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# **On the agrarian origins of civil conflict in Colombia**

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# On the agrarian origins of civil conflict in Colombia

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May 14, 2018

## Abstract

We investigate the impact of land dispossession of peasants on the origin of the civil conflict in Colombia. Using a matching-pair instrumental variable approach, we show that the historical dispossession of peasants' lands by landlords that led to the rise of peasant grievances is associated with the presence of the rural guerrilla movement -The Revolutionary Forces of Colombia (FARC)- during the first stage of the Colombian civil conflict (1974-1985). This study exploits variation in floods to identify how peasants' land dispossessions during the export boom (1914-1946) determine the rise of rural guerrilla movements and the consolidation of their rebel activities. Using a novel municipal-level data set on natural disasters and land dispossession, the study documents that municipalities experiencing floods during the years 1914-1946 were substantially more likely to have land dispossession than municipalities where floods was not severe. Floods reduced temporarily the conditions of the land and its value, facilitating the dispossession of the peasants of their lands by large landowners. We propose two mechanisms through which previous land dispossession facilitated the emergence of rebel armed groups. On the one hand, exposure to previous events of violence gave military training and access to weapons and military experience to the rural population that likely emboldened the formation of rebel groups. On the other hand, the ideological cohesion stemming from radical liberals and communists exacerbated the grievances and helped the emergence of rebel armed groups.

**Keywords:** Land reform, Land Conflict, Property Rights, Civil Conflict.

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# 1 Introduction

The studies of the causes of civil conflicts have multiplied during the recent decades. Diverse theories and hypotheses have been proposed and tested in order to determine the origins of civil wars. The debate is still alive and conclusions usually depend on the type of data or countries of study. However, most of the literature tends to explain civil conflicts as a result of poverty or low economic performance. This study, in contrast, examines the role of grievances stemming from peasants' land dispossessions as a historical cause of conflict.

Peasants' land dispossessions may occur as a result of the failure of the state to protect and enforce land property rights. Such dispossessions generate grievances that may persist over time and will manifest in a civil conflict when the window of opportunity emerges. We propose that a crucial factor to understand the origin of rural guerrilla groups are land dispossessions generally by large landowners. Peasants are expelled from their lands and lose, in most cases, their only productive asset, are forced to migrate or become landless. This triggers the perception of injustice and lead to the rise of grievances, which will persist while the state does not improve peasant's living conditions or give them access to new lands.

As peasants are at risk of losing their jobs or income or facing repression, they cannot manifest their grievances. The probability that peasants will succeed on their claims by acting without coordination is low. They need resources and political opportunities to organize themselves. Once the opportunity emerge, they will rebel against the government. Thus, our approach reivindicates the role of motive -the persistence of grievances- as the ultimate cause of civil conflict. We use the political economy theory of the peasant society (Popkin 1992) and the resource mobilization theory (Jenkins 1983; McAdam, McCarthy and Zaid 1987) to argue that peasants organize and rebel as a response to new opportunities yet their grievances and claims are endemic to the social structure and persist over time. Our paper contribute to the quantitative literature of the origins of civil wars in two ways. On the one hand, we use a precise measure of subnational historical grievances to explain the origins of conflict. On the other hand, we explore different mechanisms that led to the emergence of conflict.

We propose two mechanisms through which old land dispossessions are likely to determine the origin of guerrilla groups. On the one hand, the military feasibility that is viable during civil war periods when peasants groups had access to weapons and mil-

itary equipment. On the other hand, the ideological politics of rebellion developed by the guidance and support of the revolutionary parties that may consolidate peasants grievances, generate political awareness among the peasantry and foster the formation of rebel groups.

We apply this reasoning to the rise of the most important Colombian guerrilla movement, the Revolutionary Armed Forces of Colombia (FARC) during the early stage of the civil conflict in Colombia (1974-1985)<sup>1</sup>. The Colombian civil conflict arose in the rural areas, where land conflicts have been visible since the late 19th century. Instead of understanding the rural problems as an issue of distribution, we suggest that the main cause has been a historic problem of weak enforcement of property rights that led to the rise of grievances by the peasants, who were dispossessed of their lands by large landowners, in many cases with the informal approval of the State. Some of these grievances materialized in legal land conflicts, in which the peasant filled a land protection petition or land restitution. The key element of our argument is not only the existence of grievances, but their persistence over time.

The role of land as a main cause of the Colombian conflict has been constantly mentioned by academics, policy makers and guerrilla leaders. For example, the agrarian agreement was the first one out of the six agreed during the recent peace talks between the government and FARC. Since its foundation, this guerrilla has had the land issue at the center of its political agenda. Their leaders often mentioned as the cause of armed conflict the expansion of the latifundio and the violent dispossession of the peasant' lands by the landowners, they demanded the abolition of large properties that, according to them, consolidated through legal fraud and dispossessions. Land dispossessions in the rural areas have also impacted the food's market and production and have led to forced displacement and more poverty of the peasantry (Reyes, 2016).

Weak property rights that facilitate land dispossessions have been at the centre of the political discussion in Colombia since 19th century. Important land reforms, such the law 200 of 1936 or law 135 of 1961, aimed at facilitating the access of public land to peasants and settlers but nonetheless failed. A solution of the land issues was also the main claim that the guerrilla group FARC stated in its demands and was at the

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<sup>1</sup>The boundaries of the period of the study relate to the social foundation of the FARC (1964) and the breakdown of the agreements of 'La Uribe' between Betancourt government and FARC (1985). We exclude the following years since the civil war became more complex and hard to disentangle due to the appearance of drug trafficking and the paramilitaries

center of the debate during the Second Guerrilla Conference in 1966 when they decided to name themselves as FARC.

In the Colombian case, peasants' claims have remained mostly unchanged during the 20th century: access to land and higher provision of public goods. But the opportunity to demand them without the use of violence were only possible when a window of political opportunity and the economic resources appeared.

This work argues that the differences in the intensity of armed conflict at municipal level during its early stage (1974-1985) were due to old peasants' land dispossessions by large landowners that led to the rise and persistence of grievances. To test this argument, we use historical data that includes, among others, measures of land dispossessions, FARC rebel activities, exposure to the civil war and support to revolutionary parties. We show, first, that there is a strong link between FARC rebel activity (1974-1985) and land dispossessions during the export coffee expansion (1916-1946). And second, that the link is mediated by the exposure to the previous civil war "La Violencia", facilitating that small peasant groups had access to weapons and military experience (Molano 2015, Collier Collier, Hoeffler and Rohner 2009), and by an ideological cohesion led by the communist party.

We follow the methodology used by Acemoglu et al (2012) and use an identification strategy that combines a matching methodology with an instrumental variable approach. We compare municipalities that experienced land dispossession during the coffee expansion 1916-1948 and neighboring municipalities that did not. In order to deal with the plausible endogeneity problems and measurement error, we use as instrumental variable for land dispossessions floods during the export boom. Floods can generate damages on land plots by eroding the boundaries of properties, destroying crops, reducing their value and, in some cases, forcing peasants to migrate. Landowners can easily cope with floods shocks since they can rely on multiple sources of income or have easy access to credit. On the contrary, peasants, have limited access to markets and credits and rely entirely on their lands to survive. This vulnerability of peasants to climate shocks can be exploited by landowners who can dispossess the peasants from their lands.

By using the methodology proposed by Dipe et al (2017) we test different mechanisms through which land dispossessions led to the rise of guerrilla groups. The mechanisms tested are the exposure to the previous civil war "La Violencia" and political support to rebellion. We find that the mediators strongly associated to the rise of FARC.

This paper is organized as follows. In section 2 we briefly discuss the literature

related to the origins of civil conflicts. Section 3 provides a historical discussion of Agrarian Reform, "La Violencia" and the Communist ideology and of the Origin and expansion of FARC. Section 4 presents the data collected and used in this study. Section 5 describes the process of land dispossession and their relation with natural disasters, the identification strategy and results. Section 6 discusses the effects of land dispossessions on rebel activity. Section 7 documents the methodology and present the results of the effect of the plausible mechanisms on rebel activity. Section 8 concludes.

## 2 Literature Review

During the last decades, researchers have attempted to understand the origins of civil wars. Causes, costs, duration and consequences are some of the issues that have been addressed in theoretical and empirical works. This study contributes to a vast literature on the origins and causes of conflict from a quantitative and historical approach. This is the first study that, to the best of our knowledge, uses subnational historical data to explain the variation in presence and intensity of armed conflict.

A prolific body of work has explored the causes of conflict and have suggested that civil war are caused by "greed" rather than "grievance". The seminal paper by Collier and Hoeffler (2004) proposes an econometric model of civil war that predicts the probability that a civil war will occur and test different hypothesis. This probability depends on the motivations of rebellions. They use as proxies for grievance inequality, political rights, ethnic polarisation and religious fractionalisation, yet these authors did not find enough empirical evidence that support the grievance hypothesis. One alternative, proposed initially by a small economic theory literature (Grossman, 1999) is that civil wars might be motivated purely by greed -income that can be obtained either during rebellion or from state revenues after victory.

On the contrary, Collier and Hoeffler (2004) support the idea that wars are more likely where low opportunity costs of fighting exist and high presence of natural resources facilitates looting and rent-seeking. Their quantitative indicators of this "opportunity" view are: financial viability, military viability and history. Rebel groups require important financial resources to build their organizations and purchase armaments. They also need to meet a "survival constraint" determined by relative size of their forces compare to the government ones and other given factors such as geography and population density. Finally, history matters: in a country with previous conflict experience, a legacy of hatred

could have been created that may trigger further conflict. Empirically, all these variables of opportunities explain to some extent the origin of conflicts, and are consistent with the economic theory of rebellion as greed-motivated.

Similar to this approach, Fearon and Laitin (2003) find evidence that supports the idea that the main factors determining civil wars are conditions that favour insurgency, not ethnic or religious differences or grievances per se. These conditions are mainly state weakness characterised by poverty, large population and instability.

More recently, Collier, Hoeffler and Rohner (2009) have stressed on greed-driven arguments and have proposed a broader definition of opportunities, so called the "feasibility hypothesis", which states that where civil war is feasible, it will occur.

Other alternative, presented by political scientists, offers an account of conflict in terms of purely grievance -the opposition to perceived or actual injustice. Our paper builds on and contributes to the literature on grievances as a cause of civil conflicts. Although the most influential studies give little attention to the grievance-motivation theory, works by Stewart (2008) and Cederman, Weidmann and Gleditsch (2011) have brought up the debate its pertinence. Stewart (2008) conceptualizes horizontal inequality by considering political, economic, social, and cultural dimensions explicitly<sup>2</sup>. Cederman, Weidman and Gleditsch (2011) use a new geocoded data on politically relevant ethnic group's settlement areas and find that both political and economic horizontal inequalities contribute to civil war. Their findings indicate that countries where some ethnic groups with wealth levels far from the country average are more likely to experience civil war. Ostby (2008) finds evidence that social horizontal inequality causes civil war and that economic dimensions are less important. Using data from sub-Saharan Africa Ostby, Nordas and Rod (2009) show that both economic and social group-level differences are the main drivers of domestic conflict.

There are some other explanations consistent with rational behaviour of why conflict occurs. Most of them appeal to a problem of asymmetric information. Brito and Intriligator (1985) suggest that war emerge as a costly means of communications. Fearon (1995) also suggests that, in settings of asymmetric information, war could be chosen, in a preemptive and costly move, as a signal of strength in front of others. Sanchez-Page

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<sup>2</sup>Political horizontal inequality refers to limited access to central decision-making authority within the state, the economic refers to the distribution of wealth among households. The social measures groups' uneven social access. The cultural captures group-level inequalities with respect to cultural policies and symbols.

(2004) uses this line of analysis and supposes that information about the adversaries can be transmitted on the battlefield before and during negotiations until a final settlement is reached or negotiations breakdown. Finally, Azam and Mesnard (2003) and Bester and Warneryd (2006) identify some conditions under the scenario of asymmetric information to show that the end of conflict is not possible. Its defining feature is large scale organised violence on the part of a rebel army, establishment is prohibitively expensive and extremely dangerous regardless of its agenda (Collier, Hoeffler and Rohner, 2009).

Finally, in terms of the instrument, this paper also contributes to the literature that relates natural disasters or climate variables and conflict. Some papers have studied the relationship between rainfall and conflict, suggesting that rainfall affects conflict only through its impact on income (Miguel et al 2004 and Bohlken and Sergenti 2010). Sarsons (2015) suggests that rainfall affects conflict through other channel, especially in those places where the existence of irrigation technology reduces the dependency of agriculture on rainfall. This paper proposes a different channel between rainfall shocks that lead to floods and conflict: land dispossessions that lead to the rise and persistence of peasant's grievances.

### 3 Historical Framework

Scholars agree with the statement that "appropriation, use and possession of lands have been the base of the origin and persistence of the armed conflict in Colombia" (Centro Nacional de Memoria Historica, 2013). Conflicts over land can be traced back as early as when land became a valuable and coveted asset during the first coffee expansion in the late 19th and early 20th century (Saffon, 2015)<sup>3</sup>. In response to the increasing international demands for agricultural products, public lands increasingly started to be allocated to private individuals and been exchanged in the land markets (Sanchez, Lopez-Uribe and Fazio, 2010).

The combination of high land values and low enforcement of property rights during coffee expansion (1920s) encouraged landowners to invade land occupied by squatters and peasant settlers, to extend their borders by encroaching upon occupied neighbouring lands. As a result, conflicts related to land dispossessions intensified during the

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<sup>3</sup>The export boom was mainly driven by coffee exports, which share rose from 12% in 1885 to 79% in 1929 (LeGrand, 1986).



1920s.

The law 200 of 1936 -Colombia's first land reform-, intended to increase the bargaining power of peasants and reduce the number of conflicts. The law made harder to expel the settlers. The law made tenants and sharecroppers more likely to contest the ownership rights of the landowners and claim the status of settler (Hirschman, 1963)<sup>4</sup>.

However, the law did not foresee the cost of judicial procedures for settlers to reclaim their lands and did not protect them against future dispossessions<sup>5</sup>. Colombian historians (Fajardo 2015; Molano 2015; LeGrand 1986; Berry 2002; Kalmanovitz and Lopez 2006) have suggested that the failure of the Law 200 to protect the settlers from the large landowners encroachment was a key factor for explaining the beginning of "La Violencia".

From 1948 to 1958, "La Violencia", the rural civil war in which the Liberals, with the assistance of the Communist Party, organized and armed themselves to fight the Conservative-led government, extended across Colombia and touched every social institution. Though its intensity varied among regions, violence was intense in Colombia. The number of casualties yet difficult to determine reached 135.000 deaths (Guzman et al 1980).

"La Violencia" was a rural conflict in which the lines of confrontation were defined by loyalties to multi-class parties. It confronted liberals against conservatives and did not seem to have had a class motivation. Rather than rich and poor fighting to each other, Conservatives attacked Liberals. The lack of a class basis or of any other pattern such as land tenure or level of education was an important characteristic of this type of civil conflict. Instead, traditional party loyalties underlay "La Violencia" (Oquist 1980; Hartlyn 1993).

Due to the weakness of the Conservative government, their leaders decided to initiate violence against liberals. Conservative Ospina Perez won the presidency in 1946 after liberals split their votes in two candidates. However, liberals retained their electoral majority in congressional and local elections and would likely regain the presidency in 1950. In addition, liberals were increasing their urban vote more rapidly than were

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<sup>4</sup>The law established the state's ownership for the lands which alleged owners could not exhibit titles and recognised the right of settlers to claim the ownership of land that they had possessed in good faith for more than five years (LeGrand, 1986).

<sup>5</sup>It did not ensure that the titles obtained by peasants would be immediately and gratuitously authenticated and registered, nor did it confer inalienable rights (Saffon and Sanchez, 2017)

conservatives and consolidated a powerful opposition of national level led by Gaitan, who was the front-runner in the next presidential elections (Weinert, 1966).

In order to offset the liberal urban majorities and retain power, conservatives appealed to rural political repression and exploited the political resentments from previous conflicts. Conservatives were forced to use rural mobilisation to counter liberal urban mobilisation. The spurring of rural violence by the conservatives attempted to achieve two goals: more conservative votes in rural areas and justify stronger national measures in the countryside that facilitated repression of liberals in urban areas (Weinert,1966).

However, rather than representing purely a partisan violence, this civil war can also be seen as the representation of a fundamental struggle -and ultimately failure- to impose a hegemonic regional project of rule predicated on notions of cultural, ethnic, and racial difference (Roldan, 2002). Between 1953 and 1955 the civil war gradually started changing its character, transforming from politically to economically motivated and from guerrilla to bandit in character (Bailey 1967; Dugas 2009). Moreover, "soviet republics" -areas governed by rebellious peasants- were formed and by 1960, communists succeeded in ideologizing these "republics" and turning them into Catroite strongholds (Bailey 1967).

Armed groups successfully established enclaves in which communist peasant guerrillas were located, once the civil war ended. One of these groups, led by the Communist leader Manuel Marulanda Velez, established the Marquetalia Republic. This was the first of the guerrilla controlled territories known as "Independent Republics"<sup>6</sup>. According to Molano (2000), such "republics" were communities based on "economic self-management and military self-defense" and were "independent" of the state control. These areas experienced widespread land conflicts in the 1920s and 1930s, intensive mobilisation efforts by liberals and Communists in the 1930s and 1940s and conservative repression during the 1950s<sup>7</sup>.

During the dictatorship of Rojas Pinilla (1953), the Communist party (PCC) was banned and the peasants enclaves were attacked, displacing peasants from their lands and homes who had to resettle in regions such as Meta, Caqueta and Tolima. These

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<sup>6</sup>Others include Sumapaz, Rio Chiquito, El Pato, Guayabero, Viota

<sup>7</sup>During the 1930s, the Colombian Communist Party (PCC) organise and politize peasants, especially in the Andean region in the departments of Tolima and Cundinamarca. Since its foundation, the party made organising the rural population a priority. The PCC played an important role at organising the peasant self-defence movement during the 1950s.

regions would become later the traditional strongholds of the FARC (Leech, 2011).

The PCC responded to the government attacks in a contradictory way. On one hand, the party publicly denounced armed struggle being waged by peasants as a way to support the guidelines of the twentieth congress of the Communist party of the Soviet Union that urged its party affiliates to seek non-violent roads to revolution. On the other hand, the party kept its support to the self-defense groups in the rural areas and in 1961, during its ninth congress, adopted a different position supporting armed struggle as a way to revolution.

In May of 1964, the Colombian military attacked the Marquetalia Republic in order to subject it under the control of the national government. This attack was also part of the Latin American Security Operation, known as Plan LASO, a US-backed initiative to combat growing communist influence in Colombia by using both military operations and civic action programs in the violent areas. After the attack, the guerrilla dispersed to other enclaves and months later re-organized as the "Southern Bloc", officially renamed as the Revolutionary Armed Forces of Colombia -FARC-, which was considered the military wing of the Communist party.

At the end of May 1964, the leaders Manuel Marulanda and Jacobo Arenas and their followers drafted and signed what is considered the founding document of FARC: "The agrarian program of the guerrillas", a document in which leaders from different communist guerrilla groups agreed upon a collective strategy of the political-military organization and formulated an agrarian reform programme. The document also created a more formal insurgent organization with the main goal of seizing power from capitalists and transform the Colombian society according to the Marxist doctrine.

The following year, the first guerrilla conference agreed to expand their field of operations and moved from the Andean highlands to the eastern part of the country to regions as Meta and Caqueta. In these areas, the peasants had colonized the land and had established small farms, while the Southern Bloc defended the community from both the military and the encroachment of large landowners who sought to expropriate their new landholdings (Molano, 2015).

At their origins, the guerrilla's goals were strictly related to an agrarian reform that would transform the social structure in the rural areas, in particular giving legal rights to the peasants that work the land. However, after the second conference in 1966, the group turned from a peasant self-defense group to a revolutionary guerrilla force that sought to expand operations over the whole country in order to overthrow the government (Leech,

2011).

In the 1970s, the arrival of the Conservative government of Misael Pastrana (1970-1974) meant the adoption of a rural development model that aimed to eliminate all obstacles to free investment in the rural areas of the country. This program worsened the economic conditions of the peasants, increased land concentration, undermined the small-scale peasant producers and increased peasant proletarianization.

At the same time, the repression of the national peasant movement (ANUC) and the expel of small tenants from their lands, brought near peasants that initially were outside the political-militar strife to the newborn guerrilla group FARC. During these years, FARC consolidated its influence, expanded to new areas and intensified the military training of its leaders.

According to Molano (2000), between 1970 and 1982, an "early conflict" stage, the FARC grew from a movement of 500 people to a small army of 3000, with a centralised hierarchical structure, military code, training school and political program. Later on, during the seventh conference in May 1982, the guerrilla changed its name to The Revolutionary Armed Forces of Colombia-People's Army (FARC-EP).

During the presidency of Belisario Betancurt (1982-1986), the FARC-EP embarked in a peace negotiation process started with the government. The initial goal of the government was to legalize the guerrilla's political activity and to transform their military force into a political party (Molano, 2000). This led to the foundation of the Patriotic Union (UP) in May 1985, a legal political party originally affiliated with the FARC and the communist party. The new party obtained significant parliamentary representation during the 1986 elections. However, from 1986 to mid 1990s, 5000 activists, elected officials, candidates and community organisers belonging to UP were assassinated (Pizarro, 2011).

Since the foundation of UP in 1985 and the Betancur's peace negotiations, a second stage of conflict started. This stage was characterised by an exacerbation of the conflict and the strengthened military capacity of FARC, financed with drug trafficking, extortion and kidnapping.

## 4 Data

The unit of observation in this analysis is the Colombian municipality. We use a data set of the 1120 municipalities which aggregates information for the period 1974-1985 mainly. Table ?? provides descriptive statistics.

We measure rebel activity as the number of violent events by the FARC and ELN guerrilla groups between 1964-1985. It includes the number of threats to civilians, attacks, assaults and extortions by these rural guerrilla groups. We add up the number of events to calculate a cumulative indicator of the rebel activity at municipal level.

The variable land dispossessions measures the number of land disputes or land dispossessions between 1890 and 1946. Land disputes are defined as dispossessions of targeted settlers of public lands who had weak titles over them. Between 1827 and 1930, there are records of 600 land protection petitions. These petitions referred to public lands susceptible of privatization and were made by settlers. In general, these conflicts did not occur in the open agrarian frontier where most of the lands were not only public but also vacant, but rather in the latifundia frontier where large tracts of public lands were not so far away from old settlements, facilitating the encroachment by nearby *haciendas*. Each event is defined as a peasant petition of land protection or land restitution to a local, state or national authority. We aggregate the number of grievances from 1918 to 1946, since after this year a civil war, known as "La Violencia", began and other type of dispossessions occurred, for example, when partisan guerrillas grabbed the lands of their opponents, making more difficult to us to disentangle the real cause of the dispossession -agrarian problem or partisan disputes-. Although this is the most complete source of land dispossessions for this time period, underreporting is likely due to information costs and/or threats by dispossessors or local authorities.

The variable floods is measured as the number of events between 1914 and 1946. We give each of these events the same weight and calculate our variable by adding up these events. In the sample, 28% of the municipalities experienced a flood during this period. We also include as a control the number of floods between 1947 and 1985.

The variable land reform is an indicator of the intensity of the previous agrarian reforms (1946-1964) and it is measured as the number of public lands allocated to peasants (less than 20 has). The variable "La Violencia" is the measure of the military feasibility and indicates the presence of the partisan guerrillas during the partisan and rural civil war between 1948 and 1958.

The revolutionary political support is measured as the political support to the radical left-wing parties. The variable is measure as the share of votes that the revolutionary liberal leader Jorge Eliecer Gaitan got during the presidential elections in 1946. We use this year's election since was the last presidential election before the civil war started and also because it was an election in which all radical left-wing parties -Communist, Socialist, Maoist and radical liberals- supported one candidate. As Green (2013) mentioned, it was clear that those regions where the Communist part was strong and had support where the same regions were the was a high presence of the liberals leftists.

We also include as controls proxies of coffee potential which are measured as the presence of coffee plantations and the number of coffee trees in a municipality in 1925. Other control variables are mainly geographical variables collected by Sanchez and Nunez (2000) and include measures of altitude, rain precipitation, erosion index, aptitude index, area and distance to the departmental capital.

## 5 Floods and Land Disposessions

The variable land disposessions suffers from measurement error as we only observe those petitions of land protections submitted to the authorities. In order to examine the impact of land disposessions in 1914-1946 on subsequent rebel activities, we use floods to instrument for land disposessions. Floods damage and destroy land and have a sizeable effects on production. These impacts include destruction of land records, physical damage on crops and animals and deletion of boundaries (United Nations 2010). Additional impacts include the loss of potential production due to disturbed flow of goods and services, loss of production capacities and the increased costs of production. Floods, for instance, make land unsuitable for agricultural production until the waters receded.

Floods may also prompt displacement. Floods increase the vulnerability of rural population and compel people to leave their homes and livelihoods just to survive (Brown and Crawford 2006). The displaced people in rural areas, mainly poor peasants, have to leave their communities in exchange for uncertainty in an attempt to survive. People displaced by floods are usually the most vulnerable and their survival depend upon leaving their home, facing uncertain future and often depended on assistance (United Nations, 2010).

The greater peasant's vulnerability during periods of floods facilitates the expansion of

large properties that are more resilient to this type of shocks. Large landowners usually do not rely entirely on one income source, have better knowledge of the government benefits and programs and more access to credits (Work and Woods 2015). The unequal impact of floods on peasants and landowners makes easier for the latter to use these shocks to take advantage of the vulnerability of the peasants. Landlords would extend the boundaries of their properties through encroaching peasant to increase their potential revenues, but also as a mechanism to reduce market competition and increase labor supply and political power.

Thus, we maintain that during periods of higher peasant vulnerability, such as floods, the weak enforcement of property rights facilitates the land dispossession by large landowners. We will test this hypothesis empirically. In this section, we explore the first stage relationship between floods and land dispossessions, conditional on neighbors-pair fixed effects. We also test whether floods are correlated with a number of important pre-characteristics and examine whether the size of the first stage relationship differs across sub-groups.

## 5.1 Explaining the instrument

There is an extensive literature that relates weather shocks and conflict. Most of it assumes that the main channel is income. Given that income is endogenous, most of these works use rainfall measures as a source of exogenous variation for income. Rainfall is a plausible instrument if the country is economically dependent on rain-fed agriculture. Changes in rainfall have effects on crops, thereby affecting rural incomes.

However, the principal assumption behind this instrument is that weather shocks such as rainfall only affect conflict through its impact on income. For example, Miguel et al (2004) use rainfall as an instrument of GDP in sub-Saharan Africa and their result show that lower income increases the probability of a civil war. Bohlken and Sergenti (2010) use a similar approach by instrumenting state-level GDP with rainfall and finding that relatively low level of rainfall increases the number of riots in a state in a particular year.

Other authors have used different channels to explain the relationship between weather shocks and conflict. Couttenier and Soubeyran (2014) propose global climate shocks as the main driver in the relationship between rainfall and civil war. In the case of India, Sarsons (2015) finds that the effect of rain shocks on conflict is stronger in areas down-

stream of dams where agriculture is more dependent on rainfall. Her results suggest that rainfall might affect conflict through other channels and caution about the use of rainfall as an instrument for income in regions that have irrigation technology and hence are less dependent on agriculture.

Our paper proposes a different mechanism that relates weather shocks and conflict: land dispossessions that lead to the rise of grievances that persist over time. First, we argue that floods are positive correlated with land dispossessions. These shocks have direct and indirect effects. One of them is the displacement of rural poor peasants who are vulnerable since they lack the proper infrastructure and good access to markets. The vulnerability of this group facilitates land encroachments by landowners who are more resilient to these shocks. This unequal impact of weather shocks on peasants and landowners result of the differences in vulnerability, facilitating the dispossession of the former lands by the latter.

Peasants' land dispossessions by landlords prompt the rise of grievances. During 1914-1946 there were more than 400 land protection petitions filled by peasants. Most of these dispossessions did not occur in the open agrarian frontier but near the latifundia frontier. In these petitions, peasants claimed that landlords dispossessed illegally from their land and subsequently legalize the dispossession. Most of these disputes took place through the illegal use of legal procedure or abuse of the law. We argue that both land dispossessions and the failure of the state to protect the peasants and to enforce their rights over their lands strongly contributed to the rise of peasants' grievances. The low capacity of the state to enforce the law promoted the recurrence of these disputes during decades contributing to the persistence of the peasant's grievances over time.

## 5.2 Identification Strategy

We test whether floods in the years leading up the organisation of guerrilla movements affected land dispossessions by running a municipality-pair regression. From the total number of municipalities in Colombia (1122), our analysis takes just the municipalities that experienced land dispossessions between 1914-1946 (192 municipalities) and all their directly adjacent neighbours (529 municipalities). We use a neighbor pair fixed-effect strategy, which allow to compare municipalities that are expected to share economic, political, social and institutional characteristics but that differ in having or not experienced land dispossessions.



We index the presence of land dispossession by  $d$  and non-land dispossessed municipalities by  $nd$ . This estimation compares pairs of adjacent municipalities of which one member had at least one land dispossession and the other member did not.

In order to examine the impact of land dispossessions (1914-1946) on subsequent rebel activity (1974-1985), we use floods presence to instrument for land dispossessions. The first stage relationship for each pair  $\tau = (d, nd)$ ,  $nd \in I(d)$  estimates whether the presence of floods during 1914-1946 affected land dispossessions:

$$\text{Land\_disposse}_d = \chi_1 D_d + \chi_2 x_d + \lambda_{d,nd} + \epsilon_d$$

$$\text{Land\_disposse}_{nd} = \chi_1 D_{nd} + \chi_2 x_{nd} + \lambda_{d,nd} + \epsilon_{nd}$$

where  $\lambda_{d,nd}$  are the neighbour-pair fixed effects, which capture unobservables common for the neighbor pair  $(d, nd)$ .  $\epsilon_\tau$  are  $\tau$ -specific unobservables.  $L_\tau$  is a dummy for land dispossession and  $D_\tau$  is a dummy of floods between 1914 and 1946 in municipality  $d$ .

We then use floods as an instrument for land dispossessions. We estimate the following linear probabilistic model for each pair  $(d, nd)$ :

$$\text{Rebel\_act}_d = \beta_1 \text{Land\_disposse}_d + \beta_2 x_d + \zeta_{d,nd} + \nu_d$$

$$\text{Rebel\_act}_{nd} = \beta_1 \text{Land\_disposse}_{nd} + \beta_2 x_{nd} + \zeta_{d,nd} + \nu_{nd}$$

where  $\text{Rebel\_act}_\tau$  is a dummy of the rebel activity of the FARC during the early stage of conflict (1974-1985),  $L_\tau$  is our dummy of land dispossession,  $x_\tau$  is a vector of covariates that include geographical variables, land reform measures and number of floods in the current period.  $\zeta_{d,nd}$  are the neighbour-pair fixed effects,  $\nu_\tau$  are  $\tau$ -specific unobservables.

Even after controlling for common unobservables across the pair of municipalities and their neighbors and control for some geographical and political variables, it is possible that  $\text{cov}(\text{Land\_disposse}, \nu) \neq 0$ . In this case, land dispossession  $\text{Land\_disposse}$  can be conditionally correlated with municipality-specific unobservables. If this is the case, our identification strategy must assume that conditional on the common unobservables for a pair of neighboring municipalities, the difference in land dispossession between each pair is due to exogenous shocks such as the experience of a natural disaster in one of them.

The instrumental variables approach requires the following two assumptions (Angrist, 2009). First, floods must be correlated with land dispossessions. If this correlation is only marginally different from zero, the estimates of the instrumental variable are unlikely to be informative. Second, the exclusion restriction states that floods must be uncorrelated with any other determinants of interest: in other words,  $corr(flood_i, \nu_i) = 0$ . It will obtain if floods is randomly assigned, conditional on neighbors-pair fixed effects, and if floods during 1914-1946 has no effect on rebel activity during 1970s and 1980s other than through the land dispossessions channel.

We use the extensive and intensive margins of the endogenous variable, land dispossessions. Although, the extensive margin might better capture sources of variation in the long-run that might affect the development of the rebel activity, the intensive margin of land dispossession gives the intensity of the effect of land dispossession on conflict.

### 5.3 Similarity of neighbours

Our strategy compares municipalities that experienced land dispossession with municipalities without land dispossessions. Following the matching methodologies that create pairs based on the observables characteristics, we need to show that the pairs of neighbours do not differ significantly on the relevant observable characteristics. We estimate a standards OLS neighbour-pair fixed effect regression to show the relationship of different observables characteristics on land dispossession. In our case, presence of floods could be determined by geographical conditions.

$$G_d = \phi + \beta_2 F_d + \delta_{d,nd} + \epsilon_d$$

$$G_{nd} = \phi + \beta_2 F_{nd} + \delta_{d,nd} + \epsilon_{nd}$$

In equation (X),  $G_{g,i}$  is any geographical variable such as altitude, soil fertility, land flatness or erosion. Table ?? shows no difference between the different pairs of neighbors when we take into account observable characteristics such as altitude and land flatness index. The only geographical variable that seems to differ between neighbors is soil fertility index.

### 5.4 Results

Table ?? documents the first stage relationship between 1914-1946 floods and land dispossessions. Robust standard errors are in parentheses and all columns include

neighbors-pair fixed effects. Column 1 and 2 uses a dummy and column 3 and 4 uses the log of of land dispossessions. In both cases, the correlation between floods and land dispossessions between 1914-1946 is statistically significant at the one percent level, with a somewhat stronger relationship in the log case without controls (first stage F-statistic of 201.78) than when we include controls (first stage F-statistic of 23.01).

The introduction of geographical controls reduces the magnitude of the correlation from 0.61 to 0.23 in the dummy case and from 0.32 to 0.13 in the log case, but the estimates remain highly significant. Column 2 indicates that municipalities that experienced floods during 1914-1946 have a 17% higher probability of experiencing land dispossessions during the same period. Overall, the first stage results show that the presence of floods is associated with a 15-17% higher likelihood of having land dispossessions during the same period (1890-1946).

The instrumental variable approach will estimate the impact of land dispossessions on rebel activities for those municipalities that were induced by a flood to experience land dispossessions. We can not observe whether landlords in a given municipality grabbed a peasant's land in response to floods, Table ?? sheds light on which sorts of municipalities were influenced by the floods by examining the size of the first stage for different sub-samples.

Column 1 reports the baseline first stage relationship from the full sample, reproducing column 2 of Table ?. Column 2 limits the sample to municipalities in which the share of land owners working the land is higher than the median share, and column 3 limits the sample to municipalities that are below the median. The coefficient on floods in the full sample is 0.399 (s.e = 0.054). This coefficient is 0.453 for places above the median and 0.338 below the median. Both are statistically different than zero, and they are not statistically distinguishable from each other.

Columns 4 and 5 divide the sample by whether a municipality had a higher number of land credits during the years 1958-1962 than the median municipality (which is equal to 0). The correlation between floods and land dispossessions is statistically significant in both sample and the size of coefficients are very similar. Next, column 6 and 7 divide the sample by whether the municipality had a higher daily wage in 1968 relative to the median municipality. The relationship between floods and land dispossessions is large and highly statistically significant for both samples. Finally, column 8 and 9 divide the sample by whether the municipality had a higher number of public land allocations to peasants between 1930-1960 than in the median municipality. The correlation between

land dispossessions and floods is statistically significant in both sample but is substantially larger in the municipalities the higher land reform, at 0.185, than in the lower land reform.

Overall, these results indicate that floods led to land dispossessions in municipalities with a wide variety of initial characteristics, and that this relationship was particularly pronounced in municipalities where peasants received more public lands.

Identification requires floods between 1914 and 1946 to be as if randomly assigned. In this sense, in the absence of differences in floods during these years, municipalities that suffered floods would not have been different on average from municipalities that experienced floods. To shed light on the plausibility of this assumption, table ?? regresses a variety of outcomes from the agricultural census in 1960, the Population census in 1964 and the agricultural census in 1970 on floods, measured as a binary variable during 1914-1946. The sample sizes are different across outcomes, as there is no information for all municipalities in the different census.

For comparison purposes, column 1 reports the first stage relationship between floods and land dispossessions from table ?. The dependent variable in column 2 is the percentage of the municipal population that read and write in 1964. The dependent variable in column 3 is the log of the total number of houses in 1960. The dependent variable in column 4 is the log of the total number of properties that had irrigation in 1960. The dependent variables in column 5 and 6 are the km of roads and railroads in 1970.

The correlations between these outcomes and floods are all statistically insignificant. The magnitudes of these relationships also tend to be smaller, relative to the sample mean, than the magnitude of the relationship between floods and land dispossessions.

## 6 Rebel activity

This section uses an instrumental variable approach to test whether land dispossessions affected the consolidation of guerrilla groups in the years following the Cuban revolution and the civil war "La Violencia". The most important guerrilla movement in Colombia, FARC, formed in 1964 as the military wing of the Colombian Communist Party. In the late 1960s, the FARC was a relative marginal force with internal divisions

but by the end of 1970s, social and political support for the guerrillas peaked, nourished by the lack of space for political participation. By 1983, the FARC had more than eighteen fronts and added the title of "the people's army" to their name. We find that land dispossessions were concentrated in municipalities where FARC was stronger.

The estimates we have presented so far assume that any difference in the presence of historical land dispossession (1914-1946) across municipalities is conditionally uncorrelated with unobservables that vary within the pairs land dispossession/non land dispossession pair. We exploit the exogenous variation in the presence of natural disasters during the export boom (1914-1946) as an instrument for the presence of historical land dispossession during this period. Table ?? tests whether land dispossessions between 1914-1946 influenced the rebel activity of FARC during the years that the movement consolidated (1974-1985), using both the dummy and the log of FARC rebel activities as the dependent variable. Column 2 and 4 report the IV estimates, and for comparison column 1 and 3 report the OLS estimates. The presence of floods during 1914-1946 is used as the instrument. All the estimates control for geographical variables and the presence of floods during the following decades (1947-1985).

Overall, Table ?? provides evidence that land dispossessions during the export boom (1914-1946) led to increased FARC rebel activities during the early stage of conflict. The IV estimates in column 2 indicate that the presence of land dispossession produced a 61% percentage point (s.e=0.122) change in the probability that a rebel activity occurs, relative to the sample mean of 26.5 percent. Similarly, column 4 document that the presence of land dispossession produced a 81% change in the number of rebel activities.

Table ?? documents the results when we divide the sample depending on the land reform intensity. Column 1 reports the baseline second stage relationship from the full sample. When we focus attention on municipalities where land reform -number of public lands allocated to peasants- between 1961 to 1970 was above the median, the estimated effect is 96.5 percentage points, and this effect is statistically significant at the one percent level. In contrast, the impact of land dispossession is smaller and not statistically different from zero in the sample below the median land reform.

The process of claiming the titles for the lands the settlers occupied was not easy, since it was costly and landowners used their local influences to prevent them from doing so. Cultivated lands were targeted because lands were only valuable and ready for production after they had been cleaned from shrubs and tilled, and because seizing them from cultivators was the only way of ensueing their labor. The strategy used by

landowners was to wait until the settlers prepared the land for cultivation and thereby increased its value; then claim it and force settlers to become hacienda tenants under the threat that they would otherwise be evicted without compensation.

The IV estimates are larger than the OLS estimates. There are different reasons to explain this result. First, because of measurement error in the land dispossession variable. This reason is plausible since we only have information about the reported cases of land dispossessions that peasants reported during 1914-1946. It is likely that some cases were not reported by peasants since this could be an expensive process in terms of money and time.

Second, because of omitted variables bias in the OLS specification. This is also likely since we are mainly controlling for geographical variables and some political or land-related variables but there might other variables that could explain the land dispossessions that we are not capturing in our OLS specification.

Third, because the IV is measuring a local average treatment effect on municipalities induced to land dispossession by floods whereas the OLS is just measuring a correlation between the FARC rebel activity and the land dispossession across the entire sample. When we examine the estimates across different sub-samples (see Table ??), the land dispossession coefficient is not substantially different in the different sub-samples. We do not find any significant difference across subsamples. Finally, because floods violates the IV exclusion restriction. This is unlikely since the instrument is uncorrelated with different pre-determined characteristics.

## 7 Mechanisms

Using the analysis of mediation methodology proposed by Dippel et al 2017, we decompose the total effect of land dispossessions (estimated through the instrumental variable) into the effect produced by those dispossessions in isolation, on one hand, and the indirect effect produced through the mediating variable, on the other hand.

For the mediators we focus on the military feasibility and the political support to rebellion. The military feasibility has been previously proposed by Collier, Hoeffler and Rohner (2009) as a factor that might trigger conflict. Rebel groups need to have military training and capacity in order to counteract the state actions and consolidate their territory. We use as a proxy of military feasibility being exposure to the civil

war "La Violencia" during 1948-1958. The civil war was a result of discord between Colombia's two political parties, Conservative and Liberals, that triggered a breakdown of existing institutional structures and a partial collapse of the state. As a result of the chaotic environment and of the provisional access to military weaponry, liberal and conservative peasants organize self-defense groups leading to the formation of different guerrilla movements. The variable "La Violencia" is a binary variable that takes value 1 if the municipality experienced a violent event during the civil war and 0 otherwise.

The political support to rebellion is based on the guidance and support that the Communist Party gave to movements and peasants leagues in rural areas in Colombia. In particular, after the Cuban Revolution the political approval of the rebel groups by the Communist Party was indispensable. Although the influence of this party seems unobservable nationwide since it coincides with a period of apparent political exclusion (the National Front); the impact and penetration of the communist ideology was higher in rural areas and it was latent in particular after the revolution in the island ended. For instance, FARC was considered the military wing of the Colombian Communist Party. We then use as a proxy of the political support to rebellion the share votes that the radical left-wing parties obtained during the presidential election in 1946, when all radical parties (Communist, Maoist, Socialist and radical liberal) supported one candidate.

We divide the estimation of the mediation effect in two steps. First, we estimate the effect on land dispossessions on the mediators,  $M$ : La Violencia and Communist support, our two proxies for military feasibility and political support to rebellion using the instrumental variable approach. We then estimate the following equation:

$$M_d = \theta_1 Land\_disposse_d + \theta_2 x_d + \delta_{d,nd} + \mu_d$$

$$M_{nd} = \theta_1 Land\_disposse_{nd} + \theta_2 x_{nd} + \delta_{d,nd} + \mu_{nd}$$

where  $M$  is either a dummy for the exposure to the civil war La Violencia or the share of votes that the Communist parties obtained during the presidential elections in 1946.  $\theta_1$  is our estimator for the effect of land dispossessions on these mediators. Land dispossessions  $Land\_disposse$ , control variables  $x$  and instrument  $Floods$  are the same as the ones used to estimate the effect of land dispossessions on rebel activity in the original equation. We just replace the rebel activity with the mediators as dependent variable.

The OLS results are displayed in column 1 and the IV results in column 2 of Table ???. Panel A reports the estimates when the mediator is the Communist vote share in 1946 and Panel B when the mediator is the binary variable of exposure to civil war (1948-1958). Each panel also presents the first stage results.

Land dispossession during the export boom (1914-1946) has a significantly positive effect on the Communist support and on the exposure to civil war. The presence of land dispossessions generates an increase of 23 percentage points in vote share that communists obtained in 1946. Similarly, the presence of land dispossessions between 1914-1946 produce a 41 percentage point change in the probability of participating in the civil war during 1948-1958. These results are consistent with the qualitative literature that has highlighted the role of peasant grievances as a mechanism to capture support for revolutionary causes in the rural areas.

We also decompose the effect of land dispossessions on the mediators by intensity of land reform during 1961-1970. Table ?? reports the IV results for different samples. Column 1 documents the results for the full sample, column 2 for the sub-sample that includes only municipalities that experienced higher land reform during the years 1961-1970 than the median and column 3 for the pairs that had low land reform on the same years. The impact of land dispossessions is not statistically different from zero in both sub-samples. However, when we focus only on those municipalities that experienced high land reform intensity, the estimated effect is 30 percentage points, and this effect is statistically significant at the one percent level. In contrast, the impact of land dispossessions on the communist support on those municipalities that experienced low intensity of land reform is negative and not statistically significant.

We are interested in understanding to what extent the communist support and the participation in civil war mediate the causal relationship between land dispossessions and FARC rebel activity. The next step is to identify the causal mechanism underlying the effect of land dispossessions on FARC rebel activities. For this purpose, we need to decompose the total effect of land dispossessions on FARC rebel activities (estimated by  $\beta_1$ ), into an "indirect" effect that works through the two mediators -military feasibility and political support to rebellion- and a residual "direct" effect.

To decompose  $\beta_1$  into a direct and an indirect effect of land dispossessions on FARC rebel activity, we also need to estimate the effect of the mediators ( $\gamma_2$ ) and land dispossessions ( $\gamma_1$ ) on the rebel activities when we include as controls the mediators. We run two different instrumental variable regressions. The first stage now uses as dependent



variable the mediators and the original independent variable is instrumented and takes the following form:

$$M_d = \alpha_1 Floods_d + \alpha_2 Land\_disposse_d + \alpha_3 x_d + \delta_{d,nd} + \eta_d$$

$$M_{nd} = \alpha_1 Floods_{nd} + \alpha_2 Land\_disposse_{nd} + \alpha_3 x_{nd} + \delta_{d,nd} + \eta_{nd}$$

where  $M$  is any of the both mediators: dummy of La Violencia or Communist support in 1946. These equations differ from the preliminary first stage equation in that land dispossession is now included.

The second stage equation uses as dependent variable the outcome of interest, *Rebel\_act*, the mediator is instrumented and the original independent variable is included as a control. We estimate the following equation:

$$Rebel\_act_d = \gamma_1 Land\_disposse_d + \gamma_2 M_d + \gamma_3 x_d + \zeta_{d,nd} + \xi_d$$

$$Rebel\_act_{nd} = \gamma_1 Land\_disposse_{nd} + \gamma_2 M_{nd} + \gamma_3 x_{nd} + \zeta_{d,nd} + \xi_{nd}$$

We are now interested in the casual effect of the mediators  $M$  on the rebel activity instead of the effect of land dispossessions on the rebel activity. Table ?? reports the estimates of the second stage. Estimate  $\gamma_2$  gives the effect of the mediators military feasibility and political support to rebellion on rebel activity over the period 1974-1985. The variable  $M$  is either the communist vote share in 1946 or a dummy for exposure to the civil war "La Violencia". Results indicate that increases in the communist vote share or having participated in the civil war produce a positive change in the probability that a municipality experience a FARC rebel event.

The indirect effect of the independent variable on the outcome produced through the mediator is obtained by multiplying the IV estimator of the independent variable on the outcomes in the second regression. The direct effect produced by the independent variable is the estimator of that variable (used as control) in the second regression. The total effect should be equal to the sum of the indirect and the direct effects. This implies that the effect of land dispossessions-military feasibility and land dispossessions-political support to rebellion on rebel activity, that is the mediated effect of *Land\_disposse* on *Rebel\_act*, can be derived by multiplying  $\hat{\gamma}_2$  by  $\hat{\theta}_1$ . This is equivalent to combine table ?? with column 2 in Table ?. The implied magnitude of the indirect effect  $\hat{\gamma}_2 * \hat{\theta}_1$  is

0.773 (3.318\*0.233) in the case of the communist support and 0.683 (3.318\*0.233) in the case of presence of La Violencia.

The direct effect of land dispossession on FARC rebel activities that is unrelated to communist support or participation in the civil war is given by  $\hat{\gamma}_1$  and is equal to -0.155 and -0.065 respectively in table ???. This direct effect on rebel activity is in fact moderating. Disregarding the communist support or the presence of civil war, increasing in land dispossessions decreases the presence of rebel activities. This estimate is significant in the case of the Communist support (Panel A) and not statistically significant in the case of the La Violencia (Panel B). The estimated effects of -0.155 and -0.065 implies that direct effect is almost null compared to the total effect of 0.617 reported in table ???.

The mediation analysis shows that the total effect of land dispossessions on FARC rebel activities in the early stage of conflict consists of a large effect that runs through the communist support and La Violencia mechanisms. However, we should be cautious about the interpretation on the size of the coefficients since the endogenous variable (land dispossession) has measurement error. These results also indicate that  $\hat{\gamma}_2 * \hat{\theta}_1$  is larger than  $\beta_1$ , which means that the communists and exposure to violence have stronger implications for the consolidation of FARC during the following decades than just a simple study of the land dispossession on FARC activities.

## 8 Concluding remarks

This study identifies how peasants' land dispossessions during the export boom 1914-1946 affected subsequent guerrilla movement organization and consolidation by using floods as an instrument for land dispossessions, conditional on municipality-pair fixed effects and geographical controls. Instrumental variables estimates document that municipalities that had land dispossessions experienced substantially more FARC rebel activities in the years following the civil war La Violencia.

Based on quantitative and historical evidence, we hypothesize that the rise of peasant grievances after experiencing land dispossessions during the export boom period facilitated the consolidation of the rural guerrilla movement FARC. But the manifestation of grievances in a guerrilla could only be manifested after peasants had access to military armies and with the support of a revolutionary political party.

This study highlights the potential agrarian causes of the civil war that Colombia lived for more than 30 years and supports a view of history in which grievances persist over time and manifest when there is a window of opportunity to organize and transform these grievances into a material revolutionary representation that will challenge the status quo.

Land Dispossession (1914-1946)				
	Dummy		Log	
	(1)	(2)	(3)	(4)
Floods (1914-1946)	0.617*** (0.048)	0.399*** (0.054)	0.600*** (0.042)	0.326*** (0.068)
Floods (1947-1985)		0.137** (0.054)		0.188*** (0.029)
Distance to Capital		-0.001 (0.001)		-0.001 (0.001)
Altitude		-0.022 (0.024)		-0.039 (0.026)
Area		0.228*** (0.031)		0.205*** (0.033)
Soil Fertility Index		0.033 (0.030)		0.006 (0.032)
Land Flatness Index		-0.001 (0.013)		-0.014 (0.017)
Erosion Index		-0.009 (0.031)		-0.025 (0.032)
Population 1960		0.000* (0.000)		0.000 (0.000)
Land Reform 1946-1964		0.002*** (0.000)		0.005*** (0.000)
F-test	161.9	53.69	201.78	23.01
Observations	1758	1758	1758	1758
Number of pairs	879	879	879	879

Notes: \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

Table 1: **Descriptive Statistics**

	All municipalities			With Land Disposition			Land Disposition neighbors			
	Obs	Mean	Std.Dev	Obs	Mean	Std.Dev	Obs	Mean	Std.Dev	p-value for t-test
Floods										
Floods 1914-1946 (dummy)	1120	0.28	0.45	192	0.39	0.49	529	0.25	0.43	0.00
Floods 1947-1985 (dummy)	1120	0.79	0.41	192	0.90	0.76	529	0.79	0.41	0.00
Geographic Characteristics										
Distance to Capital	1120	81.52	60.57	192	88.34	65.84	529	80.28	58.23	0.10
Altitude (log)	1120	6.22	1.73	192	5.60	2.00	529	6.07	1.78	0.00
Area (log)	1120	5.83	1.27	192	6.28	1.13	529	5.90	1.17	0.00
Soil Fertility Index	1120	2.76	1.16	192	2.94	1.03	529	2.84	1.19	0.26
Land Flatness Index	1120	5.71	2.04	192	6.02	1.98	529	5.88	2.04	0.35
Erosion Index	1120	4.06	1.04	192	4.21	0.94	529	4.10	1.03	0.25
Average rainfall 1980-2010 (log)	1120	7.50	0.53	192	7.54	0.51	529	7.53	0.54	0.82
Population 1960 (thousands)	1120	10.49	36.53	192	25.54	83.47	529	7.82	11.34	0.00
Other controls										
Gaitanista Majority (dummy)	1120	0.22	0.42	192	0.41	0.49	529	0.19	0.40	0.00
Land Reform 1946-1964 (plots)	1120	4.68	29.5	192	25.10	66.6	529	0.46	4.40	0.00

*Notes:* test shows the t-statistic of the mean test.

Table 2: **Compliers**

Dependent Variable is land dispossession. Sample is:										
	Land Dispossessions		Land Owners		Credit		Wage		Land reform	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Floods (1914-1946)	0.399*** (0.054)	0.453*** (0.130)	0.338*** (0.112)	0.490*** (0.091)	0.435* (0.230)	0.497*** (0.082)	0.442*** (0.147)	0.497*** (0.104)	0.312*** (0.114)	
Observations	1758	344	342	416	416	590	268	500	524	
Number of pairs	879	172	171	208	208	295	134	250	262	

Floods is a binary variable that takes value 1 if between 1914-1946 a municipality experienced a flood. All columns include geographical control variables and neighbors-pair fixed effect. The dependent variable in column 1 is land dispossession, a dummy equal 1 if the municipality experienced land dispossession during 1914-1946 and 0 otherwise. The sample are defined in the column headings. Column 1 examines the full sample. Municipalities in which the share of land owners working on the land is above the median is examined in column 2, whereas municipalities that are below the median are examined in column 3. Municipalities that had a higher number of bank credits (1958-1962) than the median municipality are examined in column 4, whereas those that are below the median are examined in column 5. Municipalities that had a higher wage in 1968 are examined in column 6, whereas municipalities that had lower wage than the median are examined in column 7. Municipalities in which the number of public land allocation to peasants were above the median between 1930-1960 are examined in column 8, whereas those below the median are examined in column 9. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

Table 3: **Placebo Tests**

	Land Dispossessions	Literate Rate	Housing	Irrigated Lands	Roads	Railroads
	(1)	(2)	(3)	(4)	(5)	(6)
Floods (1914-1946)	0.399*** (0.054)	0.019 (0.037)	0.010 (0.048)	0.171 (0.230)	0.024 (0.180)	0.211 (0.196)
F-test	112.9					
Observations	1758	1166	1131	775	873	344
Number of pairs	879	786	696	552	661	257
Mean Dep.Var	0.28	0.71	7.29	2.35	9.32	9.35

Floods is a binary variable that takes value 1 if between 1914-1946 a municipality experienced a flood. All columns include geographical control variables and neighbors-pair fixed effect. The dependent variable in column 1 is land dispossessions, a dummy equal 1 if the municipality experienced land dispossessions during 1914-1946 and 0 otherwise. The dependent variable in column 2 is the literate rate in 1964 (in percentage), in column 3 is the log of number of housing in 1960, in column 4 is the log of the number of irrigated lands in 1960, in column 5 is the log of km of roads in 1970 and in column 6 is the log of the km of railroads in 1970. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

Table 4: **Similarity of neighbors**

	Altitude (log)	Land Flatness Index	Soil fertility index
Floods 1914-1946 (log)	-0.081 (0.055)	0.027 (0.085)	0.156*** (0.047)
Observations	1758	1758	1758
R-squared	0.000	0.000	0.012
Number of pairs	879	879	879

*Notes:* \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.



Table 5: **Effects of Land dispossession (1914-1946) on FARC Rebel Activity (1974-1985)**

	Dummy		Log	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Land Dispossession	0.074*** (0.018)	0.617*** (0.122)	0.003 (0.034)	0.820*** (0.240)
Floods (1947-1985)	0.147*** (0.031)	0.058 (0.049)	0.192*** (0.025)	0.022 (0.066)
Observations	1758	1758	1758	1758
Number of pairs	879	879	879	879

Table 6: **Effects of Land dispossession (1914-1946) on FARC Rebel Activity (1974-1985)**

	Dummy		
	Full Sample (1)	More Land Reform (2)	Less 1961-1970 (3)
Land Dispossession	0.617*** (0.122)	0.965*** (0.281)	0.790 (0.965)
Floods (1947-1985)	0.058 (0.049)	0.026 (0.126)	0.037 (0.171)
Observations	1758	620	378
Number of pairs	879	310	189

Table 7: **Effects of Land dispossession (1914-1946) on Communist Support and Exposure to "La Violencia"**

	OLS	IV
	(1)	(2)
Panel A: Communist vote share 1946 (%)		
Land dispossessions (dummy)	0.069*** (0.009)	0.233*** (0.050)
First Stage		
Floods 1914-1946 (dummy)		0.399*** (0.061)
F-test of excluded instruments		42.27
Panel B: La Violencia (dummy)		
Land dispossessions (dummy)	0.085*** (0.019)	0.416*** (0.104)
First Stage		
Floods 1914-1946 (dummy)		0.399*** (0.061)
F-test of excluded instruments		42.27
Observations	1758	1758
Geographical controls	Yes	Yes
Number of Pairs	879	879

Notes: \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

Table 8: **Effects of Land dispossession (1914-1946) on Communist Support and Exposure to "La Violencia" -Sub sample**

	Full Sample (1)	More Land Reform (2)	Less 1961-1970 (3)
Panel A: Communist vote share 1946 (%)			
Land dispossessions (dummy)	0.233*** (0.050)	0.306*** (0.102)	-0.189 (0.321)
First Stage			
Floods 1914-1946 (dummy)	0.399*** (0.061)	0.370*** (0.098)	0.150 (0.151)
F-test of excluded instruments	42.27	14.19	0.98
Panel B: La Violencia (dummy)			
Land dispossessions (dummy)	0.416*** (0.104)	0.091 (0.181)	0.546 (0.708)
First Stage			
Floods 1914-1946 (dummy)	0.399*** (0.061)	0.370*** (0.098)	0.150 (0.151)
F-test of excluded instruments	42.27	14.19	0.98
Observations	1758	620	378
Geographical controls	Yes	Yes	Yes
Number of Pairs	879	310	189

Notes: \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.

Table 9: **Effects of Land dispossession (1914-1946) and Communist Support and Exposure to "La Violencia" on FARC Rebel Activity**

Rebel Activity 1974-1985 (dummy)	
IV	
(1)	
Panel A: Communist vote share 1946 (%)	
Communist vote share 1946 (%)	3.318*** (0.979)
Land dispossessions (dummy)	-0.155** (0.076)
First Stage	
Floods 1914-1946 (dummy)	0.069*** (0.017)
Land dispossessions (dummy)	0.061*** (0.009)
F-test of excluded instruments	18.27
Panel B: La Violencia (dummy)	
La Violencia (dummy)	1.642*** (0.476)
Land dispossessions (dummy)	-0.065 (0.053)
First Stage	
Floods 1914-1946 (dummy)	0.139*** (0.037)
Land dispossessions (dummy)	0.069*** (0.020)
F-test of excluded instruments	14.22
Observations	1758
Geographical controls	Yes
Number of Pairs	879

*Notes: \*\*\*p<0.01, \*\*p<0.05, \*p<0.1.*

Figure 1: Land Dispossessions 1914-1946 by year

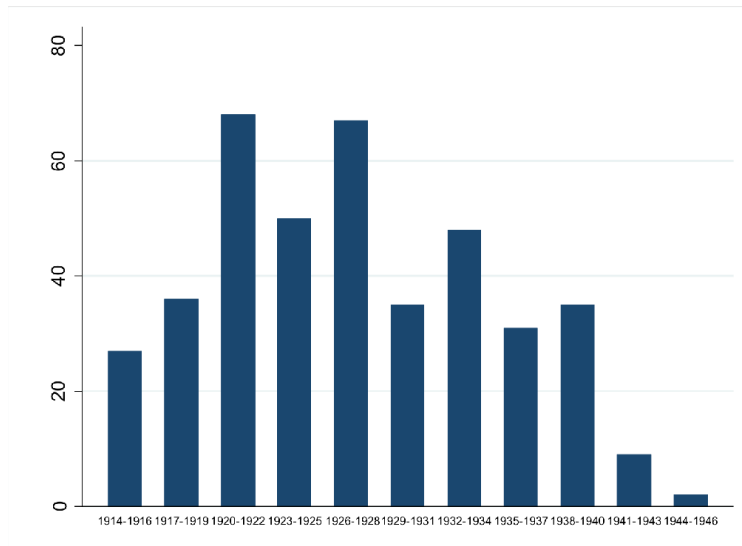
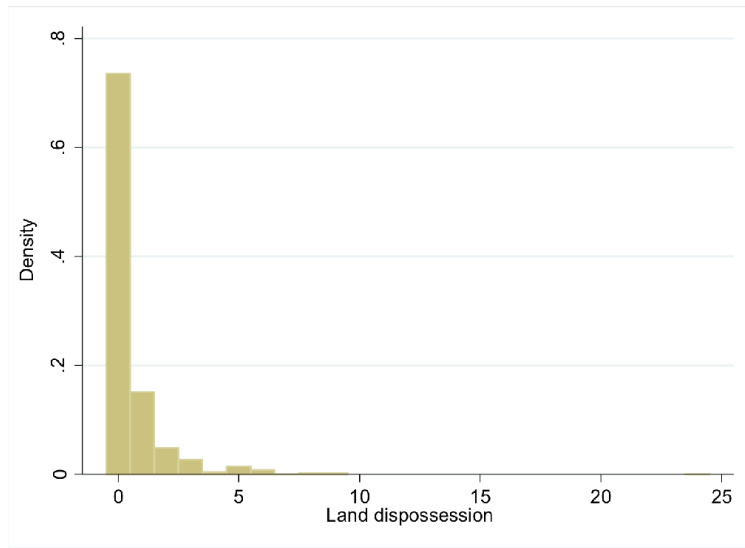


Figure 2: Land Dispossessions 1914-1946 Intensity Distribution



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