for their children. In Panel A, and in contrast to conventional expectations that land incentivizes the retention of rural families in the countrysie, column (1) illustrates that recipients were 20 percentage points more likely to have migrated relative to non-recipients and a mean of 50%. The RD estimates are statistically significant at the 5% confidence level. This result is striking, given that land market restrictions from INCORA forbade recipients from selling (and even renting) their parcels during the first 10 years of tenure. Columns (2) and (3) illustrate that the majority of this effect is driven by rural migration to urban centers, suggesting that recipients did not just migrate to other rural places, but remained in the countryside. Being a recipient increased the likelihood of moving to a large city by 11 percentage points, relative to a mean of 19%, while it decreased migration to other rural areas by almost the same margin. Again, the RD estimates are significant at the 10% confidence and substantial relative to sample means.

Next, results on the children of applicants in Panel B reinforce this picture. On average, the children have higher migration rates than their fathers (50% vs. 72%), a fact consistent with historical national trends. Yet, the children of recipients tended to migrate 27 percentage points more, as reported in columns (1) through (3), uncovering evidence that they were not necessarily tied to the land and, in fact,

[44] Results are very similar if I use the SISBEN data instead.

Table 1.8: *Geographic Mobility in 2010*

	Migration	Urban Migration	Rural Migration
	(1)	(2)	(3)
	Panel A: Applicants		
Recipient	0.198**	0.111*	-0.0937*
	(0.0869)	(0.0626)	(0.0526)
Observations	451	415	533
Bandwidth	5.0	4.9	6.5
Mean Dep. Var.	0.50	0.19	0.16
	Panel B: Children		
Recipient	0.265***	0.227***	-0.121
	(0.0861)	(0.0832)	(0.118)
Observations	560	424	460
Bandwidth	6.4	4.3	4.5
Mean Dep. Var.	0.72	0.39	0.24

Notes: This table documents the intergenerational impacts of having received land in 1968-1970 on migration using an RD design. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). The outcome data source for columns (1)-(3) is *RUAF*. For a description of each dependent variable see Appendix A.2 Table A.11.

enjoyed higher geographic mobility. As before, effects appear driven mostly by migration to large cities. Columns (2) to (3) display that the children of recipients were 23 percentage points more likely to move to a large city, relative to a mean of 39%, and less likely to move to other rural places. The first effects are statistically significant at the 5% confidence level, while the former ones are not (see also Figures 1.3 and 1.4). Moreover, splitting the sample among those who migrated and those who did not further reveals the effects are mainly mediated by urban migration. In Appendix A, Table A.5, applicants and children who did not migrate

to cities show no appreciable differences in living standard or modern economy outcomes.

These findings may be consistent with a story where land relieved credit constraints. Thus, I consulted the Superintendence of Notaries (*SNR*) to find whether and when beneficiaries sold their land. In Colombia, market transactions need to be registered in notaries to possess legal validity, although vast informal norms regulate land markets in the countryside. I find that up to 30% of recipients formally sold the land to other parties by 1980, or ten years after the reform. Some transactions were done while prohibitions on sales were theoretically in place, signaling possible corruption or administrative ineptitude. Presumably, more recipients could have done the same in informal markets, although at lower prices. This coincides with numerous historical accounts that document the incapacity of INCORA to track recipients and properties over time and the selling of parcels in departments such as Cundinamarca and Antioquia. Recipients complained of being unable to fully exploit the land (Zamosc, 1978).

The results on migration shed light on prominent development debates over the years. They suggest that rural families used the land to relieve credit constraints on urban migration costs. Therefore, the impacts do not appear mediated by the consolidation of a mass of productive farmers, despite transaction restrictions incorporated in the reform designed to do so (Banerjee et al., 2000). Rather, they are indicative of an asset shock that enabled rural families to move to urban centers, where they accessed higher quality public goods, moved out of agriculture, and entered the formal economy. I do not claim that migration was the only mechanism linking agrarian reform applicants to their development paths, but the historical and empirical evidence make it difficult to tell a story where migration does not play a central role.

1.5.2 Investment in Education

Another potential explanation is that applicants could have used the land to invest in the education of their children, who may have subsequently acquired the skills to enter the modern economy. When facing credit constraints, large transfers may be necessary to move rural families past the threshold at which it becomes feasible to invest in their children (Becker and Tomes, 1979; Galor and Zeira, 1993). Also, education is a definitive measure of progress in developing countries, where wealth information is scarce and measurement error problems significant. [45] I use information from Social Benefits records (*SISBEN*) in 2006 to measure years of schooling and code dummy variables capturing the likelihood of finishing primary school, high school, vocational education, and college for adult children. This information should reflect investments made decades earlier, even if the timing of measurement is long after the reform. Moreover, for young children, I also code variables measuring the probability of attending school and incurring in child labor.

In Table 1.9, I look at the education impacts on the children of applicants born after the reform. Column (1) indicates that adult descendants of recipients had, on average, 1.5 more years of schooling than their counterparts, a large result when compared to the sample mean (5.3 years). Similarly, column (2) shows that they were also, on average, 17 percentage points more likely to have completed primary school, compared to a mean of 52%. Both coefficients are significant at the 5% confidence level. Columns (3) to (5) also suggest the children of recipients were

[45] In developing countries, transitory incomes can be noisy estimates of lifetime income. These problems are exacerbated among the rural poor. As a result, studies of social mobility often proxy lifetime opportunity with education, an approach that has been validated in countries where both are possible (Solon, 1999).

Table 1.9: *Investment in Education in 2006*

	Years of Schooling (1)	Primary School (2)	High School (3)	Vocational Education (4)	College (5)	Attending School (6)	Child Labor (7)
	Adult Children					Young Children	
Recipient	1.551**	0.165**	0.136	0.0822	0.0688	0.0409**	-0.116
	(0.732)	(0.0805)	(0.105)	(0.0722)	(0.0549)	(0.0195)	(0.112)
Observations	298	367	367	367	367	107	107
Bandwidth	4.4	5.3	5.3	5.3	5.3	5.8	5.8
Mean Dep. Var.	5.1	0.52	0.28	0.05	0.03	0.74	0.10

Notes: This table documents the impacts of having received land in 1968-1970 on the education of children born after agrarian reform using an RD design. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the child of an applicant born after the reform. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. The RD regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). The outcome data for columns (1)-(7) is *SISBEN*. For a description of each dependent variable see Appendix A.2 Table A.11.

more likely to graduate from high school, vocational education, or college, but the coefficients are statistically insignificant. Finally, columns (6) and (7) consider young children, or those who were younger than 18 years in 2006. Young children with a parent who benefited from the reform were, on average, 4 percentage points more likely to be attending school in 2006 and less likely to incur child labor activities. The first coefficient is significant at the 5% confidence level.

Recall from Table 1.3 that applicants within the optimal bandwidth were balanced in their education levels, so any differences in educational attainment of children can be attributed to the policy. Also, results should be interpreted as a lower bound, because better-off households do not normally register for government poverty subsidies in SISBEN. Performing the previous exercise and including children born before the reform attenuates the results, suggesting that the impacts may be disproportionately concentrated on younger children (see Appendix A, Table A.6). Overall, these findings highlight that investment in the education of children was also an important channel linking applicants to their development

paths. Consistent with previous evidence, investment in education may have been facilitated by migration to urban centers, where economic agglomeration also complemented acquired skills.

1.5.3 Conflict

In the second part of the 20th century, many developing countries that pushed for agrarian reforms also suffered severe civil unrest and even war. [46] As explained in section 1.2, in Colombia, numerous historical accounts suggest civil conflict could also be an intermediating factor, as the reform was in part implemented to apease social unrest and revolutionary threats (Fajardo, 1979; Fals-Borda and Luna, 1962). I explore patterns of peasant displacement and enlistment in rebel movements and criminal activities using administrative data. I exploit information from Colombian civil war victims in the *Unique Registry of Victims* (or URV) 1985–2010 and death certificates from Vital Statistics (*RUAF*), as well historical criminal records from judicial authorities.

Though caution is warranted, since data suffers from severe measurement error, I find marginal differential impacts of the civil conflict on recipients. On average, few applicants seem to have suffered violent actions. In Appendix A.1.1, Table A.7, among applicants who died before 2006, the year in which I observe many development outcomes, column (1) illustrates recipients were 12 percentage points more likely to have suffered a violent death, relative to a mean of 8%. Similarly, among living family members in 2010, recipients were only 5 percentage points more likely to report having been displaced as part of the civil conflict. These

[46] This includes, for example, most Latin American nations (El Salvador, Guatemala, Nicaragua, Bolivia, or Perú), the Philippines, Vietnam, Zimbabwe, and South Africa.

results disappear when looking at the sample of children. The effects are mostly driven by applicants who lived in places where the civil conflict is known to have been intense. Moreover, column (3) shows that non-benefiaries were equally likely to engage in criminal actions and social disorder. In summary, these results highlight that while civil conflict was a formative event in the history of the country, it is unlikely to have driven the main findings.

1.6 Cost-Benefit Analysis

Findings on the intergenerational impacts of land ought to be weighted against the fiscal costs of the reform to further evaluate its convenience. In this section, I perform a simple cost-benefit analysis of the *Sharecroppers and Tenants Program* and discuss possible implications for development policy. I begin by calculating the benefits for rural families, focusing on increased earnings for the children of recipients. I caution that all of the calculations reported should be treated as rough estimates, because they rely on several strong assumptions, starting with the basic premise that the local treatment effects estimated in section 1.4 can be extrapolated to all recipient families. Recall that the children of recipients accumulated, on average, 1.5 more years of education than those from non-recipients. Several studies indicate returns to education in the 1970s and 1980s in Colombia oscillated around 10%.

I translate these estimates into a predicted lifetime earnings impact by assuming that (1) this 10% increase in the children's earnings remains constant over the life cycle; (2) the life cycle profile of earnings for recipients follows half of the Colombian minimum wage starting in 1985, the year when a child born in 1970 would be graduating from school; (3) the real wage growth rate is 1%, approximately the rate

of wage growth in the country over the past three decades; and (4) the discount rate is 7%, approximately the 10-year government bond rate. This a reasonable approach, as 80% of the children of applicants earned less than the minimum wage in 2010, and recent studies suggest average rural wages are equivalent to half of the minimum wage. I also employ sensitivity analysis to show how results evolve conditional on various parameters. [47] Under the baseline assumptions, a child of a recipient born just after the reform increased total lifetime earnings to USD 4,515 today. The present value of this increase in lifetime earnings was USD 694 (or $12,846 Colombian pesos) in 1970. [48] For a family with two young children born after the reform, being a recipient therefore had an estimated present value of approximately USD 1,388 in terms of increased children's earnings.

Next, I turn to the fiscal costs of the reform. According to INCORA statistics, land redistribution cost the state 0.5% of GDP in 1970, a sizable effort equivalent to 7% of the national budget. As described in section 1.2, the program only benefited roughly twenty thousand rural families at an average cost of USD 2,711 (or $50,000 Colombian pesos) per recipient (Tamayo, 1970). Today, the figure roughly amounts to USD 17,638. Three quarters of this value corresponded to costs incurred during land expropiations by INCORA, a majority of which went to compensating landowners for the acquired lands. The rest included costs related to legal advice and agricutural investments made to landholdings that entered the National Agrarian Fund. Combining calculations on benefits and costs, the

[47] In Table A.5, following empirical studies in Colombia, I use higher and lower ranges for educational returns, wage levels, real wage growth paths, and discount rates.

[48] I estimate the lifetime earnings of a child by projecting half of the minimum wage in 1985 over 47 years (18 to 65 years old) and multiplying it by 10%. I apply a 1% growth rate and a 7% discount rate to this profile to obtain an undiscounted sum of lifetime earnings and a PDV in 1970 of USD 552.

data suggests the *Sharecroppers and Tenants Program* most likely yielded net losses. In the baseline scenario, the fiscal investments made per recipient family had a private rate of return of -80%. More favorable scenarios still yield rates of -40% (see Appendix A.1.1, Table A.8).

The estimates presented neglect important factors that should be considered in a more comprehensive cost-benefit evaluation. First, they do not account for gains from better outcomes in future generations (ie: the grandsons of recipients) and ignore other potential benefits, such as improved living standards of recipients. Importantly, they do not consider any externalities of the reform, either, which most likely drove private and social rates of return to differ. Improving social mobility in other settings has been shown to generate positive externalities (less crime, more social capital, etc). Yet, in Colombia, agrarian reform has also been associated with disorder and civil conflict.

1.7 Conclusion

Providing land through agrarian reform has been a common strategy for improving economic mobility in developing countries. Yet, it is often a very costly and controversial process. This study identifies the causal intergenerational impacts of this policy. I track applicants to the 1968 Colombian agrarian reform and their children in contemporary administrative data. Exploiting discontinuities in the allocation of parcels, I find that the children of recipients exhibited considerable upward economic mobility. They experienced better living standards relative to those from non-recipients and their parents. They were also more likely to work in high-skilled sectors, become entrepreneurs, contribute to Social Security, and use formal financial markets – an entire bundle of measures that form the

nexus of modern economic life. This illustrates that providing a father with a productive asset can help alleviate poverty and change the intergenerational path of his children.

In contrast to a widely held view that land traps rural families in the countryside, these findings appear mediated by a relief of credit constraints that allowed recipients to migrate to urban centers and invest in the education of their children, who subsequently used these skills to find new opportunities in the modern economy. This is consistent with Colombian historical evidence and notarial records, which suggest that up to a third of recipients sold their land a few years after the reform. Furthermore, I evaluate the cost-effectiveness of the policy, an important element when analyzing its convenience. I compare previous intergenerational benefits against the fiscal costs of the reform. Estimates from a simple cost-benefit analysis yield that it was most likely not cost-effective. The fiscal investment per recipient family had a return of -80%. However, the analysis neglects important social externalities.

Overall, these findings have broad implications for development policy. If the reason that recipients benefit from accessing land is to sell it to relieve credit constraints, then policymakers can think of alternative policies that would subsidize these costs, rather than going through the very costly process of seizing land from powerful interests. Future research should shed light on whether, for example, other asset transfers or credit incentives can be more a more socially effective tool for reducing poverty and improving economic mobility. Moreover, another important question is whether the general equilibrium impacts of these types of policies are welfare improving for society, an exercise that would inquire about broader externalities and the fate of expropiated landowners.

Chapter 2

The Colonial State and Long-Run Development in Mexico

2.1 Introduction

Recent empirical evidence recognizes the lasting effects of colonialism on economic development (Acemoglu et al., 2001; Dell, 2010). Colonial empires often established institutions to maximize the extraction of natural resources, a process that tipically involved coercion against native populations. A crucial challenge for pursuing this endeavour was to oversee activities in the colonies and bring settlers under royal control. In Latin America, a central institution governing Spanish colonization was the *Real Audiencia* - the equivalent of the colonial state. A long-standing historical hypothesis suggests that the uneven presence of this historical institution across the continent had potentially significant consequences for economic prosperity in the long-run (Burkholder and Chandler, 1977; Elliott, 2009; North, 1990).

The Spanish Crown delegated in the colonial state most state functions, including legislative and judicial powers. An important responsability was to uphold the

Laws of the Indies, which mediated disputes among settlers and native populations. [1] However, they continously struggled to govern effectively. In places further away from their centers, settlers often disregarded royal decrees, an attitude characterized by a famous dictum in Latin America: "*Obedezco pero no cumplo*"(or "*I Obey But Do Not Comply*"). Historians have noted this behavior weakened indigenous property rights even further as settlers remained unchecked to coerce them and extract natural resources (Coatsworth, 2008). Some argue this environment may have incited local conflicts and changed norms of cooperation after colonialism.

This paper revisits this hypothesis and examines the persistent impacts of colonial state presence in Mexico. A difficulty when studying this topic is that the centers of colonial states are also big cities, which may confound an economic agglomeration component. I overcome this issue by using a spatial regression discontinuity design to compare nearby locations that had different levels of colonial state presence. The Spanish Crown delegated governance to two colonial states in Mexico - to the north, the *Real Audiencia of Guadalajara*, and just south of it, the *Real Audiencia of Mexico*. Historical evidence suggests the presence of the colonial states changed discontinously at their boundary (Parry, 1948; Gerhard, 1972). The northern state had a stronger presence near the boundary as its center was located relatively close, while the southern state had a weaker presense because its center was situated further away.

To evaluate the validity of the empirical strategy, Section 2.2 provides detailed evidence that the definition of the boundary occurred because of idiosyncratic political circumstances, unrelated to other institutional boundaries and pre-existing

[1] They were Supreme Courts of Appeal, and thus represented the Spanish Crown in his role as maker of laws and dispenser of justice within the framework of the *Laws of the Indies*, designed to govern Spanish America.

differences in the populations or the environment that could affect outcomes of interest (see Figure 2.1). The jurisdictions of the two colonial states were set in 1575 by King Phillip II to restore order in the northern provinces of Mexico after the Mixton War of 1542, a brutal indigenous rebellion that temporarily stopped the Spanish conquest [2]. The boundary barely changed until Independence in 1821. It is important to highlight that this strategy does not evaluate the broad impacts of colonialism but rather investigates whether regions subjected to more intensive colonial state presence have experienced differential development trajectories.

Consistent with the historical hypothesis, I find that locations with weaker colonial state presence exhibit lower contemporary and historical living standards. Using microdata from the 2000 population census, estimates indicate that household income was 20% lower in these locations. Likewise, people on average had accumulated 0.6 less years of schooling and were more likely to be illiterate. These results are consistent across various birth cohorts. There are, however, no significant differences in the provision of electricity, water or roads, suggesting effects are not necessarily driven by a lack of other public goods. I show that the impacts are persistent over time, using data from the colonial period, the 1960 population census, and other historical economic indicators. Moreover, results are robust to the selection of bandwidth, RD functional form and alternative samples.

After documenting long-run impacts, I explore channels of persistence. A common argument in the Latin American historiography suggests that in places where the colonial state was absent, provincial authoritarian elites called *caudillos* surged after Independence (Centeno, 2002). Land property rights and self-governance of *pueblos* (or villages) became prominent sources of conflict in Mexico as the state

[2]The formal name of the Spanish colony in Mexico was New Spain, which occupied the present territories of Mexico and parts of the United States

tried to centralize power over these elites (Tutino, 1988; Knight, 2002; Mahoney, 2010). [3] To test this idea I collect information on historical insurrections, a majority of which related to land and political centralization. I show that locations with weaker colonial state presence were on average 15% more likely (relative to a mean of 20%) to experience local conflicts during the 19th and early 20th centuries, indicating an inability of the state to monopolize violence.

Futhermore, the environment of coercion helped to develop norms of parochial cooperation. It promoted in-group cooperation within villages (or *pueblos*) but not necesarilly towards the state. Using public opinion surveys from Latinobarometro 1998-2015, I find that individuals living in places which had weaker colonial state presence are more likely to participate in community organizations or self-governance mechanisms. However, they also report lower trust in different Mexican state institutions, are less likely to follow the law, pay taxes or participate in politics. Parochial cooperation may have helped overcome weak property rights and widespread coercion. This pattern is consistent with a broad literature on evolutionary biology emphasizing that such behavior may evolve as a response to external threats (Bowles, 2008, 2006; Turchin, 2016).

Previous findings are consistent with a path dependent setting where conflict and parochial cooperation incentivized insecure property rights. Using data from population censuses, I document that places with weaker colonial state presence exhibit more historical and contemporary property and land informality. Suggestive evidence indicates that weaker property rights delayed the development of financial intermediation through the banking system and industrialization,

[3] In fact, the key slogan for the Mexican Revolution in 1911 was "*Libertad y Tierra*"(or "Freedom and Land"), which refered both to the comunal regulation of property rights and the right to self-governance of villages.

which are important proximate factors of economic development in the long-run. Today, workers in the same areas are 5% more likely to be employed in agriculture and 10% less likely to do so in manufacturing. Overall, these findings support the view that the colonial state had profound long-run consequences on economic development in Mexico.

This paper contributes to several strands of the social science literature. First, it relates to an extensive empirical literature on the colonial origins of comparative development (Dell and Olken, 2019; Lowes and Montero, 2018; Michalopoulos and Papaioannou, 2016; Nunn and Wantchekon, 2011; Nunn, 2008; Acemoglu et al., 2001). Using the Mexican experience as a salient example of the wider Latin American trajectory, I identify conflict and parochial cooperation as additional channels of persistence linking colonial legacies to contemporary economic performance. The findings complement seminal studies underscoring pervasive political and economic inequality as prime mechanisms that explain the continent's long-run underdevelopment relative to other world regions (Dell, 2010; Bruhn and Gallego, 2012; Acemoglu et al., 2008; Sokoloff and Engerman, 2000).

Similarly, the results are consistent with recent studies documenting that the organization of pre-colonial and colonial states affected long-run prosperity in Asia and Africa (Dell et al., 2018; Michalopoulos and Papaioannou, 2013; Osafo-Kwaako and Robinson, 2013; Gennaioli and Rainer, 2007). By focusing on one country and studying mechanisms, I contribute to a growing literature on the social and institutional legacies of conflict that can derive from weak states (Bauer et al., 2016; Dell, 2012; Blattman and Miguel, 2010). The literature focuses primarily on the impacts of conflict on the labor, capital, and human capital stocks, whereas empirical work on long- run institutional effects of conflict is limited. This study also improves our undersandings on the complex interdependencies between the

state and civil society (Acemoglu et al., 2014; Fukuyama, 1995; Putnam et al., 1994; Banfield, 1956). When mediated by coercion, these can be substitutes with adverse consequences for economic development.

The paper is organized as follows. The next section provides a historical overview of the institution of *Real Audiencia* - or the Spanish colonial state - and dwelves deeper to explain in detail the context that led to the establishment of two colonial states in Mexico. Section 2.3 discusses the data used in the empirical analysis, including the historical and contemporary sources, and the construction of information. Section 2.4 presents the spatial regression discontinuity specification. Section 2.5 discusses the main effects on economic prosperity. Section 2.6 examines mechanisms of persistence, primarily focusing on evaluating the role of conflict and parochial cooperation but also exploring alternative channels. Finally, section 2.7 concludes.

2.2 Historical Background

2.2.1 The Colonial State

As the colonization of the Americas unfolded in the early 16th century, the Spanish Empire erected *Reales Audiencias* - or colonial states - to govern the continent and bring settlers and conquerors under royal control. [4] These possessed most state functions, including broad legislative and judicial powers, and their decisions could only be overruled by the Crown. [5] As guarantor of the *Laws of the Indies*,

[4]Traditionally, the *Reales Audiencias* operated as Supreme Courts of Appeal in continental Spain. However, they were also delegated several other government functions in Spanish America.

[5]Their authority excluded ecclesiastical, military or mercantile affairs which had *fueros* - or special jurisdictions.

which codified the indirect rule system of governance based on racial relations, they had the crucial responsability of enforcing the royal will among natives and settlers. [6] The colonial states were composed of a president or *Viceroy*, numerous magistrates (or *oidores*), and law enforcement officials, directly appointed by the Council of the Indies in Seville. A majority of them possessed noble ancestry that guaranteed loyalty to the Crown (Burkholder and Chandler, 1977; Lynch, 1992; Haring, 1947).

The *Laws of the Indies* divided colonial society into a dual system: the *Republic of Spaniards* and the *Republic of Indians*. The first system regulated the life of settlers, including *creoles* - or descendants from original conquistadors. The law decentralized local governance to them, including collecting tributes from natives, regulating commercial relations and imparting justice in first instance. [7] It also granted them property rights to exploit natural resources, most importantly in agriculture and gold and silver mining. [8] The New World gave settlers considerable opportunities to amass wealth and power (Elliott, 2009; Knight, 2002; Mahoney, 2010). Through the colonial state, the Crown held settlers accountable, and supervised patronage and revenues, investigating all usurpations of royal authority. It monitored local governance through periodic audits called *visitas de residencia*.

[6]The laws were composed of a myriad of decrees issued over centuries, including the seminal laws of the 16th century, such as the *Laws of Burgos* (1512) and the *New Laws* (1542).Throughout the colonial rule the laws were compiled several times, most notably in 1680 under Charles II in the *Recopilación de las Leyes de los Reynos de Indias* (Compilation of the Laws of the Kingdoms of the Indies).

[7]Local governance rested on mayors (or *alcaldes mayores*) and governors (or *gobernadores*). Settlers could occupy these positions if named by the Crown or they bought the political office.

[8]The most relevant extractive institutions included: the *encomiendas* - or grants by the Crown to settlers conferring the right to demand labor and tributes from natives, the *mita* - a forced labor system used in mining activities, and the *repartimiento* - an internal trade tax forced on natives.

Furthermore, the second system organized the life of the natives. The law separated them into villages (or *pueblos*), which allowed settlers to administer forced labor more efficiently under different extractive institutions. [9] Within villages, indigenous populations had the right to self-governance and to preserve most pre-colonial customs, except for religion since Catholic evangelization was a central objetive of the Crown. In Mexico, following Aztech or Mayan customs, most villages were governed by *caciques* - or indigenous leaders, established communal property rights known as *ejidos* and applied redistributive norms through a common pool of tributes called *cajas de comunidad* (Tank de Estrada et al., 2005). The law protected the natives from extreme coercion by settlers, and in case it ocurred, they could appeal to the colonial state to uphold their rights.

Historians have exhaustively documented the enormous challenge faced by the Crown to govern across the Americas (Coatsworth, 2008, 2005; Elliott, 2009). The decentralized nature and vastness of the Spanish Empire often allowed settlers to disregard royal decrees giving rise to the famous Latin American dictum: "*Obedezco pero no cumplo*"(or "*I Obey But Do Not Comply*"). This adage implied that settlers recognized the legal authority of the Crown ("I obey") but not necesarilly that of the law ("but not comply"). [10] Numerous scholars have suggested this behavior was more likely to occur in places further away from the centers of colonial states as the costs of monitoring (*visitas de residencia*) and appealing were higher (Knight,

[9]The policy of indigenous settlement into villages was in many cases limited to providing legal recognition to pre-colonial villages, such as the *altépetl* in Mexico or the *ayllus* in Peru. In other ocassions, it reallocated indigenous populations to fit labor supply needs (or *reducciones*). Labor regulations prohibited natives from migrating across villages without royal consent.

[10]This saying was supposedly first used by the conquistador of Mexico, Hérnan Córtes, when he refused to obey King Charles V on the conquest strategy. Nevertheless, this behavior is thought to have emanated earlier from medieval Spain.

2002; Mahoney, 2010). While the Crown was conscious of these problems, it tolerated them in order to continue extracting valuable economic resources.

Nevertheless, the inability of colonial states to govern effectively may have had perverse long-run consequences. These problems in turn exacerbated extreme coercion against native populations by settlers and made property rights more insecure. Without accountability, numerous historical accounts detail how settlers stole lands from the natives, colluded with *caciques* (or indigenous leaders) to overtax or force natives into labor, underported rents from mining or trade and developed alternative legal systems. Similarly, indigineous populations retreated inwards for protection, relying instead on local cooperation to overcome coercion. They also learned to use the law and to appeal to colonial states whenever possible to defend themselves, with uneven success. This is thought to have generated a high distrust in state institutions.

2.2.2 Assignment in Mexico

I study the legacy of the colonial state using the Mexican case as an example of the broader Latin American experience. The Viceroyalty of New Spain [11] - located in modern Mexico - was the only Spanish colony to have had two colonial states. The first, called the *Real Audiencia of Mexico* - henceforth the southern state - was established in 1527 by the conquistador Hernán Cortés on behalf of King Charles V. [12] In 1548, the conquistador Nuño de Guzmán convinced King Phillip II to establish another state called the *Real Audiencia of New Galicia* - henceforth the

[11]The Viceroyalty of New Spain was composed of the current territories of Mexico, Central America, and parts of the United States, including Texas, New Mexico, Arizona and California.

[12]Its jurisdiction intially encompassed the whole of New Spain but was soon incapable of governing altogether as the Spanish colonization expanded the dominions of the Empire northward.

northern state - in the city of Compostela. The center of the northern state was later moved to the city of Guadalajara in 1560. It gained its autonomy in 1572 and from then on both states worked independently for two and a half centuries until the independence of Mexico in 1821 (Parry, 1948).

The jurisdictions of the two colonial states were precisely described in the Compilation of Indian Laws of 1680. [13] The northern state ruled over the northern regions of the Viceroyalty of New Spain, including the important silver mines of Zacatecas and Aguascalientes and parts of the modern United States, such as California and Texas. In contrast, the sourthern state encompassed central Mexico and the sourthern indigenuos territories, including Oaxaca and all the way south to the Guatemalan border. The boundary between the two colonial states coincide with the southern borders of the current states of Colima and parts of Jalisco, Michoacán, Guanajuato, San Luis de Potosí and Nuevo León (see Figure 2.1).

The Mexican historiography suggests that the ability of the Crown to enforce the *Laws of the Indies* varied discretely at the boundary of the two colonial states. The city of Guadalajara was located much closer to the southern border of the northern colonial state than Mexico City to the northern border of the sourthern colonial state (see Figure 2.1). Thus, just north of the boundary the northern colonial state had a more intense presence to supervise settlers and enforce royal decrees. In contrast, just south of the boundary the sourthern state was less able to do this, presumably encouraging more strongly a disregard towards royal authority ((Parry, 1948). Variation in colonial state presence created constant problems along the boundary, with several villages in the modern states of Guanajuato and San

[13] Although there were episodes of tension, most notably in the province of Colina, the boundary between the *Reales Audiencias* remained intact for the most part from 1572 to 1821.

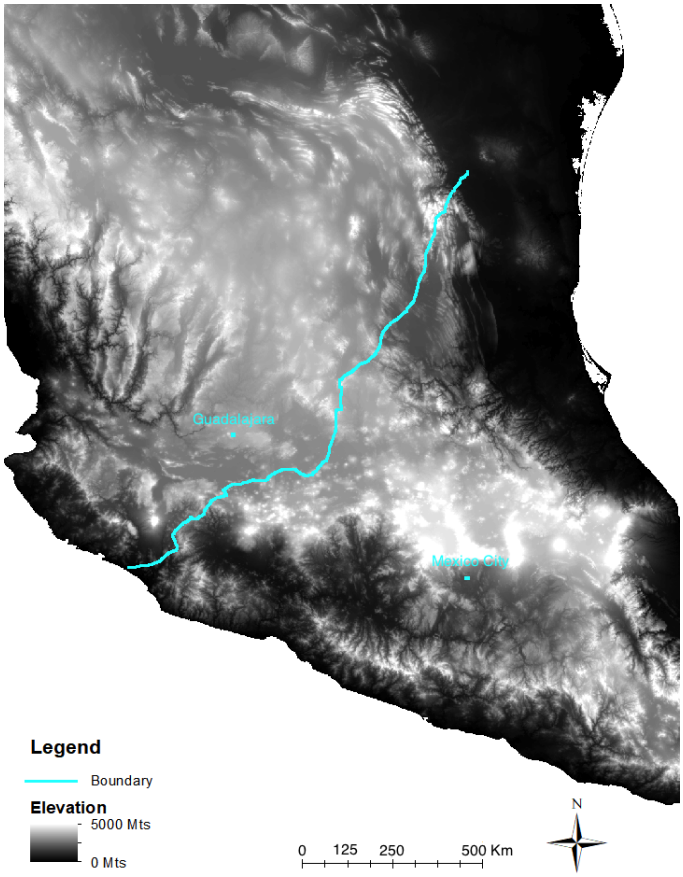


Figure 2.1: *Boundary of the Reales Audiencias in New Spain 1572-1821*

Note: This figure shows a map of the boundary between the northern and southern colonial states in New Spain, the former Spanish colony in Mexico. Source: Gerhard (1972), Parry (1948), INEGI.

Luis de Potosí unsuccesfully lobbying the Council of the Indies in Seville, Spain to change their jurisdictions.

A significant aspect is the manner in which the boundary was determined. The area was the scene a dangerous native revolt in the early history of the Mexican conquest - the Mixton war of 1541. After the war, the Crown sent a royal mission to New Spain to investigate the surge of indigenous revolts. Based on its report, in 1560 King Phillip II drew the boundary between the two colonial states with the express purpose of restoring order in the turbulent northern provinces (Gerhard, 1972; Parry, 1948). It was thus based on idiosyncratic political circumstances,

unrelated to other institutional boundaries and pre-existing differences in the populations or the environment in colonial Mexico. Most significantly, it was drawn before the discovery of the biggest silver mines in Zacatecas in the early 17th century.

2.3 Data

I examine the long-run impacts of the colonial state on economic development by testing whether historical presence of it affects contemporary and historical living standards in Mexico. I match colonial villages to modern municipalities using the equivalences produced by historian Tank de Estrada et al. (2005). To measuse outcomes, I use 5% random micro-level samples of the Mexican Population Censuses in 2000 and 1960 from IPUMS. These anonimized microdata is produced by the Minnesota Population Center at the University of Minnesota based on census data from Mexican statistical office (INEGI). IPUMS provides census data from around the world integrated across time and space and is widely considered as a reliable and accurate source of government produced information.

I use a variety of sources to explore channels of persistence. First, I look at local conflicts after Independence. I collect historical municipal information from the *Enciclopedia de Municipios de Mexico* in 2000 and code variables regarding the nature and number of local conflicts exerienced during the 19th and 20th centuries near the boundary of the two colonial states. This data source describes relevant historical events of each municipality. Second, I look at the historical use of judicial institutions. In particular, I compile information on judicial trials during and after the colonial rule. The sources come from the Public Library of Jalisco, which hold the historical archives of the colonial states, the *Estadísticas Sociales del Porfiriato*

1877-1910, a thorough statisical compendium of Mexico at the end of the 19th century, and the Mexican statistical office (INEGI). [14]

Furthermore, I look at contemporary attitudes torwards the state and local cooperation. I use various waves of the Latinobarómetro (1995-2015), an annual public opinion survey performed across Latin American countries by Vanderbilt University. These surveys contain information about people's prosocial behavior, including preferences for democracy and the state, rule following, trust, participation in civic organizations and demand for public goods. While sample sizes are relatively small, they are still very much suggestive. [15] I also gather administrative data on local governance from *Encuesta de Desarrollo Municipal* in 2000, a government sponsored survey of all municipalities, and property rights (INEGI, 2000). A precise description of the construction of different variables is found in the Online Appendix.

Finally, I use different historical and geographical information to test for balance on pre-treatment characteristics across the boundary of the two colonial states. I use elevation data produced by NASA's Shuttle Radar Topography Mission (SRTM, 2000) and geographical raster (soil fertility, rainfall, etc.) datasets from INEGI. Similarly, I use historical information from the *Relaciones Geográficas* (1570-1575) - a series of questionnaires ordered by King Phillip II regarding politics, taxes, population and ethnic patterns, trade and evangelization in the Viceroyalty of New Spain. While sample sizes are small and most probably suffer from measuremente error, they are still suggestive of colonial developmental patterns.

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[14] I compile historical data on taxation and education in 1805-1810 from the *Estados Generales de Tributos*, a series of recently discovered tax revenue statements from the Viceroyalty of New Spain

[15] I complement this information with statistics from Google Trends over the period 2005-2015 to measure the extent to which people in Mexico search topics regarding state institutions.

2.4 Empirical Strategy

My empirical strategy relies on a spatial regression discontinuity (RD) design exploiting the discontinuous change in the presence of the Mexican colonial states at their historical boundary. I compare nearby households in locations that belonged to the northern colonial state, which had a more intense presence near the boundary, to households in regions historically located in the southern colonial state. The boundary forms a multidimensional discontinuity in longitude-latitude space. I estimate regressions of various forms following:

$$y_{i,m,s} = \alpha + \gamma southernstate_m + X'\beta + f(\text{geo}_m) + \phi_s + dist_d f_m + \epsilon_{i,m,s} \tag{2.1}$$

where $y_{i,m,s}$ is an outcome variable of interest for observation i in municipality m along segment s of the boundary, $southernstate_m$ is a dummy variable that equals 1 if municipality m belonged to the southern colonial state (*Real Audiencia of Mexico*) and 0 otherwise; $X_{i,m}$ is a set of covariates and $f(\text{geo}_m)$ is the RD polynomial, which controls for smooth functions of geographic location. Also, $distdf_m$ is the distance of municipality m to Mexico City and is included in all regressions to explicitly control for proximity to the country's largest urban area. $\epsilon_{i,m,s}$ is an error term that is independently and normally distributed. Finally, ϕ_s is a set of 50km boundary segment fixed effects. For regressions examining individual outcomes, I also include a vector of demographic variables according to the number of infants, children, and adults in the household. The baseline specification limits the sample to municipalities within 75 kilometers of the boundary.

Following Gelman and Imbens (2018); Imbens and Kalyanaraman (2012), I use a local linear RD polynomial and document robustness to a wide variety of

different bandwidths and RD polynomials. [16] The empirical strategy requires two identifying assumptions: (1) all relevant factors besides treatment must vary smoothly at the boundary of the colonial states and (2) there shouldn't be selective sorting. Letting c_1 and c_0 denote potential outcomes under treatment and control, x denote longitude, and y denote latitude, the first identifying assumption requires that $E[c_1|x,y]$ and $E[c_0|x,y]$ are continuous at the discontinuity threshold. These expectations are needed for observations located just across the northern side of the boundary to be an appropriate counterfactual for observations just south of it.

To assess the plausibility of this assumption, I look at geographical and pre-treatment balance across the boundary. Table 2.2.1 examines a variety of geographic characteristics, using gridded geographic data and regressions of the form described in equation (1). The unit of analisis is the municipality. To be conservative, I treat municipalities as independent observations because the use of spatially correlated standard errors tends to slightly increase their magnitude. Moreover, Table 2.2 examines economic and social patterns from the *Relaciones Geográficas* (1570-1575), a series of surveys carried out by the Spanish Crown just before the establishment of the two colonial states. The basic intuition is to show that were no significant differences in relevant covariates that may have determined the selection of the boundary or that may confound outcomes of interest.

Columns (1) and (2) of Table 2.2.1 examine elevation and slope, respectively. The point estimates on distance to the colonial state are small relative to the mean and statistically insignificant. Not surprisingly, column (3) shows that temperature is likewise balanced. Column (4) does find a modest difference in precipitation that is marginally significant at the 10% level, but the coefficient is quite small

[16] The specification of multidimensional RD regressions is subject to significant debate. Thus, in the empirical exercises I show robustness checks to different specifications.

Table 2.1: *Geographic Balance*

	Elevation (in mts) (1)	Slope (in %) (2)	Temperature (in C°) (3)	Rainfall (in mm) (4)	Soil Quality (5)	Rivers (in km) (6)
Southern State	-21.315	-0.653	0.0849	0.901	0.542	0.813
	[39.296]	[0.832]	[0.0862]	[1.942]	[0.161]	[1.599]
Obs.	162	162	162	162	162	162
Clusters	162	162	162	162	162	162
Mean	1,786	5.8	19.2	51.3	3.8	14.1

Note: Robust standard errors in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-6 is the municipality. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include a linear polynomial in longitude and latitude, boundary segment FE and observations within 75km of the boundary. Source: INEGI, FAO.

relative to the mean. Column (5) documents that soil quality is similar on either side of the boundary. Finally, column (6) examines the kilometers of river flowing through each municipality, which is also balanced. Overall, these results suggest that across a number of geographical conditions there is statistical balance along the boundary of the colonial states.

Moreover, Table 2.2 looks at pre-treatment covariates. Columns (1) and (2) shows that there were no differences regarding ethnic mix and indigenous tributes. Columns (3) and (5) suggests balance in colonial economic activities such as agriculture or the presence of extractive institutions such as *encomiendas*. Column (4) shows a slight difference in mining activities, but these are marginally small coefficients. Finally, there is balance in column (6) in the number of Catholic churches. While the sample is extremelly small, these findings are consistent with a setting where the demarcation of the boundary was uncorrelated with economic characteristics. This coincides with the historical evidence presented in Section 2.2 arguing that the boundary was a consequence of idiosincratic political factors

Table 2.2: *Pre-Treatment Balance in 1570-1575*

	% Indigenous Population	Has Tributes	Has Agriculture	Has Mining	# of Encomiendas	# of Churches
	(1)	(2)	(3)	(4)	(5)	(6)
Southern State	0.113	0.133	0.0245	-0.0679+	0.198	0.0817
	[0.293]	[0.106]	[0.0842]	[0.0384]	[0.279]	[0.124]
Obs.	32	32	32	32	32	32
Clusters	32	32	32	32	32	32
Mean	0.91	0.84	0.81	0.41	2.34	1.28

Note: Robust standard errors in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-6 is the colonial district. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include elevation, slope, a linear polynomial in longitude and latitude, boundary segment FE and observations within 75km of the boundary. Source: *Relaciones Geográficas, 1570-1575*.

internal to the Spanish conquest of the northern territories of the Viceroyalty of New Spain.

Nevertheless, alternative explanations are also plausible. For instance, one may be worried that for intrinsic reason areas north of the boundary were initially richer, and persistence of the initial capital stock gave them an edge. However, if anything the northern side had a poorer agricultural landscape with a low capital stock in the first place, as shown in Table 2.2. The silver mines of Zacatecas were located further north in the states of Zacatetas, Chihuahua and Durango, far away from the boundary of the colonial states. Likewise, many of the territories were largely unpopulated and unexplored (Gerhard, 1972; Parry, 1948). No other pre-colonial or colonial institutions or geographical barriers coincide with the boundary, which suggests that it's unlikely that the empirical strategy picks up other confouding variables (see Figure 2.1).

The second crucial assumption is no selective sorting across the boundary. This would be violated if relatively productive individuals moved from the southern colonial state to the northern side and these differences persisted. Section 2.2 presented qualitative evidence that labor regulations forbade indigenous populations

from migrating without royal consent. While historians debate the effectiveness of these measures, settlers did have the incentive to control the movement of natives (Knight, 2002; Mahoney, 2010). Also, indigenous communities had a central attachment to their *pueblo* and the costs of migration were relatively high (Tank de Estrada et al., 2005). To investigate further, I look at migration patterns after Independence in the 1960 and 2000 Population Censuses. Columns (1) and (1) in Table 2.9 document no significant differences in migration rates across the boundary (this topic is debated in more depth in section 2.6.4).

2.5 Impacts on Economic Prosperity

This section examines the impacts of colonial state presence on long-run economic prosperity in Mexico. Using the 2000 Population Census data, I first look at a measure of contemporary household income. As it has been widely documented in the development literature, consumption would probably be a more convenient measure because it has smaller variance than income, reflecting a more permanent situation of the household. However, to the best of my knowledge there are no consumption measures recorded in the Mexican censuses or other sources with a large enough sample size (INEGI, 2000). To be conservative, I subtract transfers received from the government, though estimates are similar when transfers are included.

Following Deaton (1997), I assume that children aged 0 to 4 are equal to 0.4 adults and children aged 5 to 14 are equal to 0.5 adults. The baseline regressions include 50km boundary segment fixed effects, distance to Mexico City, elevation, slope and the number of household members aged 0-4, 5-14, and 15 and older. Alternative 25km and 100km boundary segment fixed effects are used as robustness

checks. While certain specifications loose statistical significance, most likely due to the small sample size, results are quantitatively similar. Moreover, standard errors are clustered at the municipal level. Statistical significance levels don't change dramatically if these are clustered at a higher administrative level or adjusted for spatial dependence.

Estimates are reported in Table 2.3. The baseline regressions document that contemporary household income is around 15-20% lower in places with weaker colonial state presence. Effects are robust to alternative bandwidths and RD polynomial choices, though naturally these to be noisier with smaller bandwidths or higher polynomals. Panels A and B control for different functional forms of the RD polynomial: latitude-longitude and distance to the boundary. [17] Columns (1) to (3) show results for three different bandwidths, including observations within 25km, 50km and 75km of the boundary. I also perform additional robustness checks: dropping cities (column 4) or state capitals (column 5), including state fixed effects (column 6) or using quadratic or cubic functional forms (columns 7 through 8). While coefficients vary a little, they show a similar picture.

Another potential concern is that the boundary may be at an unusual place. I address this by examining alternatives samples. The first considers only places 25-100 km away, omitting the boundary region itself (column 9). Additionally, in Column 10 I perform a placebo comparing across the provincial boundaries in the study area that fall entirely within the southern colonial state, in order to see whether income differentials of the magnitude found along the boundary are typical. I assign the richer side of each provincial boundary segment as treated, and the specification does not reveal a statistically significant discontinuity.

[17] Additional robustness checks are shown in the Online Appendix, including another specifications controlling both for linear latitude-longitude and linear distance to the boundary

Table 2.3: *Income*

	Log(Household Income) in 2000								
	All	All	All	No cities	No capitals	Est. Fixed Effects	Quadratic	Cubic	Placebo
	25km	50km	75km	75km	75km	75km	75km	75km	75km
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Polynomial in X Y									
Southern State	-0.0759	-0.164+	-0.155*	-0.143*	-0.162*	-0.380*	-0.119+	-0.120+	-0.0410
	[0.116]	[0.0839]	[0.0729]	[0.0657]	[0.0622]	[0.0962]	[0.0707]	[0.0710]	[0.0987]
Panel B: Polynomial in distance to boundary									
Southern State	-0.152+	-0.155*	-0.228**	-0.230**	-0.233**	-0.465**	-0.160*	-0.159*	-0.0803
	[0.0886]	[0.0729]	[0.0703]	[0.0640]	[0.0848]	[0.154]	[0.676]	[0.0674]	[0.0960]
Obs.	58,519	93,239	162,283	162,283	162,283	162,283	162,283	162,283	162,283
Clusters	61	108	162	162	162	162	162	162	162
Mean	2.431	2.340	2.473	2.429	2.445	2.473	2.473	2.473	2.473

Note: Robust standard errors, clustered at municipality level, are in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-8 is the household. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include elevation, slope, boundary segment FE, distances to Mexico City and USA and demographic controls for the number of infants, children, and adults in the household.
Source: Census 2000 INEGI.

Furthermore, additional robustness checks are shown in the Online Appendix, including empirical excercises with Mexican localities instead of municipalities. Overall, these results suggest persistant beneficial long-run effects of colonial state presence.

Human capital is another important proximate factor of economic development. Table 2.4 examines individual-level data from Mexican Population Censuses on years of schooling. I focus on adult cohorts and split them in four categories: less than 25 years old, between 25 and less than 40 years old, between 40 and less than 60 years old and over 60 years old. Columns (1) to (4) report results for 1960 while columns (5) to (8) for 2000. Across different specifications, estimates document that individuals in areas with weaker colonial state presence have on average of 0.6 less years of schooling, relative to a mean of 7 years. Direct impacts on education today are large enough to explain about a fifth of the economic differences, using

Table 2.4: *Education*

	Years of Schooling							
	Cohorts in 1960				Cohorts in 2000			
	<25	25-40	40-60	>60	<25	25-40	40-60	>60
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Linear polynomial in X Y							
Southern State	-0.659*	-0.716**	-0.585**	-0.454*	-0.175	-0.556+	-0.836*	-0.785*
	[0.290]	[0.259]	[0.223]	[0.205]	[0.184]	[0.318]	[0.380]	[0.309]
	Panel B: Linear polynomial in distance to boundary							
Southern State	-0.638*	-0.775**	-0.588*	-0.457*	-0.157	-0.503	-0.810*	-0.663*
	[0.297]	[0.274]	[0.233]	[0.211]	[0.187]	[0.331]	[.382]	[0.304]
Obs.	8,560	10,384	7,742	3,435	148,293	199,198	141,192	73,573
Clusters	162	162	162	162	162	162	162	162
Mean	2.5	2.1	1.8	1.2	7.2	7.0	4.9	2.6

Note: Robust standard errors, clustered at municipality level, are in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-4 is the person. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include elevation, slope, boundary segment FE, distances to Mexico City and USA and demographic controls for age, race and sex. Source: Census 1960, 2000, INEGI.

typical returns to education. As in the case of income, estimates are robust to variations in sample size, RD polynomials and bandwiths.

2.6 Mechanisms

These results raise the intriguing question of why the colonial state's historical influence would be so persistent in the face of the major upheavals that have followed, including Independence, the Mexican Revolution, and the return to democracy followed by major market reforms. Based on an extensive Latin American historiography, I hypothesize that weaker colonial state presence decreased accountability of settlers, instigating local conflicts and parochial cooperation long after it ceased to exist (Burkholder and Chandler, 1977; Coatsworth, 2008; Elliott, 2009; North, 1990). In places further away from their centers, rampant coercion by settlers weakened property rights and self-governance of villages (or *pueblos*).

These may not be the only mechanisms linking the colonial state to long-run development, but the historical evidence makes it difficult to consider a setting where they do not play a central role.

2.6.1 Conflict

As in most of Latin American, the end of colonial rule in Mexico created a severe vacuum of power. Across the country, the legacy of the colonial state may have incentivized insurrections and rebellions (Centeno, 2002; Tutino, 1988). Two phenomenoms helped to reconfigure the political landscape. First, the rise of *caudillos* - or local authoritarian elites - during the 19th and 20th centuries led to continuous instability. The most widespread type of such elites sought to defend local political structures against efforts by the central state to centralize power. [18] They imposed order through coercion with the support of local militias. Their authority was commonly grounded in their economic power derived from the possesion of lands (Lynch et al., 1992) [19]. Anecdotal evidence has long documented *caudillos* marginalized local communities. [20]

Furthermore, newly created municipalities also sought more autonomy to run their affairs, in particular regarding local governance and the definition of land property rights. This demand was a mere recognition of the colonial tradition that allowed self-governance within *pueblos* or indigenous villages. More importantly,

[18]During much of the 19th century, rival political factions between Liberals and Convervatives struggled to seize power across the country. Mexico changed presidents numerous times until autocrat Porfirio Diaz came to power in 1877.

[19]*Caudillos* are also regarded as significant in other Latin American countries. See for example: Bolivia and Peru

[20]Many of these movements demanded autonomy. For instance, in the following decades Independence several states tried to split from Mexico: Zacatecas in 1835, Cohuila and Texas in 1836, Tabasco in 1841, Yucatán in 1848.

though, it was seen as a response to the despotic power of *caudillos*, who often coerced or displaced local communities, making property rights more insecure. Historians have documented a sharp increase in the number of villages that became municipalities after establishing *cabildos* - or local councils. These issues became prominent sources of tensions in the decades following Independence, all the way up to the Mexican revolution and even today. However, most conflicts were local in their demands, scope, and political aspirations.

I empirically revisit conflict as an important mechanism linking the colonial state to economic development. I use the historical descriptions of the *Enciclopedia de los Municipios Mexicanos* to code variables reflecting the likelyhood that a municipality suffered insurections or rebellions in the 19th and 20th centuries. Most of these conflicts were related to political centralization and land property rights. I also construct different historical measures on crimes, such as homicides or robberies, and normalize these variables using population statistics to have comparable metrics across municipalities. This information comes from the Mexican Statistical Office - INEGI. In order to have a larger sample and variation in the data, I report regressions using the baseline bandwith of 75km, although results are fairly consistent at smaller bandwiths but loose significance.

In Table 2.5, columns (1) through (6) consider municipal outcomes, which are described in detail in the Online Appendix. Column (1) documents that across different specifications, having been assigned to the southern colonial state increased the likelihood of suffering local conflicts in the 19th century by about 17% relative to a mean of 21%. Coefficients are significant at the 10% confidence level. This result is ratified in column (3), which looks at episodes of violence during the Mexican Revolution. Coefficients are significant at the 1% confidence level. In columns (4) and (5), evidence suggests this is persistent over the 20th century even

Table 2.5: *Conflict*

	19th Century <1877 (1)	Porfirio Diaz 1877-1910 (2)	Mexican Revolution 1910-1920 (3)	Post-Revolution >1920 (4)	All Periods (5)	Homicide Rate 2000-2015 (6)
			Panel A: Linear polynomial in X Y			
Southern State	0.178*	0.0416	0.141**	0.0353	0.0516	0.259**
	[0.0894]	[0.0349]	[0.0508]	[0.0236]	[0.0298]	[0.0486]
			Panel B: Linear polynomial in distance to boundary			
Southern State	0.0981+	0.0690*	0.0952*	0.0569+	0.0781	0.163**
	[0.0545]	[0.0348]	[0.0452]	[0.0328]	[0.103]	[.0353]
Obs.	162	162	162	162	162	162
Clusters	162	162	162	162	162	162
Mean	0.21	0.04	0.17	0.14	0.41	2.9

Note: Robust standard errors are in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-6 is the municipality. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include elevation, slope, boundary segment FE, distance to USA and obvervations within 75km. Source: Enciclopedia de los Municipios Mexicanos 2000.

though it is not statistically significant. On the other hand, column (6) indicates that places with weaker colonial state presence have 10% higher contemporary average homicide rates. Overall, these results suggest the Mexican state has faced major difficulties monopolizing violence in these regions.

2.6.2 Parochial Cooperation

The Latin American historiography also highlights that the legacy of the colonial state may have affected the norms of behavior. I hypothesize that in areas of weak accountability of settlers, *pueblos* (or villages) may have developed less out-group trust torwards the state but increased in-group prosocial behavior in order to overcome widespread coercion and weak property rights. This pattern of behavior - refered to parochial cooperation - is consistent with a broad literature on evolutionary biology and has been reported to evolve as a response to external threats

Table 2.6: *Attitudes Towards the State*

	Dependant Variables in 1998-2015					
	Trust in National Government	Trust in Congress	Trust in Justice System	Obey the Law	Demand Rights	Pay Taxes
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Linear polynomial in X Y					
Southern State	-0.154	-0.194*	-0.122*	-0.0422	-0.299*	-0.144*
	[0.145]	[0.0925]	[0.0595]	[0.157]	[0.148]	[0.0577]
	Panel B: Linear polynomial in distance to boundary					
Southern State	-0.0850	-0.118	-0.0167	-0.108	-0.291**	-0.101
	[0.111]	[0.114]	[0.0614]	[0.139]	[0.108]	[0.117]
Obs.	1,814	1,814	1,814	1,272	1,267	1,044
Clusters	59	59	59	59	59	59
Mean	3.0	2.9	2.8	0.38	2.4	0.35

Note: Robust standard errors, clustered at municipality level, are in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-6 is the individual. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include individual controls (age, sex, race, matiral status), elevation, slope, boundary segment FE, survey-year FE, distances to Mexico City and USA and obvervations within 75km. Source: Latinobarometro 1998-2015.

in other contexts (Bowles, 2008, 2006; Turchin, 2016). Using contemporary information on public opinion surveys from Latinobarometro (1996-2015), I empirically examine the nature of cooperation as another mechanism of persistence.

Table 2.6 looks at people's contemporary attitudes towards the state. Columns (1)-(3) suggest that individuals living in locations with weaker colonial state presence exihibit lower trust in different state institutions, including, executive, legislative and judicial institutions. Consequently, in columns (4) to (8) individuals living in these areas are also less likely to show higher out-group prosocial behavior towards the state, such as obeying the law, paying taxes, voting in elections or other type of civil engagements. Coefficients are statistically significant at the 5% and 1% confidence level. Alternative results, not shown for simplicity but available upon request, show that individuals do not exhibit differential levels of out-group trust for other groups, suggesting that the effects mainly concentrate on the state.

Table 2.7: *Civil Society*

	Dependant Variables in 2000					
	Community Participation	% *Cabildo Abierto*	ONGs	Civic	Religious	Neighbors
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Linear polynomial in X Y					
Southern State	0.170	0.216+	0.289*	0.263+	0.142	0.247*
	[0.242]	[0.129]	[0.127]	[0.150]	[0.131]	[.121]
	Panel B: Linear polynomial in distance to boundary					
Southern State	0.0393	0.188+	0.194+	0.274+	0.123	-0.151
	[0.227]	[0.110]	[0.112]	[0.138]	[0.126]	[0.141]
Obs.	162	143	162	162	162	162
Clusters	162	143	162	162	162	162
Mean	3.3	0.57	0.20	0.43	0.31	0.55

Note: Robust standard errors are in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-6 is the municipality. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include elevation, slope, boundary segment FE, distances to Mexico City and USA and obvervations within 75km.Source: Encuesta de Desarrollo Municipal 2000.

In contrast, Table 2.7 investigates the importance of civil society. Across a number of measures, places with weaker colonial state presence exhibit on average higher in-group prosocial behavior. Using data from the *Encuesta de Desarrollo Municipal* in 2000, columns (1) to (2) reveal that individuals in these locations participate more in municipal activities organized by the mayor or in local council meetings through the *cabildo abierto* - a self-governance mechanism inherited from the colonial rule. Furthermore, columns (3) to (6) suggest that people in these areas are also more likely to participate in different community organizations, such as ONGs, civic, religous or neighbor groups. Most results are significant at the 5% or 10% confidence level although some are not.

Altogether, these findings signal that weaker presence of the colonial state may have crowded out norms of out-group cooperation torwards the state, but also increased in-group cooperation among communities in *pueblos*. They complement an extensive literature about the complex relationship between civil society and

the state (Banfield, 1956; Fukuyama, 1995; Putnam et al., 1994). A majority of seminal studies in the social sciences, which mostly concentrate their analysis in Italy, argue that civil society and the state are natural complements with potential benefits for economic prosperity. In contrast, the evolution of cooperation in Mexico determined that civil society may be a substitute to the state in the long-run. The results are more closely related to other studies that exhibit more complex relationships in a variety of contexts in Africa and Asia (Dell et al., 2018; Bauer et al., 2016; Lowes et al., 2017; Acemoglu et al., 2014; Scott, 1998).

2.6.3 Economic Structure

The persistence of conflicts and parochial cooperation may have created perverse incentives for economic activity in the long-run. For instance, conflicts about land property rights have been a dominating theme in Mexican history, and more broadly, in Latin America (Coatsworth, 1978, 2008). If these contributed to the persistence of weak property rights, it may have led to the consolidation of an informal economy and delayed structural change. A large economic literature highlights that informality has profound negative effects on firms and individuals as they cannot access the financial sector and other relevant government services (De Soto, 2000; De Soto et al., 1989). In this section, I dwelve deeper into this issue by examining the effects of the colonial state on historical and contempory economic structure.

I use the 1960 and 2000 Mexican Population Censuses to examine household property informality and the sectoral distribution of jobs. In Table 2.8, columns (1) to (2) document that households in areas with weaker colonial state presence are less likely to hold formal property rights of their houses, both historically

Table 2.8: *Economic Structure*

	Property Ownership		Employment in: Agriculture		Manufacturing	
	1960	2000	1960	2000	1960	2000
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Linear polynomial in X Y					
Southern State	-0.0548*	-0.0189*	0.0642*	0.112**	-0.103**	-0.0926**
	[0.0254]	[0.00816]	[0.0307]	[0.0292]	[0.0219]	[0.0212]
	Panel B: Linear polynomial in distance to boundary					
Southern State	-0.0554**	-0.0225**	0.0785*	0.119**	-0.111**	-0.101**
	[0.0197]	[0.00816]	[0.0383]	[0.0301]	[0.0267]	[0.0209]
Obs.	11,300	217,257	9,413	324,852	9,413	324,852
Clusters	162	162	162	162	162	162
Mean	0.56	0.79	0.27	0.20	0.27	0.23

Note: Robust standard errors, clustered at municipality level, are in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-2 is the household and in columns 3-6 the worker. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include elevation, slope, boundary segment FE, distances to Mexico City and USA and demographic controls for age, race and sex. Source: Censuses 1960, 2000, INEGI.

and today. Furthermore, columns (3) and (4) show that adult individuals residing in these areas are 10 percentage points less likely to have a job in agriculture, both 1960 and 2000, relative to means of 27% and 20% respectively. Similarly, columns (5) and (6) document that adult individuals are on average 15 percentage points more likely to be employed in manufacturing in the same years, relative to means of 27% and 23%. All estimates are statistically significant at the 5% or 1% significance level.

These findinds suggest that while places on the southern side of the boundary have higher in-group cooperation, this behavior cannot fully compensate incomplete contracting or weak property rights. It also indicates that the historical environment of coercion promoted informality of property rights, which in turn seems to have slowed structural change. Overall, the evidence indicates that the proximate effects of the colonial state on economic structure almost entirely ex-

plain economic disparities at the boundary today and have been quite persistent overtime. When the state is incapable of monopolizing violence and earning the trust of citizens, the consequences for economic structure may be substantial.

2.6.4 Alternative Mechanisms

The mechanisms explored in previous sections may not be the only ones mediating the long-run effects of the colonial state. Nevertheless, based on available information, it appears unlikely that the impacts of this historical institution persist through migration or public goods. As mentioned in section 2.4, of particular concern is the first alternative mechanism. Even if migration restrictions were in place during the colonial rule, individuals could have migrated across the boundary long after the disappearance of the colonial states. While this wouldn't necesarilly invalidate the broad findings of the study, it may change the interpretation of them. For instance, if richer households differentially sorted out of locations with weaker colonial state presence, then the baseline results could be overestimated. Moreover, conflict may have also affected physical capital hence, other type of public goods.

Table 2.9 looks at these issues. Migration is defined by contrasting the contemporary place of residence with the place of residence 5 years earlier or the place of birth. Columns (1) to (2) indicate there are no statistically significant differences in migration rates in 1960 or 2000 across the boundary. Results are also quantitatively similar under different definitions of migration, including migrating out of the municipality or state. These are consistent with broader empirical evidence in developoing countries arguing that migration extremelly low in rural areas, possibly due its costs. Likewise, columns (3) to (8) inquire about the public provision of electricity, running water, or sewage infrastructure in earlier decades or today.

Table 2.9: *Alternative Mechanisms*

	Migration		Public Goods: Electricity		Running Water		Sewage	
	1960	2000	1960	2000	1960	2000	1960	2000
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Linear polynomial in X Y							
Southern State	0.0102	0.0122	0.0700	-0.0229	0.0611	-0.0427	0.0462	-0.0189
	[0.0168]	[0.0216]	[0.277]	[0.0176]	[0.0469]	[0.0317]	[0.0590]	[0.0598]
	Panel B: Linear polynomial in distance to boundary							
Southern State	0.0119	0.0159	0.0256	-0.0187	0.0298	-0.0265	0.0174	-0.0130
	[0.0132]	[0.0205]	[0.0564]	[0.0179]	[0.281]	[0.0306]	[0.0778]	[0.0749]
Obs.	29,300	494,466	9,413	219,759	10,886	218,950	9,679	219,450
Clusters	162	162	162	162	162	162	162	162
Mean	0.09	0.21	0.42	0.95	0.31	0.88	0.19	0.65

Note: Robust standard errors, clustered at municipality level, are in brackets. ** p<0.01, * p<0.05, + p<0.1. The unit of observation in columns 1-2 is the individual and in columns 3-8 the household. *Southern State* is a dummy variable that equals 1 if located at the southern colonial state, where presence was weak, and 0 otherwise. All regressions include elevation, slope, boundary segment FE, distances to Mexico City and USA and demographic controls for age, race and sex. Source: Censuses 1960, 2000, INEGI.

In general, coefficients are also statistically insignificant, suggesting public goods have an unlikely role in explaining the persistent effects of the colonial state.

2.7 Conclusion

This study examines the persistant effects of the colonial state in Mexico. It revisits a salient historical hypothesis in Latin America which posits that in places with weaker colonial state presence, settlers often disregarded royal decrees and remained unchecked to coerce indigenous populations and extract natural resources. Using a spatial RD design, I document that households and individuals living in places with weaker colonial state presence exhibit lower historical and contemporary living standards. They have higher incomes and education levels. Moreover, adult individuals are also more likely to work in manufacturing sectors and less so in agriculture, indicating that these regions experienced accelerated structural change.

Based on quantitative and historical evidence, I hypothesize that the effects of the colonial state persisted long after it dissapeared through conflict and norms of parochial cooperation, which in turn affected the structure of economic activity. Using a wealth of data sources, I show that regions with weaker colonial state presence experienced more local conflicts in the 19th and 20th centuries. The Mexican state struggled to monopolize violence as *caudillos* - or local authoritarian elites - resisted the centralization of power. Furthermore, the legacy of coercion in regions with weaker colonial state presence fostered in-group cooperation within villages (or *pueblos* but not necesarilly torwards the central state. These historical forces in turn weakened property rights.

The findings complement an extensive literature of the historical origins of Latin American development and provide new insights about the complex relationship between civil society and the state. Developing a better understanding of the types of circumstances that create persistence and opportunities for change remains a central area for future research.

Chapter 3

Acting Like a State: Evidence from Colombian Paramilitarism (with María A. Bautista and James A. Robinson)

3.1 Introduction

A fundamental source of comparative development is the nature of the state. Across the world, states differ widely in their ability to monopolize the legitimate use of violence, raise taxes or deliver even the most basic public goods to its citizens, with important consequences for economic development. A massive social science literature on state formation and a smaller but growing related literature on rebel governance has theorized about the incentives that lead to the creation of states and the vast differences in their organization and behavior (see for example Skocpol et al. (1985); Evans (1995); Tilly (1975); Tilly et al. (1985); Tilly

(1990); Diamond (1997); Herbst (2000); Olson (1993, 2000); Besley and Persson (2011)). Yet, these hypothesis have rarely been examined properly because of the difficulty to find empirical evidence in the modern world (Sánchez De La Sierra, 2019).

In this paper we use the specific experience of the *Frente José Luis Zuluaga* (FJLZ), a paramilitary group that developed in the midst of the Colombian civil conflict, to study some of the classic theories of state formation and rebel governance. The FJLZ was one of six fronts which were part of a larger group that demobilized in 2006 under a transitional justice process, the Peasant Self-Defense Forces of the Middle Magdalena (*Autodefensas Campesinas del Magdalena Medio* - ACMM). [1] The FJLZ was comanded by Luis Eduardo Zuluaga, nicknamed "McGuiver" after the US TV character McGuyver. [2] For a decade between 1996 and 2006, McGuiver and the FJLZ controlled a large territory in the eastern part of the department of Antioquia. This included the municipalities of Sonsón, Argelia, El Carmen de Viboral, La Unión, San Francisco and San Luis and even as far as Communa 13, a suburb on the city of Medellín. [3] We focus on documenting and describing how the FJLZ operated as an institution and making a comparative analysis with other fronts of the ACMM.

[1]The other fronts of the ACMM were the *Frente Central*, commanded by Ramón Isaza (alias "El Viejo" - or the Old One), the *Frente Celestino Mantilla*, commanded by Jhon Fredy Gallo (alias "Pajaro" - or Bird), the *Frente Omar Isaza*, commanded by Walter Ochoa (alias "El Gurré " - or Armadillo), the *Frente Isaza Heroes del Prodigio*, commanded by Oliverio Isaza (alias "Terror " - or Terror), and the *Frente Jhon Isaza*, commanded by Ovidio Isaza (alias "Roque ").

[2]The front was named after McGuiver's murdered brother, José Luis, who died at the hand of guerrilla groups in the 1990s.

[3]Tha base of the front was located at the corregimientos of Jerusalén, La Danta, and San Miguel in the municipality of Sonsón.

The information comes from various sources, including but not limited to: hearings of the transitional justice tribunals (*Proceso de Justicia y Paz*) which have been conducted since October 2011 at Bogotá, documents collected by the Prosecutor's Office investigating the ACMM, interviews with paramilitary commanders and extensive fieldwork in eastern Antioquia. Although this is a single case study, and almost certainly not representative of the wider paramilitary experience in Colombia, we believe that such empirically grounded exercises are critical to evaluating the differing theoretical perspectives to state building. In the process, we do not attempt to describe how the Colombian state ceded control of large areas of its territory to paramilitary groups but analyse some of their interactions to understand the comparative behavior of the ACMM. [4]

Amid the absence of the Colombian state, the FJLZ built and ran a *de facto* state. [5] They tried to establish a monopoly of violence, isolated by Weber as a necessary condition for the state. While they considered this illegal, and in this sense not legitimate, they also saw it as necessary and popular, hence possibly legitimate in a different sense. The FJLZ also had a written legal system to regulate trade and social life and professed a rudimentary equality before the law among their own combatants and civilians. They engaged in acts of violence to enforce these. The Prosecutor's Office has documented more than one thousand crimes associated to the front (or 12% of the crimes of the ACMM) for different

[4]There is a quite large but not very satisfactory literature attempting to understand the nature and persistence of the Colombian "dual society" where the national government governs part of the country and delegates control of the rest to different groups. See Robinson (2007); Acemoglu et al. (2013, 2015) for treatments of directly this issue. It is of course implicit in much research, for example of Safford and Palacios (2002) or work on clientelism in Leal and Dávila (1990).

[5]They did not refer to their organization as a state and indeed distinguish between it and the state. They preferred the description "the de facto authority". According to McGuiver's own testimony, during the decade which he ran this territory, neither the Police nor the Army ever came there.

motives, including, among others, massacres, homicides and social cleansing. Other evidence, including the testimony of McGuiver, indicates that the FJLZ was plausibly responsible for at least 400 homicides.

Furthermore, the FJLZ raised regular 'taxes' which they collected from all farms and business according to well defined rules. They provided other 'public goods', including 176 kilometers of roads, electrification, schools, a health clinic, an old age people's home, houses for poor people, and a bull ring and a sports stadium in La Danta. They gave out educational scholarships and other types of private goods and did so in a relatively non-clientelistic way. The FJLZ also had a bureaucratized organization with functional specialization, with civilian 'tax collectors', a social team, political officers and a military command and control structure. They had a mission statement, an ideology with a hymn and a prayer. They even gave out medals, including the "Order of Francisco de Paula Santander" and the "Grand Cross of Gold" (Frenté José Luis Zuluaga, n.d.a) and trasmitted news to the community through their radio station "Integración Estéreo" .

Acting like a state was seen by McGuiver as a complement to combating the two Marxist guerilla groups which had previously dominated the area, the Revolutionary Armed Forces of Colombia (*Fuerzas Armadas Revolucionarias de Colombia* - FARC) and the National Liberation Army (*Ejercito Liberación Nacional* - ELN). [6] The behavior of the FJLZ was very distinct from that chosen by the other fronts of the ACMM. Why did this group choose one model and the other commanders a different one? We draw several conclusions from the evidence. Some of the most important concern what the FJLZ was not. First, in political economy it is quite common for scholars to draw parallels between war and the

[6] In particular, Fronts 9 and 47 of the FARC and the Fronts Carlos Alirio Buitrago and Bernardo López Arroyave of the ELN.

construction of the state (Tilly, 1975, 1990). However, warfare seems to have been a constant across all fronts of the ACMM. The FJLZ did spent more in total on warfare and was engaged in more combat but this was endogenous to the front's strategy.

Second, another popular theory links organized crime or the Mafia and the construction of the state (Tilly et al., 1985; Grossman, 1995; Skaperdas, 2001; Konrad and Skaperdas, 2012). The Mafia is seen as some intermediate institution between anarchy and a nascent state. However, the FJLZ was definitely neither like these groups, although it did tax both of them. In contrast to the origins of the Mafia layed out in (Gambetta, 1996), the FJLZ did not begin by selling protection to private parties and instead coerced people into contributing to public goods, particularly order. The roots of the group were as a military organization to defeat guerilla groups in the region. It applied universalistic principles which it attempted to enforce and did not provide rivalrous public or private goods on a clientelistic basis. Contrary to what one might expect from the social science literature, nascent states don't necesarilly emerge out of war or are therefore patrimonial.

Third, in contrast to Olson (1993)'s seminal theory of stationary bandits, the provision of public goods seems to have mostly been a strategy for fighting against the guerillas and was not movitated by a desire to maximize rents or to get to the top of the Laffer curve. Some direct evidence of this is that the taxes the front charged did not increase in an area after it had established order. Hence, the FJLZ did not practice 'proprietary public finance' (Grossman and Noh, 1994). Moreover, the front made most income from taxing illegal gasoline cartels, unrelated to public good provision. The evidence contradicts a 'resource curse' setting, which would predict for more violence and less public good provision, or other theories about the role of structural factors, such as geography or ecology (Diamond, 1997;

Herbst, 2000). There are few apparent differences in agricultural productivity or population density between the places occupied by the FJLZ and those of the other fronts.

Fourth, neither was the FJLZ predatory in the sense used in the political economy literature. When looking at its finances, the largest item of expenditure was paying and provisioning its military organization, which took up 34% of its incomes. The next largest item was the costs of providing public goods, which took up 23%. The rest was spent on weapons and ammunition, medical expenses for members of its group and other war expenses. There is certainly some evidence of rent extraction or kleptocratic behavior by the leadership, but it appears to be small. For example, the process of demobilization required that paramilitary groups gave their assets to the government to make reparations to victims. Although it almost certainly is an underestimated figure, McGuiver surrendered assets for a total value of only 2% of the total incomes of the FJLZ.

Overall, even if the behavior of the FJLZ fits parts of prominent theories about state formation and rebel governance it seems very unlikely to us that their comparative statics could explain the variation observed. One possible explanation is the idiosyncracy of superior commanders. However, quantitative and qualitative sources suggest that a more profound difference with the ACMM fronts was the nature of its nascent bureaucracy (or combatants) amid the absence of other state authorities. The FJLZ strived to recruit combatants from the Middle Magdalena region. Also, they actively avoided contacts with the Colombian state, including political elites or the Armed Forces. This seems to have allowed the front to develop a better military control and command structure with deep ties to local communities and the environment.

The paper proceeds as follows. In the next section we discuss in more detail some of the most famous hypotheses about state formation and rebel governance. This is a vast subject and we focus on those we can hope to evaluate in the light of our understanding of the FJLZ. Section 3.3 discusses the data sources used in the analysis. In section 3.4 we provide some brief background information on the history of Colombian paramilitary groups, particularly focusing on the ACMM. Section 3.5 then dwelves deeper into the origins of the FJLZ and its behavior. We break down the discussion into several sub-categories. Section 3.6 then brings the theories of state formation together with the evidence we have presented from the FJLZ. Section 3.7 concludes.

3.2 Theories on the Origins and Nature of the State

A massive social science literature has theorized about the origins and nature of the state. The seeds of early states are often thought to lie in the move from roving bandits to stationary bandits (Olson, 1993). Under anarchy, a roving bandit only has an incentive to steal and destroy, whilst a stationary bandit or a tyrant has an incentive to encourage a degree of economic success, since he will expect to be in power long enough to take a share of it. A stationary bandit thereby begins to take on the state function of protecting citizens and their property. When thinking about this transition, it is quite common to draw parallels between organized crime like the Mafia and the construction of the state (Tilly et al., 1985; Grossman, 1995; Skaperdas, 2001; Konrad and Skaperdas, 2012). Organized crime is seen as some intermediate institution, which primarily practices protection rackteteering and selling as a private good (Gambetta, 1996).

Perhaps the most common argument is that effective states are created by warfare. This provides incentives to elites to eliminate external and internal threats as well as to secure resources or tax its citizens to perform these tasks. For instance, in the face of international conflict, nascent states must become strong in order to survive. As in the case of medieval Europe, states need to raise taxes and provide public goods to induce its citizens to support it (Tilly, 1975, 1990). In contrast, such survival imperatives never ocurred in Latin America or Africa, which may explain why states in these regions have been often unable to extend their authority (Herbst, 2000; Centeno, 2002). Moreover, when internal threats that come from elite competition cannot be overcome, civil conflict and violence inhibits the process of state building (Besley and Persson, 2011). [7]

Others conceive the state as arising from its interaction with civil society (Hobbes, 1651, Rousseau, 1762). Ultimately this view comes from the work of Max Weber who emphasized the transition of states from those which were "patrimonial" to those which were "rational-legal" and possessed legitimacy. The state develops most strongly when it can compete with civil society on equal terms. Though the state may wish to establish dominance over society, the ability of society to develop its own strengths (in the form of coordination, social norms and organization) is central because it induces the state to become even stronger (Putnam et al., 1994; Acemoglu and Robinson, 2017). Alternatively, this can occur when citizens are expected to replace rulers who do not provide sufficient public goods or otherwise misbehave (Acemoglu, 2005). Ineffective states are thus a

[7]Other work by Acemoglu et al. (2013) and Acemoglu et al. (2011) again emphasize elite incentives. Acemoglu et al. (2016) study more systematically the interaction between elite incentives and social mobilization.

consequence of a strong society that can oppose them and their interference (Migdal, 1988; Scott, 1998).

Another stream of thought argues that the roots of strong states are to do with other structural factors such as geography, ecology, or natural resources. For instance, high agricultural productivity leads to high population density which tends to create states. Such arguments suggest that parts of the world which have effective states have thus deep historical origins, perhaps going back to the Neolithic Revolution (Diamond, 1997). Similarly, the presence of natural resources, such as oil or diamonds, may incentivize the emergence of 'rentier' states. Without the need to create a tax base, these states feel less compelled to provide public goods to its citizens and are more prone to using coercion as means to extend their control (Weinstein, 2006).

3.3 Data Sources

This study uses information from various sources to contrast the theorical perspectives debated in the previous section with empirical evidence. The most relevant material comes from the hearings of the transitional justice tribunals (*Proceso de Justicia y Paz* or Justice and Peace Process). These were conducted since the time of collective demobilization of the ACMM in February 7 2006, under a peace treaty between the Colombian government and 38 different paramilitary groups. All ACMM commanders attented these tribunals until 2016 and purged reduced sentences of up to 8 years in prison. The transitional justice system incentivized more lenient punishments in exchange for full confessions of war crimes, reparations

to victims and the promise of no repetition. [8] If commanders were caught lying or misreporting events, they could loose all legal benefits, experience increased sentences and, in case of drug-dealing, even face extradition to the United States.

We use documents produced by the Prosecutor's Office investigating the ACMM and presented during the hearings. The information covers topics on georeference, history, combatants (*Versiones Ley 782*), crimes (*SIJYP*) and finances (Fiscalia Para la Justicia y la Paz, 2009). Other important elements include reports made by McGuiver about the social works of the FJLZ and their legal statutes (Frenté José Luis Zuluaga, n.d.a; Frente José Luis Zuluaga, n.d.b). We also transcribed and analyzed public audiences between 2011 and 2012, the most important public part of the process. These contain the official statements made by the ACMM ex-combatants to the Justice and Peace magistrates in charge of judging them (Fiscalia Para la Justicia y la Paz, 2011-2012). We complement this information with interviews of paramilitary commanders in prison and extensive fieldwork in eastern Antioquia in December 2011, particularly in Jerusalén, La Danta, Rio Negro, San Francisco and San Miguel.

Moreover, we draw from several sources to characterize socio-economic and geographic conditions in the territories of the ACMM. We focus on the period 2000-2006, when the ACMM decentralized the operation of the fronts. First, we use municipal information from the Population Census 2005 on population, education and public service delivery. To contrast violence and conflict with the Prosecutor's Office, we employ data from the Ministry of Defense and Noche y Niebla - CINEP, an NGO that gathers newspaper reports on the Colombian civil conflict. Finally,

[8]There is widespread debate in Colombia about the effectiveness of the Justice and Peace Process. While it helped to demobilize 38 paramilitary groups, the transitional justice system has been marred by controversy. Legal hurdles, low number of sentences and incomplete accounts of crimes, among other problems, have hindered its mission.

we use information on geography and natural resources produced by Center for the Study of Economic Development at the Department of Economics, Universidad de los Andes, and satellite imagery from Google Maps in 2007.

3.4 Colombian Paramilitarism and the ACMM

The origins of the FJLZ lie with those of the paramilitary group of which it was a front, the ACMM. In the late 1960s, the government introduced several counterinsurgency measures (Law 48 of 1968) to fight off the threat from left-wing guerilla movements, including the Revolutionary Armed Forces of Colombia (*Fuerzas Armadas Revolucionarias de Colombia* - FARC) and the National Liberation Army (*Ejercito Liberación Nacional* - ELN). The law allowed the creation of self-defense groups by private citizens for the purposes of protecting their properties and lives (Duncan, 2006). The rapid expansion of paramilitary activity in the 1980s was associated with an increasing threat to traditional rural elites and the rise of the large drug cartels in Medellín and Cali (Gutiérrez Sanín and Barón, 2005). One area of rapid expansion was the northwestern department of Antioquia, which saw the emergence of groups such as the Peasant Self-Defense Forces of the Middle Magdalena (*Autodefensas Campesinas del Magdalena Medio* - ACMM) in 1977 led by Ramón Isaza.

This organization went through quite a few reincarnations over time. The first version was founded in the municipality of Puerto Triunfo under the name of The Shotgunners (*Los Escopeteros*) (Fiscalia Para la Justicia y la Paz, 2009). Isaza was illiterate but had gained military experience during military service where he fought against FARC's number one commander Manuel Marulanda, nicknamed Sureshot (*Tirofijo*), and the Liberal bandit Teófilo Rojas, alias *Chispas*, in the 1960s.

The Shotgunners notoriously grew in size and capabilities when it merged with a neighbouring paramilitary group in 1982, the Peasant Self-Defense Forces of Puerto Boyacá (*Autodefensas Campesinas del Puerto Boyacá* - ACPB) under the command of the legendary paramilitary leader, Henry Peréz, who had links to the Medellín drug cartel of Pablo Escobar. In fact, this powerful drug dealer owned a large number *haciendas* and drug laboratories near Isaza's territory, most notably the famous *Hacienda Napoles*.

However, Isaza soon realized that the Medellín drug cartel was mostly interested in laundering money out of the illegal drug trade and not fighting left-wing guerrillas. Pablo Escobar started to wage war against the Colombian state, indiscriminately killing policemen, army personel, judges and politicians, including government ministers and three presidential candidates in the 80s, and intimidating the civilian population with car bombs. Isaza did not agree with such actions and in 1986 he broke off ties with the ACPB, declared war against the Medellín drug cartel and founded his own independent paramilitary group, the ACMM. The war between the ACMM and the Medellin drug cartel lasted until Pablo Escobar was killed in 1993, with a death toll as high as one thousand people (Audience, November 25 2011). During these years, the ACMM was severly diminished and almost wiped out by continued attacks from both Medellín drug cartel and the ELN guerrilla.

Taking advantage of a government peace process in 1991, the ACMM collectively disarmed along with other paramilitary and guerrilla movements. [9] Ramón Isaza, his family and even McGuiver, which already worked for him as a driver, went into hiding. However, the FARC and ELN quickly filled the void left by

[9]For example, notable guerrilla groups such as the M-19, Quitin Lame and others demobilized in the same year.

these armed groups and began their incursion into the drug trade business, which gave them considerable resources to continue their fight against the Colombian state. This led the government to allow the creation of Convivir in 1994, a national program of neighborhood watch groups, which further facilitated the expansion of paramilitaries. According to both Ramón Isaza and McGuiver, they had to regroup again in 1996 because the government was not keeping up their promises of protecting the civilian population (Audience, February 21 2012).

They led the rearming of the ACMM from his home town of Puerto Triunfo and started to occupy new territories at local landowners and businessmen' requests. He expanded to the north to Puerto Berrio and especially to the south into the neighbouring departments of Caldas, Tolima and as far as Guaduas, Cundinamarca, which is only a two hour ride from Bogotá (see Figure 3.1). By this time, his sons and his son in law, McGuiver, were already middle commanders in the area near Sonsón and Puerto Triunfo. In 2000, as the FARC and ELN intensified their operations in the area, Ramón Isaza decided to decentralize his group into six independent fronts in order to fight them more efficiently (see Figure 3.2). The other fronts of the ACMM were the *Frente Central*, commanded by Ramón Isaza (alias "El Viejo" - or the Old One), the *Frente Celestino Mantilla*, commanded by Jhon Fredy Gallo (alias "Pájaro" - or Bird), the *Frente Omar Isaza*, commanded by Walter Ochoa (alias "El Gurré" - or Armadillo), the *Frente Isaza Heroes del Prodigio*, commanded by Oliverio Isaza (alias "Terror" - or Terror), and the *Frente Jhon Isaza*, commanded by Ovidio Isaza (alias "Roque").

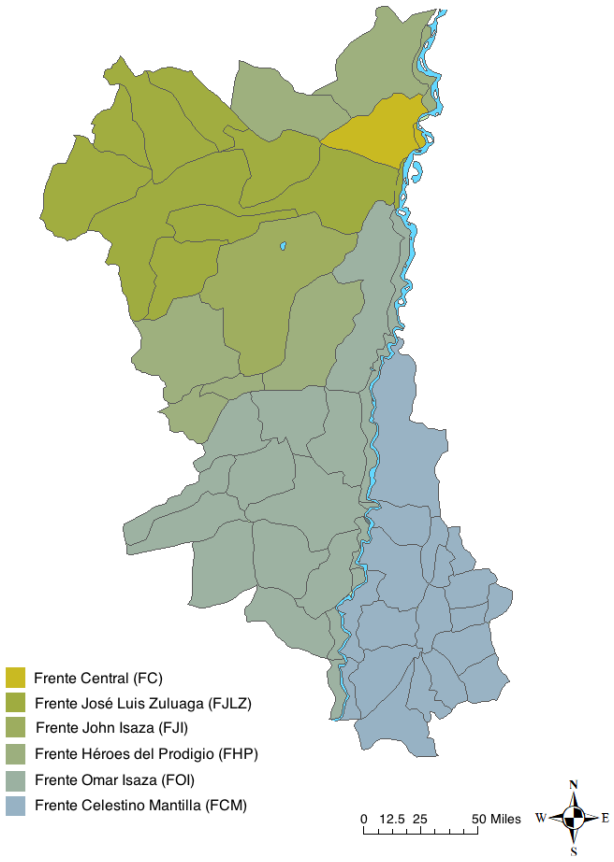


Figure 3.1: *Map of the ACCM territory*

Note: This figure shows a map of the municipalities controlled by the ACMM during 2000-2006, discriminating by each front. Source: Prosecutor's Office.

In 1997, the ACMM joined the United Self-Defense Forces of Colombia (*Autodefensas Unidas de Colombia* - AUC) of the Castaño brothers, which included possibly 80% of the existing 38 different paramilitary forces in the country. The creation of this national organization increased the effectiveness of the paramilitaries considerably. As a result, along with a surge in goverment military operations and capabilities, the FARC and ELN guerrilla groups were thrown out of large areas of the country in the next decade. As the conflict intensified, violence spiked to unprecedented levels. However, most of these paramilitary groups remained independent from one another, setting their own policies in the territories each of

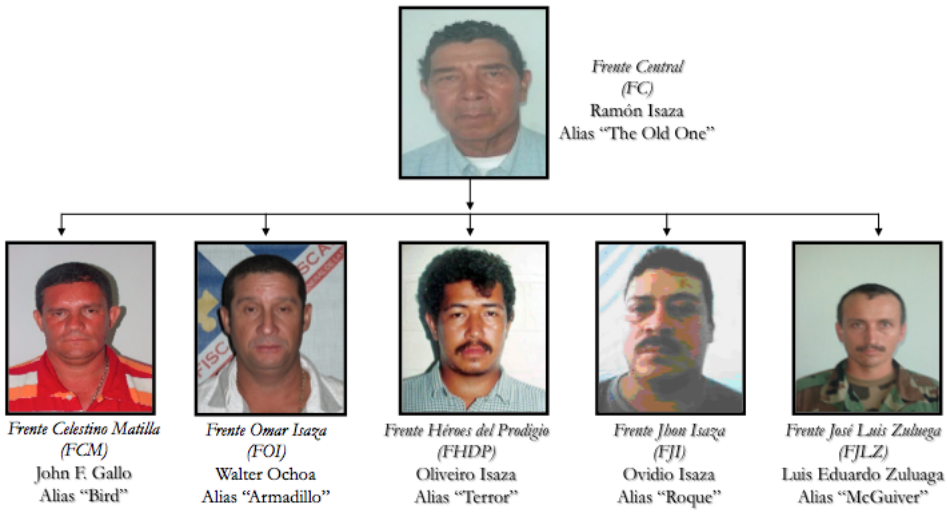


Figure 3.2: *Organigram of ACMM*

Notes: This figure shows the organigram of the ACMM when it demobilized in 2006. Each image shows the commander in charge of a front, his name and alias. Source: Prosecutor's Office.

them controlled. [10] While belonging to the same paramilitary group and under the superior command of Ramón Isaza, the 6 fronts of the ACMM acted independently and there was a large variation in the way they carried out their activities and operations.

In 2003, the government signed an agreement with most of the groups of the AUC to demobilize under the Justice and Peace Law (*Ley de Justicia y Paz*). On February 7, 2006 Ramón Isaza and the ACMM collectively demobilized with 1,201 men in the rural jurisdiction of Las Mercedes in Puerto Triunfo. This transitional justice process gave de-facto amnesty for paramilitaries not under investigation for human rights violations as long as they confessed their activites and crimes and helped to compensate their victims. Those found guilty of human rights violations, mostly top and middle commanders, were to be given sentences between five and

[10] On several occasions they even fought against each other for the control of important drug routes or because they had conflicting political interests.

eight years and judged by the Justice and Peace tribunals across the country. [11] Ramón Isaza and all the fronts commanders, including McGuiver, attended the Justice and Peace tribunals in Bogotá from 2007 until 2016.

3.5 The FJLZ

3.5.1 Origins and Territory

Luis Eduardo Zuluaga, alias McGuiver, was born in 1969 in the municipality of San Francisco, just west of Puerto Triunfo. This was an area of intense guerrilla activity. In 1987, the ELN captured the town and kidnapped many people including his brother José Luis. Though he was freed the next day this incident created a great animosity against the guerilla. McGuiver, then 18, went with his brother and others to see Ramón Isaza in order to join his paramilitary group. They were sent for three months to La Guayabera, a paramilitary training camp, and McGuiver became a driver assigned to Isaza. He was very crafty making military artifacts and home made grenades. He was given the nickname "McGuiver" after the US TV character McGuyver and quickly started scaling up through the ranks. He demobilized in 1991 but three years later his brother José Luis was killed by the ELN. This incident greatly motivated him to rejoin the ranks of the ACMM when Isaza started regrouping 1996.

[11] The demobilization process resulted in a power struggle between different paramilitary leaders, which led to the assatination of many notable commanders like the Castaño brothers. There is a great deal of controversy about whether the paramilitary demobilization is real (or simply the institutionalization/legitimation of the power of the AUC; on this issue see Pardo 2007; International Crisis Group 2007; Zuckerman 2009) and how it is connected to the upsurge of new illegal armed groups known by the acronym 'Bacrim' (Bandas Criminales - or Criminal Bands).

The ACMM had made presence in this area at least since 1985 when one of the founders of The Shotgunners, Monkey Celin (or *Mono Celin*), set up a base in La Danta (Audience, October 31 2011). In the 1990s the commander was Champion (or *Campeón*), who was killed in 1998. He was replaced by one of Ramón Isaza's sons, Omar Isaza, alias Lieutenant (or *Teniente*), who was also killed by a bomb later that year (possibly by the ELN but also possibly accidentally). After the death of Lieutenant in 1998, Ramón Isaza placed McGuiver in charge of Sonsón and in 2000 the FJLZ was born as an indepedent front. He received an initial installment of another 100 men and weapons. McGuiver did not see themselves as the state but as de facto authorities. In one of the Audiences he claims: "we were an illegal group but we were necesarry for providing security outside the law, given that there was a central state incapable of providing us such security " (Audience, October 28 2011).

The FJLZ made the corregimiento of La Danta in the municipality of Sonsón, Antioquia its base, but it's power also extended to the rest of Sonsón, and into the neighboring municipalities of Argelia, El Carmen de Viboral, Cocorná, La Unión, Nariño, San Francisco and San Luis and even as far as Communa 13, a suburb in the city of Medellín (see Figure 3.1 and 3.3). This region lies at the intersection of the Andes mountain range and the valley of the Magdalena river, the largest river in Colombia. Altitude changes drastically from sea level at the bottom of the valley to almost 2,000 meters above sea level in Sonsón, providing large variation in terrain ruggedness and soil quality. At the time, a bit more than 150,000 people lived in this region, 60% of them resided in rural areas which explained why agriculture was the main economic activity (DANE, 2005). Poverty was widespread, as 40% of people faced unsatisfied basic needs, but this setting

Figure 3.3: *Map of the FJLZ territory*

Note: This figure shows a map of the municipalities controlled by the FJLZ during 2000-2006. Source: Prosecutor's Office.

was not very different from the socio-economic conditions of the other fronts' territories (see Table 3.1).

3.5.2 Nascent Bureaucratization

The FJLZ had a nascent bureaucratized organization, with financial, military, political and social wings. They had a written legal system to regulate social order refered to as "The statutes"(*Los Estatutos*), which applied both to members of the FJLZ and civilians. They saw the most important of objectives to be order and protection against left-wing guerillas, particularly the fronts 9 and 47 of the FARC and the fronts Carlos Alirio Buitrago and Bernardo Lopez Arroyave of the ELN. They defined themselves "on the military front as a counterinsurgency organization [...] and on the political front as a civil resistance movement that

Table 3.1: *Structural Factors*

Front	Frente Central (FC)	Frente Celestino Mantilla (FCM)	Frente Héroes del Prodigio (FHDP)	Frente Jhon Isaza (FJI)	Frente José Luis Zuluaga (FJLZ)	Frente Omar Isaza (FOI)
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: Geography			
Agricultural Use	25.3	36.0	19.5	32.2	33.3	32.4
Soil Quality*	4.3	3.7	2.1	2.4	1.8	2.6
Water	3.8	1.4	1.0	0.3	0.2	1.5
Avg. Slope (in %)	3.1	9.4	8.3	13.2	14.6	9.8
Avg. Altitude (in meters)	506	1150	1244	1715	1796	1278
			Panel B: Natural Resources 2000-2006			
Avg. Coca Production (in hectares)	1	0	1393	1016	882	1062
Gasoline Pipelines (in km)	10	37	24	0	0	74
			Panel C: Socioeconomic Conditions in 2005			
Population	16,248	163,817	109,318	32,552	155,826	419,939
Avg. Population Density (per km^2)	44.5	74.1	59.1	31.4	50.9	76.1
% Rural Population	71.2	70.3	60.0	60.3	62.9	49.4
Avg. Years of Schooling	3.5	4.3	4.0	3.7	3.9	4.3
Avg. Unsatisfied Basic Needs (UBN)	33.7	32.0	31.3	34.8	32.1	29.5
Avg. Land Gini	0.73	0.68	0.67	0.67	0.74	0.70

Notes: This table summarizes information characterizing the geographical and socio economic conditions of ACMM front territories. Panel A shows geographical and ecological data, Panel B data regarding natural resources and Panel C socio economic conditions. Sources: Census (2005), CEDE-Uniandes.

represents and defends rights and interests neglected by the (central) state"(see Frente José Luis Zuluaga (n.d.a)).

The military wing was in charge of counterinsurgency operations and providing security and basic order. Their personel wore military clothes and insignia. There were middle and low ranking commanders and stations in each municipality and mobile groups which routinely patrolled rural areas (see Figure 3.4). They were trained at two bases at La Guayabera and Rio Claro and had a military factory where they produced home made weapons, ammunition and grenades. These bases had such a reputation that members from other fronts of the ACMM were also trained there. The commanders had CVs for all of the men on computers and they used these to record minor infringements of the statutes. They had a mission statement, an ideology with a hymn and a prayer. They even gave out medals,

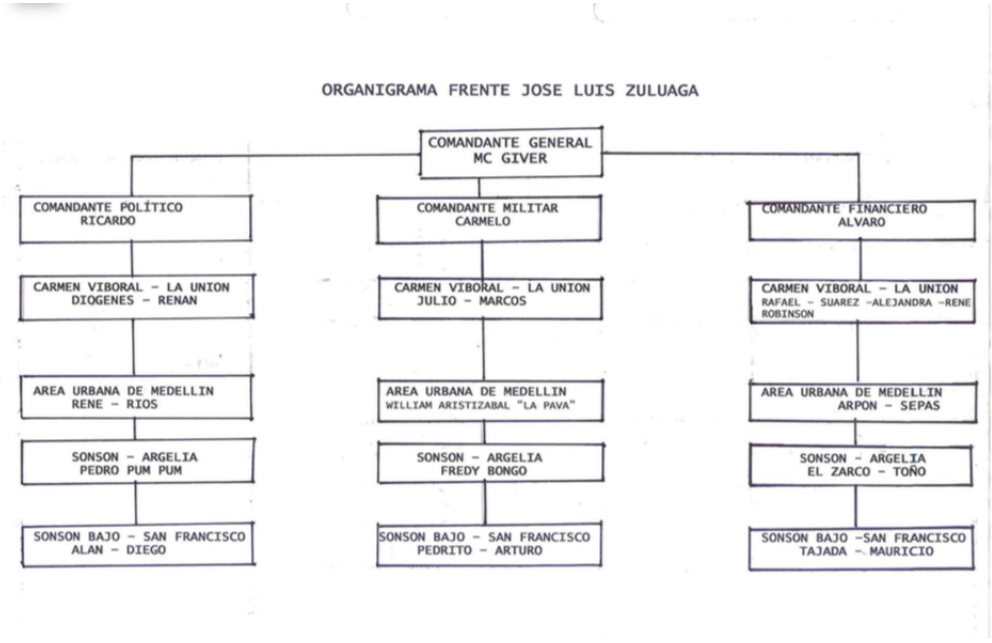


Figure 3.4: *Organigram of FJLZ*

Notes: This figure shows the original organigram of the FJLZ when it demobilized in 2006. The left column shows the alias of local political commanders posted at different municipalities, the center columns those of local military commanders and the right column those of the financiers. Source: Prosecutor's Office.

including the "Order of Francisco de Paula Santander" and the "Grand Cross of Gold" . Unlike in other fronts of the ACMM, most of the members of the FJLZ were born in the Middle Magdalena and had no direct previous contacts with the Armed Forces (see Table 3.3.2). The most important decisions were consulted with McGuiver.

On the financial wing, the financiers always wore civilian clothes and were kept distinct from the military side of things. They did not have different rank insignia but commanders did have a different logo. They did not decide on how much a farm or business should contribute in taxes, the commanders did. McGuiver noted "the financier has to be a neutral person, far from the arsenal " (Audience, October 28 2011). After they had conquered a territory militarilly "we entered in small groups, which included a financier that always wore civilian clothes. He could not

Table 3.2: *Combatants in 2006*

Front	Frente Central (FC)	Frente Celestino Mantilla (FCM)	Frente Héroes del Prodigio (FHDP)	Frente Jhon Isaza (FJI)	Frente José Luis Zuluaga (FJLZ)	Frente Omar Isaza (FOI)
	(1)	(2)	(3)	(4)	(5)	(6)
Number of combatants	95	200	175	88	229	112
Age	29.4	29.3	27.4	27.6	26.9	27.1
Years of Schooling	4.4	5.1	4.0	4.4	4.0	5.1
Years of Service	6.5	1.8	5.3	5.0	2.1	4.4
% Married	3.2	15.8	7.4	2.1	16.8	3.2
% Born in ACMM Territories	65.3	33.5	65.1	62.5	67.2	68.8
% Born in Front Territories	9.5	10.0	25.7	20.5	54.1	54.5
% Former Armed Forces	7.4	8.5	6.9	21.6	5.7	19.6
% Received Training	84.2	76.5	90.3	75.0	77.3	46.4
% Criminal Records	16.8	15.5	20.6	19.3	21.8	30.4

Notes: This table summarizes information characterizing ACMM combatants, discriminated by each front. It includes 889 combatants that collectively demobilized in 2006, 50 combatants the demobilized before that year and 154 members captured by the Armed Forces between 2000 and 2006. Source: Versiones Ley 782, Prosecutor's Office.

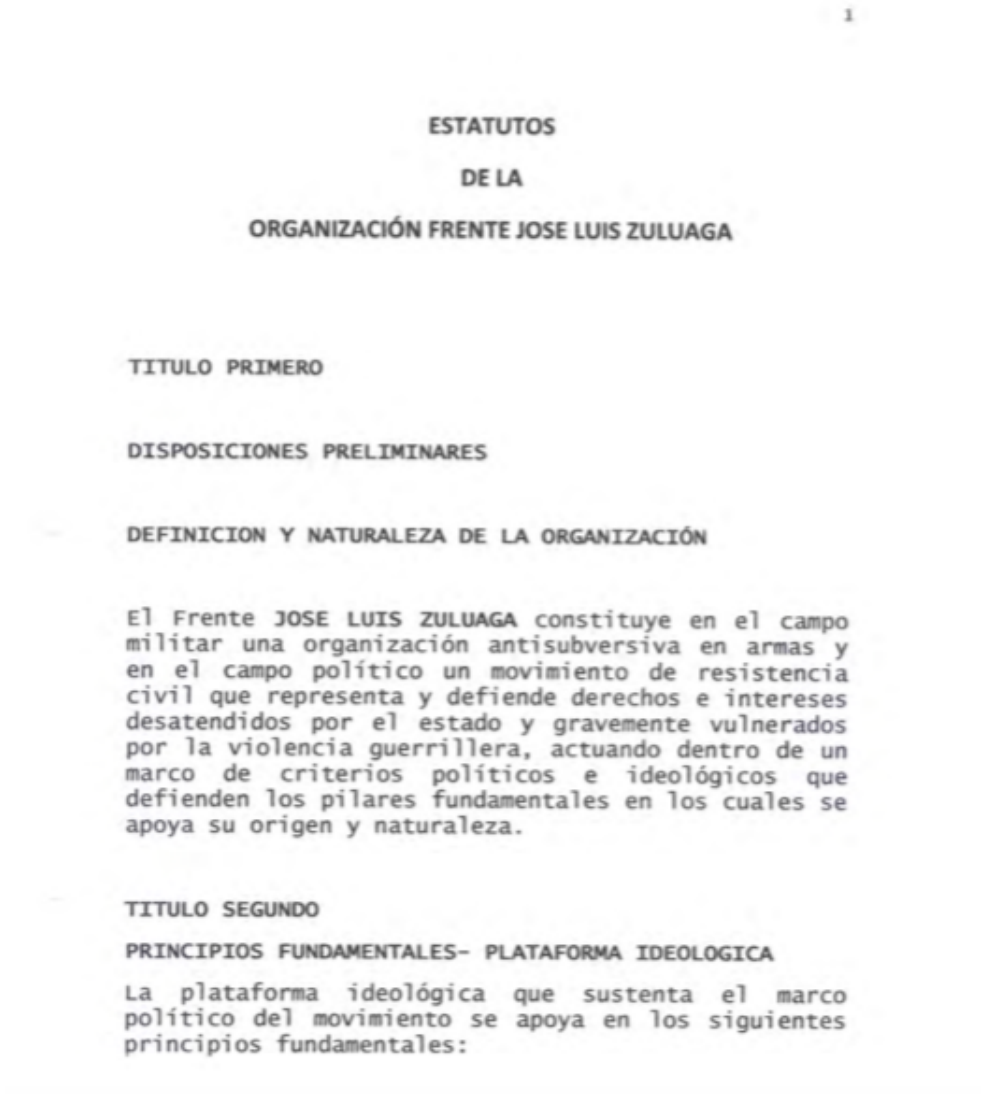
act because he was the image (of the organization) and asks for the contributions. He cannot be involved in the military side".

The political and social teams were made up of members of the FJLZ who worked on developing the ideology behind the organization and on the construction of public goods. The political wing constantly organized community meetings, where the community was informed about the policies of the front. They also administered other information channels, including a radio station called "Integración Estéreo". On the other hand, members of the social team were in charge of designing the construction of social works that would benefit the community, along with other civilians. Overall, the nascent bureaucratization was a central instrument for fighting left-wing guerrillas and developing public support.

3.5.3 The Legal System

The legal code of the FJLZ, called "The Statutes"(*Los Estatutos*), was originally derived from a set of codes of the same name devised by Carlos Castaño at the time of the creation of the AUC in 1997 (see Figure 3.5). These in turn were derived from even earlier statutes Castaño had developed when in charge of the paramilitary forces of the Peasant Self-Defense Forces of Córdoba y Urabá (*Autodefensas Campesinas de Córdoba y Urabá* - ACCU). These were adapted by McGuiver with the aid of his commanders to the needs of the FJLZ. They were specific about how to deal with combatants and the civilian population and there was a rudimentary equality before the law. In theory he punished equally civilians and members of his own group though McGuiver later observed: "I was more flexible with the civilians because of the image we had to keep [...] One spends a lifetime trying to win people's trust and you loose it in one second"(Audience, November 22 2011).

The statutes regulated conflict resolution, the economy and social interactions. In exchange for the contributions, the FJLZ made the commitment that "whatever happens here is our responsability"(Audience, October 2 2012). This plegde went beyond just guaranteeing security. McGuiver argued: "We were authority in the area, we were the de facto authority, [...] in us fell the possibility of solving all kinds of social conflicts"(Audience, February 2 2012). The front attended to all classes of conflicts. From those that seemed of low importance, such as chickens running loose and eating the neighbor's seeds, all the way up to contract enforcement, robbery or homicide. Without their presence, testimonies in the Audiences suggested tensions were resolved according to rural culture, which in some instances involved duels with machetes.



1

ESTATUTOS

DE LA

ORGANIZACIÓN FRENTE JOSE LUIS ZULUAGA

TITULO PRIMERO

DISPOSICIONES PRELIMINARES

DEFINICION Y NATURALEZA DE LA ORGANIZACIÓN

El Frente JOSE LUIS ZULUAGA constituye en el campo militar una organización antisubversiva en armas y en el campo político un movimiento de resistencia civil que representa y defiende derechos e intereses desatendidos por el estado y gravemente vulnerados por la violencia guerrillera, actuando dentro de un marco de criterios políticos e ideológicos que defienden los pilares fundamentales en los cuales se apoya su origen y naturaleza.

TITULO SEGUNDO

PRINCIPIOS FUNDAMENTALES- PLATAFORMA IDEOLOGICA

La plataforma ideológica que sustenta el marco político del movimiento se apoya en los siguientes principios fundamentales:

Figure 3.5: *The Statutes*

Notes: This figure shows the first page of The Statutes (*Los Estatutos*) developed by the FJLZ to regulate social order. Source: FJLZ.

They enforced the legal code in various ways, ranging from coercion to small sanctions. For example, coercion was used to force people into contributing to security and order, the most important public good. Death was not supposed to be a punishment for not paying a contribution but people were often encouraged to leave and sell their land if they did not agree with these policies. Alternatively,

the FJLZ would exclude non-contributors from protection and ignore them in case they were robbed or targeted by the guerilla. In another example, they could held up the assets of farm or business owners, such as "lorries full of milk to make sure the milk producers paid their contributions". McGuiver himself observed "We were the police. We gave the orders to establishments about what time to open and close. A circular was used to determine how the establishments should operate"(Audience, October 28 2011).

If the crime was grave enough a was procedure was followed to impart justice and reach a veredict, in consulation with other commanders. The iconic case of Juan and Leidy serves as a prime example (Audience, October 28 2011). Juan was a member of the FJLZ who went in battledress with a gun into La Danta when not on duty, which was a violation of the statutes. He got drunk in a bar and killed a 16 year old girl Leidy who had two brothers in the FJLZ. Juan was arrested and disarmed. McGuiver then went to the bar and talked to witnesses about what had happened. A meeting with the commanders of the FJZL and others was convened where it was decided that he should be executed. Juan's cousin Condorito was also in the FJLZ and was consulted for his opinion on the matter, to which he replied that Juan had known very well what the statutes were. They compensated his family with 10 million pesos (or 5 thousand US dollars).

The FJLZ would apply economic sanctions if there were minor infrigements of the statutes. The standard procedure was "we called on people one time, two times and the third time we applied sanctions". A good example was if people's pigs or chickens were running loose or someone did not tie their horse up in town. They could impose fines of around 10,000 pesos (or 5 US dollars) and keep the animals until they were paid. Moreover, social sanctions on civilians who broke the statutes were also used. For instance, in the Justice and Peace trials McGuiver

recalls the case of 5 men who stole 25 or 30 million pesos (or 15,000 US dollars) from the electricity company, who were then given social sanctions by working on building roads or community duties. Members of the FJLZ were also sanctioned if they wasted ammunition, broke military material or misstreated civilians.

They also had a jail where they would keep civilians who were out of control and their own men but not for long periods of time. You could complain against the application of the statutes, especially civilians and it happened. This was much more difficult for members of the FJLZ. They would have a number of meetings where the people could make themselves heard. According to McGuiver: "I made a lot of meetings with the people, and in eveyone of those meetings people could speak freely"(Audience, October 28 2011). Sanctions that had been imposed could be reversed by commanders higher up the chain of command and anecdotal evidence suggests this happened in El Carmen de Viboral and La Unión.

However, their attitude towards these laws was complex. There were clear deviations between these standards and what actually happened. For instance, McGuiver noted "we understand we don't have the right to establish the death penalty"(Audience, October 28 2011) and they nowhere mention execution as a punishment for violating the statutes. Yet, both members of the FJLZ and civilians were executed as punishments. They also stated that the front would be funded by voluntary contributions, while the testimony of McGuiver himself indicates that contributions were not voluntary but compulsory. Also, other things that were not mentioned in the statutes were clearly santioned with death, such as drug abuse issues, prostitution and even homosexuality.

3.5.4 The Fiscal System

As discussed above, the financial wing was a key component of FJLZ. The most important principal of tax policy was that all farm and business owners had to pay contributions. People were called to obligatory meetings with the clear objective of avoiding free-riding. As McGuiver observed "we had the lemma that security was an obligation of everyone and we all had to contribute to this. For this reason, no one was left out"(Audience, October 28 2011). But the FJLZ did not make explicit contracts as they "didn't make agreements with anybody"(Audience, October 31 2011). The FJLZ tried to convince people that "these contributions are not for McGuiver, they are for the war, they are to be redistributed in your benefit in the form of security"and "economic development"(Audience, October 31 2011).

There were some important differences in the extent and incidence of taxation. [12] They taxed in different ways, from farm products to wealth and they even had road tolls. On products such as potatoes they would charge 100 pesos (30 US cents) per bulk or on milk 20 pesos (7 US cents) per litre. In the market at La Unión, McGuiver said "all the potato comes from the farms, we had a civilian person that doesn't have a gun, he keeps count of everything that comes in and from whom"(Audience, October 31 2011). For the case of milk they would monitor all the cars and the drivers had to report how much milk they had. If the production of a farm was 80% or 90% cattle ranching, people payed based on the number of animals or hectares of land. If someone could not afford what they asked for then the issue was investigated by the commander to reach an agreement.

[12]The FJLZ did not use the Spanish term 'impuestos' (in English 'taxes) but rather called them 'contribuciones' (in English 'contributions').

Table 3.3: *Finances 2000-2006*

Front	Frente Celestino Mantilla (FCM)		Frente Héroes del Prodigio (FHDP)		Frente José Luis Zuluaga (FJLZ)		Frente Omar Isaza (FOI)	
	USD M (1)	(%) (2)	USD M (3)	(%) (4)	USD M (5)	(%) (6)	USD M (7)	(%) (8)
				Revenues				
Farms	0.206	2.9	0.816	13.2	0.733	5.8	2.755	33.6
Businesses	0.242	3.4	0.262	4.2	1.194	8.4	2.156	26.3
Coca Production	1.705	23.6	3.310	53.4	1.108	7.8	0.175	2.1
Gasoline Trade	5.062	70.2	1.815	29.3	10.152	71.8	3.091	37.7
Road Tolls	0	0	0	0	0.158	1.1	0.018	0.2
Other Revenues	0	0	0	0	0.797	5.6	0	0
Total Revenues	7.216	100	6.203	100	14.143	100	8.196	100
				Spending				
Warfare	1.112	16.7	1.517	30.3	4.263	31.0	0.969	16.1
Vehicles & Equipment	1.716	25.8	0.573	11.5	0.302	2.2	0.315	5.2
Combatants	3.404	51.1	2.914	58.2	5.345	38.8	4.554	75.9
Social Works	0	0	0	0	3.618	26.3	0	0
Other Spending	0.429	6.4	0	0	0.239	1.7	0.165	2.7
Total Spending	6.661	100	5.003	100	13.767	100	6.003	100
Deficit	0.555	7.7	1.200	19.3	0.376	2.7	2.193	26.8

Notes: This table exhibits the aggregate revenues and spending of different ACMM fronts for the period 2000-2006. Columns 1, 3, 5, and 7 report numbers in US million dollars. Columns 2, 4, 6, and 8 report numbers as % of the front's total revenues or spending. Source: Prosecutor's Office.

They also taxed drugdealers and drug processing laboratories as well as the illegal gasoline cartels in the region. In fact, the FJLZ made most of its income from taxing other illegal actors (see Table 3.3). [13] Coca production was popular in the region, although McGuiver argued the front never directly venture into drug trafficking. [14] Drugdealers had to pay up to 80 thousand pesos (40 US dollars) for a kilo of coca produced while the gasoline contraband cartels had to contribute

[13] Another source of income for the other fronts was taxing 10% on public contractors, although this could not be independently verified (Audience, February 8 2012).

[14] This was a persistant point of tension with the Colombian legal authorities. Under the Justice and Peace Process, paramilitaries involved in drug trafficking could face extradition to the US.

with 60 thousand pesos (or 30 US dollars) per barril of gasoline sold in the FJLZ territory. Revenues from taxing farms and businesses amounted to almost 14% of their incomes while taxing drug-dealers represented 8% and gasoline cartels 72% of them respectively. The revenues of some taxes were allocated for specific things. For example, the taxes raised from the tolls around La Danta were allocated to maintaining the roads. Fines collected from people for small infringements of statutes were used for social works in the veredas.

Each year they collected information to assess the taxable capacity, including the different farms and businesses, and used it to design tax policy. In areas where the front was primarily in control, such as close to La Danta, they carried out a sort of census to find out who owned what and how much they made. McGuiver pointed out that "a study was carried out to see who lived in the territory, the farms and urban centers"(Audience, October 31 2011). In the places where the front had less control, like in La Unión or El Carmen de Viboral, it was more difficult as they possesed incomplete information. In order to upddate information, though, a financier was posted in each vereda of the areas that the front controlled. According to their finantial statements, the taxes the group charged did not increase in an area after it had established order or provided other public goods.

3.5.5 Social Works

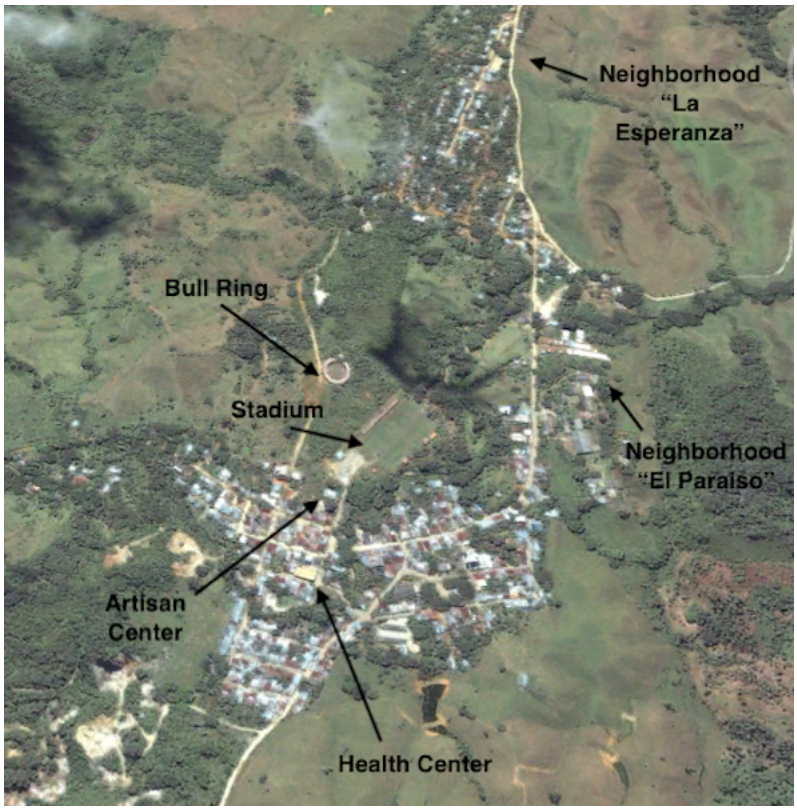
A central strategy of the FJLZ to win the war was to engage in social works (Frente José Luis Zuluaga, n.d.b). [15] Though the more normal terminology from economics would be to talk about public goods, McGuiver rejected this description saying

[15]They were so proud of these that they produced a document Frente José Luis Zuluaga (n.d.) which lists many of them including how much they cost. These claims of the document were checked during fieldwork and they seem to be completely true.

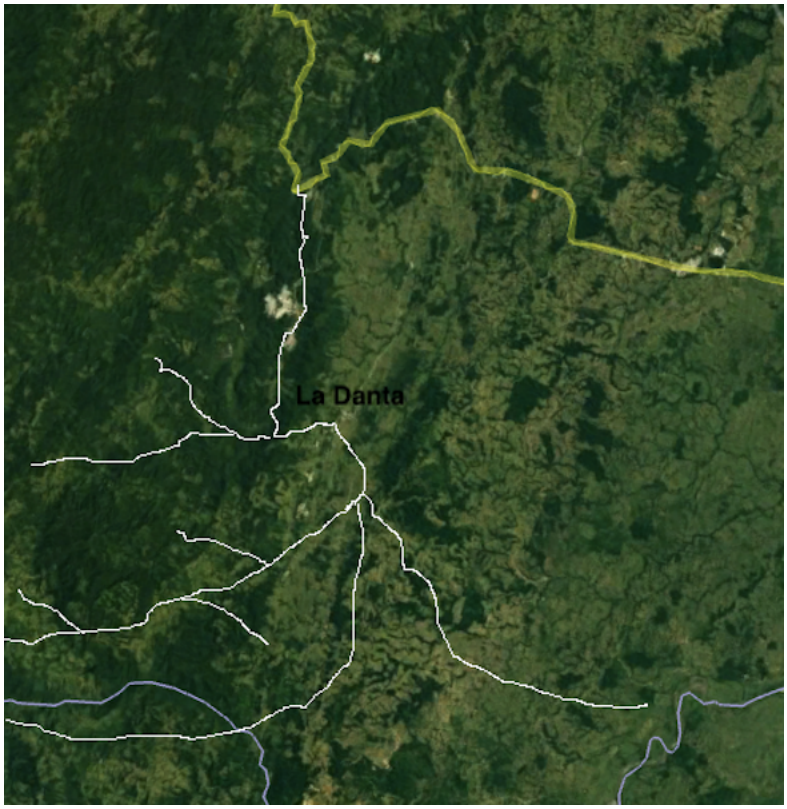
"we were not the state, so these are not public goods, they are social works". They included the following: an extensive system of approximately 176 kms gravel roads focused around La Danta (see map); the provision of free electricity to rural veredas; four schools with paid teachers, computers and musical instruments; a health clinic in La Danta; a re-builted old-age people's home; houses for poor people in the neighborhoods of El Paraíso and La Esperanza in La Danta and also in the veredas Piedras Blancas and La Hermosa; an artisan center; a sports stadia and a bull ring (see Figure 3.6 and Appendix). Also, in Comuna 13 in Medellín they built a park and a rehabilitation center for drug addicts. Equally relevant were festivals and parties organized for the community, such as the Peasant's Day festival or the Mother's Day festival.

The provision of social works seemed to be focused on winning hearts and minds and not to maximize fiscal revenues. In an Audience, McGuiver pointed out "social work was one of the bases or ideological platforms for us to accumulate masses". The FJLZ allocated around 1/3 of its budget to the construction of social works. These were concentrated in the Bajo Sonsón and the poorest and most neglected veredas. In one audicence, McGuiver pointed out that "El Carmen and La Unión were richer, they didn't need that much help", implying that his strategy was to provide social works for the most vulnerable people (Audience, October 31 2011). Another salient example comes from the selection of the 30 families who benefited from the houses for the poor project, which was based on a socio-economic study done by the local community board (*Junta de Acción Comunal*) of Piedras Blancas to identify the most vulnerable families.

Equally as important as the fact that these social works were provided is the way they were provided. The remarkable fact is that this seems to have been done in a very non-clientelistic way. Significantly, the houses were not given to the families or



(a) La Danta



(b) Road Network

Figure 3.6: *Social Works*

Notes: Figure 3.6.a shows a satellite image from 2007 of some social works built by the FJLZ at La Danta, Sonsón. Figure 3.6.b shows another satellite image from the same year detailing the road network built by the FJLZ communicating the same place with nearby municipalities, including Argelia and San Luis, and the national highway that links Bogotá to Medellín.

relatives of any of the members of the FJLZ. Neither were the people who got the houses charged for them. Once potential beneficiaries were identified, the houses were distributed by random lottery with each of the chosen families picking a key out of a bag. The construction work started on March 23rd of 2003 and finished on December 30th, 2003, and on that day the neighborhood was inaugurated. In fact, the electricity was given free until the time of the demobilization of the FJLZ, at which point the system became integrated into the distribution network of the Electric Company of Antioquia.

The FJLZ started providing social works when they started operating. Members of the social team were in charge of designing them. Civilians and combatants of the FJLZ who had broken the statutes as well as people who were to benefit from these also worked on them. For example, in Piedras Blancas the families who were chosen to receive one of the 30 new houses for the poor would give one day of labor for free each month. The front had heavy equipment for this, as McGuiver said: "the organization had heavy equipment for this like machinery, bulldozers". For more complex projects, particularly the health clinic in La Danta, the FJLZ hired civil engineers who had the required experience (Audience, October 31 2011). And in another trial, McGuiver observed how he actually added bullet proof shields to the bulldozers that built the road to Guadualito in the municipality of Argelia, a traditional stronghold of the guerrillas.

3.5.6 The Use of Violence

Like most stationary bandits, the FJLZ primarily engaged in acts of violence and coercion. They tried to establish a monopoly of violence, isolated by Weber as a necessary condition for the emergence of the state. When questioned about how

the front maintained control, one peasant from El Porvenir told us: "If I have a gun and you don't, I rule". The FJLZ were reported to have committed 1,119 crimes by the Colombian legal authorities, out of the 10,323 crimes associated to the ACMM (or 11.6%). [16] The most notorious crimes investigated included massacres and selective homicides, social cleansing, illegal recruitment of minors, forced displacement and sexual violence. [17] One estimate is that the FJLZ was responsible for around 400 homicides and 20 massacres, althought this could plausibly be underestimated. The motives for the crimes, according the testimony of McGuiver, were to eliminate external and internal threats. These included members of the guerrillas and suspected collaborators, disobedient combatants of the FJLZ, and civilians that behaved against their orders, among these drug-addicts, prostitutes or homosexuals.

Fighting left-wing guerrillas was a central feature of their mission. Combats against the fronts 9 and 47 of the FARC and the fronts Carlos Alirio Buitrago and Bernardo Lopez Arroyave of the ELN were common, especially in Argelia and San Francisco, and could last several days (see Table 3.4). Official figures reveal that during the years 2000-2006 more than 40 clashes between paramilitary and guerrilla groups ocurred in this region, with hundreds of casualties. McGuiver did not execute combatants automatically for being in the guerilla, he gave them a chance to come over to his side. For instance, in a trial he told the story of two combatants of the ELN guerrilla, alias Parcero and alias Evaristo, who deserted were captured by members of the FJLZ. They were brought to McGuiver at his

[16] These were geographically distributed in the following way: 308 in La Unión, 595 in Sonsón and 216 in Carmen de Viboral. As the front controlled other municipalities, the aggregate figure of crimes attributed to the FJLZ by the Prosecutor's Office is probably underestimated.

[17] The FJLZ was reported to have demobilized with 1536 guns of different types (Audience, February 2 2012).

Table 3.4: *Violence 2000-2006*

Front	Frente Central (FC)	Frente Celestino Mantilla (FCM)	Frente Héroes del Prodigio (FHDP)	Frente Jhon Isaza (FJI)	Frente José Luis Zuluaga (FJLZ)	Frente Omar Isaza (FOI)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Warfare						
Combats Against Guerrillas	0	0	19	14	12	20
Combats Against the State	0	3	23	14	18	22
Guerrilla Casualties	1	29	84	41	174	107
Paramilitary Casualties	1	5	26	7	100	70
Guerrilla Attacks	2	42	114	39	225	123
Paramilitary Attacks	1	7	21	10	42	40
Panel B: Crimes						
Massacres	0	3	6	1	18	7
Avg. Homicide Rate*	15.8	22.2	45.3	75.9	61.9	34.0
Avg. Kidnapping Rate*	8.8	10.6	23.7	17.6	42.0	11.5
Avg. Forced Displacement Rate*	101.1	237.7	1021.4	1805.0	1523.6	439.0
Avg. Sexual Violence Rate*	10.6	2.3	11.4	21.1	28.5	5.1
Avg. Terrorism Rate*	3.5	2.3	8.4	4.4	9.4	1.3

Notes: * Average rates expressed per 100,000 inhabitants per year. This table summarizes information characterizing violence levels across the ACMM territories. Panel A shows warfare statistics between ACMM fronts and guerrillas or the Colombian state. Panel B exhibits crime statistics across ACMM territories. Source: Ministry of Defense, Noche y Niebla, CEDE-Uniandes.

base La Guyabera who tried to persuade them to join him. Parcero agreed and was eventually integrated into the FJLZ but Evaristo refused the offer and was executed (Audience, October 27 2011).

When dealing with civilians, McGuiver pointed out "initially we enter a territory with force, we show that there is military activity"(Audience, October 31 2011). In theory combatants could not kill somebody without an order from a superior. However, people were executed, most importantly civilians who suspected of supporting the guerillas. This was a very difficult task to perform because people were under a lot of pressure both from the guerilla and the paramilitaries. He experienced this with his own family as a child in San Francisco. "I remember the guerrilla went to my house and we had to give them everything! And my mother would send us to our rooms so we did not mix with them. Nevertheless, the girls

mixed with them and were shown the guns. So we were collaborators because we had to. That's why we tried to not be too extreme with civilians ".

3.5.7 The Political Strategy

The mix of nascent bureaucratization, violence and provision of social works in relatively non-clientelistic ways was part of a clear political strategy intended to legitimize the actions of the FJLZ in the areas it controlled. McGuiver argued "we had a good image in that town, a population that allows you to stay there for more than 15 years without denouncing us, respecting the laws and policies of the organization, I think is a population that learns how to live and behave in that context and that is because there is a good behavior (from our part)". Elsewhere he said that the people had given them the power to defend them "that population had given us the power to defend them and we had become the police of the veredas"(Audience, October 31 2011). Thus, they considered their actions illegal, and in this sense not legitimate, they also saw it as necessary and popular, hence possibly legitimate in a different sense.

The intuition behind this behavior was to ultimately "disintegrate"the guerrillas. The community had inside information about the behavior and operations of the FARC and ELN, so it was important to count with their support. For example, when "a guerrilla member deserted in a vereda, almost all the people in that vereda finds out about it and through the peasants one can know whether that is a personal decision from him or a strategy of his commander". The front constantly used the radio station, called "Integración Estero", to transmit negative propaganda about the guerrillas and invite people to cooperate with the FJLZ.

Table 3.5: *Links to Colombian state 2000-2006*

Front	Frente Central (FC)	Frente Celestino Mantilla (FCM)	Frente Héroes del Prodigio (FHDP)	Frente Jhon Isaza (FJI)	Frente José Luis Zuluaga (FJLZ)	Frente Omar Isaza (FOI)
	(1)	(2)	(3)	(4)	(5)	(6)
Politicians	4	4	0	-	0	17
Law Enforcement	1	0	1	-	0	9
Armed Forces	3	8	3	-	0	18
Other	0	0	1	-	0	1

Notes: This table summarizes information characterizing the number of links that the ACMM fronts had with the Colombian state. The links are measured as the number of penal investigations opened by the Prosecutor's Office against different state authorities for connections with paramilitary groups. Source: Prosecutor's Office.

They would give incentives for guerilla members to change sides. They contacted the families of known members of the the FARC or ELN and tried to persuade them that they should come over to them. The FJLZ could offer economic compensations of up to 3 million pesos (or 1,500 US dollars) for a gun and protection for the family if combatants deserted to their group. Also, houses in the neighborhoods of La Danta were given to ex-guerilla members and their families as part of this strategy. When discussing about this issue, McGuiver emphasized that former combatants could provide valuable intelligence for the group. He claimed: "for me it is more valuable a captured, surrendered or hurt in combat guerrilla member than 50 or 100 of them dead. This is my motto because after he will meet with his family and can help to disintegrate the opposite group"(Audience, October 31, 2011).

An integral part of the political strategy was to disregard local politicians (see Table 3.5). McGuiver said "we became the de facto authority in that region and for that reason there are no links (with politicians). I would do wrong to do social works for others to take credit for them"(Audience, October 28 2011). This is why, according to him "the mayors would not come, because they knew they

would have trouble with me". In another story he observed: "In that area there was a family that held the monopoly of that municipality (Sonsón) for 12 years. It was the Patińos. There was an event where the mayor, Luz Amparo, and an engineer that was going to build the aqueduct of La Danta, an aqueduct that was contemplated for a budget of 12 thousand million pesos (aprox. USD 6 million) asked me: The mayor wants to start making the first investment on the aqueduct to see if she gets the first part of the money, how much will you charge? To which I replied: Tell the mayor to not even dare to do that because I am not going to unite with her to steal the resources of the town".

3.5.8 Rent Extraction

There is of course some evidence of kleptocratic behavior from the FJLZ (see Table 3.4). As part of the Justice and Peace process, demobilized paramilitaries were supposed to reparate victims with their assets. According to Acción Social, the government agency in charge of compensating victims of the civil conflict at the time, McGuiver returned some assets and admitted "the FJLZ possessed some lands, some properties and some cows"(Audience, November 25 2011). The assets declared included an apartment in Medellín, three farms and 281 cows. The Colombian legal authorities suggest that this may be definitely an underestimated number. Also, they took over farms after they were abandonned, particularly after attacks by the guerillas. Nevertheless, this is a relatively modest amount of assets compared to the ones exhibited by other ACMM fronts, valued at about 2.5% of the total incomes of the FJLZ.

In fact, McGuiver seemed to be aware of the pitfalls of rent extraction, particularly in relation to the public image of the group. He noted that the commanders

in other fronts were commonly accused of getting rich from the conflict, which explains why it was important to have detailed accounts of the finances. These were not only relevant for taxing farms and business owners but also accountability. He claimed: "it is always said that the commanders are getting rich or that we are making profits from the war we are fighting, and I make these reports, both of incomes and expenditures, to show that the money that was collected was all used in the fight and in different things because the war implies the use of lots of resources"(Audience, October 31 2011).

3.6 Confronting the Theories with the Evidence

"*There are two ways to rule: with fear or with dreams. We opted for the first.*"

— Demobilized member of the paramilitary group *Frente Héroes de Granada*

All ACMM commanders were stationary bandits but the FJLZ acted like a state (mixed fear and dreams) while the other fronts did so to a much lesser extent (just fear). [18] They saw this behavior as complementary in their fight against guerrillas. This is remarkable given how close they all were at a personal level. No other front developed similar strategies to fight left-wing guerrillas or had written statutes (*Los Estatutos*) to institutionalize social order in the same way. No other front engaged in the provision of social works in anything like the same extent. FJLZ allocated almost a quarter of its expenditures to public good provision whereas the amount invested in this item by the other three fronts (FCM, FHDP, FOI) for

[18]Except possibly Ramón Isaza who was closer but did not came even close to the same level of behavior.

which there is available data was essentially zero (see Table 3.3). [19] In contrast, not only did the FJLZ use relatively less coercion with civilians, but the way it exerted it was less violent than other fronts, particularly FOI. [20]

The FJLZ also taxed and spent far more than the other fronts in total. Taxation on farms and businesses was less than FHDP and FOI. However, these could be due to inter-relationships with the public goods strategy as McGuiver sought to get the support of local communities and may have wanted to tax below the peak of the Laffer curve. The proportion of its income that came from taxing drug activities was smaller than FHDP or FCM, and unlike what has been reported about the FJI, did not venture into drug trafficking. The FOI and FCM stole gasoline from the pipelines of Ecopetrol, the largest Colombian petroleum company, that crossed their territory and sold it to the gasoline cartels who illegally sold it on. FJLZ taxed the trucks of the gasoline cartels and generated far more revenues than either the FOI and the FCM.

So why did McGuiver choose one model and the others a different one? The literature on state formation and rebel governance reviewed in section 3.2 suggests several ideas. It may well be that the FJLZ behaved more state-like in order to maximize tax revenues as Olson (1993)'s theory of stationary bandits would suggest. But McGuiver made most of its income from taxing gasoline cartels, which was unrelated to order and security. Another fact is that the taxes on farms and businesses were constant over time and did not increase with the expansion of public goods (for example the road network around La Danta). Thus, tax policy was not motivated by a desire to maximize rents or to get to the top of the Laffer

[19] Fieldwork suggests that it was essentially zero in the other two (FC and FJI) as well).

[20] While not reported in the table, the Colombian legal authorities have documented how the FOI committed mass beheadings, abortions etc.

curve. Hence, the FJLZ did not practice 'proprietary public finance' (Grossman and Noh, 1994).

On the other hand, a common argument in the literature is to say that 'states made war and war made states' (Tilly, 1975, 1990). While this idea originally refers international conflict, there are clear analogies to this particular context. Warfare against guerrillas or the Colombian state seems a constant across all these groups (see Table 3.4). The FJLZ did spent more in total on warfare and was engaged in more combat but this was completely endogenous to the front's strategy. A similar theory suggests that nascent states behave like organized crime (Gambetta, 1993). Nevertheless, order and security was provided by the FJLZ as a public good and they did not sell private goods like contract enforcement or protection services to individuals. Neither was the FJLZ an organized crime group, although they taxed them.

For instance, the behavior of the FJLZ could be explained by the fact McGuiver had a long time horizon and faced low opposition from the local population, something which legitimized his actions (Arjona, 2016). Fieldwork and interviews with McGuiver suggests that the community mostly accepted their presence, although testimonies from peasants also noticed this was forced upon them. Yet contrary to this thinking, fighting is exactly the time when you need support, hence public good provision. The FJLZ started providing social works when they started operating. And in an audience, McGuiver observed how he actually added bullet proof shields to the bulldozers that built the road from La Danta to Guadualito, a historical stronghold of the guerrillas. Also, it's not necessarily desirable to build public goods or have the type of aspirations to bureaucracy or rules.

Furthermore, the variation observed cannot be explained by structural factors, such as geography or natural resources (Diamond, 1997; Herbst, 2000). There are

few apparent differences in agricultural productivity, population density or other type of socio-economic characteristics between the places occupied by the FJLZ and those of the other fronts. The behavior of the FJLZ was also totally opposed to a natural resource curse or 'rentier state' setting (Weinstein, 2006), which would predict for more violence and less provision of public goods. The tax base was endogenous. As stated earlier, the front made most of its income from taxing gasoline cartels and McGuiver even extracted more from this item than Gurre or Pájaro, who had Ecopetrol pipelines in their territories. Moreover, the region of Middle Magdalena provided fertile ground for coca production but, to the best of our knowledge, the FJLZ did not get into the business of drug trafficking.

Even if any of these models applies it seems very unlikely that their comparative statics could explain the differences observed across the ACMM fronts. Very clear that developing bureaucratic capacity, enforcing statutes and mixing the provision of violence and public goods were complements to the strategy of fighting the guerillas. But the FJLZ didn't need to act like a state in this way to fight, as the other fronts of the ACMM showed. While interviewing commanders and doing fieldwork, some factors came up that may help ellucidate the variation. One possibility is the idiosyncracy of McGuiver. He had a very different family background from the other commanders (except Ramón Isaza). He had rural hard-working peasant upbringing while others were all involved at very early ages in paramilitarism and even in drug-dealing (a clear contrast with Gurre, who had joined the ACMM when he was a child). This may suggest something about the political socialization of McGuiver.

Another salient issue that came up was the nature of the nascent bureaucracy (or combatants) and the ties it developed with civil society (Migdal,1988; Scott, 2010; Acemoglu and Robinson, 2017). McGuiver liked to recruit people from

the Middle Magdalena region, trained them at his Guayabera base and avoided contacts with the Armed Forces (see Table 3.2). There were few ex-military officers in the FJLZ, compared to FOI which was in close proximity to a military base at La Dorada. McGuiver argued that having people from other regions or ex-members of the Armed Forces in the front quickly distorted his counterinsurgency tactics. It became harder to develop a functional command and control structure and for combatants to build relationship with the community. In the same way, he mentioned that he liked to avoid urban areas. La Danta is very rural, a place where the state was completely absent. On several ocasions, McGuiver stressed how ruling urban areas was something completely different because the type of war and the tactics used to fight that war were different.

Lastly, as already pointed out, McGuiver avoided contacts with the Colombian state (see Table 3.5). A striking fact about La Danta is how peripheral it is in Sonsón, a fact that allowed the FJLZ to be autonomous from powerful and corrupt political elites or the Armed Forces.

3.7 Conclusion

This paper contrasts the behavior of the Frente José Luis Zuluaga (FJLZ), a paramilitary group in the eastern part of the department of Antioquia, Colombia, with the most prominent theories about the origins and nature of the state. Several conclusions are drawn from the evidence. Some of the most important concern what the FJLZ was not. First, in political economy it is quite common for people to draw parallels between organized crime and the Mafia and the construction of the state. However, the FJLZ was definitely neither like the Mafia nor an organized crime group, though it did tax both types of groups. It did not begin by selling

protection to private parties and instead coerced people into contributing to public goods, particularly order (against the origins of the Mafia layed out in Gambetta, 1993). Second, the FJLZ was not patrimonial and was nascently bureacratic. It applied universalistic principles which it attempted to enforce and did not provide rivalrous public or private goods on a clientelistic basis. Contrary to what one might have believed from the social science literature, nascent states or stationary bandits are therefore not necessarily patrimonial.

Third, neither was the FJLZ predatory in the sense used in the political economy literature. In the finances reports, the largest item of expenditure was on paying and provisioning its military organization, which took up 1/3 of its incomes. The next largest item was the costs of providing public goods, which took up 1/4 of its expenditures. There is certainly some evidence of rent extraction or kleptocratic behavior by the leadership, but it appears to be small. Fourth, the provision of public goods seems to have mostly been a strategy for fighting against the guerillas and was not movitated by a desire to maximize rents or to get to the top of the Laffer curve, as Olson (1993)'s theory of stationary bandits would suggest. Also, the taxes which the group charged did not increase in an area after it had established order (provided public goods) as would be dictated by this theory. Hence the FJLZ did not practice 'proprietary public finance' (Grossman and Noh, 1994).

A salient feature of the FJLZ was the nature of its nascent bureaucracy (or combatants) and the ties it developed with civil society and the environment. Also relevant seems the fact that, unlike other fronts, they actively avoided any links with representatives of the Colombian state, such as politicians or the Armed Forces. However, we still need more studies and better ways of conceptualizing rebel governance as well as more empirical tests about the formation and operation

of states. Of particular interest seems to understand under what conditions different equilibria may emerge (dreams and fear vs. just fear) or when is a state-like behavior a complement or substitute for fighting a war. The next interesting step, of course, would be to take these theories to the data.

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Appendix A

Appendix to Chapter 1

A.1 Robustness Checks

A.1.1 Tables

Table A.1: *Robustness Checks for Table 1.4*

	Linear Half optimal bandwith	Linear Twice optimal bandwith	Linear Triangular bandwith	Linear Epanechnikov bandwith	Quadratic	Cubic	Placebo 1	Placebo 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Applicants				
Wealth Index	0.199*	0.248**	0.185	0.187	0.140	0.171**	-0.231	0.412
	(0.120)	(0.113)	0.137	0.138	(0.182)	(0.0867)	(0.940)	(0.306)
Housing Index	0.261**	0.197**	0.302**	0.307*	0.337**	0.321*	0.0479	-0.370
	(0.129)	(0.100)	(0.147)	(0.158)	(0.155)	(0.172)	(0.159)	(0.320)
Asset Index	0.0581	0.112	-0.0470	-0.0646	0.0471	0.0191	0.0823	0.0771
	(0.242)	(0.210)	(0.254)	(0.255)	0.298	(0.179)	(0.300)	(0.0658)
Registers for Poverty Subsidies	-0.0223	-0.174***	-0.158**	-0.202***	-0.0504	0.0101	0.0678	0.179
	(0.120)	(0.0635)	(0.0667)	(0.0611)	(0.0905)	(0.121)	(0.159)	(0.246)
Above Minimum Wages	0.0207	0.0441**	0.0302	0.0361	0.0163	0.0147	-0.0801	0.0350
	(0.0304)	(0.0213)	(0.0239)	(0.0240)	(0.0286)	(0.0291)	(0.0681)	(0.0265)
				Panel B: Children				
Wealth Index	0.421***	0.238**	0.327***	0.332***	0.254	0.273	0.0741	0.206
	(0.104)	(0.106)	(0.117)	(0.0864)	(0.258)	(0.445)	(0.933)	(0.633)
Housing Index	0.410***	0.374***	0.408***	0.390***	0.357	0.527	0.284	0.160
	(0.133)	(0.102)	(0.0943)	(0.0953)	(0.291)	(0.566)	(0.625)	(0.682)
Asset Index	0	0.184*	0.194**	0.194	0.200**	0.139	0.0319	-0.0790
	(0)	(0.105)	(0.0880)	(0.244)	(0.0898)	(0.117)	(0.0264)	(0.102)
Registers for Poverty Subsidies	-0.0574	-0.198**	-0.205*	-0.228*	-0.113	-0.0178	0.412	-0.211
	(0.192)	(0.0976)	(0.115)	(0.118)	(0.151)	(0.178)	(0.306)	(0.305)
Above Minimum Wages	0.213	0.157**	0.186**	0.189**	0.226	0.180	0.121	0.128
	(0.139)	(0.0761)	(0.0776)	(0.0781)	(0.158)	(0.216)	(0.0921)	(0.106)

Notes: This table documents different robustness checks for outcome in Table 3. *** p<0.01, ** p<0.05, * p<0.1. Each cell reports the coefficient from a type of RD regression, shown columns, of an outcome on *Recipient*, an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970, shown in rows. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). Source: INCORA, *SISBEN*, *RUAF*. For a description of each dependent variable see Appendix B Table A.11.

Table A.2: *Robustness Checks for Table 1.5*

	Linear Half optimal bandwith	Linear Twice optimal bandwith	Linear Triangular bandwith	Linear Epanechnikov bandwith	Quadratic	Cubic	Placebo 1	Placebo 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Applicants				
Works	-0.0405	-0.0516	-0.0211	-0.0199	-0.0371	-0.0273	0.0381	-0.00827
	(0.104)	(0.111)	(0.0748)	(0.0742)	(0.0831)	(0.181)	(0.125)	(0.0970)
Works in Formal Sector	-0.146	0.113	0.143	0.171	0.00934	-0.0581	-0.855	0.136
	(0.242)	(0.112)	(0.131)	(0.136)	(0.168)	(0.191)	(0.788)	(0.147)
Contributes to Social Security	0.0258	0.0314	0.0326	0.0289	0.0161	0.00712	-0.0166	-0.0517
	(0.0274)	(0.0262)	(0.0293)	(0.0278)	(0.0254)	(0.0251)	(0.0433)	(0.0555)
Agriculture	-0.0208	-0.107	-0.140*	-0.131*	-0.138	-0.151	0.239	-0.110
	(0.127)	(0.0656)	(0.0786)	(0.0740)	(0.0929)	(0.111)	(0.286)	(0.0965)
Manufacturing	-0.00345	0.0111	0.00988	0.0139	0.0107	0	0.0108	-0.00627
	(0.0259)	(0.0134)	(0.0120)	(0.0198)	(0.0133)	(0)	(0.0138)	(0.0261)
Services	-0.106	0.0903	0.139*	0.137*	0.159	0.153	-0.200	0.107
	(0.158)	(0.0705)	(0.0802)	(0.0759)	(0.0983)	(0.110)	(0.259)	(0.0960)
				Panel B: Children				
Works	0	-0.0323	-0.0591	-0.0536	-0.0323	-0.0362	0.00188	-0.00190
	(0)	(0.103)	(0.0896)	(0.0899)	(0.0996)	(0.184)	(0.114)	(0.111)
Works in Formal Sector	0.0975	0.160**	0.157***	0.175***	0.0890	-0.00570	-0.111	0.105
	(0.0820)	(0.0589)	(0.0575)	(0.0785)	(0.0968)	(0.0575)	(0.284)	(0.0788)
Contributes to Social Security	0.177	0.160*	0.185**	0.181**	0.140	0.163	0.197	0.117
	(0.159)	(0.0819)	(0.0866)	(0.0858)	(0.107)	0.163	(0.186)	0.117
Agriculture	-0.0358	-0.0225	0.00218	-0.00617	-0.0178	-0.0705	0.0386	-0.0255
	(0.176)	(0.0824)	(0.0995)	(0.100)	(0.116)	(0.148)	(0.374)	(0.106)
Manufacturing	0.137*	0.0601	0.0945**	0.1000**	0.0967*	0.0737	0.0625	-0.0198
	(0.0738)	(0.0469)	(0.0466)	(0.0476)	(0.0588)	(0.0648)	(0.0446)	(0.116)
Services	-0.145	-0.0762	-0.157	-0.145	-0.124	-0.0810	-0.356	-0.141
	(0.139)	(0.0856)	(0.115)	(0.115)	(0.139)	(0.169)	(0.382)	(0.139)

Notes: This table documents different robustness checks for outcome in Table 4. *** p<0.01, ** p<0.05, * p<0.1. Each cell reports the coefficient from a type of RD regression, shown columns, of an outcome on *Recipient*, an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970, shown in rows. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). Source: INCORA, *RUAF*. For a description of each dependent variable see Appendix B Table A.11.

Table A.3: *Robustness Checks for Table 1.8 and Table 1.9*

	Linear Half optimal bandwith	Linear Twice optimal bandwith	Linear Triangular bandwith	Linear Epanechnikov bandwith	Quadratic	Cubic	Placebo 1	Placebo 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Applicants								
Migration	0.0350	0.120*	0.160**	0.157**	0.182*	0.182	-0.170	0.127
	(0.130)	(0.0665)	(0.0794)	(0.0747)	(0.0976)	(0.113)	(0.286)	(0.0965)
Urban Migration	0.117*	0.135***	0.111*	0.116*	0.0940	0.0841	0.000164	0.109
	(0.0630)	(0.0436)	(0.0627)	(0.0609)	(0.0783)	(0.0957)	(0.147)	(0.0726)
Rural Migration	-0.0635	-0.0908*	-0.0934*	-0.0985*	-0.0515	-0.0304	-0.0632	-0.0660
	(0.0991)	(0.0506)	(0.0543)	(0.0529)	(0.0747)	(0.0898)	(0.120)	(0.0698)
Panel B: Children								
Migration	0	0.0575	0.287***	0.293***	0.277***	0.282**	0.102	0.0193
	(0)	(0.0504)	(0.119)	(0.111)	(0.102)	(0.121)	(0.151)	(0.362)
Urban Migration	0	0.289***	0.282***	0.284***	0.249***	0.122	-0.0957	-0.405
	(0)	(0.103)	(0.0673)	(0.0649)	(0.0621)	(0.175)	(0.290)	(0.148)
Rural Migration	0.147	0.0921	0.130	0.129	0.198	0.243	0.0297	0.172
	(0.183)	(0.0892)	(0.107)	(0.105)	(0.142)	(0.171)	(0.295)	(0.122)
Years of Schooling	1.426*	1.218*	1.890**	1.866**	0.432	0.759	0.322	0.296
	(0.843)	(0.637)	(0.940)	(0.936)	(0.725)	(0.703)	(0.246)	(0.325)
Primary School	0.234***	0.168	0.191***	0.170***	0.146	0.163	0.0699	0.0663

Notes: This table documents different robustness checks for outcomes in Table 8 and 9. *** p<0.01, ** p<0.05, * p<0.1. Each cell reports the coefficient from a type of RD regression, shown columns, of an outcome on *Recipient*, an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970, shown in rows. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). Source: INCORA, *SISBEN*, *RUAF*. For a description of each dependent variable see Appendix B Table A.11.

Table A.4: *OLS Regressions*

	In 2006		In 2010			
	Wealth Index	Housing Index	Register for Poverty Subsidies	Above Minimum Wage	Formal Sector	Agriculture
	(1)	(2)	(2)	(4)	(5)	(6)
			Panel A: Applicants			
Recipient	0.14	0.217*	-0.0307	0.00302	0.0454	-0.0221
	(0.113)	(0.114)	(0.0540)	(0.0133)	(0.0450)	(0.0523)
R^2	0.32	0.16	0.30	0.35	0.27	0.32
Observations	728	728	975	975	975	975
Mean Dep. Var.	0	0	0.72	0.03	0.23	0.50
			Panel B: Children			
Recipient	0.198***	0.259**	-0.187	0.132	0.145	-0.134
	(0.0725)	(0.107)	(0.425)	(0.333)	(0.197)	(0.0887)
R^2	0.48	0.45	0.58	0.60	0.61	0.71
Observations	638	638	991	991	991	991
Mean Dep. Var.	0	0	0.58	0.17	0.43	0.32

Notes: This table documents the intergenerational impacts of having received land in 1968-1970 on selected outcome variables using OLS regressions. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Source: INCORA, *SISBEN*. For a description of each dependent variable see Appendix B Table A.11.

Table A.5: *RD Regressions Excluding Urban Migrants*

	In 2006		In 2010			
	Wealth Index	Housing Index	Register for Poverty Subsidies	Above Minimum Wage	Formal Sector	Agriculture
	(1)	(2)	(2)	(4)	(5)	(6)
			Panel A: Applicants			
Recipient	0.0739	0.222	-0.0745	0.0374	0.0655	-0.0817
	(0.102)	(0.123)	(0.0945)	(0.0307)	(0.0792)	(0.106)
Observations	314	286	316	316	316	316
Bandwidth	5.2	4.5	4.4	4.5	4.5	4.3
Mean Dep. Var.	0	0	0.80	0.03	0.15	0.63
			Panel B: Children			
Recipient	-0.0513	0.357	-0.130	0.135	-0.00125	-0.246
	(0.215)	(0.291)	(0.185)	(0.123)	(0.183)	(0.210)
Observations	302	244	358	358	358	358
Bandwidth	5.4	4.3	4.3	3.9	4.7	3.5
Mean Dep. Var.	0	0	0.65	0.17	0.28	0.45

Notes: This table documents the intergenerational impacts of having received land in 1968-1970 on selected outcome variables excluding from the sample urban migrants and using an RD design. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). Source: INCORA, *RUAF*. For a description of each dependent variable see Appendix B Table A.11.

Table A.6: *Investment in Education Among All Children*

	Years of schooling (1)	Primary school (2)	High school (3)	Vocational education (4)	College (5)
Recipient	0.759	0.0994	-0.169	-0.0591	-0.0353
	(0.703)	(0.0887)	(0.106)	(0.0896)	(0.0592)
Observations	298	367	367	367	367
Bandwidth	4.4	5.3	5.3	5.3	5.3
Mean Dep. Var.	5.1	0.52	0.28	0.05	0.03

Notes: This table documents the impacts of having received land in 1968-1970 on investment in the education of children among all adult children using an RD design. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation the child of an applicant. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). The outcome data for columns (1)-(5) is *SISBEN*. For a description of each dependent variable see Appendix B Table A.11.

Table A.7: *Civil Conflict*

	Violent Death <2006 (1)	Forced Displacement 1985-2010 (2)	Criminal Record 1990-2010 (3)
	Panel A: Applicants		
Recipient	0.117*	0.0490*	-0.0379
	(0.0504)	(0.0193)	(0.0165)
Observations	645	573	468
Bandwidth	5.2	6.5	6.2
Mean Dep. Var.	0.08	0.03	0.01
	Panel B: Children		
Recipient	0.0538	0.0945	0.0214
	(0.0673)	(0.152)	(0.0366)
Observations	645	1328	468
Bandwidth	6.2	7.5	6.2
Mean Dep. Var.	0.11	0.05	0.01

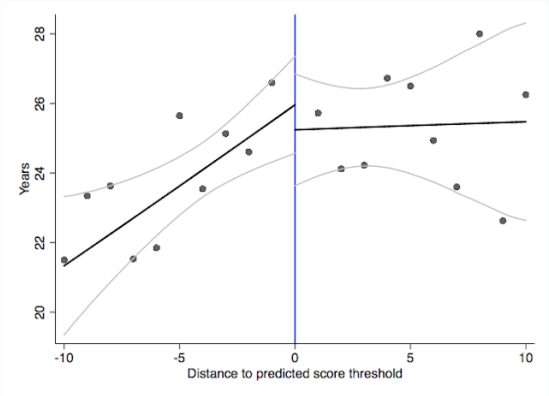
Notes: This table documents the impacts of having received land in 1968-1970 on civil conflict outcomes using an RD design. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors clustered at applicant family level are in brackets. *Recipient* is an indicator variable equal to 1 if an applicant was eligible to be allocated land during the agrarian reform 1968-1970. The unit of observation is the applicant in Panel A and the children in Panel B. All regressions include the following controls: age, sex, marital status, expropiation file fixed effects. Regressions also include a local linear polynomial estimated separately on each side of the threshold. Bandwidths are chosen using the MSE optimal procedure suggested by Calonico et al. (2017). Source: INCORA, *RUAF*, *RUPTA*, *PROCURADURIA*.

Table A.8: *Cost-Benefit Analysis*

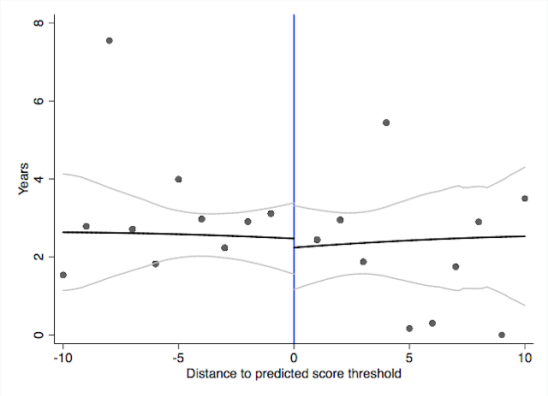
Returns to Education (1)	% Benefited (2)	Rate of Return (3)
10%	40%	-79.5%
10%	60%	-69.3%
10%	80%	-59.0%
15%	40%	-69.5%
15%	60%	-54.0%
15%	80%	-38.5%

Notes: This table presents different scenarios for the cost-benefit analysis. Column (1) shows the returns to education assumption used, column (2) the percentage of the children of recipients benefiting from these returns and column (3) the fiscal investment per recipient family rate of return. Source: INCORA.

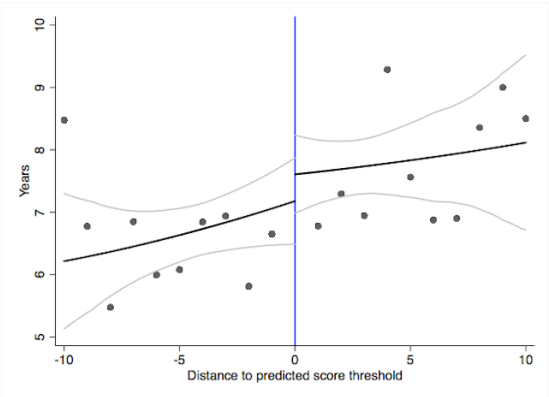
A.1.2 Figures



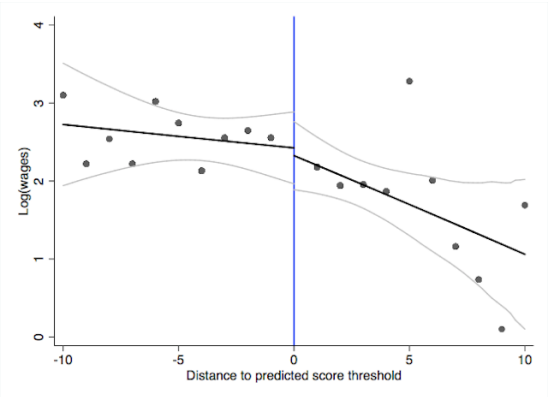
(a) Age



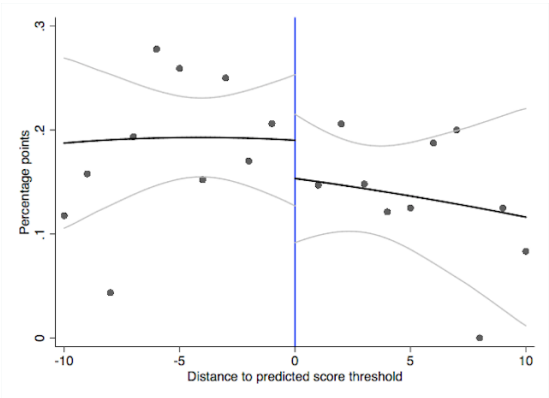
(b) Years of Schooling



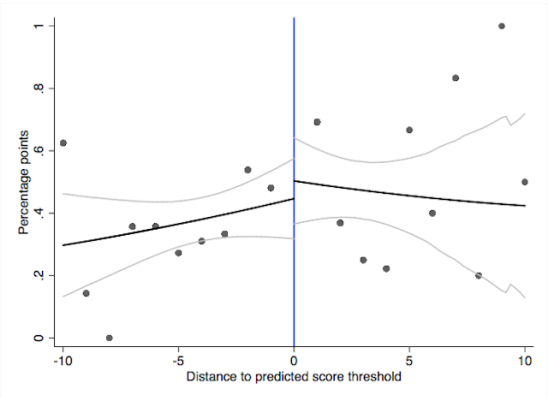
(c) Years of Agricultural Experience



(d) Log(Wages)



(e) Has House



(f) Staple Crops

Figure A.1: *Pre-Treatment Balance 1968-1970*

Notes: This figure graphically documents pre-treatmen balance within the RD optimal bandwidth. It shows RD plots estimates from the effect of being an applicant eligible to receive land during the agrarian reform 1968-1970 on different pre-treatment characteristics. Each point plots an average value within a bin. Discontinuity fixed effects have been partialled out. The solid line plots a local linear regression and dashed lines show 95% confidence intervals. Source: INCORA, *SISBEN*, *RUAF*.

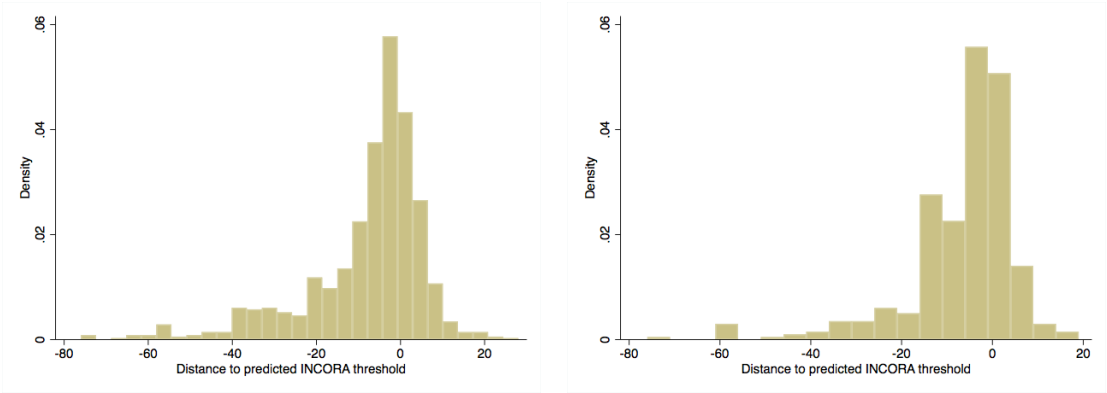


Figure A.2: *Histograms of Distance to Predicted Score Threshold*

Notes: This figure plots histograms documenting the number of observations in each cumulative predicted INCORA score bins for applicants and children.
Source: INCORA, *SISBEN*, *RUAF*.

A.2 Data Construction

A.2.1 Agrarian Reform Data

In this section, I explain the data sources and construction of agrarian reform information. As explained in section 1.3, this study uses historical data constructed from the archives of the extinguished Colombian Institute for Agrarian Reform (or INCORA), which are currently managed by the National Land Agency (ANT) at Bogotá, Colombia. Specifically, I draw upon three archival series: expropiation files from the *Sharecroppers and Tenants Program* and land titles issued by the agency and the National Registry of Civil Status (*Registraduria Nacional*) during the years 1966-1972. The archives are protected under Colombian law by privacy measures that prohibit the publication and use of personal information (Laws 1581 of 2012, 1712 of 2014, 79 of 1993, and Decree 1743 of 2016). Consequently, the data is accessed through a confidentiality agreement with the unique purpose of promoting academic research under the present research project.

The archives contain information on more than twelve thousand expropiation files from the *Sharecroppers and Tenants Program* and one hundred thousand land titles granted by INCORA during this period, which include state-owned lands (or *baldios*), parcels and other types of land transactions. Research assistants helped to tabulate information and construct a database. Each expropiation file includes the following information: legal documents (INCORA and judicial decisions, Notarial records, etc.), technical studies of the landholding made by INCORA officials (*informe de visita*) and, if the expropiation took place, applicant surveys (*formulario de aplicación*). Each land title contains the name, ID number, date, place and area titled. As explained in section 1.2, only 10% of expropiation processeses were successfull (see Figures A.3 and A.4). However, of these, only 218 effectively include systematic information regarding applicants to the reform. I use all data sources to collect personal data about applicants: full name, ID number (or *cédula de ciudadania*), address, household members, occupation, working experience, wages, assets, housing, types of crops grown and whether it was titled a parcel of land or not. The scores assigned by INCORA are reported in several files but not all.

Based on INCORA Directives, I use information collected from the archives (complemented with Notarial and Social Security records) to predict the scores used in the empirical strategy. The evaluation of each applicant was made along 4 key topics: age, agricultural experience, assets and housing investments according to the grading system described in Table 1.1. Summing across all attributes available, I calculate a predicted INCORA score for each applicant family. Next, for each expropiation process e I define its score threshold s_e as the minimum score needed to become a *recipient* based on the number of Agricultural Family Units available for allocation. For instance, if officials decided there were 5 available AFUs, then the fifth ranked predicted score would become the cutoff for that

process. This means thresholds varied at an expropiation process level. To make applicants comparable, I rescale each cutoff to zero by defining the distance between an applicant's score s_i and its respective score cutoff s_e as $dists_e = s_i - s_e$. Under this set up, applicants with a score above (or on) zero would be eligible to become recipients, while those below would not. I employ this variable to implement th RD design in the empirical strategy in section 1.3.4.

Table A.9: *Agrarian Reform Data*

Variable	Description	Type	Source
Agricultural Experience	Years	Integers	INCORA
Log(Wages)	Colombian pesos in 1968-1970	Continuous	INCORA
Has House	1=has house, 0=otherwise	Dummy	INCORA
Plot Area	Hectares	Continuous	INCORA
Grows Cash Crops	1=grows cash crops, 0=otherwise	Dummy	INCORA
Grows Staple Crops	1=grows staple crops, 0=otherwise	Dummy	INCORA

Nº29845

No.

REPUBLICA DE COLOMBIA

incora

CLASE DE ACTUACION ADQUISICIONES

INTERESADOS

NOMBRE DEL PREDIO

MUNICIPIO OVEJAS CORREGIMIENTO

DEPARTAMENTO SUCRE

INTENDENCIA

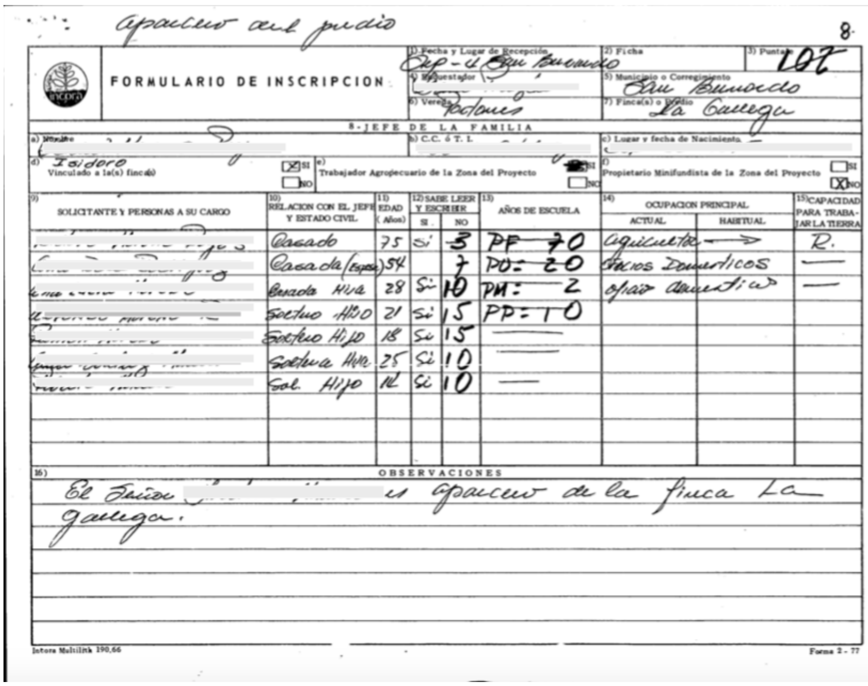
COMISARIA

RADICADO

LIBRO I TOMO I FOLIO

BOGOTA, SINCELEJO, MAYO 8 - 1969

Figure A.3: *Expropiation File*



apacero del predio 8.

FORMULARIO DE INSCRIPCION

incora

1) Fecha y Lugar de Recepción: Oct - 4 San Bernardo
2) Ficha
3) Puntaje: 107
4) Encuestador
5) Municipio o Corregimiento: San Bernardo
6) Vereda: Portones
7) Finca(s) o Predio: La Gallega

8 - JEFE DE LA FAMILIA

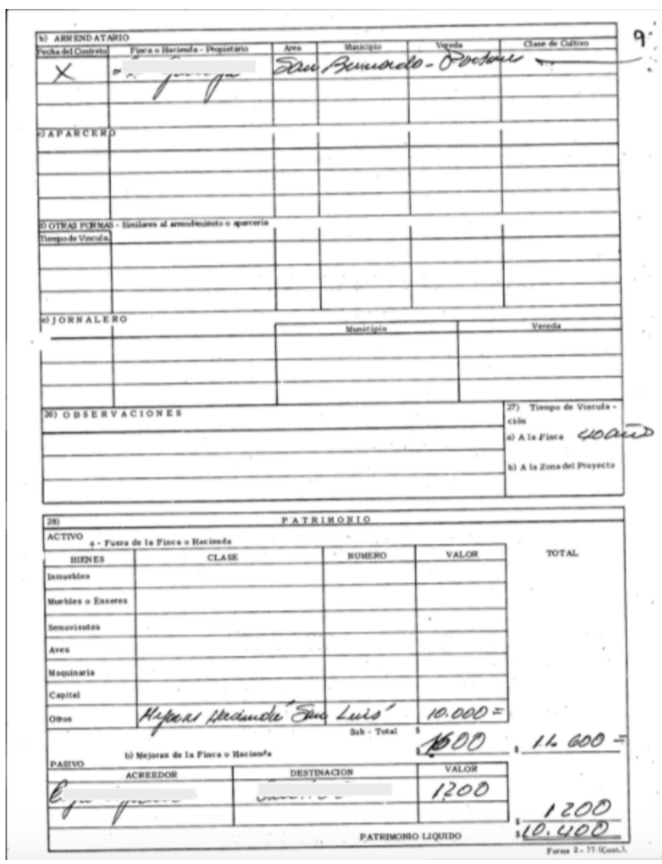
a) Nombre
b) C.C. ó T. I.
c) Lugar y fecha de Nacimiento
d) Isidoro — Vinculado a la(s) finca(s): [X] SI [ ] NO
e) Trabajador Agropecuario de la Zona del Proyecto: SI [ ] NO
f) Propietario Minifundista de la Zona del Proyecto: [ ] SI [X] NO

9) SOLICITANTE Y PERSONAS A SU CARGO	10) RELACION CON EL JEFE Y ESTADO CIVIL	11) EDAD (Años)	12) SABE LEER Y ESCRIBIR SI	NO	13) AÑOS DE ESCUELA	14) OCUPACION PRINCIPAL ACTUAL	HABITUAL	15) CAPACIDAD PARA TRABAJAR LA TIERRA
	Casado	75	si	3	PP 70	agricultor →		R.
	Casada (esposa)	54		7	PO: 20	Oficios Domesticos		—
	Casada Hija	28	Si	10	PM: 2	oficios domesticos		—
	Soltero Hijo	21	Si	15	PP: 10			
	Soltero Hijo	18	Si	15	—			
	Soltera Hija	25	Si	10	—			
	Sol. Hijo	16	Si	10	—			

16) OBSERVACIONES

El Señor … es apacero de la finca La Gallega.

Incora Multilith 190,66 — Forma 2 - 77



9.

b) ARRENDATARIO

Fecha del Contrato	Finca o Hacienda - Propietario	Area	Municipio	Vereda	Clase de Cultivo
X			San Bernardo - Portones		

c) APARCERO

d) OTRAS FORMAS - Similares al arrendamiento o aparcería

Tiempo de Vincula.

e) JORNALERO — Municipio — Vereda

26) OBSERVACIONES

27) Tiempo de Vinculación
a) A la Finca: 40 años
b) A la Zona del Proyecto

28) PATRIMONIO

ACTIVO
a - Fuera de la Finca o Hacienda

BIENES	CLASE	NUMERO	VALOR	TOTAL
Inmuebles				
Muebles o Enseres				
Semovientes				
Aves				
Maquinaria				
Capital				
Otros	Mejoras Hacienda "San Luis"		10.000 =	
		Sub - Total	$	
b) Mejoras de la Finca o Hacienda			$ 1600	$ 11.600 =

PASIVO

ACREEDOR	DESTINACION	VALOR
		1200

$ 1200

PATRIMONIO LIQUIDO $ 10.400

Forma 2 - 77 (Cont.).

Figure A.4: *Agrarian Reform Applicant Survey*

A.2.2 Subsample of Applicants and Children

In Table A.10, I present the correlation between the probability of finding a child of an applicant in notarial records, the treatment variable and other relevant pre-treatment applicant characteristics.

Table A.10: *Correlations of Subsample of Children*

	RD	
	Coefficient	Standard Error
	(1)	(2)
Recipient	-0.0239	(0.0365)
Score	-0.000565	(0.00120)
Years of Schooling	0.0245	(0.0185)
Years of Agricultural Experience	-0.000449	(0.00119)
Log(Wages)	-0.00669	(0.00915)
Has House	-0.00282	(0.00183)
Plot Area	-0.00282	(0.00183)
Distance to Urban Center (in Km)	-0.000337***	(0.000118)

*** p<0.01, ** p<0.05, * p<0.1. Each cell in Column (1) in this table reports the coefficient from a RD regression following Calonico et al (2017) of a pre-treatment applicant characteristic in 1968-1970 on the likelihood of finding a child in notarial records, with standard errors in parentheses in Column (2).

A.2.3 Administrative Data Linkage Algorithm

The merging of agrarian reform records with the outcome data (including Social Security and Benefits, Vital Statistics, Financial and Violence records) follows a simple algorithm involving the full names and ID numbers of applicants. In Colombia, as in most spanish speaking countries, a person has two legal last names: the first last name is inherited from the father and the second last name is inherited from the mother. A person can have more than one first name, with two first names being a popular combination. Moreover, names and last names can be often mispelled, which is why an error term in the linkage process is introduced.

All government agencies mandated to match first on ID number and then on a combination of the 4 name variables. To be consistent across estimations, I use the same method for matching publicly collected data (including Entrepreneurship, Patents, Elections and Criminal records). Therefore, the algorithm is designed to match ID numbers and full names (two first names and two last names) based on phonetic coincidence along 16 criteria in descending order of importance.

1º 100% phonetic coincidence. Matches ID number, two first names and two last names.

2º 100% phonetic coincidence. Matches ID number, concatenate all first names and last names.

3º 100% phonetic coincidence. Matches ID number, concatenate all last names and first names.

4º 100% phonetic coincidence. Matches ID number, first names and first last name in agrarian reform data with at least one last name in outcome data.

5º 100% phonetic coincidence. Matches ID number, first names and second last name in agrarian reform data with at least one last name in outcome data.

6º 95% phonetic coincidence. Matches ID number, two first names and two last names.

7º 95% phonetic coincidence. Matches ID number, one first name and two last names (in absense of middle name in agrarian reform data).

8º 95% phonetic coincidence. Matches ID number, one first name and two last names (in absense of middle name in outcome data).

9º 90% phonetic coincidence. Matches ID number, two first names (second first name at 90%) and first last name.

10º 90% phonetic coincidence. Matches ID number, two first names at 90% and two last names.

11º 90% phonetic coincidence. Matches ID number, two first names and two last names at 90%.

12º 90% phonetic coincidence. Matches ID number, one of two first names at 90% and one of two last names at 90%.

13º 90% phonetic coincidence. Matches ID number, first names in outcome data match last names in agrarian reform data and vice-versa.

14º 90% phonetic coincidence. Matches ID number, first first name in agrarian reform data with one of the two first names in outcome data and two last names.

15º 90% phonetic coincidence. Matches ID number, second first name in agrarian reform data with one of the two first names in outcome data and two last names.

16º 90% phonetic coincidence. Matches ID number, second first name in agrarian reform data with one of the two first names in outcome data and two last names.

A.2.4 Contemporary Administrative Data

Sources and Description

As in the case of agrarian records, personal information in administrative data is also protected by privacy laws. Therefore, the outcome data that is legally safeguarded is accessed through confidentiality agreements with: National Planning Department, Ministry of Health and Social Protection, National Registry of Civil Status and Universidad de los Andes. All agreements guarantee the data is employed for academic research but prohibit personal information sharing, disclosure, or usage, in partial or full. A minority of the outcome data (RUES, etc.) used is publicly available at different government websites and web scapred. Table A.11 describes in detail the outcome data sources and construction of the various administrative data used in the paper.

Principal Component Analysis (PCA)

To calculate housing and asset indices with the *SISBEN* data, I use standard principal component analysis. This statistical procedure uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a new system such that the greatest variance by some projection of the data comes to lie on the first coordinate (called the first principal component), the second greatest variance on the second coordinate, and so on (Jolliffe, 2002). Table A.12 presents the variables used to calculate the wealth index using this method.

Table A.11: *Outcome Data*

Variable	Description	Type	Date	Source
Wealth Index	1-10 score	Continuous	2006	*SISBEN*
Household Index	1-10 score	Continuous	2006	*SISBEN*
Assets Index	1-10 score	Continuous	2006	*SISBEN*
Electricity	1=has electricity, 0=otherwise	Dummy	2006	*SISBEN*
Sewage	1=has sewage, 0=otherwise	Dummy	2006	*SISBEN*
Aqueduct	1=has aqueduct, 0=otherwise	Dummy	2006	*SISBEN*
Running Water	1=has running water, 0=otherwise	Dummy	2006	*SISBEN*
Gas	1=has gas, 0=otherwise	Dummy	2006	*SISBEN*
Alive	1=alive in 2010, 0=otherwise	Dummy	2010	*RUAF-Estadísticas Vitales*
Registers for Poverty Subsidies	1=found in *SISBEN*, 0=otherwise	Dummy	2010	*RUAF*
Above Minimum Wages	1=wage>minimum wage, 0=otherwise	Dummy	2010	*PILA*
Works	1=works, 0=otherwise	Dummy	2010	*RUAF*
Works in Formal Sector	1=is in contributory regime, 0=otherwise	Dummy	2010	*RUAF & PILA*
Contributes to Social Security	1=contributions>0, 0=otherwise	Dummy	2010	*PILA*
Has Bank Account	1=has bank account, 0=otherwise	Dummy	2010	*SuperFinanciera*
Has Credit Card	1=has credit card, 0=otherwise	Dummy	2010	*SuperFinanciera*
Has Loan	1=has loan, 0=otherwise	Dummy	2010	*SuperFinanciera*
Agriculture	1=works in sectors CIIU Rev 4: A, 0=otherwise	Dummy	2010	*RUAF-Afiliaciones Salud & PILA*
Manufacturing	1=works in sectors CIIU Rev 4: C, 0=otherwise	Dummy	2010	*RUAF-Afiliaciones Salud & PILA*
Services	1=works in sectors code CIIU Rev 4: H-S, , 0=otherwise	Dummy	2010	*RUAF-Afiliaciones Salud & PILA*
Entrepreneurship	1=has mercantile register, 0=otherwise	Dummy	2005-2018	*RUES*
Migration	1=if migrated, 0=otherwise	Dummy	2010	*RUAF*
Urban Migration	1=if migrated to city>300 thousand inhab., 0=otherwise	Dummy	2010	*RUAF*
Rural Migration	1=if migrated to places<25 thousand inhab., 0=otherwise	Dummy	2010	*RUAF*
Years of Schooling	Years	Integers	2006	*SISBEN*
Primary School	1=finished primary school, 0=otherwise	Dummy	2006	*SISBEN*
High School	1=finished high school, 0=otherwise	Dummy	2006	*SISBEN*
Technical Education	1=finished technical education, 0=otherwise	Dummy	2006	*SISBEN*
College	1=finished college, 0=otherwise	Dummy	2006	*SISBEN*
Attending School	1=finished attending school, 0=otherwise	Dummy	2006	*SISBEN*
Child Labor	1=is child works, 0=otherwise	Dummy	2006	*SISBEN*
Violent Death	1=death is homicide-massacre, 0=otherwise	Dummy	Death year	*RUAF-Estadísticas Vitales*
Displaced	1=appears in RUPTA, 0=otherwise	Dummy	1980-2010	*RUPTA*
Criminal Record	1=has criminal record at Procuraduria, 0=otherwise	Dummy	1980-2018	*Procuraduria*

Table A.12: *Wealth Index Composition*

Variable	Description	Type
Housing type	1=house or apartment, 2=room, 3=other	Integers
Risk	1=high, 2=regular, 3=low	Integers
Walls	1=block, brick, stone, polished wood 2=clay, 3=wattle and daub 4=prefabricated material 5=coarse wood, plank 6=bamboo, cane, mat, other vegetable 7=zinc, cloth, cannon, cans, waste, plastics 0=without walls	Integers
Floor	1=carpet or rug, marble, marque, polished wood 2=tile, vinyl, tablet or brick 3=cement, gravel 4=rough or shabby wood plank 5=dust, sand	Integers
Rooms	Number of rooms	Continuous
Kitchen	1=has kitchen, 0=otherwise	Dummy
Bathrooms	Number of bathrooms	Continuous
Toilet	1=toilet connected to aqueduct 2=toilet connected to septic tank 3=toilet not connected 4=latrine 0=no toilet	Integers
Shower	1=has shower, 0=otherwise	Dummy
Trash	1=has trash disposal, 0=otherwise	Integers
Fridge	1=has fridge, 0=otherwise	Dummy
Washing machine	1=has washing machine, 0=otherwise	Dummy
TV	1=has TV, 0=otherwise	Dummy
Cable TV	1=has cable TV, 0=otherwise	Dummy
Telephone	1=has telephone, 0=otherwise	Dummy
Oven	1=has oven, 0=otherwise	Dummy
Heater	1=has heater, 0=otherwise	Dummy
Computer	1=has computer, 0=otherwise	Dummy
Car	1=has car, 0=otherwise	Dummy
Electricity	1=has electricity, 0=otherwise	Dummy
Aqueduct	1=has aqueduct, 0=otherwise	Dummy
Sewage	1=has sewage, 0=otherwise	Dummy
Running water	1=has running water, 0=otherwise	Dummy
Gas	1=has car, 0=otherwise	Dummy

Appendix B

Appendix to Chapter 3

B.1 Social Works

(a) Piedras Blancas

(b) El Porvenir

Figure B.1: *Schools*

Notes: This figures shows images of two schools built by the FJLZ at Sonsón. Figure A.1.a exhibits the school at the Piedras Blancas neighborhood while figure A.1.b does so for El Porvenir neighborhood. Source: Fieldwork in 2011.

(a) Road Autopista - San Francisco

(b) Road La Danta - San Miguel

Figure B.2: *Roads*

Notes: This figure shows images of two roads built by the FJLZ near La Danta, Sonsón. Figure A.2.a exhibits the road linking La Danta to the national highway to Medellín while figure A.2.b shows the road linking La Danta to the corregimiento of San Miguel. Source: Fieldwork in 2011.

(a) Piedras Blancas

(b) El Paraiso

Figure B.3: *Houses for the Poor*

Notes: This figure shows images of houses for the poor given near La Danta, Sonsón. Figure A.3.a exhibits the houses at the Piedras Blancas neighborhood while figure A.3.b shows houses at El Paraiso neighborhood. Source: Fieldwork in 2011.

(a) Bull Ring

(b) Stadium

Figure B.4: *Bull Ring and Stadium*

Notes: This figure shows images of two recreational facilities built by the FJLZ near La Danta, Sonsón. Figure A.4.a exhibits a bullring at La Danta while figure A.4.b shows the a sports stadium. Source: Fieldwork in 2011.

(a) La Danta

Figure B.5: *Health Center*

Notes: This figure shows an image of the health center built by the FJLZ at La Danta, Sonsón. Source: Fieldwork in 2011.